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SIMATIC

Products for Totally Integrated Automation

Catalog ST 70

Edition 2019

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Related catalogs

SIMATIC HMI / PC-based Automation ST 80/ST PC
Human Machine Interface Systems
PC-based Automation

E86060-K4680-A101-C6-7600



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SIMOTION
Equipment for Production Machines

E86060-K4921-A101-A4-7600



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SIMATIC ST PCS 7
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Vol. 1: System components

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Siemens TIA Selection Tool
for the selection, configuration and ordering of TIA products and devices

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SIMATIC ST 400
SIMATIC S7-400 advanced controller

PDF (E86060-K4678-A151-A1-7600)



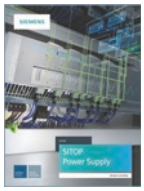
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TIA Selection Tool

The smart configurator for the entire Siemens automation portfolio



Prime reasons for the TIA Selection Tool

Quick, easy and secure

Components can be selected, configured and ordered quickly, easily and securely from the Siemens automation portfolio

Intelligent

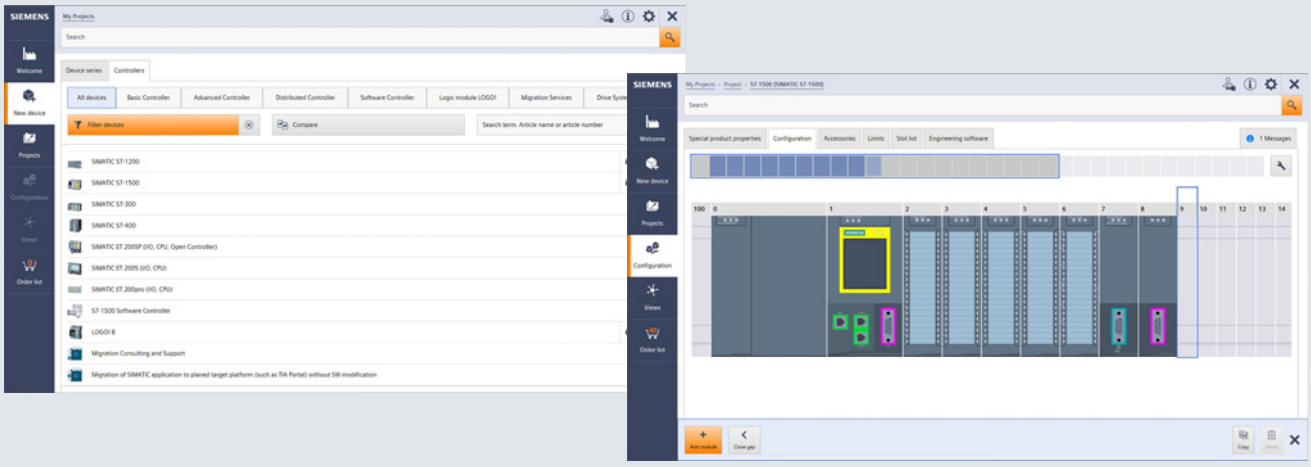
Intelligent selection wizards check the compatibility of the configured components and enable error-free ordering

Clear

Required modules, devices and networks are automatically generated and clearly compared to one another

Time-saving

Time savings of 80% in design – thanks to ease of use and intelligent support



The TIA Selection Tool is a completely paperless solution.

Download it now:

www.siemens.com/tst

For more information, scan the QR code

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Products for Totally Integrated Automation

SIMATIC



Catalog ST 70 · 2019

Supersedes:
Catalog ST 70 · 2017
Catalog News ST 70 N · 2018

Refer to the Industry Mall for current updates of this catalog:
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The products contained in this catalog can also be found in the Interactive Catalog CA 01.
Please contact your local Siemens branch.
The catalog can also be downloaded at:
www.siemens.com/automation/ca01

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Digital Enterprise

The building blocks that ensure everything works together perfectly in the digital enterprise

Digitalization is already changing all areas of life and existing business models. It is placing greater pressure on industry while at the same time creating new business opportunities. Today, thanks to scalable solutions from Siemens, companies can already become a digital enterprise and ensure their competitiveness.



Industry faces tremendous challenges

Reduce time-to-market

Today manufacturers have to bring products to market at an ever-increasing pace despite the growing complexity of these products. In the past, a major manufacturer would push aside a small one, but now it is a fast manufacturer that overtakes a slow one.

Boost flexibility

Consumers want customized products, but at a price they would pay for a mass-produced item. That only works if production is more flexible than ever before.

Improve quality

To ensure a high level of quality while meeting legal requirements, companies have to establish closed quality loops and enable the traceability of products.

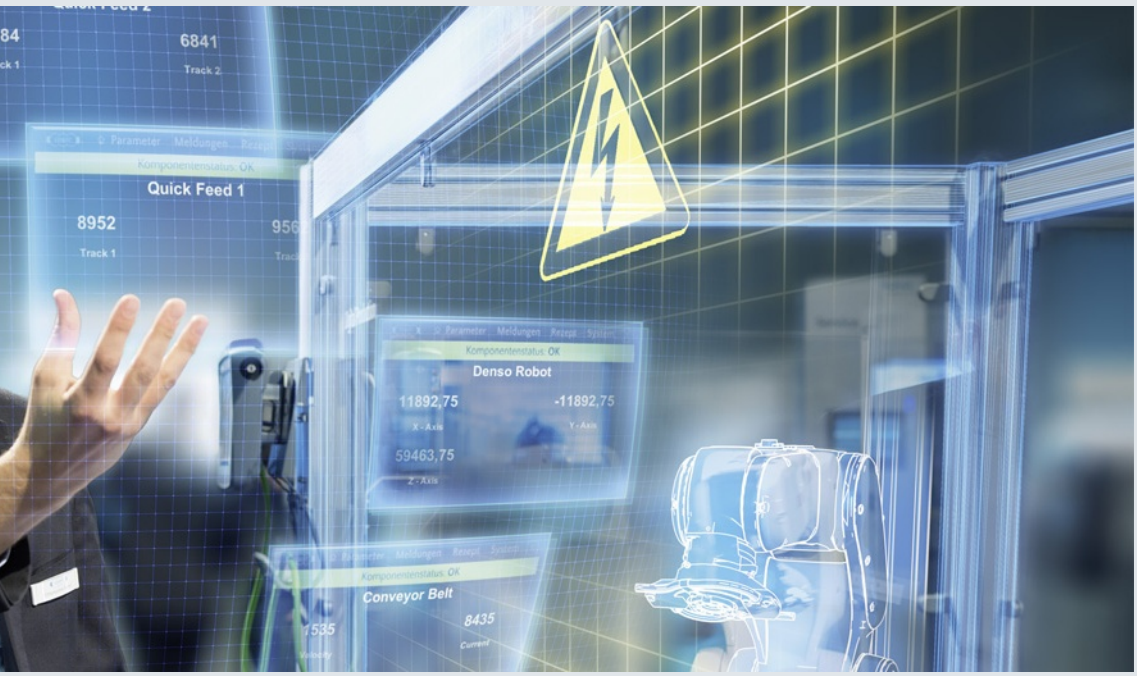
Boost efficiency

Today the product itself needs to be sustainable and environmentally friendly, while energy efficiency in production has become a competitive advantage.

Increase security

Increasing networking escalates the threat to production facilities of cyberattacks. Today more than ever, companies need suitable security measures.

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The digital enterprise has already become a reality

To fully benefit from all the advantages of digitalization, companies first have to achieve complete consistency of their data. Fully digitally integrated business processes, including those of suppliers, can help to create a digital representation of the entire value chain. This requires

- the integration of industrial software and automation,
- expansion of the communication networks,
- security in automation,
- and the use of business-specific industrial services.

MindSphere

The cloud-based open IoT operating system from Siemens

With MindSphere, Siemens offers a cost-effective and scalable cloud platform as a service (PaaS) for the development of applications. The platform, designed as an open operating system for the Internet of Things, makes it possible to improve the efficiency of plants by collecting and analyzing large volumes of production data.

Totally Integrated Automation (TIA)

Where digitalization becomes reality

Totally Integrated Automation (TIA) ensures the seamless transition from the virtual to the real world. It already encompasses all the necessary conditions for transforming the benefits of digitalization into true added value. The data that will form the digital twin for actual production is generated from a common base.

Digital Plant
Learn more about the digital enterprise for the process industry
www.siemens.com/digitalplant

Digital Enterprise Suite
Learn more about the digital enterprise for the discrete industry
www.siemens.com/digital-enterprise-suite

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Introduction



1/2 **Totally Integrated Automation** – **Future inside**

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Totally Integrated Automation – Future inside

Siemens helps machine and plant manufacturers as well as plant operators to implement the digital enterprise with approaches that have been proven in practice (TIA use cases).

Companies around the world are looking for new ways to harness the full potential of digitalization. Siemens offers a unique range of products and services that allow companies of all sizes to implement their digital transformation gradually. Totally Integrated Automation provides three digital twins, representing the product, production, and the performance of product and production. This allows users to exploit new potentials for more productivity, efficiency, and flexibility in all phases of the value chain.

- Digital Workflow – code verification, simulation, and testing of different machine scenarios, and digital intera ction between multiple disciplines such as mechanical systems, electrical systems, and automation.
- Integrated Engineering – from automatic code generation to interdisciplinary engineering solutions.
- Transparent Operation – efficient execution, monitoring, and continuous optimization of actual production.

TIA use cases are generalized application examples that facilitate the implementation. They describe the customer requirements for implementing the digital enterprise and show how Siemens solutions can be used to overcome the challenges of digitalization in machine and plant manufacturing and operation ■

More TIA use cases can be found at
↗ **siemens.com/tia**

Digital workflow

- PLM integration into automation engineering
- Efficient, cloud-based engineering
- Virtual commissioning
- Virtual training

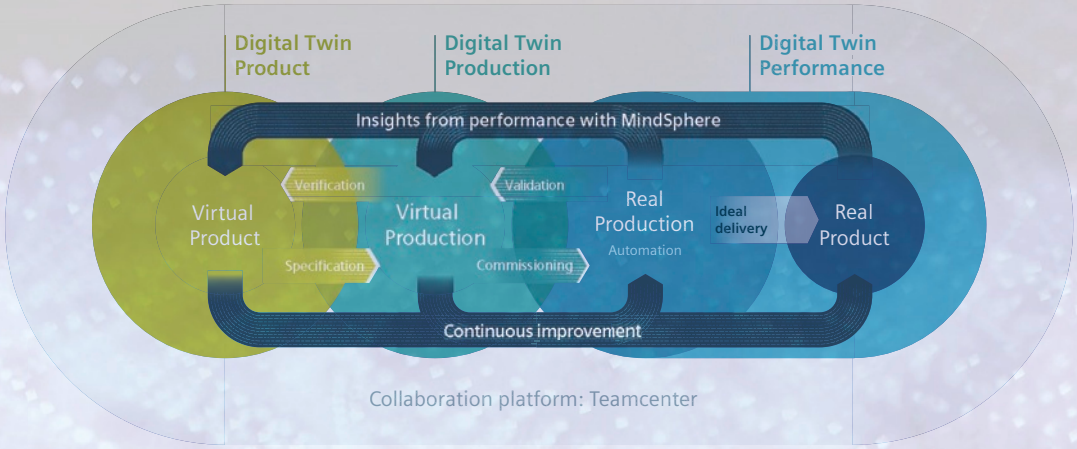
Integrated engineering

- Automated execution of engineering tasks
- Line integration
- Collaborative automation design
- Integrated engineering of kinematics
- Automation planning

Transparent operation

- Integrated energy management
- Machine and plant security
- Data acquisition for cloud services
- Edge computing
- Industrial communication
- RFID-enabled supply chain management
- Analysis of drive data

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Digital workflow

Work in an open, virtual, networked environment

TIA use case
Virtual commissioning

Eliminating errors early in the product lifecycle

Digitalization opens up entirely new ways to detect errors early in the product lifecycle: from the optimization of machine functionality using simulation tools to the virtual commissioning of entire production lines. Simatic S7-PLCSIM Advanced, the digital twin of a real Simatic S7-1500, allows for simulations encompassing all communications tasks, know-how-protected modules, the safety program part, and the web server functionality of the real CPU. It supports multiple and distributed instances to simulate several controllers on a PC or on the network. A documented public interface (API) additionally performs a simple data exchange with co-simulations such as NX-Mechatronics Concept Designer or test software such as Matlab. This makes it possible to conduct intensive testing of PLC programs in the context of a machine, line, or even more complex plants, and to eliminate errors at an early stage.

Integrated engineering

Reduce time to market

TIA use case
Collaborative automation design

Linking system design and mechanical systems with electrical systems and automation software

Shorter innovation cycles are having a dramatic impact on engineering. This calls for optimization of the development process for machines and plants. The Automation Designer links the available data from the mechanical drafting and planning process with the electrical and automation design. A common database ensures data consistency across all disciplines and enables parallel engineering with a central application. The necessary wiring diagrams and associated automation programs can also be generated on the basis of predefined rules and templates, instead of being programmed manually. This increases engineering efficiency, improves the quality of the automation solution, and reduces the risk of errors. All this speeds up development and shortens the time to market.

Transparent operation

Increase productivity

TIA use case
Edge computing

Efficiently preprocessing huge data volumes

Industrial Edge Computing brings data processing down from the cloud and closer to the data source. This opens up new ways to use data in the manufacturing process. It also makes it even easier to connect devices to each other in a common infrastructure for administration and maintenance. Data acquisition and analysis are handled by distributed components with corresponding applications that are directly installed in the factory. The necessary computing power is available right where it is needed: at the edge of the network, directly at the process. Siemens Industrial Edge consists of a central management infrastructure, which is used to manage Edge devices and applications. The distributed Edge devices provide the necessary hardware and software for the applications. The data acquisition and analysis functionality is located in the Edge apps, which are developed and maintained either by Siemens or its partners, or by the users themselves.

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Overview



LOGO! logic module

- The compact, easy-to-use and low-cost solution for simple control tasks
- Compact, easy to operate, universally applicable without accessories
- "All in one": Integrated display and operator panel
- 36 different functions can be connected at the press of a button or by means of PC software; up to 130 times over
- LOGO! 8: 38/43 different functions can be linked at the press of a button or using PC software; up to 200/400 times
- Functions are easy to change at the press of a button. No more time-consuming rewiring

SIPLUS LOGO!

- The controller for use in the toughest environmental conditions
- With extended temperature range from -40/-25 °C to +70 °C
- Suitable for exposure to environmental substances (harmful gas atmosphere)
- Condensation permissible
- With the proven PLC technology of LOGO!
- Easy to handle, program, maintain, and service
- Ideal for use in automotive engineering, environmental engineering, mining, chemical plants, material handling, food industry, etc.

Accessories:

- The front panel mounting set also allows simple and reliable installation of the logic modules in front panels; IP65 protection is thus possible.
- In order to ensure dependable operation of SIPLUS devices supplied by the battery in conjunction with combustion engines, it is necessary to put in a SIPLUS upmiter upstream device between the battery and the SIPLUS LOGO!.

For more information, please go to:

http://www.siemens.com/siplus-extreme

Technical specifications SIPLUS LOGO!

Ambient temperature range	-40/-25 ... +70 °C
Conformal coating	Coating of the printed circuit boards and the electronic components
Technical data	The technical data of the standard product applies except for the ambient conditions.
Ambient conditions	
Extended range of environmental conditions	
• with reference to ambient temperature, air pressure and altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
• At cold restart, min.	0° C
Relative humidity	
• with condensation, max.	100 %; RH incl. bedewing/frost (no commissioning in bedewed state)
Resistance	
• to biologically active substances/ compliance with EN 60721-3-3	Yes; Class 3B2 mold and fungal spores (except fauna); the supplied plug covers must remain in place on the unused interfaces during operation.
• to chemically active substances/ compliance with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray in accordance with EN 60068-2-52 (severity 3); the supplied plug covers must remain in place on the unused interfaces during operation.
• to mechanically active substances, compliance with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust; the supplied plug covers must remain in place on unused interfaces during operation.

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Overview



- The space-saving basic variants
- Interface for the connection of expansion modules, up to 24 digital inputs, 20 digital outputs, 8 analog inputs and 8 analog outputs can be addressed
- All basic units with integrated web server
- Enclosure width 72 mm (4 U)
- All basic units with Ethernet interface for communication with LOGO! 8, LOGO! TDE, SIMATIC Controllers, SIMATIC Panels and PCs
- Use of standard micro CF cards

Technical specifications

Article number	**6ED1052-1CC08-0BA0** LOGO! 24CE, 8DI(4AI)/4DQ, 400 Blocks	**6ED1052-1MD08-0BA0** LOGO!12/24RCE, 8DI(4AI)/4DQ, 400 Blocks	**6ED1052-1HB08-0BA0** LOGO! 24RCE, 8DI/4DQ, 400 Blocks	**6ED1052-1FB08-0BA0** LOGO!230RCE, 8DI/4DQ, 400 Blocks
Display				
with display	Yes	Yes	Yes	Yes
Installation type/mounting				
Mounting	on 35 mm DIN rail, 4 spacing units wide	on 35 mm DIN rail, 4 spacing units wide	on 35 mm DIN rail, 4 spacing units wide	on 35 mm DIN rail, 4 spacing units wide
Supply voltage				
Rated value (DC)				
• 12 V DC		Yes		
• 24 V DC	Yes	Yes	Yes	
• 115 V DC				Yes
• 230 V DC				Yes
permissible range, lower limit (DC)	20.4 V	10.8 V	20.4 V	100 V
permissible range, upper limit (DC)	28.8 V	28.8 V	28.8 V	253 V
Rated value (AC)				
• 24 V AC			Yes	
• 115 V AC				Yes
• 230 V AC				Yes
Time of day				
Time switching clocks				
• Number	400; Max. 400, function-specific	400; Max. 400, function-specific	400; Max. 400, function-specific	400; Max. 400, function-specific
• Power reserve	480 h	480 h	480 h	480 h
Digital inputs				
Number of digital inputs	8; Of which 4 can be used in analog mode (0 to 10 V)	8; Of which 4 can be used in analog mode (0 to 10 V)	8	8
Digital outputs				
Number of digital outputs	4; Transistor	4; Relays	4; Relays	4; Relays
Short-circuit protection	Yes; electrical (1 A)	No; external fusing necessary	No; external fusing necessary	No; external fusing necessary
Output current				
• for signal "1" permissible range for 0 to 55 °C, max.	0.3 A	10 A		
Relay outputs				
Switching capacity of contacts				
- with inductive load, max.		3 A	3 A	3 A
- with resistive load, max.		10 A	10 A	10 A

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Technical specifications (continued)

Article number	6ED1052-1CC08-0BA0 LOGO! 24CE, 8DI(4AI)/4DQ, 400 Blocks	6ED1052-1MD08-0BA0 LOGO!12/24RCE, 8DI(4AI)/4DQ, 400 Blocks	6ED1052-1HB08-0BA0 LOGO! 24RCE, 8DI/4DQ, 400 Blocks	6ED1052-1FB08-0BA0 LOGO!230RCE, 8DI/4DQ, 400 Blocks
EMC				
Emission of radio interference acc. to EN 55 011				
• Limit class B, for use in residential areas	Yes; Radio interference suppression according to EN55011, Limit Value Class B	Yes	Yes	Yes
Degree and class of protection				
Degree of protection acc. to EN 60529				
• IP20	Yes	Yes	Yes	Yes
Standards, approvals, certificates				
CE mark	Yes	Yes	Yes	Yes
CSA approval	Yes	Yes	Yes	Yes
UL approval	Yes	Yes	Yes	Yes
FM approval	Yes	Yes	Yes	Yes
developed in accordance with IEC 61131	Yes	Yes	Yes	Yes
according to VDE 0631	Yes	Yes	Yes	Yes
Marine approval	Yes	Yes	Yes	Yes
Ambient conditions				
Ambient temperature during operation				
• min.	-20 °C; No condensation	-20 °C; No condensation	-20 °C; No condensation	-20 °C; No condensation
• max.	55 °C	55 °C	55 °C	55 °C
Ambient temperature during storage/transportation				
• min.	-40 °C	-40 °C	-40 °C	-40 °C
• max.	70 °C	70 °C	70 °C	70 °C
Altitude during operation relating to sea level				
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 080 hPa ... 795 hPa (-1 000 m ... +2 000 m)		Tmin ... Tmax at 1 080 hPa ... 795 hPa (-1 000 m ... +2 000 m)	Tmin ... Tmax at 1 080 hPa ... 795 hPa (-1 000 m ... +2 000 m)
Dimensions				
Width	71.5 mm	71.5 mm	71.5 mm	71.5 mm
Height	90 mm	90 mm	90 mm	90 mm
Depth	60 mm	60 mm	60 mm	60 mm

Ordering data

	Article No.
LOGO! 8 logic module	
LOGO! 24CE Supply voltage 24 V DC, 8 digital inputs 24 V DC, of which 4 can be used in analog mode (0 to 10 V), 4 digital outputs 24 V DC, 0.3 A, integrated time switch, Ethernet interface; 400 function blocks can be interlinked, modular expansion capability	**6ED1052-1CC08-0BA0**
LOGO! 12/24RCE Supply voltage 12...24 V DC, 8 digital inputs 12/24 V DC, of which 4 can be used in analog mode (0 to 10 V) 4 relay outputs 10 A, integrated time switch, Ethernet interface; 400 function blocks can be interlinked, modular expansion capability	**6ED1052-1MD08-0BA0**
LOGO! 24RCE Supply voltage 24 V AC/DC, 8 digital inputs 24 V AC/DC, 4 relay outputs 10 A, integrated time switch, Ethernet interface; 400 function blocks can be interlinked, modular expansion capability	**6ED1052-1HB08-0BA0**
LOGO! 230RCE Supply voltage 115...230 V AC/DC, 8 digital inputs 115...230 V AC/DC, 4 relay outputs 10 A, integrated time switch, Ethernet interface; 400 function blocks can be interlinked, modular expansion capability	**6ED1052-1FB08-0BA0**

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Ordering data

	Article No.
Accessories	
LOGO! 8 text display HMI 6-line text display, can be connected to all LOGO! 8 variants with and without display, with 2 Ethernet interfaces; incl. installation accessories. Requires additional 12 V DC or 24 V AC/DC power supply	**6ED1055-4MH08-0BA0**
LOGO!Soft Comfort V8 For programming on the PC in LAD/FBD; executes on Windows 8, 7, XP, Linux and Mac OSX; on DVD	**6ED1058-0BA08-0YA1**
LOGO! Starter Kits In TANOS Box, with LOGO! Soft Comfort V8, WinCC Basic, Ethernet cable	
LOGO! Starter Kit 12/24 RCE With LOGO! 12/24 RCE, power supply, screwdriver, in Systainer	**6ED1057-3BA01-0AA8**
LOGO! Starter Kit 130 RCE With LOGO! 230 RCE, power supply, screwdriver, in Systainer	**6ED1057-3BA03-0AA8**
LOGO! Starter Kit 12/24 V With LOGO! 12/24 RCEO, LOGO! TD, power supply, screwdriver, in Systainer	**6ED1057-3BA11-0AA8**
LOGO! 8 KP300 Basic Starter Kit With LOGO! 12/24RCE, LOGO! Power 24 V 1.3 A, KP300 Basic mono PN	**6AV2132-0HA00-0AA1**
LOGO! 8 KTP400 Basic Starter Kit With LOGO! 12/24RCE, LOGO! Power 24 V 1.3 A, KTP400 Basic	**6AV2132-0KA00-0AA1**
LOGO! 8 KTP700 Basic Starter Kit With LOGO! 12/24RCE, LOGO! Power 24 V 1.3 A, KTP700 Basic	**6AV2132-3GB00-0AA1**
Front panel mounting set	
Width 4 U, with keys	**6AG1057-1AA00-0AA3**
Width 8 U, with keys	**6AG1057-1AA00-0AA2**

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LOGO! basic modules without display

Overview



- Basic variants optimized for costs
- Interface for the connection of expansion modules, up to 24 digital inputs, 20 digital outputs, 8 analog inputs and 8 analog outputs can be addressed
- With connection option for LOGO! TDE text display
- All basic units with integrated web server
- Enclosure width 72 mm (4 U)
- All basic units with Ethernet interface for communication with LOGO! 8, LOGO! TDE, SIMATIC Controllers, SIMATIC Panels and PCs
- Use of standard micro CF cards

Technical specifications

Article number	**6ED1052-2CC08-0BA0** LOGO! 24CEO, 8DI(4AI)/4DQ, 400 Blocks	**6ED1052-2MD08-0BA0** LOGO!12/24RCEO, 8DI(4AI)/4DQ,400 Blocks	**6ED1052-2HB08-0BA0** LOGO! 24RCEO, 8DI/4DQ, 400 Blocks
Installation type/mounting			
Mounting	on 35 mm DIN rail, 4 spacing units wide	on 35 mm DIN rail, 4 spacing units wide	on 35 mm DIN rail, 4 spacing units wide
Supply voltage			
Rated value (DC)			
• 12 V DC		Yes	
• 24 V DC	Yes	Yes	Yes
permissible range, lower limit (DC)	20.4 V	10.8 V	20.4 V
permissible range, upper limit (DC)	28.8 V	28.8 V	28.8 V
Rated value (AC)			
• 24 V AC			Yes
Time of day			
Time switching clocks			
• Number	400; Max. 400, function-specific	400; Max. 400, function-specific	400; Max. 400, function-specific
• Power reserve	480 h	480 h	480 h
Digital inputs			
Number of digital inputs	8; Of which 4 can be used in analog mode (0 to 10 V)	8; Of which 4 can be used in analog mode (0 to 10 V)	8
Digital outputs			
Number of digital outputs	4; Transistor	4; Relays	4; Relays
Short-circuit protection	Yes; electrical (1 A)	No; external fusing necessary	No; external fusing necessary
Output current			
• for signal "1" permissible range for 0 to 55 °C, max.	0.3 A	10 A	
Relay outputs			
Switching capacity of contacts			
- with inductive load, max.		3 A	3 A
- with resistive load, max.		10 A	10 A
EMC			
Emission of radio interference acc. to EN 55 011			
• Limit class B, for use in residential areas	Yes; Radio interference suppression according to EN55011, Limit Value Class B	Yes	Yes
Degree and class of protection			
Degree of protection acc. to EN 60529			
• IP20	Yes	Yes	Yes

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Technical specifications (continued)

Article number	**6ED1052-2CC08-0BA0** LOGO! 24CEO, 8DI(4AI)/4DQ, 400 Blocks	**6ED1052-2MD08-0BA0** LOGO!12/24RCEO, 8DI(4AI)/4DQ,400 Blocks	**6ED1052-2HB08-0BA0** LOGO! 24RCEO, 8DI/4DQ, 400 Blocks
Standards, approvals, certificates			
CE mark	Yes	Yes	Yes
CSA approval	Yes	Yes	Yes
UL approval	Yes	Yes	Yes
FM approval	Yes	Yes	Yes
developed in accordance with IEC 61131	Yes	Yes	Yes
according to VDE 0631	Yes	Yes	Yes
Marine approval	Yes	Yes	Yes
Ambient conditions			
Ambient temperature during operation			
• min.	-20 °C; No condensation	-20 °C; No condensation	-20 °C; No condensation
• max.	55 °C	55 °C	55 °C
Ambient temperature during storage/transportation			
• min.	-40 °C	-40 °C	-40 °C
• max.	70 °C	70 °C	70 °C
Altitude during operation relating to sea level			
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 080 hPa ... 795 hPa (-1 000 m ... +2 000 m)		Tmin ... Tmax at 1 080 hPa ... 795 hPa (-1 000 m ... +2 000 m)
Dimensions			
Width	71.5 mm	71.5 mm	71.5 mm
Height	90 mm	90 mm	90 mm
Depth	58 mm	60 mm	58 mm

Article number	**6ED1052-2FB08-0BA0** LOGO!230RCEO, 8DI/4DQ,400 Blocks
Display	
with display	No
Installation type/mounting	
Mounting	on 35 mm DIN rail, 4 spacing units wide
Supply voltage	
Rated value (DC)	
• 115 V DC	Yes
• 230 V DC	Yes
permissible range, lower limit (DC)	100 V
permissible range, upper limit (DC)	253 V
Rated value (AC)	
• 115 V AC	Yes
• 230 V AC	Yes
Time of day	
Time switching clocks	
• Number	400; Max. 400, function-specific
• Power reserve	480 h
Digital inputs	
Number of digital inputs	8
Digital outputs	
Number of digital outputs	4; Relays
Short-circuit protection	No; external fusing necessary
Relay outputs	
Switching capacity of contacts	
- with inductive load, max.	3 A
- with resistive load, max.	10 A
EMC	
Emission of radio interference acc. to EN 55 011	
• Limit class B, for use in residential areas	Yes

Article number	**6ED1052-2FB08-0BA0** LOGO!230RCEO, 8DI/4DQ,400 Blocks
Degree and class of protection	
Degree of protection acc. to EN 60529	
• IP20	Yes
Standards, approvals, certificates	
CE mark	Yes
CSA approval	Yes
UL approval	Yes
FM approval	Yes
developed in accordance with IEC 61131	Yes
according to VDE 0631	Yes
Marine approval	Yes
Ambient conditions	
Ambient temperature during operation	
• min.	-20 °C; No condensation
• max.	55 °C
Ambient temperature during storage/transportation	
• min.	-40 °C
• max.	70 °C
Altitude during operation relating to sea level	
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 080 hPa ... 795 hPa (-1 000 m ... +2 000 m)
Dimensions	
Width	71.5 mm
Height	90 mm
Depth	60 mm

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LOGO! basic modules without display

Ordering data	Article No.
LOGO! 8 logic module	
LOGO! 24CEo logic module 24 V DC supply voltage, 8 digital inputs 24 V DC, of which 4 can be used in analog mode (0 to 10 V), 4 digital outputs 24 V DC, 0.3 A, integrated time switch, Ethernet interface; without display and keyboard; 400 function blocks can be interlinked, modular expansion capability	**6ED1052-2CC08-0BA0**
LOGO! 12/24RCEo logic module 12...24 V DC supply voltage, 8 digital inputs 12...24 V DC, of which 4 can be used in analog mode (0 to 10 V), 4 relay outputs 10 A, integrated time switch, Ethernet interface; without display or keyboard; 400 function blocks can be interlinked, modular expansion capability	**6ED1052-2MD08-0BA0**
LOGO! 24RCEo logic module 24 V AC/DC supply voltage, 8 digital inputs 24 V AC/DC, 4 relay outputs 10 A, integrated time switch, Ethernet interface; without display or keyboard; 400 function blocks can be interlinked, modular expansion capability	**6ED1052-2HB08-0BA0**
LOGO! 230RCEo logic module 115...230 V AC/DC supply voltage, 8 digital inputs 115...230 V AC/DC, 4 relay outputs 10 A, integrated time switch, Ethernet interface; without display or keyboard; 400 function blocks can be interlinked, modular expansion capability	**6ED1052-2FB08-0BA0**

Accessories	Article No.
LOGO! TDE text display 6-line text display, can be connected to all LOGO! 8 variants with and without display, with 2 Ethernet interfaces; incl. installation accessories. Requires additional 12 V DC or 24 V AC/DC power supply	**6ED1055-4MH08-0BA0**
LOGO!Soft Comfort V8 For programming on the PC in LAD/FBD; executes on Windows 8, 7, XP, Linux and Mac OSX; on DVD	**6ED1058-0BA08-0YA1**
LOGO! Starter Kits In TANOS Box, with LOGO! Soft Comfort V8, WinCC Basic, Ethernet cable	
LOGO! Starter Kit 12/24 RCE With LOGO! 12/24 RCE, power supply, screwdriver, in Systainer	**6ED1057-3BA01-0AA8**
LOGO! Starter Kit 130 RCE With LOGO! 230 RCE, power supply, screwdriver, in Systainer	**6ED1057-3BA03-0AA8**
LOGO! Starter Kit 12/24 V With LOGO! 12/24 RCEO, LOGO! TD, power supply, screwdriver, in Systainer	**6ED1057-3BA11-0AA8**
LOGO! 8 KP300 Basic Starter Kit With LOGO! 12/24RCE, LOGO! Power 24 V 1.3 A, KP300 Basic mono PN	**6AV2132-0HA00-0AA1**
LOGO! 8 KTP400 Basic Starter Kit With LOGO! 12/24RCE, LOGO! Power 24 V 1.3 A, KTP400 Basic	**6AV2132-0KA00-0AA1**
LOGO! 8 KTP700 Basic Starter Kit With LOGO! 12/24RCE, LOGO! Power 24 V 1.3 A, KTP700 Basic	**6AV2132-3GB00-0AA1**

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Overview



- Expansion modules for connection to LOGO! Modular
- With digital inputs and outputs, analog inputs, or analog outputs

Technical specifications

Article number	**6ED1055-1CB00-0BA2** LOGO! DM8 24 Exp. mod., 4DI/4DQ	**6ED1055-1HB00-0BA2** LOGO! DM8 24R Exp. mod. 2 MW, 4DI/4DQ	**6ED1055-1MB00-0BA2** LOGO! DM8 12/24R Exp. mod. 2 MW, 4DI/DQ	**6ED1055-1FB00-0BA2** LOGO! DM8 230R Exp. mod. 2 MW, 4DI/4DQ
Installation type/mounting				
Mounting	on 35 mm DIN rail, 2 spacing units wide	on 35 mm DIN rail, 2 spacing units wide	on 35 mm DIN rail, 2 spacing units wide	on 35 mm DIN rail, 2 spacing units wide
Supply voltage				
Rated value (DC)				
• 12 V DC			Yes	
• 24 V DC	Yes	Yes	Yes	
• 115 V DC				Yes
• 230 V DC				Yes
permissible range, lower limit (DC)	20.4 V	20.4 V	10.8 V	100 V
permissible range, upper limit (DC)	28.8 V	28.8 V	28.8 V	253 V
Rated value (AC)				
• 24 V AC		Yes		
• 115 V AC				Yes
• 230 V AC				Yes
Line frequency				
• permissible range, lower limit		47 Hz		47 Hz
• permissible range, upper limit		63 Hz		63 Hz
Digital inputs				
Number of digital inputs	4	4	4	4
Input voltage				
• Type of input voltage	DC	AC/DC	DC	AC/DC
• for signal "0"	< 5 V DC	< 5 V AC/DC	< 5 V DC	< 40 V AC, < 30 V DC
• for signal "1"	> 12 V DC	> 12 V AC/DC	> 8.5 V	> 79 V AC, > 79 V DC
Input current				
• for signal "0", max. (permissible quiescent current)	0.88 mA	1.1 mA	0.88 mA	0.06 mA; 0.05 mA with AC, 0.06 mA with DC
• for signal "1", typ.	2.1 mA	2.63 mA	1.5 mA	0.13 mA
Input delay (for rated value of input voltage)				
for standard inputs				
- at "0" to "1", max.	1.5 ms	1.5 ms	1.5 ms	40 ms
- at "1" to "0", max.	1.5 ms	15 ms	1.5 ms	75 ms

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Technical specifications (continued)

Article number	6ED1055-1CB00-0BA2 LOGO! DM8 24 Exp. mod., 4DI/4DQ	6ED1055-1HB00-0BA2 LOGO! DM8 24R Exp. mod. 2 MW, 4DI/4DQ	6ED1055-1MB00-0BA2 LOGO! DM8 12/24R Exp. mod. 2 MW, 4DI/DQ	6ED1055-1FB00-0BA2 LOGO! DM8 230R Exp. mod. 2 MW, 4DI/4DQ
Digital outputs				
Number of digital outputs	4	4; Relays	4; Relays	4; Relays
Short-circuit protection	Yes	No	No	No
Controlling a digital input		Yes	Yes	Yes
Switching capacity of the outputs				
• on lamp load, max.		1 000 W	1 000 W	1 000 W; 500 W at 115V AC
Parallel switching of two outputs				
• for uprating	No	No	No	No
Switching frequency				
• with resistive load, max.	10 Hz	2 Hz	2 Hz	2 Hz
• with inductive load, max.	0.5 Hz	0.5 Hz	0.5 Hz	0.5 Hz
• mechanical, max.		10 Hz	10 Hz	10 Hz
Relay outputs				
Switching capacity of contacts				
- with inductive load, max.		3 A	3 A	3 A
- with resistive load, max.		5 A	5 A	5 A
EMC				
Emission of radio interference acc. to EN 55 011				
• Limit class B, for use in residential areas	Yes	Yes	Yes	Yes
Degree and class of protection				
Degree of protection acc. to EN 60529				
• IP20	Yes	Yes	Yes	Yes
Standards, approvals, certificates				
CE mark	Yes	Yes	Yes	Yes
CSA approval	Yes	Yes	Yes	Yes
UL approval	Yes	Yes	Yes	Yes
FM approval	Yes	Yes	Yes	Yes
developed in accordance with IEC 61131	Yes	Yes	Yes	Yes
according to VDE 0631	Yes	Yes		Yes
Marine approval	Yes	Yes	Yes	Yes
Ambient conditions				
Ambient temperature during operation				
• min.	0 °C; ES03 and higher: -20 °C	0 °C; ES03 and higher: -20 °C	0 °C; ES03 and higher: -20 °C	0 °C; ES03 and higher: -20 °C
• max.	55 °C	55 °C	55 °C	55 °C
Dimensions				
Width	35.5 mm	35.5 mm	35.5 mm	35.5 mm
Height	90 mm	90 mm	90 mm	90 mm
Depth	58 mm	58 mm	58 mm	58 mm

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Technical specifications (continued)

Article number	6ED1055-1CB10-0BA2 LOGO! DM16 24 Exp. mod., 4 MW, 8DI/8DQ	6ED1055-1NB10-0BA2 LOGO! DM16 24R Exp. mod. 4 MW, 8DI/8DQ	6ED1055-1FB10-0BA2 LOGO! DM16 230R Exp. mod. 4 MW, 8DI/8DQ
Installation type/mounting			
Mounting	on 35 mm DIN rail, 4 spacing units wide	on 35 mm DIN rail, 4 spacing units wide	on 35 mm DIN rail, 4 spacing units wide
Supply voltage			
Rated value (DC)			
• 24 V DC	Yes	Yes	
• 115 V DC			Yes
• 230 V DC			Yes
permissible range, lower limit (DC)	20.4 V	20.4 V	100 V
permissible range, upper limit (DC)	28.8 V	28.8 V	253 V
Rated value (AC)			
• 24 V AC		No	
• 115 V AC			Yes
• 230 V AC			Yes
Line frequency			
• permissible range, lower limit			47 Hz
• permissible range, upper limit			63 Hz
Digital inputs			
Number of digital inputs	8	8	8
Input voltage			
• Type of input voltage	DC	DC	AC/DC
• for signal "0"	< 5 V DC	< 5 V DC	< 40 V AC, < 30 V DC
• for signal "1"	> 12 V DC	> 12 V DC	> 79 V AC, > 79 V DC
Input current			
• for signal "0", max. (permissible quiescent current)	0.85 mA	0.85 mA	0.06 mA; 0.05 mA with AC, 0.06 mA with DC
• for signal "1", typ.	2 mA	2 mA	0.13 mA
Input delay (for rated value of input voltage)			
for standard inputs			
- at "0" to "1", max.	1.5 ms	1.5 ms	40 ms
- at "1" to "0", max.	1.5 ms	1.5 ms	75 ms
Digital outputs			
Number of digital outputs	8	8; Relays	8; Relays
Short-circuit protection	Yes	No	No
Controlling a digital input		Yes	Yes
Switching capacity of the outputs			
• on lamp load, max.		1 000 W	1 000 W; 500 W at 115V AC
Parallel switching of two outputs			
• for uprating	No	No	No
Switching frequency			
• with resistive load, max.	10 Hz	2 Hz	2 Hz
• with inductive load, max.	0.5 Hz	0.5 Hz	0.5 Hz
• mechanical, max.		10 Hz	10 Hz
Relay outputs			
Switching capacity of contacts			
- with inductive load, max.		3 A	3 A
- with resistive load, max.		5 A	5 A

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Technical specifications (continued)

Article number	6ED1055-1CB10-0BA2 LOGO! DM16 24 Exp. mod., 4 MW, 8DI/8DQ	6ED1055-1NB10-0BA2 LOGO! DM16 24R Exp. mod. 4 MW, 8DI/8DQ	6ED1055-1FB10-0BA2 LOGO! DM16 230R Exp. mod. 4 MW, 8DI/8DQ
EMC			
Emission of radio interference acc. to EN 55 011			
• Limit class B, for use in residential areas	Yes	Yes	Yes
Degree and class of protection			
Degree of protection acc. to EN 60529			
• IP20	Yes	Yes	Yes
Standards, approvals, certificates			
CE mark	Yes	Yes	Yes
CSA approval	Yes	Yes	Yes
UL approval	Yes	Yes	Yes
FM approval	Yes	Yes	Yes
developed in accordance with IEC 61131	Yes	Yes	Yes
according to VDE 0631	Yes	Yes	Yes
Marine approval	Yes	Yes	Yes
Ambient conditions			
Ambient temperature during operation			
• min.	0 °C; ES03 and higher: -20 °C	0 °C; ES03 and higher: -20 °C	0 °C; ES03 and higher: -20 °C
• max.	55 °C	55 °C	55 °C
Dimensions			
Width	71.5 mm	71.5 mm	71.5 mm
Height	90 mm	90 mm	90 mm
Depth	58 mm	58 mm	58 mm

Article number	6ED1055-1MA00-0BA2 LOGO! AM2 Exp. mod., 12/24V, 2AI,	6ED1055-1MD00-0BA2 LOGO! AM2 RDT, 2AI, -50..+200°C
Installation type/mounting		
Mounting	on 35 mm DIN rail, 2 spacing units wide	on 35 mm DIN rail, 2 spacing units wide
Supply voltage		
Rated value (DC)		
• 12 V DC	Yes; 10.8 V DC to 28.8 V DC	Yes; 10.8 V DC to 28.8 V DC
• 24 V DC	Yes; 10.8 V DC to 28.8 V DC	Yes; 10.8 V DC to 28.8 V DC
Analog inputs		
Number of analog inputs	2	2; 2 or 3 wire connection
Input ranges		
• Voltage	Yes	No
• Current	Yes	No
• Resistance thermometer	No	Yes; For PT100/PT1000 sensors
Input ranges (rated values), voltages		
• 0 to +10 V	Yes	No
Input ranges (rated values), currents		
• 0 to 20 mA	Yes; 0 mA or 4 mA to 20 mA	No
Input ranges (rated values), resistance thermometer		
• Pt 100	No	Yes
EMC		
Emission of radio interference acc. to EN 55 011		
• Limit class B, for use in residential areas	Yes	Yes
Degree and class of protection		
Degree of protection acc. to EN 60529		
• IP20	Yes	Yes

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Technical specifications (continued)

Article number	**6ED1055-1MA00-0BA2** LOGO! AM2 Exp. mod., 12/24V, 2AI,	**6ED1055-1MD00-0BA2** LOGO! AM2 RDT, 2AI, -50..+200°C
Standards, approvals, certificates		
CE mark	Yes	Yes
CSA approval	Yes	Yes
UL approval	Yes	Yes
FM approval	Yes	Yes
developed in accordance with IEC 61131	Yes	Yes
according to VDE 0631	Yes	
Marine approval	Yes	Yes
Ambient conditions		
Ambient temperature during operation		
• min.	0 °C; ES03 and higher: -20 °C	0 °C; ES03 and higher: -20 °C
• max.	55 °C	55 °C
Dimensions		
Width	35.5 mm	35.5 mm
Height	90 mm	90 mm
Depth	58 mm	58 mm

Article number	**6ED1055-1MM00-0BA2** LOGO! AM2 AQ, 2AQ, 0-10V, 0/4-20mA
Installation type/mounting	
Mounting	on 35 mm DIN rail, 2 spacing units wide
Supply voltage	
Rated value (DC)	
• 12 V DC	No
• 24 V DC	Yes
Analog outputs	
Number of analog outputs	2
Output ranges, voltage	
• 0 to 10 V	Yes
Output ranges, current	
• 0 to 20 mA	Yes
• 4 mA to 20 mA	Yes
EMC	
Emission of radio interference acc. to EN 55 011	
• Limit class B, for use in residential areas	Yes
Degree and class of protection	
Degree of protection acc. to EN 60529	
• IP20	Yes

Article number	**6ED1055-1MM00-0BA2** LOGO! AM2 AQ, 2AQ, 0-10V, 0/4-20mA
Standards, approvals, certificates	
CE mark	Yes
CSA approval	Yes
UL approval	Yes
FM approval	Yes
developed in accordance with IEC 61131	Yes
according to VDE 0631	Yes
Marine approval	Yes
Ambient conditions	
Ambient temperature during operation	
• min.	0 °C; ES03 and higher: -20 °C
• max.	55 °C
Dimensions	
Width	35.5 mm
Height	90 mm
Depth	58 mm

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LOGO! expansion modules

Ordering data	Article No.
LOGO! 8 expansion modules	
LOGO! DM8 24 24 V DC supply voltage, 4 digital inputs 24 V DC, 4 digital outputs 24 V DC, 0.3 A	**6ED1055-1CB00-0BA2**
LOGO! DM16 24 24 V DC supply voltage, 8 digital inputs 24 V DC, 8 digital outputs 24 V DC, 0.3 A	**6ED1055-1CB10-0BA2**
LOGO! DM8 12/24R 12...24 V DC supply voltage, 4 digital inputs 12...24 V DC, 4 relay outputs 5 A	**6ED1055-1MB00-0BA2**
LOGO! DM8 24R 24 V AC/DC supply voltage, 4 digital inputs 24 V AC/DC, 4 relay outputs 5 A	**6ED1055-1HB00-0BA2**
LOGO! DM16 24R 24 V DC supply voltage, 8 digital inputs 24 V DC, 8 relay outputs 5 A	**6ED1055-1NB10-0BA2**
LOGO! DM8 230R 115...230 V AC/DC supply voltage, 4 digital inputs 115...230 V AC/DC, 4 relay outputs 5 A	**6ED1055-1FB00-0BA2**
LOGO! DM16 230R 115...230 V AC/DC supply voltage, 8 digital inputs 115...230 V AC/DC, 8 relay outputs 5 A	**6ED1055-1FB10-0BA2**
LOGO! AM2 12...24 V DC supply voltage, 2 analog inputs 0 to 10 V or 0 to 20 mA, resolution 10 bits	**6ED1055-1MA00-0BA2**
LOGO! AM2 PT 100 12...24 V DC supply voltage, 2 analog inputs Pt100, temperature range -50 °C to 200 °C	**6ED1055-1MD00-0BA2**
LOGO! AM2 AQ 24 V DC supply voltage, 2 analog outputs 0 to 10 V, 0/4 to 20 mA	**6ED1055-1MM00-0BA2**

Accessories for LOGO! 8	Article No.
LOGO!Soft Comfort V8 For programming on the PC in LAD/FBD; executes on Windows 8, 7, XP, Linux and Mac OSX; on DVD	**6ED1058-0BA08-0YA1**

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Overview



- The space-saving basic variants
- Interface for connecting expansion modules, up to 24 digital inputs, 20 (16) digital outputs, 8 analog inputs and 8 (2) analog outputs can be addressed
- With connection option for LOGO! TDE text display
- All basic units with integrated web server
- Same enclosure width as LOGO! 0BA6 (4 U)
- All basic units with Ethernet interface for communication with LOGO!, SIMATIC Controllers, SIMATIC Panel and PC
- Use of standard micro CF cards

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

Technical specifications

Article number	**6AG1052-1CC08-7BA0**	**6AG1052-1MD08-7BA0**	**6AG1052-1HB08-7BA0**	**6AG1052-1FB08-7BA0**
Based on	**6ED1052-1CC08-0BA0**	**6ED1052-1MD08-0BA0**	**6ED1052-1HB08-0BA0**	**6ED1052-1FB08-0BA0**
	SIPLUS LOGO! 24CE	SIPLUS LOGO! 12/24RCE	SIPLUS LOGO! 24RCE	SIPLUS LOGO! 230RCE
Ambient conditions				
Ambient temperature during operation				
• min.	-25 °C; = Tmin; Startup @ -20 °C	-25 °C; = Tmin; Startup @ -20 °C	-25 °C; = Tmin; Startup @ -20 °C	-25 °C; = Tmin; Startup @ -20 °C
• max.	70 °C; Tmax; Tmax > +55 °C max. load 0.2 A per output	70 °C; Tmax; Tmax > +55 °C max. load 1 A per relay or max. load 3 A per relay and half the number of DIs (no adjacent points)	70 °C; Tmax; Tmax > +55 °C max. load 1 A per relay or max. load 3 A per relay and half the number of DIs (no adjacent points)	70 °C; Tmax; Tmax > +55 °C max. load 1 A per relay
• At cold restart, min.	-20 °C; incl. condensation / frost permitted (no commissioning under condensation conditions)	-20 °C; incl. condensation / frost permitted (no commissioning under condensation conditions)	-20 °C; incl. condensation / frost permitted (no commissioning under condensation conditions)	-20 °C; incl. condensation / frost permitted (no commissioning under condensation conditions)
Ambient temperature during storage/transportation				
• min.	-40 °C	-40 °C	-40 °C	-40 °C
• max.	70 °C	70 °C	70 °C	70 °C
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m	2 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)
Relative humidity				
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation

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Technical specifications (continued)

Article number	6AG1052-1CC08-7BA0	6AG1052-1MD08-7BA0	6AG1052-1HB08-7BA0	6AG1052-1FB08-7BA0
Based on	6ED1052-1CC08-0BA0	6ED1052-1MD08-0BA0	6ED1052-1HB08-0BA0	6ED1052-1FB08-0BA0
	SIPLUS LOGO! 24CE	SIPLUS LOGO! 12/24RCE	SIPLUS LOGO! 24RCE	SIPLUS LOGO! 230RCE
Resistance				
Coolants and lubricants				
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
Use on ships/at sea				
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Remark				
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating				
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability	Yes; Class 2 for high availability	Yes; Class 2 for high availability	Yes; Class 2 for high availability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

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Ordering data

	Article No.
SIPLUS LOGO! 8 logic module	
SIPLUS LOGO! 24CE	
Supply voltage 24 V DC, 8 digital inputs 24 V DC, of which 4 can be used in analog mode (0 to 10 V), 4 digital outputs 24 V DC, 0.3 A, integrated time switch, Ethernet interface; 400 function blocks can be interlinked, modular expansion capability	
Extended temperature range and exposure to environmental substances	**6AG1052-1CC08-7BA0**
SIPLUS LOGO! 12/24RCE	
Supply voltage 12...24 V DC, 8 digital inputs 12/24 V DC, of which 4 can be used in analog mode (0 to 10 V), 4 relay outputs 10 A, integrated time switch, Ethernet interface; 400 function blocks can be interlinked, modular expansion capability	
Extended temperature range and exposure to environmental substances	**6AG1052-1MD08-7BA0**
SIPLUS LOGO! 24RCE	
Supply voltage 24 V AC/DC, 8 digital inputs 24 V AC/DC, 4 relay outputs 10 A, integrated time switch, Ethernet interface; 400 function blocks can be interlinked, modular expansion capability	
Extended temperature range and exposure to environmental substances	**6AG1052-1HB08-7BA0**
SIPLUS LOGO! 230RCE	
Supply voltage 115...230 V AC/DC, 8 digital inputs 115...230 V AC/DC, 4 relay outputs 10 A, integrated time switch, Ethernet interface; 400 function blocks can be interlinked, modular expansion capability	
Extended temperature range and exposure to environmental substances	**6AG1052-1FB08-7BA0**

	Article No.
Accessories	
SIPLUS LOGO! TDE	**6AG1055-4MH08-2BA0**
(Extended temperature range -10 ... +60 °C and exposure to environmental substances) 6-line text display, can be connected to all LOGO! 8 variants with and without display, with 2 Ethernet interfaces; incl. installation accessories. Requires additional 12 V DC or 24 V AC/DC power supply	
Accessories for SIPLUS LOGO! 6, 7, 8	
LOGO!Soft Comfort V8	**6ED1058-0BA08-0YA1**
For programming on the PC in LAD/FBD; executes on Windows 8, 7, XP, Linux and Mac OSX; on DVD	
Front panel mounting set	**6AG1057-1AA00-0AA2**
Width 8 U, with keys	

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SIPLUS LOGO! basic modules without display

Overview



- Basic variants optimized for costs
- Interface for connecting expansion modules, up to 24 digital inputs, 16 (20) digital outputs, 8 analog inputs and 2 (8) analog outputs can be addressed
- With connection option for LOGO! TDE text display
- All basic units with integrated web server
- Same enclosure width as LOGO! 0BA6 (4 U)
- All basic units with Ethernet interface for communication with LOGO!, SIMATIC Controllers, SIMATIC Panel and PC
- Use of standard micro CF cards

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were adopted from the respective standard products. SIPLUS extreme specific information was added.

Technical specifications

Article number	**6AG1052-2CC08-7BA0**	**6AG1052-2MD08-7BA0**	**6AG1052-2HB08-7BA0**	**6AG1052-2FB08-7BA0**
Based on	**6ED1052-2CC08-0BA0**	**6ED1052-2MD08-0BA0**	**6ED1052-2HB08-0BA0**	**6ED1052-2FB08-0BA0**
	SIPLUS LOGO! 24CEO	SIPLUS LOGO! 12/24RCEO	SIPLUS LOGO! 24RCEO (AC)	SIPLUS LOGO! 230RCEO
Ambient conditions				
Ambient temperature during operation				
• min.	-40 °C; = Tmin; Startup @ -25 °C	-40 °C; = Tmin; Startup @ -25 °C	-40 °C; = Tmin; Startup @ -25 °C	-40 °C; = Tmin; Startup @ -25 °C
• max.	70 °C; Tmax; Tmax > +55 °C max. load 0.2 A per output	70 °C; Tmax; Tmax > +55 °C max. load 1 A per relay or max. load 3 A per relay and half the number of DIs (no adjacent points)	70 °C; Tmax; Tmax > +55 °C max. load 1 A per relay or max. load 3 A per relay and half the number of DIs (no adjacent points)	70 °C; Tmax; Tmax > +55 °C max. load 1 A per relay
• At cold restart, min.	-25 °C; incl. condensation / frost permitted (no commissioning under condensation conditions)	-25 °C; incl. condensation / frost permitted (no commissioning under condensation conditions)	-25 °C; incl. condensation / frost permitted (no commissioning under condensation conditions)	-25 °C; incl. condensation / frost permitted (no commissioning under condensation conditions)
Ambient temperature during storage/transportation				
• min.	-40 °C	-40 °C	-40 °C	-40 °C
• max.	70 °C	70 °C	70 °C	70 °C
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m	2 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)
Relative humidity				
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation

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Technical specifications (continued)

Article number	6AG1052-2CC08-7BA0	6AG1052-2MD08-7BA0	6AG1052-2HB08-7BA0	6AG1052-2FB08-7BA0
Based on	6ED1052-2CC08-0BA0	6ED1052-2MD08-0BA0	6ED1052-2HB08-0BA0	6ED1052-2FB08-0BA0
	SIPLUS LOGO! 24CEO	SIPLUS LOGO! 12/24RCEO	SIPLUS LOGO! 24RCEO (AC)	SIPLUS LOGO! 230RCEO
Resistance				
Coolants and lubricants				
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
Use on ships/at sea				
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Remark				
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating				
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability	Yes; Class 2 for high availability	Yes; Class 2 for high availability	Yes; Class 2 for high availability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

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SIPLUS LOGO! basic modules without display

Ordering data	Article No.
SIPLUS LOGO! 8 logic module	
SIPLUS LOGO! 24CEo 24 V DC supply voltage 8 digital inputs 24 V DC, of which 4 can be used in analog mode (0 to 10 V) 4 digital outputs 24 V DC, 0.3 A, integrated time switch, Ethernet interface; without display and keyboard 400 function blocks can be interlinked, modular expansion capability	
Extended temperature range and exposure to environmental substances	**6AG1052-2CC08-7BA0**
SIPLUS LOGO! 230RCEo 115...230 V AC/DC supply voltage 8 digital inputs 115...230 V AC/DC 4 relay outputs 10 A integrated time switch, Ethernet interface; without display or keyboard 400 function blocks can be interlinked, modular expansion capability	
Extended temperature range and exposure to environmental substances	**6AG1052-2FB08-7BA0**
SIPLUS LOGO! 24RCEo 24 V AC/DC supply voltage, 8 digital inputs 24 V AC/DC, 4 relay outputs 10 A, integrated time switch, Ethernet interface; without display or keyboard; 400 function blocks can be interlinked, modular expansion capability	
Extended temperature range and exposure to environmental substances	**6AG1052-2HB08-7BA0**
SIPLUS LOGO! 12/24RCEo 12...24 V DC supply voltage 8 digital inputs 12...24 V DC, of which 4 can be used in analog mode (0 to 10 V) 4 relay outputs 10 A integrated time switch, Ethernet interface; without display and keyboard 400 function blocks can be interlinked, modular expansion capability	
Extended temperature range and exposure to environmental substances	**6AG1052-2MD08-7BA0**

	Article No.
Accessories	
SIPLUS LOGO! TDE (Extended temperature range -10 ... +60 °C and exposure to environmental substances) 6-line text display, can be connected to all LOGO! 8 variants with and without display, with 2 Ethernet interfaces; incl. installation accessories. Requires additional 12 V DC or 24 V AC/DC power supply	**6AG1055-4MH08-2BA0**
Accessories for SIPLUS LOGO! 6, 8	
LOGO!Soft Comfort V8 For programming on the PC in LAD/FBD; executes on Windows 8, 7, XP, Linux and Mac OSX; on DVD	**6ED1058-0BA08-0YA1**
Front panel mounting set Width 8 U, with keys	**6AG1057-1AA00-0AA2**

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Overview



- Expansion modules for connection to LOGO! modular
- With digital inputs and outputs, analog inputs, or analog outputs

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were adopted from the respective standard products. SIPLUS extreme specific information was added.

Technical specifications

Article number	**6AG1055-1CB00-7BA2**	**6AG1055-1HB00-7BA2**	**6AG1055-1MB00-7BA2**
Based on	**6ED1055-1CB00-0BA2**	**6ED1055-1HB00-0BA2**	**6ED1055-1MB00-0BA2**
	SIPLUS LOGO! DM8 24 V8	SIPLUS LOGO! DM8 24R V8	SIPLUS LOGO! DM8 12/24R (LOGO 8)
Ambient conditions			
Ambient temperature during operation			
• min.	-40 °C; = Tmin; Startup @ -25 °C	-40 °C; = Tmin; Startup @ -25 °C	-40 °C; = Tmin; Startup @ -25 °C
• max.	70 °C; Tmax; Tmax > +55 °C max. load 0.2 A per output	70 °C; = Tmax; Tmax > +55 °C max. load 3 A per relay or max. total current 10 A	70 °C; = Tmax; Tmax > +55 °C max. load 3 A per relay or max. total current 10 A
• At cold restart, min.	-25 °C; incl. condensation / frost permitted (no commissioning under condensation conditions)	-25 °C; incl. condensation / frost permitted (no commissioning under condensation conditions)	-25 °C; incl. condensation / frost permitted (no commissioning under condensation conditions)
Ambient temperature during storage/transportation			
• min.	-40 °C	-40 °C	-40 °C
• max.	70 °C	70 °C	70 °C
Altitude during operation relating to sea level			
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m

• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at
	1 140 hPa ... 795 hPa
	(-1 000 m ... +2 000 m) //
	Tmin ... (Tmax - 10 K) at
	795 hPa ... 658 hPa
	(+2 000 m ... +3 500 m) //
	Tmin ... (Tmax -20 K) at
	658 hPa ... 540 hPa
	(+3 500 m ... +5 000 m)
		Tmin ... Tmax at
		1 140 hPa ... 795 hPa
		(-1 000 m ... +2 000 m) //
		Tmin ... (Tmax - 10 K) at
		795 hPa ... 658 hPa
		(+2 000 m ... +3 500 m) //
		Tmin ... (Tmax -20 K) at
		658 hPa ... 540 hPa
		(+3 500 m ... +5 000 m)
			Tmin ... Tmax at
			1 140 hPa ... 795 hPa
			(-1 000 m ... +2 000 m) //
			Tmin ... (Tmax - 10 K) at
			795 hPa ... 658 hPa
			(+2 000 m ... +3 500 m) //
			Tmin ... (Tmax -20 K) at
			658 hPa ... 540 hPa
			(+3 500 m ... +5 000 m)

Relative humidity			
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance			
Coolants and lubricants			
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems			
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *

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Technical specifications (continued)

Article number	6AG1055-1CB00-7BA2	6AG1055-1HB00-7BA2	6AG1055-1MB00-7BA2
Based on	6ED1055-1CB00-0BA2	6ED1055-1HB00-0BA2	6ED1055-1MB00-0BA2
	SIPLUS LOGO! DM8 24 V8	SIPLUS LOGO! DM8 24R V8	SIPLUS LOGO! DM8 12/24R (LOGO 8)
Use on ships/at sea			
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Remark			
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating			
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability	Yes; Class 2 for high availability	Yes; Class 2 for high availability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A
Dimensions			
Width	35.5 mm	35.5 mm	35.5 mm
Height	90 mm	90 mm	90 mm
Depth	58 mm	58 mm	58 mm

Article number	6AG1055-1FB00-7BA2	6AG1055-1NB10-7BA2
Based on	6ED1055-1FB00-0BA2	6ED1055-1NB10-0BA2
	SIPLUS LOGO! DM8 230R V8	SIPLUS LOGO! DM16 24R V8
Ambient conditions		
Ambient temperature during operation		
• min.	-40 °C; = Tmin; Startup @ -25 °C	-40 °C; = Tmin; Startup @ -25 °C
• max.	70 °C; = Tmax; Tmax > +55 °C max. load 3 A per relay or max. total current 10 A	70 °C; = Tmax; Tmax > +55 °C max. load 3 A per relay
• At cold restart, min.	-25 °C; incl. condensation / frost permitted (no commissioning under condensation conditions)	-25 °C; incl. condensation / frost permitted (no commissioning under condensation conditions)
Ambient temperature during storage/transportation		
• min.	-40 °C	-40 °C
• max.	70 °C	70 °C
Altitude during operation relating to sea level		
• Installation altitude above sea level, max.	2 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity		
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance		
Coolants and lubricants		
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air

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Technical specifications (continued)

Article number	**6AG1055-1FB00-7BA2**	**6AG1055-1NB10-7BA2**
Based on	**6ED1055-1FB00-0BA2**	**6ED1055-1NB10-0BA2**
	SIPLUS LOGO! DM8 230R V8	SIPLUS LOGO! DM16 24R V8
Use in stationary industrial systems		
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
Use on ships/at sea		
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Remark		
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating		
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability	Yes; Class 2 for high availability
• Protection against fouling a cc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

Article number	**6AG1055-1MA00-7BA2**
Based on	**6ED1055-1MA00-0BA2**
	SIPLUS LOGO! AM2 V8
Ambient conditions	
Ambient temperature during operation	
• min.	-40 °C; = Tmin; Startup @ -25 °C
• max.	70 °C; = Tmax
• At cold restart, min.	-25 °C; incl. condensation / frost permitted (no commissioning under condensation conditions)
Ambient temperature during storage/transportation	
• min.	-40 °C
• max.	70 °C
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance	
Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air

Article number	**6AG1055-1MA00-7BA2**
Based on	**6ED1055-1MA00-0BA2**
	SIPLUS LOGO! AM2 V8
Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
Remark	
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A

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Technical specifications (continued)

Article number	**6AG1055-1MM00-7BA2**
Based on	**6ED1055-1MM00-0BA2** SIPLUS LOGO! AM2 AQ V8
Ambient conditions	
Ambient temperature during operation	
• min.	-40 °C; = Tmin; Startup @ -25 °C
• max.	70 °C; = Tmax
• At cold restart, min.	-25 °C; incl. condensation / frost permitted (no commissioning under condensation conditions)
Ambient temperature during storage/transportation	
• min.	-40 °C
• max.	70 °C
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation

Article number	**6AG1055-1MM00-7BA2**
Based on	**6ED1055-1MM00-0BA2** SIPLUS LOGO! AM2 AQ V8
Resistance	
Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
Remark	
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A

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Ordering data	Article No.
SIPLUS LOGO! 8 expansion modules	
SIPLUS LOGO! DM8 24	
Supply voltage 24 V DC, 4 digital inputs 24 V DC, 4 digital outputs 24 V DC, 0.3 A	
Extended temperature range and exposure to environmental substances	**6AG1055-1CB00-7BA2**
SIPLUS LOGO! DM8 230R	
115...230 V AC/DC supply voltage, 4 digital inputs 115...230 V AC/DC, 4 relay outputs 5 A	
Extended temperature range and exposure to environmental substances	**6AG1055-1FB00-7BA2**
SIPLUS LOGO! DM8 24R	
Supply voltage 24 V AC/DC, 4 digital inputs 24 V AC/DC, 4 relay outputs 5 A	
Extended temperature range and exposure to environmental substances	**6AG1055-1HB00-7BA2**
SIPLUS LOGO! AM2	
12...24 V DC supply voltage, 2 analog inputs 0 to 10 V or 0 to 20 mA, 10-bit resolution	
Extended temperature range and exposure to environmental substances	**6AG1055-1MA00-7BA2**
SIPLUS LOGO! DM8 12/24R	
12...24 V DC supply voltage, 4 digital inputs 12...24 V DC, 4 relay outputs 5 A	
Extended temperature range and exposure to environmental substances	**6AG1055-1MB00-7BA2**
SIPLUS LOGO! AM2 AQ	
Supply voltage 24 V DC, 2 analog outputs 0 to 10 V, 0/4 to 20 mA	
Extended temperature range and exposure to environmental substances	**6AG1055-1MM00-7BA2**
SIPLUS LOGO! DM16 24R	
Supply voltage 24 V DC, 8 digital inputs 24 V DC, 8 relay outputs 5 A	
Extended temperature range and exposure to environmental substances	**6AG1055-1NB10-7BA2**

	Article No.
Accessories	
LOGO!Soft Comfort V8	**6ED1058-0BA08-0YA1**
For programming on the PC in LAD/FBD; executes on Windows 8, 7, XP, Linux and Mac OSX; on DVD	
Front panel mounting set	
Width 8 U, with keys	**6AG1057-1AA00-0AA2**

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Introduction

Overview



- Communication modules for connecting LOGO! Modular to different bus systems.

Note on compatibility:

Communication module	Can be used with:
LOGO! CMK2000 communication module	LOGO! ...0BA8
LOGO! CSM 12/24	LOGO! ...0BA7/...0BA8
LOGO! CSM 230	LOGO! ...0BA7
LOGO! CMR2020	LOGO! ...0BA8
LOGO! CMR2040	LOGO! ...0BA8

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Overview



- Expansion module for LOGO! 8 basic versions
- For integrating LOGO! 8 in KNX installations
- With 24 digital inputs, 20 digital outputs as well as 8 analog inputs and outputs for processing process signals via KNX.

Technical specifications

Article number	**6BK1700-0BA20-0AA0** LOGO! CMK2000
General information	
Firmware version	
• FW update possible	Yes
Installation type/mounting	
Mounting	on 35 mm DIN rail, 4 spacing units wide
Supply voltage	
Rated value (DC)	24 V
• 12 V DC	No
• 24 V DC	Yes
Rated value (AC)	
• 24 V AC	No
Input current	
Current consumption, max.	0.04 A
Power loss	
Power loss, max.	1.1 W
Memory	
Flash	Yes
Time of day	
Clock synchronization	
• supported	Yes
Interfaces	
Number of industrial Ethernet interfaces	1; Ethernet, 1 port, RJ45
Number of other interfaces	1; EIB/KNX
Transmission rate, max.	100 Mbit/s over Ethernet, 9 600 bit/s over KNX
Protocols	
EIB/KNX	Yes
Web server	
• supported	Yes
Communication functions	
S7 basic communication	
• supported	No
LOGO! communication	
• supported	Yes
Interrupts/diagnostics/ status information	
Diagnostics indication LED	
• RUN/STOP LED	Yes
EMC	
Emission of radio interference acc. to EN 55 011	
• Limit class B, for use in residential areas	Yes; In accordance with EN 61000-6-3
Degree and class of protection	
Degree of protection acc. to EN 60529	
• IP20	Yes
Standards, approvals, certificates	
CE mark	Yes
CSA approval	Yes
UL approval	Yes
cULus	Yes
FM approval	No
RCM (formerly C-TICK)	No
KC approval	Yes
EAC (formerly Gost-R)	Yes
according to VDE 0631	No
Marine approval	No
Ambient conditions	
Ambient temperature during operation	
• min.	0 °C
• max.	55 °C
Ambient temperature during storage/transportation	
• min.	-40 °C
• max.	70 °C
Relative humidity	
• Operation, max.	95 %
Connection method	
Design of electrical connection for supply voltage	2 screw-type terminals: L+, M 0.5 mm² - 2.5 mm² Screw-type terminal: FE 0.5 mm² ... 6.0 mm²
Design of plug-in connection	KNX terminal 0.6 mm² - 1.0 mm²
Dimensions	
Width	71.5 mm; 4TE
Height	90 mm
Depth	58.5 mm
Weights	
Weight, approx.	0.14 kg

Ordering data

	Article No.
LOGO! CMK2000 communication module For integrating LOGO! 8 in the KNX building system bus, max. 50 communication objects can be configured; RJ45 port for Ethernet; supply voltage 24 V DC/40 mA	**6BK1700-0BA20-0AA0**

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LOGO! CSM unmanaged

Overview



The module is used to connect a LOGO! and up to three other nodes to an Industrial Ethernet network with 10/100 Mbps in an electrical linear, tree or star topology.

The essential features of the LOGO! CSM are:

- Unmanaged 4-port switch, of which one port is on the front for easy diagnostics access
- Two versions for the voltage ranges 12/24 V DC or 230 V AC/DC
- Problem-free connection using four RJ45 standard connectors
- Space-saving, optimized for connection to LOGO!
- Low-cost solution for implementing small, local Ethernet networks
- Stand-alone use for networking any Ethernet devices

Technical specifications

Article number	**6GK7177-1FA10-0AA0**	**6GK7177-1MA20-0AA0**
Product type designation	LOGO! CSM 230	LOGO! CSM 12/24
Transmission rate		
Transfer rate	10 Mbit/s, 100 Mbit/s	10 Mbit/s, 100 Mbit/s
Interfaces for communication integrated		
Number of electrical connections		
• for network components or terminal equipment	4	4
Number of 100 Mbit/s SC ports		
• for multimode	0	0
Number of 1000 Mbit/s LC ports		
• for multimode	0	0
• for single mode (LD)	0	0
Interfaces others		
Number of electrical connections		
• for power supply	1	1
Type of electrical connection		
• for power supply	3-pole terminal block	3-pole terminal block
Supply voltage, current consumption, power loss		
Type of voltage of the supply voltage	115...240 V AC/DC	12/24 V DC
Supply voltage		
• external	230 V	24 V
• external minimum	100 V	10.2 V
• external maximum	240 V	30.2 V
Product component fusing at power supply input	Yes	Yes
Consumed current maximum	0.02 A	0.15 A
Power loss [W]		
• at DC at 24 V		1.5 W
• at AC at 230 V	1.8 W	
Permitted ambient conditions		
Ambient temperature		
• during operation	0 ... 55 °C	0 ... 55 °C
• during storage	-40 ... +70 °C	-40 ... +70 °C
• during transport	-40 ... +70 °C	-40 ... +70 °C
Relative humidity		
• at 25 °C without condensation during operation maximum	90 %	90 %
Protection class IP	IP20	IP20

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Technical specifications (continued)

Article number	6GK7177-1FA10-0AA0	6GK7177-1MA20-0AA0
Design, dimensions and weight		
Design	LOGO! module	LOGO! module
Width	72 mm	71.5 mm
Height	90 mm	90 mm
Depth	55 mm	58.2 mm
Net weight	0.155 kg	0.15 kg
Mounting type		
• 35 mm DIN rail mounting	Yes	Yes
• wall mounting	Yes	Yes
• S7-300 rail mounting	No	No
• S7-1500 rail mounting	No	No
Product functions management, configuration		
Product function		
• multiport mirroring	No	No
Product function switch-managed	No	No
Standards, specifications, approvals		
Standard		
• for FM	FM3600 and 3611: CL. I, Div2, Group A,B,C,D T4, CL I, Zone 2, Group IIC, T4, Ta=55°C	
• for hazardous zone	no	ATEX: EN 60079-0 : 2009,EN 60079-15 :2010 (Directive 94/9/EC), IECEx: IEC 60079-0 :2011, IEC 60079-15 :2010
• for safety from CSA and UL	UL60079-0, UL60079-15, CSA C22.2	UL 508, CSA C22.2 No. 142
• for hazardous zone from CSA and UL		Haz-Loc ANSI/ISA 12.12.01: CL. I, Div2, Group A,B,C,D T4, CL I, Zone 2, Group IIC, T4, Ta=55°C
Standards, specifications, approvals CE		
Certificate of suitability CE marking	Yes	Yes
Standards, specifications, approvals miscellaneous		
Certificate of suitability		
• C-Tick	Yes	Yes
• KC approval	No	No
Standards, specifications, approvals ship classification		
Marine classification association		
• American Bureau of Shipping Europe Ltd. (ABS)	No	No
• Bureau Veritas (BV)	No	No
• Det Norske Veritas (DNV)	No	No
• Germanische Lloyd (GL)	No	No
• Lloyds Register of Shipping (LRS)	No	No
• Nippon Kaiji Kyokai (NK)	No	No
• Polski Rejestr Statkow (PRS)	No	No

Ordering data

	Article No.
LOGO! CSM compact switch modules	
Unmanaged switch for connection of one LOGO! and up to three further nodes on Industrial Ethernet with 10/100 Mbps; 4 x RJ45 ports; LED diagnostics, LOGO! module	
• **LOGO! CSM12/24** external 12 V DC or 24 V DC power supply, for LOGO! ... 0BA7/... 0BA8	**6GK7177-1MA20-0AA0**
• **LOGO! CSM230** external 115 ... 240 V AC power supply, for LOGO! ... 0BA7	**6GK7177-1FA10-0AA0**

	Article No.
Accessories	
IE TP cord RJ45/RJ45	
TP cable 4 x 2 with 2 RJ45 plugs	
• 0.5 m	**6XV1870-3QE50**
• 1 m	**6XV1870-3QH10**
• 2 m	**6XV1870-3QH20**
• 6 m	**6XV1870-3QH60**
• 10 m	**6XV1870-3QN10**
IE FC outlet RJ45	**6GK1901-1FC00-0AA0**
For connection of Industrial Ethernet FC cables and TP cords; graduated prices for 10 and 50 units or more	

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LOGO! CMR (wireless communication)

Overview



LOGO! CMR in combination with the LOGO! logic module is a cost-efficient communication system suitable for monitoring and controlling distributed plants and systems via text message or email.

LOGO! CMR can send text messages or emails to predefined mobile network numbers as well as receive text messages from predefined mobile network numbers.

Sending a text message/email can be initiated by events in the LOGO! basic module as well as by the two digital alarm inputs of the LOGO! CMR. The values in the LOGO! logic module can be directly influenced by receiving a text message.

The LOGO! CMR offers comfortable Web Based Management commissioning and diagnostics via local and/or remote access.

The two digital outputs can also be switched remotely by incoming text messages/emails.

LOGO! CMR determines the current position of the module based on the GPS signal received by the GPS antenna. In addition, the LOGO! 8 logic module can be time-synchronized by means of the time included in the GPS signal. Determination of time by means of an NTP server or from the data of the mobile network provider offers more options for synchronization of the LOGO! BM with the current time of day.

Product version:

- LOGO! CMR2020 for use in GSM/GPRS mobile wireless networks
- LOGO! CMR2040 for use in LTE mobile wireless networks

Warning! The country-specific mobile network approvals must be observed:

DE: http://www.siemens.de/mobilfunkzulassungen

EN: http://www.siemens.com/mobilenetwork-approvals

Technical specifications

Article number	**6GK7142-7BX00-0AX0**	**6GK7142-7EX00-0AX0**
Product type designation	LOGO! CMR2020	LOGO! CMR2040
Transmission rate		
Transfer rate		
• at the 1st interface	10 ... 100 Mbit/s	10 ... 100 Mbit/s
• for GPRS transmission		
- with downlink maximum	80 kbit/s	85.6 kbit/s
- with uplink maximum	40 kbit/s	85.6 kbit/s
• for LTE transmission		
- with downlink maximum		100 Mbit/s
- with uplink maximum		50 Mbit/s
Interfaces		
Number of interfaces acc. to Industrial Ethernet	1	1
Number of electrical connections		
• at the 1st interface acc. to Industrial Ethernet	1	1
• for external antenna(s)	2	2
• for power supply	1	1
Number of slots		
• for SIM cards	1	1
• for memory cards	1	1
Type of electrical connection		
• at the 1st interface acc. to Industrial Ethernet	RJ45 port	RJ45 port
• for external antenna(s)	SMA socket (50 ohms)	SMA socket (50 ohms)
• for power supply	3-pole terminal block	3-pole terminal block
Type of antenna		
• at port 1 connectable	GPS Antenna	GPS Antenna
• at port 2 connectable	Mobile radio antenna (GPRS/GSM)	Mobile radio antenna (GPRS/GSM, UMTS, LTE)
Wire length of antenna cable maximum	15 m	15 m

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Technical specifications (continued)

Article number	**6GK7142-7BX00-0AX0**	**6GK7142-7EX00-0AX0**
Product type designation	LOGO! CMR2020	LOGO! CMR2040
Slot version		
• for SIM card	Standard	Standard
• of the memory card	microSD	microSD
Storage capacity of the memory card maximum	32 Gibyte	32 Gibyte
Performance class of the memory card minimum necessary	Class 6	Class 6
Type of file system Type of file system	FAT32	FAT32
Signal-Inputs/outputs		
Number of electrical connections for digital input signals	2	2
Type of electrical connection for digital input signals	3 pole terminal block	3 pole terminal block
Digital input version	not galvanically isolated, not debounced	not galvanically isolated, not debounced
Input voltage at digital input		
• with signal <0> at DC	0 ... 5 V	0 ... 5 V
• for signal <1> at DC	8.5 ... 24 V	8.5 ... 24 V
Input current at digital input for signal <1> maximum	5.5 mA	5.5 mA
Number of electrical connections for digital output signals	2	2
Type of electrical connection for digital output signals	3 pole terminal block	3 pole terminal block
Digital output version	transistor, not potential seperated	transistor, not potential seperated
Output voltage at digital output		
• for signal <1>	12 ... 24 V; Value of the actual supply voltage	12 ... 24 V; Value of the actual supply voltage
• for signal <0>	0 ... 5 V	0 ... 5 V
Output current at digital output for signal <1> maximum	0.3 A	0.3 A
Wireless technology		
Type of mobile wireless service		
• is supported SMS	Yes	Yes
• is supported GPRS	Yes	Yes
• Note	GPRS (Multislot Class 10, Mobile Station Class B)	LTE
Type of mobile network is supported		
• GSM	Yes	Yes
• UMTS	No	Yes
• LTE	No	Yes
Operating frequency		
• for GSM transmission 850 MHz	Yes	No
• for GSM transmission 900 MHz	Yes	Yes
• for GSM transmission 1800 MHz	Yes	Yes
• for GSM transmission 1900 MHz	Yes	No
• with UMTS transmission 850 MHz	No	Yes
• with UMTS transmission 900 MHz	No	Yes
• with UMTS transmission 2100 MHz	No	Yes
• for LTE transmission 800 MHz	No	Yes
• for LTE transmission 1800 MHz	No	Yes
• for LTE transmission 2600 MHz	No	Yes

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Technical specifications (continued)

Article number	6GK7142-7BX00-0AX0	6GK7142-7EX00-0AX0
Product type designation	LOGO! CMR2020	LOGO! CMR2040
Supply voltage, current consumption, power loss		
Type of voltage of the supply voltage	DC	DC
Supply voltage external	12 ... 24 V	12 ... 24 V
Supply voltage external at DC	12 ... 24 V	12 ... 24 V
Supply voltage for GPS antenna maximum	3.8 V; at 5 mA: 3,575 V / at 10 mA: 3,35 V / at 15 mA: 3,125 V	3.8 V; at 5 mA: 3,575 V / at 10 mA: 3,35 V / at 15 mA: 3,125 V
Relative positive tolerance at DC at 24 V	20 %	20 %
Relative negative tolerance at DC at 12 V	10 %	10 %
Consumed current		
• from external supply voltage at DC at 12 V maximum	0.25 A	0.25 A
• from external supply voltage at DC at 24 V maximum	0.125 A	0.125 A
Output current for GPS antenna maximum	15 mA	15 mA
Power loss [W]	3 W	3 W
Permitted ambient conditions		
Ambient temperature		
• during operation	-20 ... +70 °C	-20 ... +70 °C
• during storage	-40 ... +85 °C	-40 ... +85 °C
• during transport	-40 ... +85 °C	-40 ... +85 °C
Relative humidity at 25 °C without condensation during operation maximum	95 %	95 %
Protection class IP	IP20	IP20
Design, dimensions and weight		
Module format	Compact module, for rail mounting	Compact module, for rail mounting
Width	71.5 mm	71.5 mm
Height	90 mm	90 mm
Depth	58.2 mm	58.2 mm
Net weight	0.16 kg	0.16 kg
Mounting type		
• 35 mm DIN rail mounting	Yes	Yes
• wall mounting	Yes	Yes
Product properties, functions, components general		
Product function		
• DynDNS client	Yes	Yes
• no-ip.com client	Yes	Yes
Performance data		
Number of possible connections to the LOGO! logic module	1	1
Number of users/telephone numbers/ email addresses definable maximum	20	20
Number of user groups definable maximum	10	10
Number of signals for monitoring or device control definable maximum	32	32
Number of events for monitoring definable maximum	32	32
number of actions definable maximum	32	32
Number of assignments definable maximum	32	32
Number of alias SMS commands definable maximum	20	20
Number of constants definable maximum	10	10

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Technical specifications (continued)

Article number	**6GK7142-7BX00-0AX0**	**6GK7142-7EX00-0AX0**
Product type designation	LOGO! CMR2020	LOGO! CMR2040
Performance data IT functions		
Number of possible connections		
• as server by means of HTTP maximum	2	2
• as server by means of HTTPS maximum	2; http and https can be combined (max. number of 2 connections cannot be exceeded). Max. one connection via https is possible on the mobile wireless interface.	2; http and https can be combined (max. number of 2 connections cannot be exceeded). Max. one connection via https is possible on the mobile wireless interface.
• as e-mail client maximum	1	1
Number of free texts for e-mails definable by user	20	20
Performance data Teleservice		
Product function		
• Remote firmware update	Yes	Yes
• remote configuration	Yes	Yes
Product functions Diagnosis		
Product function Web-based diagnostics	Yes	Yes
Product functions Security		
Suitability for operation Virtual Private Network	Yes	Yes
Operating mode Virtual Private Network note	Open VPN server in PSK mode	Open VPN server in PSK mode
Product function with VPN connection	OpenVPN PSK	OpenVPN PSK
Type of encryption algorithms with VPN connection	AES-128 CBC	AES-128 CBC
Type of authentication with Virtual Private Network PSK	Yes	Yes
Type of hashing algorithms with VPN connection	SHA-256	SHA-256
Number of possible connections with VPN connection	1	1
Product function		
• password protection for Web applications	Yes	Yes
• password protection for VPN	Yes	Yes
• encrypted data transmission	Yes	Yes
• switch-off of non-required services	Yes	Yes
• log file for unauthorized access	Yes	Yes
Product functions Time		
Product function pass on time synchronization	Yes	Yes
Accuracy of the hardware real-time clock per day maximum	7.5 s	7.5 s
time synchronization		
• from NTP-server	Yes	Yes
• from GPS-signal	Yes	Yes
• from mobile network provider	Yes	Yes
• PC	Yes	Yes
• manual setting	Yes	Yes
Product functions Position recognition		
Product function		
• position detection with GPS	Yes	Yes
• pass on position data	Yes	Yes

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LOGO! CMR (wireless communication)

Ordering data	Article No.
LOGO! CMR Communication Module Radio Communication modules for connection of LOGO! 0BA8 to GSM/GPRS or LTE network; 1x RJ45 port for Industrial Ethernet connection; 2x digital input; 2x digital output; read/write access to LOGO! tags; possible to send/receive text messages; GPS position detection; time-of-day synchronization/forwarding with real time clock; configuration and diagnostics per web interface; Note country approvals: http://www.siemens.com/mobilenetwork-approvals	
LOGO! CMR2020 For connecting LOGO! 0BA8 to a GSM/GPRS network	**6GK7142-7BX00-0AX0**
LOGO! CMR2040 For connecting LOGO! 0BA8 to an LTE network	**6GK7142-7EX00-0AX0**
Accessories	
Mobile radio antennas	
ANT794-4MR For indoor and outdoor use; 5 m connecting cable permanently connected to antenna; SMA connector; incl. installation bracket, screws, wall anchors	**6NH9860-1AA00**
ANT896-4MA Rod antenna for direct mounting on device; SMA male connector	**6GK5896-4MA00-0AA3**
ANT896-4ME Cylinder-shaped antenna for remote installation, e.g. on a control cabinet; N-Connect female connector	**6GK5896-4ME00-0AA0**

	Article No.
GPS antenna	
ANT895-6ML GPS/Glonass antenna for remote installation indoor and outdoor, magnet or screw mounting, 30 cm cable with N-Connect female connector	**6GK5895-6ML00-0AA0**
Antenna adapter cable N-Connect/SMA male/male Flexible Connection Cable, pre-assembled, connection cable; suitable for 0 ... 6 GHz, IP68	
• 0.3 m	**6XV1875-5LE30**
• 1 m	**6XV1875-5LH10**
• 2 m	**6XV1875-5LH20**
• 5 m	**6XV1875-5LH50**
IWLAN RCoax/antenna N-Connect male/male flexible connection cable Flexible connection cable for connecting an RCoax cable or antenna to a SCALANCE W-700 access point with N-Connect connectors; pre-assembled with two N-Connect male connectors; suitable from 0 ... 6 GHz, IP68	
• 1 m	**6XV1875-5AH10**
• 2 m	**6XV1875-5AH20**
• 5 m	**6XV1875-5AH50**
• 10 m	**6XV1875-5AN10**
Cabinet feedthrough	
IWLAN RCOAX N-Connect/ N-Connect female/female panel feedthrough; Control cabinet feedthrough for wall thickness max. 4.5 mm; 2.4 GHz and 5 GHz, suitable from 0 ... 6 GHz, IP67	**6GK5798-2PP00-2AA6**
Lightning protector LP798-2N	
Lightning protector with N/N female/female connection for ANT 790 antennas, IP67 (-40 to +85 °C), frequency range: 0 … 6 GHz	**6GK5798-2LP00-2AA6**

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Ordering data

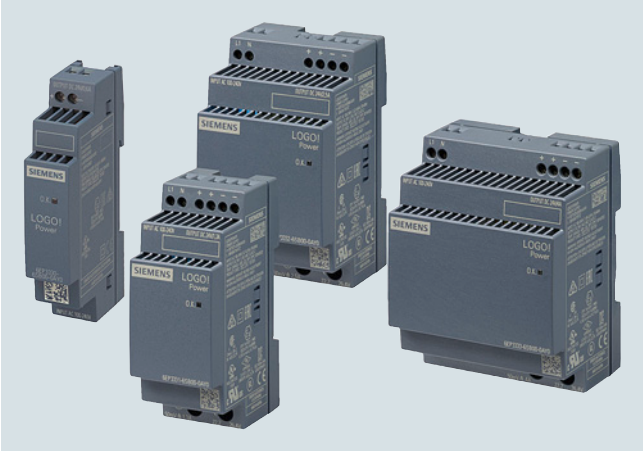
	Article No.
Patch cable	
IE TP Cord RJ45/RJ45 TP cable 4 x 2 with 2 RJ45 plugs	
• 0.5 m	**6XV1870-3QE50**
• 1 m	**6XV1870-3QH10**
• 2 m	**6XV1870-3QH20**
• 6 m	**6XV1870-3QH60**
• 10 m	**6XV1870-3QN10**
IE FC outlet RJ45 For connection of Industrial Ethernet FC cables and TP Cords; graduated prices for 10 and 50 units or more	**6GK1901-1FC00-0AA0**
LOGO! CSM12/24 Compact switch module for connecting a LOGO! (...0BA7/...0BA8) and up to 3 additional nodes to Industrial Ethernet; 12/24 V DC power supply	**6GK7177-1MA20-0AA0**
LOGO! CSM230 Compact switch module for connecting a LOGO! (...0BA7) and up to 3 additional nodes to Industrial Ethernet 115 ... 240 V AC/DC	**6GK7177-1FA10-0AA0**

	Article No.
Stainless steel enclosure in IP68 degree of protection Stainless steel enclosure in IP68 degree of protection; suitable for SIMATIC RTU3030C; temperature range -60 to +135 °C; matte surface; cover with Pin Torx screws and padlock 7 cable openings and opening for mobile radio antenna prepared; please order the needed quantity of cable glands and sealing plugs separately	**6NH3112-3BA00-1XX1**
Aluminum enclosure in IP68 degree of protection Aluminum enclosure in IP68 degree of protection; suitable for SIMATIC RTU3030C; temperature range -40 to +80 °C; cover with Pin Torx screws; 7 cable openings and opening for mobile radio antenna prepared; please order the needed quantity of cable glands and sealing plugs separately	**6NH3112-3BA00-1XX3**
Cable gland PG16 F for IP68 enclosure Cable gland, M16, IP68, -40 to +100 °C; nickel-plated brass; suitable for enclosure with article numbers 6NH3112-3BA00-1x X1 and 6NH3112-3BA00-1x X3 pack quantity = 2 units	**6NH3112-3BA00-1XX4**
Sealing plug M16 for IP68 enclosure Sealing plug, M16, IP68, -40 to +100 °C; nickel-plated brass; suitable for enclosure with article numbers 6NH3112-3BA00-1x X1 and 6NH3112-3BA00-1x X3 pack quantity = 2 units	**6NH3112-3BA00-1XX5**

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2

Overview



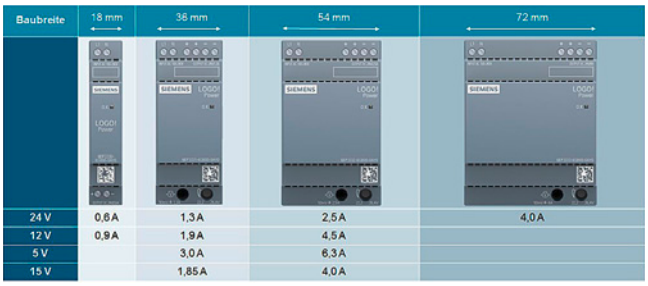
The flat power supply unit for distribution boards

Small. Clever. LOGO!Power

Small. Clever. LOGO!Power: Thanks to its stepped profile design, the LOGO! 8 product line is ideally suited for installation in small distribution boards. The stabilized power supplies with a wide range input of 100 … 240 V AC (85 … 264 V) and 110 ... 300 V DC are available in two performance classes with an output voltage of 5 V and 15 V, in three performance classes with 12 V and in four performance classes with 24 V. The 12 V and 24 V versions are ideal for supplying LOGO! controllers with the corresponding voltage input. The high level of efficiency across the entire load range as well as the low no-load losses result in lower overall energy consumption. Greater convenience when commissioning and servicing thanks to the integrated current monitor. The extended temperature range from -25 °C to +70 °C enables a host of additional applications.

To further increase 24 V availability, the 24 V LOGO!Power power supply units can be combined with **DC-UPS**, **redundancy** and **selectivity modules**.

LOGO!Power is the ideal choice when components need to be supplied with DC voltage. It can provide currents up to 4 A. This mini power pack can be used regardless of industry, e.g. in building technology applications for light and heating controllers or for access control systems. LOGO!Power is also well-suited for use in industrial automation, such as in packaging machine, machine tool, conveyor belt or sorting system applications.



Main product highlights

- Low width
  with minimum of 18 mm to maximum of 72 mm, thus requiring very little space in the control cabinet or distribution board
- High energy efficiency
  with efficiency levels of up to 90% over the entire power range and ERP-compliant no-load losses of < 0.3 W
- Global use
  due to operating temperature range from -25 °C to +70 °C and international certificates
- Load monitoring
  due to real-time measurement of the output current without disconnecting the cable, i.e. without interrupting the DC supply
- Flexible mounting
  with DIN rail or wall mounting in different installation positions
- Broad portfolio
  including 11 devices with 5 V, 12 V, 15 V and 24 V DC up to 100 watts (new: 12 V/0.9 A and 24 V/0.6 A)
- Flexible operation
  in all standard 1-phase supply networks thanks to wide range input of 100 … 240 V AC without switchover and operation on DC networks with 110 … 300 V DC
- Reliability
  due to problem-free connection of loads with high inrush currents thanks to power reserve when starting up as well as constant current in the event of overload

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Overview



Thanks to its stepped profile design, the LOGO!Power product family is ideally suited for low installation depths, such as in miniature distribution boards. The stabilized power supplies with a wide range input of 100 … 240 V AC (85 … 264 V) and 110 ... 300 V DC are available with an output voltage of 5 V in two performance classes. The high level of efficiency across the entire load range as well as the low no-load losses result in lower overall energy consumption. Greater convenience when commissioning and servicing thanks to the integrated current monitor. The extended temperature range from -25 °C to +70 °C enables a host of additional applications.

Main product highlights

- 5 V DC / 3 A and 6.3 A
- Narrow unit with 36 mm or 54 mm width and overall depth of 53 mm in LOGO! design
- Flexible mounting: DIN rail or wall mounting in a range of installation positions
- Higher energy efficiency: over the entire load range as well as no-load power losses of < 0.3 W
- Integrated current monitor: Actual output current measurement directly at the power supply unit
- Global use: Operating temperature range from -25 °C to +70 °C as well as international certifications such as UL, CSA, FM or ATEX

Technical specifications

Article number	**6EP3310-6SB00-0AY0**	**6EP3311-6SB00-0AY0**
Product	LOGO!Power	LOGO!Power
Power supply, type	5 V/3 A	5 V/6.3 A
Input		
Input	1-phase AC or DC	1-phase AC or DC
Rated voltage value $V_{in\ rated}$	100 ... 240 V	100 ... 240 V
Voltage range AC	85 ... 264 V	85 ... 264 V
Input voltage		
• at DC	110 ... 300 V	110 ... 300 V
Wide-range input	Yes	Yes
Overvoltage resistance	300 V AC for 1 s	300 V AC for 1 s
Mains buffering at $I_{out\ rated}$, min.	40 ms; at Vin = 187 V	40 ms; at Vin = 187 V
Rated line frequency 1	50 Hz	50 Hz
Rated line frequency 2	60 Hz	60 Hz
Rated line range	47 ... 63 Hz	47 ... 63 Hz
Input current		
• at rated input voltage 120 V	0.36 A	0.71 A
• at rated input voltage 230 V	0.22 A	0.37 A
Switch-on current limiting (+25 °C), max.	26 A	50 A
I^2t, max.	0.8 $A^2 \cdot s$	3 $A^2 \cdot s$
Built-in incoming fuse	internal	internal
Protection in the mains power input (IEC 898)	Recommended miniature circuit breaker: from 6 A characteristic B or from 2 A characteristic C	Recommended miniature circuit breaker: from 10 A characteristic B or from 6 A characteristic C

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Technical specifications (continued)

Article number	6EP3310-6SB00-0AY0	6EP3311-6SB00-0AY0
Product	LOGO!Power	LOGO!Power
Power supply, type	5 V/3 A	5 V/6.3 A
Output		
Output	Controlled, isolated DC voltage	Controlled, isolated DC voltage
Rated voltage V_{out} DC	5 V	5 V
Total tolerance, static ±	3 %	3 %
Static mains compensation, approx.	0.1 %	0.1 %
Static load balancing, approx.	0.1 %	0.1 %
Residual ripple peak-peak, max.	100 mV	100 mV
Residual ripple peak-peak, typ.	30 mV	30 mV
Spikes peak-peak, max. (bandwidth: 20 MHz)	100 mV	100 mV
Spikes peak-peak, typ. (bandwidth: 20 MHz)	50 mV	50 mV
Adjustment range	4.6 ... 5.4 V	4.6 ... 5.4 V
Product function Output voltage adjustable	Yes	Yes
Output voltage setting	via potentiometer	via potentiometer
Status display	Green LED for output voltage OK	Green LED for output voltage OK
On/off behavior	No overshoot of V_{out} (soft start)	No overshoot of V_{out} (soft start)
Startup delay, max.	0.5 s	0.5 s
Voltage rise, typ.	100 ms	100 ms
Rated current value $I_{out\ rated}$	3 A	6.3 A
Current range	0 ... 3 A	0 ... 6.3 A
• Note	+55 ... +70 °C: Derating 2%/K	+55 ... +70 °C: Derating 2%/K
Supplied active power typical	15 W	31.5 W
Parallel switching for enhanced performance	Yes	Yes
Numbers of parallel switchable units for enhanced performance	2	2
Efficiency		
Efficiency at $V_{out\ rated}$, $I_{out\ rated}$, approx.	76 %	80 %
Power loss at $V_{out\ rated}$, $I_{out\ rated}$, approx.	5 W	8 W
Power loss [W] during no-load operation maximum	0.3 W	0.3 W
Closed-loop control		
Dynamic mains compensation ($V_{in\ rated}$ ±15 %), max.	0.2 %	0.2 %
Dynamic load smoothing (I_{out}: 10/90/10 %), U_{out} ± typ.	5 %	7 %
Load step setting time 10 to 90%, typ.	1 ms	1 ms
Load step setting time 90 to 10%, typ.	1 ms	1 ms
Protection and monitoring		
Output overvoltage protection	Yes, according to EN 60950-1	Yes, according to EN 60950-1
Current limitation, typ.	3.8 A	8.2 A
Property of the output Short-circuit proof	Yes	Yes
Short-circuit protection	Constant current characteristic	Constant current characteristic
Enduring short circuit current RMS value		
• maximum	3.8 A	8.2 A
Overcurrent overload capability in normal operation	overload capability 150% Iout rated typ. 200 ms	overload capability 150% Iout rated typ. 200 ms
Overload/short-circuit indicator	-	-
measuring point for output current	50 mV =^ 3 A	50 mV =^ 6.3 A
Overcurrent overload capability when switching on	150% $I_{out\ rated}$ typ. 200 ms	150% $I_{out\ rated}$ typ. 200 ms

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Technical specifications (continued)

Article number	**6EP3310-6SB00-0AY0**	**6EP3311-6SB00-0AY0**
Product	LOGO!Power	LOGO!Power
Power supply, type	5 V/3 A	5 V/6.3 A
Safety		
Primary/secondary isolation	Yes	Yes
Galvanic isolation	Safety extra-low output voltage Uout acc. to EN 60950-1 and EN 50178	Safety extra-low output voltage Uout acc. to EN 60950-1 and EN 50178
Protection class	Class II (without protective conductor)	Class II (without protective conductor)
CE mark	Yes	Yes
UL/cUL (CSA) approval	cULus-Listed (UL 508, CSA C22.2 No. 107.1), File E197259; cURus-Recognized (UL 60950, CSA C22.2 No. 60950), File E151273, NEC class 2 (acc. to UL 1310)	cULus-listed (UL 508, CSA C22.2 No. 107.1), File E197259; cURus-recognized (UL 60950, CSA C22.2 No. 60950), File E151273
Explosion protection	ATEX (EX) II 3G Ex nA IIC T3; cULus Class I Div. 2 (ANSI/ISA-12.12.01, CSA C22.2 No. 213) Group ABCD, T4, File E488866	ATEX (EX) II 3G Ex nA IIC T3; cULus Class I Div. 2 (ANSI/ISA-12.12.01, CSA C22.2 No. 213) Group ABCD, T4, File E488866
FM approval	Class I, Div. 2, Group ABCD, T4	Class I, Div. 2, Group ABCD, T4
CB approval	Yes	Yes
Marine approval	ABS, DNV GL	ABS, DNV GL
Degree of protection (EN 60529)	IP20	IP20
EMC		
Emitted interference	EN 55022 Class B	EN 55022 Class B
Supply harmonics limitation	not applicable	not applicable
Noise immunity	EN 61000-6-2	EN 61000-6-2
Operating data		
Ambient temperature		
• during operation	-25 ... +70 °C	-25 ... +70 °C
- Note	with natural convection	with natural convection
• during transport	-40 ... +85 °C	-40 ... +85 °C
• during storage	-40 ... +85 °C	-40 ... +85 °C
Humidity class according to EN 60721	Climate class 3K3, no condensation	Climate class 3K3, no condensation
Mechanics		
Connection technology	screw-type terminals	screw-type terminals
Connections		
• Supply input	L, N: 1 screw terminal each for 0.5 ... 2.5 mm2 single-core/finely stranded	L, N: 1 screw terminal each for 0.5 ... 2.5 mm2 single-core/finely stranded
• Output	+, -: 1 screw terminal each for 0.5 ... 2.5 mm^2	+, -: 1 screw terminal each for 0.5 ... 2.5 mm^2
• Auxiliary	-	-
Width of the enclosure	36 mm	54 mm
Height of the enclosure	90 mm	90 mm
Depth of the enclosure	53 mm	53 mm
Required spacing		
• top	20 mm	20 mm
• bottom	20 mm	20 mm
• left	0 mm	0 mm
• right	0 mm	0 mm
Weight, approx.	0.12 kg	0.2 kg
Product feature of the enclosure housing for side-by-side mounting	Yes	Yes
Installation	Snaps onto DIN rail EN 60715 35x7.5/15, direct mounting in different mounting positions	Snaps onto DIN rail EN 60715 35x7.5/15, direct mounting in different mounting positions
MTBF at 40 °C	2 931 709 h	2 654 280 h
Other information	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)

Ordering data

	Article No.		Article No.
LOGO!Power 1-phase, 5 V DC/3 A Stabilized power supply Input: 100 … 240 V AC (110 ... 300 V AC) Output: 5 V DC/3 A	**6EP3310-6SB00-0AY0**	**LOGO!Power 1-phase, 5 V DC/6.3 A** Stabilized power supply Input: 100 … 240 V AC (110 ... 300 V AC) Output: 5 V DC/6.3 A	**6EP3311-6SB00-0AY0**

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Overview



Thanks to its stepped profile design, the LOGO!Power product family is ideally suited for low installation depths, such as in miniature distribution boards. The stabilized power supplies with a wide range input of 100 … 240 V AC (85 … 264 V) and 110 ... 300 V DC are available with an output voltage of 12 V in three performance classes. The 12 V versions are ideal for supplying LOGO! controllers with the corresponding voltage input. The high level of efficiency across the entire load range as well as the low no-load losses result in lower overall energy consumption. Greater convenience when commissioning and servicing thanks to integrated current monitor (for devices at least 36 mm wide). The extended temperature range from -25 °C to +70 °C enables a host of additional applications.

Main product highlights

- 12 V DC / 0.9 A, 1.9 A and 4.5 A
- Narrow unit with width of 18 mm, 36 mm or 54 mm and overall depth of 53 mm in LOGO! design
- Flexible mounting: DIN rail or wall mounting in a range of installation positions
- Higher energy efficiency: over the entire load range as well as no-load power losses of < 0.3 W
- Integrated current monitor: Actual output current measurement directly at the power supply unit (for devices at least 36 mm wide)
- Global use:
  Operating temperature range from -25 °C to +70 °C as well as international certifications such as UL, CSA, FM or ATEX

Technical specifications

Article number	**6EP3320-6SB00-0AY0**	**6EP3321-6SB00-0AY0**	**6EP3322-6SB00-0AY0**
Product	LOGO!Power	LOGO!Power	LOGO!Power
Power supply, type	12 V/0.9 A	12 V/1.9 A	12 V/4.5 A
Input			
Input	1-phase AC or DC	1-phase AC or DC	1-phase AC or DC
Rated voltage value $V_{in\ rated}$	100 ... 240 V	100 ... 240 V	100 ... 240 V
Voltage range AC	85 ... 264 V	85 ... 264 V	85 ... 264 V
Input voltage			
• at DC	110 ... 300 V	110 ... 300 V	110 ... 300 V
Wide-range input	Yes	Yes	Yes
Overvoltage resistance	300 V AC for 1 s	300 V AC for 1 s	300 V AC for 1 s
Mains buffering at $I_{out\ rated}$, min.	40 ms; at V_{in} = 187 V	40 ms; at V_{in} = 187 V	40 ms; at V_{in} = 187 V
Rated line frequency 1	50 Hz	50 Hz	50 Hz
Rated line frequency 2	60 Hz	60 Hz	60 Hz
Rated line range	47 ... 63 Hz	47 ... 63 Hz	47 ... 63 Hz
Input current			
• at rated input voltage 120 V	0.3 A	0.53 A	1.13 A
• at rated input voltage 230 V	0.2 A	0.3 A	0.61 A
Switch-on current limiting (+25 °C), max.	20 A	25 A	50 A
I^2t, max.	0.8 $A^2 \cdot s$	0.8 $A^2 \cdot s$	3 $A^2 \cdot s$
Built-in incoming fuse	internal	internal	internal
Protection in the mains power input (IEC 898)	Recommended miniature circuit breaker: from 6 A characteristic B or from 2 A characteristic C	Recommended miniature circuit breaker: from 6 A characteristic B or from 2 A characteristic C	Recommended miniature circuit breaker: from 10 A characteristic B or from 6 A characteristic C

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Technical specifications (continued)

Article number	6EP3320-6SB00-0AY0	6EP3321-6SB00-0AY0	6EP3322-6SB00-0AY0
Product	LOGO!Power	LOGO!Power	LOGO!Power
Power supply, type	12 V/0.9 A	12 V/1.9 A	12 V/4.5 A
Output			
Output	Controlled, isolated DC voltage	Controlled, isolated DC voltage	Controlled, isolated DC voltage
Rated voltage V_{out} DC	12 V	12 V	12 V
Total tolerance, static ±	3 %	3 %	3 %
Static mains compensation, approx.	0.1 %	0.1 %	0.1 %
Static load balancing, approx.	0.1 %	0.1 %	0.1 %
Residual ripple peak-peak, max.	200 mV	200 mV	200 mV
Residual ripple peak-peak, typ.	30 mV	30 mV	30 mV
Spikes peak-peak, max. (bandwidth: 20 MHz)	300 mV	300 mV	300 mV
Spikes peak-peak, typ. (bandwidth: 20 MHz)	50 mV	50 mV	50 mV
Adjustment range		10.5 ... 16.1 V	10.5 ... 16.1 V
Product function Output voltage adjustable	No	Yes	Yes
Output voltage setting		via potentiometer	via potentiometer
Status display	Green LED for output voltage OK	Green LED for output voltage OK	Green LED for output voltage OK
On/off behavior	No overshoot of V_{out} (soft start)	No overshoot of V_{out} (soft start)	No overshoot of V_{out} (soft start)
Startup delay, max.	0.5 s	0.5 s	0.5 s
Voltage rise, typ.	100 ms	100 ms	100 ms
Rated current value $I_{out\ rated}$	0.9 A	1.9 A	4.5 A
Current range	0 ... 0.9 A	0 ... 1.9 A	0 ... 4.5 A
• Note	+55 ... +70 °C: Derating 2%/K	+55 ... +70 °C: Derating 2%/K	+55 ... +70 °C: Derating 2%/K
Supplied active power typical	10.8 W	22.8 W	54 W
Parallel switching for enhanced performance	No	Yes	Yes
Numbers of parallel switchable units for enhanced performance		2	2
Efficiency			
Efficiency at $V_{out\ rated}$, $I_{out\ rated}$, approx.	78 %	81 %	87.1 %
Power loss at $V_{out\ rated}$, $I_{out\ rated}$, approx.	3 W	5 W	8 W
Power loss [W] during no-load operation maximum	0.3 W	0.3 W	0.3 W
Closed-loop control			
Dynamic mains compensation ($V_{in\ rated}$ ±15 %), max.	0.2 %	0.2 %	0.2 %
Dynamic load smoothing (I_{out}: 10/90/10 %), U_{out} ± typ.	3 %	2 %	4 %
Load step setting time 10 to 90%, typ.	1 ms	1 ms	1 ms
Load step setting time 90 to 10%, typ.	1 ms	1 ms	1 ms
Protection and monitoring			
Output overvoltage protection	Yes, according to EN 60950-1	Yes, according to EN 60950-1	Yes, according to EN 60950-1
Current limitation, typ.	1.3 A	2.5 A	5 A
Property of the output Short-circuit proof	Yes	Yes	Yes
Short-circuit protection	Constant current characteristic	Constant current characteristic	Constant current characteristic
Enduring short circuit current RMS value			
• maximum	1.3 A	2.5 A	5 A
Overcurrent overload capability in normal operation	overload capability 150% $I_{out\ rated}$ typ. 200 ms	overload capability 150% $I_{out\ rated}$ typ. 200 ms	overload capability 150% $I_{out\ rated}$ typ. 200 ms
Overload/short-circuit indicator	-	-	-
measuring point for output current		50 mV =^ 1.9 A	50 mV =^ 4.5 A
Overcurrent overload capability when switching on	150% $I_{out\ rated}$ typ. 200 ms	150% $I_{out\ rated}$ typ. 200 ms	150% $I_{out\ rated}$ typ. 200 ms

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Technical specifications (continued)

Article number	6EP3320-6SB00-0AY0	6EP3321-6SB00-0AY0	6EP3322-6SB00-0AY0
Product	LOGO!Power	LOGO!Power	LOGO!Power
Power supply, type	12 V/0.9 A	12 V/1.9 A	12 V/4.5 A
Safety			
Primary/secondary isolation	Yes	Yes	Yes
Galvanic isolation	Safety extra-low output voltage U_{out} acc. to EN 60950-1 and EN 50178	Safety extra-low output voltage U_{out} acc. to EN 60950-1 and EN 50178	Safety extra-low output voltage U_{out} acc. to EN 60950-1 and EN 50178
Protection class	Class II (without protective conductor)	Class II (without protective conductor)	Class II (without protective conductor)
CE mark	Yes	Yes	Yes
UL/cUL (CSA) approval	cULus-Listed (UL 508, CSA C22.2 No. 107.1), File E197259; cURus-Recognized (UL 60950, CSA C22.2 No. 60950), File E151273, NEC class 2 (acc. to UL 1310)	cULus-Listed (UL 508, CSA C22.2 No. 107.1), File E197259; cURus-Recognized (UL 60950, CSA C22.2 No. 60950), File E151273, NEC class 2 (acc. to UL 1310)	cULus-Listed (UL 508, CSA C22.2 No. 107.1), File E197259; cURus-Recognized (UL 60950, CSA C22.2 No. 60950), File E151273, NEC class 2 (acc. to UL 1310)
Explosion protection	ATEX (EX) II 3G Ex nA IIC T3; cULus Class I Div. 2 (ANSI/ISA-12.12.01, CSA C22.2 No. 213) Group ABCD, T4, File E488866	ATEX (EX) II 3G Ex nA IIC T3; cULus Class I Div. 2 (ANSI/ISA-12.12.01, CSA C22.2 No. 213) Group ABCD, T4, File E488866	ATEX (EX) II 3G Ex nA IIC T3; cULus Class I Div. 2 (ANSI/ISA-12.12.01, CSA C22.2 No. 213) Group ABCD, T4, File E488866
FM approval	Class I, Div. 2, Group ABCD, T4	Class I, Div. 2, Group ABCD, T4	Class I, Div. 2, Group ABCD, T4
CB approval	Yes	Yes	Yes
Marine approval	ABS, DNV GL	ABS, DNV GL	ABS, DNV GL
Degree of protection (EN 60529)	IP20	IP20	IP20
EMC			
Emitted interference	EN 55022 Class B	EN 55022 Class B	EN 55022 Class B
Supply harmonics limitation	not applicable	not applicable	not applicable
Noise immunity	EN 61000-6-2	EN 61000-6-2	EN 61000-6-2
Operating data			
Ambient temperature			
• during operation	-25 ... +70 °C	-25 ... +70 °C	-25 ... +70 °C
- Note	with natural convection	with natural convection	with natural convection
• during transport	-40 ... +85 °C	-40 ... +85 °C	-40 ... +85 °C
• during storage	-40 ... +85 °C	-40 ... +85 °C	-40 ... +85 °C
Humidity class according to EN 60721	Climate class 3K3, no condensation	Climate class 3K3, no condensation	Climate class 3K3, no condensation
Mechanics			
Connection technology	screw-type terminals	screw-type terminals	screw-type terminals
Connections			
• Supply input	L, N: 1 screw terminal each for 0.5 ... 2.5 mm2 single-core/finely stranded	L, N: 1 screw terminal each for 0.5 ... 2.5 mm2 single-core/finely stranded	L, N: 1 screw terminal each for 0.5 ... 2.5 mm2 single-core/finely stranded
• Output	+, -: 1 screw terminal each for 0.5 ... 2.5 mm^2	+, -: 1 screw terminal each for 0.5 ... 2.5 mm^2	+, -: 1 screw terminal each for 0.5 ... 2.5 mm^2
• Auxiliary	-	-	-
Width of the enclosure	18 mm	36 mm	54 mm
Height of the enclosure	90 mm	90 mm	90 mm
Depth of the enclosure	53 mm	53 mm	53 mm
Required spacing			
• top	20 mm	20 mm	20 mm
• bottom	20 mm	20 mm	20 mm
• left	0 mm	0 mm	0 mm
• right	0 mm	0 mm	0 mm
Weight, approx.	0.07 kg	0.12 kg	0.2 kg
Product feature of the enclosure housing for side-by-side mounting	Yes	Yes	Yes
Installation	Snaps onto DIN rail EN 60715 35x7.5/15, direct mounting in different mounting positions	Snaps onto DIN rail EN 60715 35x7.5/15, direct mounting in different mounting positions	Snaps onto DIN rail EN 60715 35x7.5/15, direct mounting in different mounting positions
MTBF at 40 °C	3 793 080 h	2 938 542 h	2 566 680 h
Other information	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)

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Ordering data

	Article No.
LOGO!Power 1-phase, 12 V DC/0.9 A Stabilized power supply Input: 100 … 240 V DC (110 ... 300 V AC) Output: 12 V DC/0.9 A	**6EP3320-6SB00-0AY0**
LOGO!Power 1-phase, 12 V DC/1.9 A Stabilized power supply Input: 100 … 240 V AC (110 ... 300 V DC) Output: 12 V DC/1.9 A	**6EP3321-6SB00-0AY0**

	Article No.
LOGO!Power 1-phase, 12 V DC/4.5 A Stabilized power supply Input: 100 … 240 V AC (110 ... 300 V AC) Output: 12 V DC/4.5 A	**6EP3322-6SB00-0AY0**

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Overview



Thanks to its stepped profile design, the LOGO!Power product family is ideally suited for low installation depths, such as in miniature distribution boards. The stabilized power supplies with a wide range input of 100 … 240 V AC (85 … 264 V) and 110 ... 300 V DC are available with an output voltage of 15 V in two performance classes. The high level of efficiency across the entire load range as well as the low no-load losses result in lower overall energy consumption. Greater convenience when commissioning and servicing thanks to the integrated current monitor. The extended temperature range from -25 °C to +70 °C enables a host of additional applications.

Main product highlights

- 15 V DC / 1.9 A and 4.0 A
- Narrow unit with 36 mm or 54 mm width and overall depth of 53 mm in LOGO! design
- Flexible mounting: DIN rail or wall mounting in a range of installation positions
- Higher energy efficiency: over the entire load range as well as no-load power losses of < 0.3 W
- Integrated current monitor: Actual output current measurement directly at the power supply unit
- Global use:
  Operating temperature range from -25 °C to +70 °C as well as international certifications such as UL, CSA, FM or ATEX

Technical specifications

Article number	**6EP3321-6SB10-0AY0**	**6EP3322-6SB10-0AY0**
Product	LOGO!Power	LOGO!Power
Power supply, type	15 V/1.9 A	15 V/4 A
Input		
Input	1-phase AC or DC	1-phase AC or DC
Rated voltage value $V_{in\ rated}$	100 ... 240 V	100 ... 240 V
Voltage range AC	85 ... 264 V	85 ... 264 V
Input voltage		
• at DC	110 ... 300 V	110 ... 300 V
Wide-range input	Yes	Yes
Overvoltage resistance	300 V AC for 1 s	300 V AC for 1 s
Mains buffering at $I_{out\ rated}$, min.	40 ms; at V_{in} = 187 V	40 ms; at V_{in} = 187 V
Rated line frequency 1	50 Hz	50 Hz
Rated line frequency 2	60 Hz	60 Hz
Rated line range	47 ... 63 Hz	47 ... 63 Hz
Input current		
• at rated input voltage 120 V	0.63 A	1.24 A
• at rated input voltage 230 V	0.33 A	0.68 A
Switch-on current limiting (+25 °C), max.	25 A	55 A
I^2t, max.	0.8 $A^2 \cdot s$	3 $A^2 \cdot s$
Built-in incoming fuse	internal	internal
Protection in the mains power input (IEC 898)	Recommended miniature circuit breaker: from 6 A characteristic B or from 2 A characteristic C	Recommended miniature circuit breaker: from 10 A characteristic B or from 6 A characteristic C

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Technical specifications (continued)

Article number	6EP3321-6SB10-0AY0	6EP3322-6SB10-0AY0
Product	LOGO!Power	LOGO!Power
Power supply, type	15 V/1.9 A	15 V/4 A
Output		
Output	Controlled, isolated DC voltage	Controlled, isolated DC voltage
Rated voltage V_{out} DC	15 V	15 V
Total tolerance, static ±	3 %	3 %
Static mains compensation, approx.	0.1 %	0.1 %
Static load balancing, approx.	0.1 %	0.1 %
Residual ripple peak-peak, max.	200 mV	200 mV
Residual ripple peak-peak, typ.	30 mV	30 mV
Spikes peak-peak, max. (bandwidth: 20 MHz)	300 mV	300 mV
Spikes peak-peak, typ. (bandwidth: 20 MHz)	50 mV	50 mV
Adjustment range	10.5 ... 16.1 V	10.5 ... 16.1 V
Product function Output voltage adjustable	Yes	Yes
Output voltage setting	via potentiometer	via potentiometer
Status display	Green LED for output voltage OK	Green LED for output voltage OK
On/off behavior	No overshoot of V_{out} (soft start)	No overshoot of V_{out} (soft start)
Startup delay, max.	0.5 s	0.5 s
Voltage rise, typ.	100 ms	100 ms
Rated current value $I_{out\ rated}$	1.9 A	4 A
Current range	0 ... 1.9 A	0 ... 4 A
• Note	+55 ... +70 °C: Derating 2%/K	+55 ... +70 °C: Derating 2%/K
Supplied active power typical	28.5 W	60 W
Parallel switching for enhanced performance	Yes	Yes
Numbers of parallel switchable units for enhanced performance	2	2
Efficiency		
Efficiency at $V_{out\ rated}$, $I_{out\ rated}$, approx.	83 %	88.4 %
Power loss at $V_{out\ rated}$, $I_{out\ rated}$, approx.	6 W	8 W
Power loss [W] during no-load operation maximum	0.3 W	0.3 W
Closed-loop control		
Dynamic mains compensation ($V_{in\ rated}$ ±15 %), max.	0.2 %	0.2 %
Dynamic load smoothing (I_{out}: 10/90/10 %), U_{out} ± typ.	2 %	3 %
Load step setting time 10 to 90%, typ.	1 ms	1 ms
Load step setting time 90 to 10%, typ.	1 ms	1 ms
Protection and monitoring		
Output overvoltage protection	Yes, according to EN 60950-1	Yes, according to EN 60950-1
Current limitation, typ.	2.5 A	5 A
Property of the output Short-circuit proof	Yes	Yes
Short-circuit protection	Constant current characteristic	Constant current characteristic
Enduring short circuit current RMS value		
• maximum	2.5 A	5 A
Overcurrent overload capability in normal operation	overload capability 150% $I_{out\ rated}$ typ. 200 ms	overload capability 150% $I_{out\ rated}$ typ. 200 ms
Overload/short-circuit indicator	-	-
measuring point for output current	50 mV =^ 1.9 A	45 mV =^ 4 A
Overcurrent overload capability when switching on	150% $I_{out\ rated}$ typ. 200 ms	150% $I_{out\ rated}$ typ. 200 ms

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Technical specifications (continued)

Article number	6EP3321-6SB10-0AY0	6EP3322-6SB10-0AY0
Product	LOGO!Power	LOGO!Power
Power supply, type	15 V/1.9 A	15 V/4 A
Safety		
Primary/secondary isolation	Yes	Yes
Galvanic isolation	Safety extra-low output voltage U_{out} acc. to EN 60950-1 and EN 50178	Safety extra-low output voltage U_{out} acc. to EN 60950-1 and EN 50178
Protection class	Class II (without protective conductor)	Class II (without protective conductor)
CE mark	Yes	Yes
UL/cUL (CSA) approval	cULus-Listed (UL 508, CSA C22.2 No. 107.1), File E197259; cURus-Recognized (UL 60950, CSA C22.2 No. 60950), File E151273, NEC class 2 (acc. to UL 1310)	cULus-Listed (UL 508, CSA C22.2 No. 107.1), File E197259; cURus-Recognized (UL 60950, CSA C22.2 No. 60950), File E151273, NEC class 2 (acc. to UL 1310)
Explosion protection	ATEX (EX) II 3G Ex nA IIC T3; cULus Class I Div. 2 (ANSI/ISA-12.12.01, CSA C22.2 No. 213) Group ABCD, T4, File E488866	ATEX (EX) II 3G Ex nA IIC T3; cULus Class I Div. 2 (ANSI/ISA-12.12.01, CSA C22.2 No. 213) Group ABCD, T4, File E488866
FM approval	Class I, Div. 2, Group ABCD, T4	Class I, Div. 2, Group ABCD, T4
CB approval	Yes	Yes
Marine approval	ABS, BV, DNV GL, LRS	ABS, BV, DNV GL, LRS
Degree of protection (EN 60529)	IP20	IP20
EMC		
Emitted interference	EN 55022 Class B	EN 55022 Class B
Supply harmonics limitation	not applicable	not applicable
Noise immunity	EN 61000-6-2	EN 61000-6-2
Operating data		
Ambient temperature		
• during operation	-25 ... +70 °C	-25 ... +70 °C
- Note	with natural convection	with natural convection
• during transport	-40 ... +85 °C	-40 ... +85 °C
• during storage	-40 ... +85 °C	-40 ... +85 °C
Humidity class according to EN 60721	Climate class 3K3, no condensation	Climate class 3K3, no condensation
Mechanics		
Connection technology	screw-type terminals	screw-type terminals
Connections		
• Supply input	L, N: 1 screw terminal each for 0.5 ... 2.5 mm^2 single-core/finely stranded	L, N: 1 screw terminal each for 0.5 ... 2.5 mm^2 single-core/finely stranded
• Output	+, -: 1 screw terminal each for 0.5 ... 2.5 mm^2	+, -: 1 screw terminal each for 0.5 ... 2.5 mm^2
• Auxiliary	-	-
Width of the enclosure	36 mm	54 mm
Height of the enclosure	90 mm	90 mm
Depth of the enclosure	53 mm	53 mm
Required spacing		
• top	20 mm	20 mm
• bottom	20 mm	20 mm
• left	0 mm	0 mm
• right	0 mm	0 mm
Weight, approx.	0.12 kg	0.2 kg
Product feature of the enclosure housing for side-by-side mounting	Yes	Yes
Installation	Snaps onto DIN rail EN 60715 35x7.5/15, direct mounting in different mounting positions	Snaps onto DIN rail EN 60715 35x7.5/15, direct mounting in different mounting positions
MTBF at 40 °C	2 938 542 h	2 566 680 h
Other information	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)

Ordering data

	Article No.		Article No.
LOGO!Power 1-phase, 15 V DC/1.9 A		**LOGO!Power 1-phase, 15 V DC/4 A**	
Stabilized power supply Input: 100 … 240 V AC (110 ... 300 V DC) Output: 15 V DC/1.9 A	**6EP3321-6SB10-0AY0**	Stabilized power supply Input: 100 … 240 V AC (110 ... 300 V DC) Output: 15 V DC/4 A	**6EP3322-6SB10-0AY0**

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Overview



Thanks to its stepped profile design, the LOGO!Power product family is ideally suited for low installation depths, such as in miniature distribution boards. The stabilized power supplies with a wide range input of 100 … 240 V AC (85 … 264 V) and 110 ... 300 V DC are available with an output voltage of 24 V in four performance classes. The 24 V versions are ideal for supplying LOGO! controllers with the corresponding voltage input. The high level of efficiency across the entire load range as well as the low no-load losses result in lower overall energy consumption. Greater convenience when commissioning and servicing thanks to integrated current monitor (for devices at least 36 mm wide). The extended temperature range from -25 °C to +70 °C enables a host of additional applications.

To further increase the 24 V availability, the LOGO!Power power supplies can be combined with **DC UPS**, **redundancy** and **selectivity modules**.

Main product highlights

- 24 V DC / 0.6 A, 1.3 A, 2.5 A and 4.0 A
- Narrow unit with width of 18 mm, 36 mm, 54 mm or 72 mm and overall depth of 53 mm in LOGO! design
- Flexible mounting: DIN rail or wall mounting in a range of installation positions
- Higher energy efficiency: up to 90 % efficiency over the entire load range as well as no-load power losses of < 0.3 W
- Integrated current monitor: Actual output current measurement directly at the power supply unit (for devices at least 36 mm wide)
- Global use:
  Operating temperature range from -25 °C to +70 °C as well as international certifications such as UL, CSA, FM or ATEX

Technical specifications

Article number	**6EP3330-6SB00-0AY0**	**6EP3331-6SB00-0AY0**	**6EP3332-6SB00-0AY0**	**6EP3333-6SB00-0AY0**
Product	LOGO!Power	LOGO!Power	LOGO!Power	LOGO!Power
Power supply, type	24 V/0.6 A	24 V/1.3 A	24 V/2.5 A	24 V/4 A
Input				
Input	1-phase AC or DC	1-phase AC or DC	1-phase AC or DC	1-phase AC or DC
Rated voltage value $V_{in\ rated}$	100 ... 240 V	100 ... 240 V	100 ... 240 V	100 ... 240 V
Voltage range AC	85 ... 264 V	85 ... 264 V	85 ... 264 V	85 ... 264 V
Input voltage				
• at DC	110 ... 300 V	110 ... 300 V	110 ... 300 V	110 ... 300 V
Wide-range input	Yes	Yes	Yes	Yes
Overvoltage resistance	300 V AC for 1 s	300 V AC for 1 s	300 V AC for 1 s	300 V AC for 1 s
Mains buffering at $I_{out\ rated}$, min.	40 ms; at V_{in} = 187 V	40 ms; at V_{in} = 187 V	40 ms; at V_{in} = 187 V	40 ms; at V_{in} = 187 V
Rated line frequency 1	50 Hz	50 Hz	50 Hz	50 Hz
Rated line frequency 2	60 Hz	60 Hz	60 Hz	60 Hz
Rated line range	47 ... 63 Hz	47 ... 63 Hz	47 ... 63 Hz	47 ... 63 Hz
Input current				
• at rated input voltage 120 V	0.3 A	0.7 A	1.22 A	1.95 A
• at rated input voltage 230 V	0.2 A	0.35 A	0.66 A	0.97 A
Switch-on current limiting (+25 °C), max.	20 A	25 A	52 A	31 A
I^2t, max.	0.8 $A^2 \cdot s$	0.8 $A^2 \cdot s$	3 $A^2 \cdot s$	2.5 $A^2 \cdot s$
Built-in incoming fuse	internal	internal	internal	internal
Protection in the mains power input (IEC 898)	Recommended miniature circuit breaker: from 6 A characteristic B or from 2 A characteristic C	Recommended miniature circuit breaker: from 6 A characteristic B or from 2 A characteristic C	Recommended miniature circuit breaker: from 10 A characteristic B or from 6 A characteristic C	Recommended miniature circuit breaker: from 10 A characteristic B or from 6 A characteristic C

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Technical specifications (continued)

Article number	6EP3330-6SB00-0AY0	6EP3331-6SB00-0AY0	6EP3332-6SB00-0AY0	6EP3333-6SB00-0AY0
Product	LOGO!Power	LOGO!Power	LOGO!Power	LOGO!Power
Power supply, type	24 V/0.6 A	24 V/1.3 A	24 V/2.5 A	24 V/4 A
Output				
Output	Controlled, isolated DC voltage	Controlled, isolated DC voltage	Controlled, isolated DC voltage	Controlled, isolated DC voltage
Rated voltage V_{out} DC	24 V	24 V	24 V	24 V
Total tolerance, static ±	3 %	3 %	3 %	3 %
Static mains compensation, approx.	0.1 %	0.1 %	0.1 %	0.1 %
Static load balancing, approx.	0.1 %	0.1 %	0.1 %	0.1 %
Residual ripple peak-peak, max.	200 mV	200 mV	200 mV	200 mV
Residual ripple peak-peak, typ.	30 mV	30 mV	30 mV	30 mV
Spikes peak-peak, max. (bandwidth: 20 MHz)	300 mV	300 mV	300 mV	300 mV
Spikes peak-peak, typ. (bandwidth: 20 MHz)	50 mV	50 mV	50 mV	50 mV
Adjustment range		22.2 ... 26.4 V	22.2 ... 26.4 V	22.2 ... 26.4 V
Product function Output voltage adjustable	No	Yes	Yes	Yes
Output voltage setting		via potentiometer	via potentiometer	via potentiometer
Status display	Green LED for output voltage OK	Green LED for output voltage OK	Green LED for output voltage OK	Green LED for output voltage OK
On/off behavior	No overshoot of V_{out} (soft start)	No overshoot of V_{out} (soft start)	No overshoot of V_{out} (soft start)	No overshoot of V_{out} (soft start)
Startup delay, max.	0.5 s	0.5 s	0.5 s	0.5 s
Voltage rise, typ.	100 ms	100 ms	100 ms	100 ms
Rated current value $I_{out\ rated}$	0.6 A	1.3 A	2.5 A	4 A
Current range	0 ... 0.6 A	0 ... 1.3 A	0 ... 2.5 A	0 ... 4 A
• Note	+55 ... +70 °C: Derating 2%/K	+55 ... +70 °C: Derating 2%/K	+55 ... +70 °C: Derating 2%/K	+55 ... +70 °C: Derating 2%/K
Supplied active power typical	14.4 W	31.2 W	60 W	96 W
Parallel switching for enhanced performance	No	Yes	Yes	Yes
Numbers of parallel switchable units for enhanced performance		2	2	2
Efficiency				
Efficiency at $V_{out\ rated}$, $I_{out\ rated}$, approx.	81 %	86 %	90 %	89 %
Power loss at $V_{out\ rated}$, $I_{out\ rated}$, approx.	3 W	5 W	7 W	12 W
Power loss [W] during no-load operation maximum	0.3 W	0.3 W	0.3 W	0.3 W
Closed-loop control				
Dynamic mains compensation ($V_{in\ rated}$ ±15 %), max.	0.2 %	0.2 %	0.2 %	0.2 %
Dynamic load smoothing (I_{out}: 10/90/10 %), U_{out} ± typ.	2 %	1 %	2 %	2 %
Load step setting time 10 to 90%, typ.	1 ms	1 ms	1 ms	1 ms
Load step setting time 90 to 10%, typ.	1 ms	1 ms	1 ms	1 ms
Protection and monitoring				
Output overvoltage protection	Yes, according to EN 60950-1	Yes, according to EN 60950-1	Yes, according to EN 60950-1	Yes, according to EN 60950-1
Current limitation, typ.	0.8 A	1.7 A	3.2 A	5 A
Property of the output Short-circuit proof	Yes	Yes	Yes	Yes
Short-circuit protection	Constant current characteristic	Constant current characteristic	Constant current characteristic	Constant current characteristic
Enduring short circuit current RMS value				
• maximum	0.8 A	1.7 A	3.2 A	5 A
Overcurrent overload capability in normal operation	overload capability 150% $I_{out\ rated}$ typ. 200 ms	overload capability 150% $I_{out\ rated}$ typ. 200 ms	overload capability 150% $I_{out\ rated}$ typ. 200 ms	overload capability 150% $I_{out\ rated}$ typ. 200 ms
Overload/short-circuit indicator	-	-	-	-
measuring point for output current		50 mV =^ 1.3 A	50 mV =^ 2.5 A	50 mV =^ 4 A
Overcurrent overload capability when switching on	150% $I_{out\ rated}$ typ. 200 ms	150% $I_{out\ rated}$ typ. 200 ms	150% $I_{out\ rated}$ typ. 200 ms	150% $I_{out\ rated}$ typ. 200 ms

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Technical specifications (continued)

Article number	6EP3330-6SB00-0AY0	6EP3331-6SB00-0AY0	6EP3332-6SB00-0AY0	6EP3333-6SB00-0AY0
Product	LOGO!Power	LOGO!Power	LOGO!Power	LOGO!Power
Power supply, type	24 V/0.6 A	24 V/1.3 A	24 V/2.5 A	24 V/4 A
Safety				
Primary/secondary isolation	Yes	Yes	Yes	Yes
Galvanic isolation	Safety extra-low output voltage Uout acc. to EN 60950-1 and EN 50178	Safety extra-low output voltage Uout acc. to EN 60950-1 and EN 50178	Safety extra-low output voltage Uout acc. to EN 60950-1 and EN 50178	Safety extra-low output voltage Uout acc. to EN 60950-1 and EN 50178
Protection class	Class II (without protective conductor)	Class II (without protective conductor)	Class II (without protective conductor)	Class II (without protective conductor)
CE mark	Yes	Yes	Yes	Yes
UL/cUL (CSA) approval	cULus-Listed (UL 508, CSA C22.2 No. 107.1), File E197259; cURus-Recognized (UL 60950, CSA C22.2 No. 60950), File E151273, NEC class 2 (acc. to UL 1310)	cULus-Listed (UL 508, CSA C22.2 No. 107.1), File E197259; cURus-Recognized (UL 60950, CSA C22.2 No. 60950), File E151273, NEC class 2 (acc. to UL 1310)	cULus-Listed (UL 508, CSA C22.2 No. 107.1), File E197259; cURus-Recognized (UL 60950, CSA C22.2 No. 60950), File E151273, NEC class 2 (acc. to UL 1310)	cULus-listed (UL 508, CSA C22.2 No. 107.1), File E197259; cURus-recognized (UL 60950, CSA C22.2 No. 60950), File E151273
Explosion protection	ATEX (EX) II 3G Ex nA IIC T3; cULus Class I Div. 2 (ANSI/ISA-12.12.01, CSA C22.2 No. 213) Group ABCD, T4, File E488866	ATEX (EX) II 3G Ex nA IIC T3; cULus Class I Div. 2 (ANSI/ISA-12.12.01, CSA C22.2 No. 213) Group ABCD, T4, File E488866	ATEX (EX) II 3G Ex nA IIC T3; cULus Class I Div. 2 (ANSI/ISA-12.12.01, CSA C22.2 No. 213) Group ABCD, T4, File E488866	ATEX (EX) II 3G Ex nA IIC T3; cULus Class I Div. 2 (ANSI/ISA-12.12.01, CSA C22.2 No. 213) Group ABCD, T4, File E488866
FM approval	Class I, Div. 2, Group ABCD, T4	Class I, Div. 2, Group ABCD, T4	Class I, Div. 2, Group ABCD, T4	Class I, Div. 2, Group ABCD, T4
CB approval	Yes	Yes	Yes	Yes
Marine approval	ABS, BV, DNV GL, LRS	ABS, BV, DNV GL, LRS	ABS, BV, DNV GL, LRS	ABS, BV, DNV GL, LRS
Degree of protection (EN 60529)	IP20	IP20	IP20	IP20
EMC				
Emitted interference	EN 55022 Class B	EN 55022 Class B	EN 55022 Class B	EN 55022 Class B
Supply harmonics limitation	not applicable	not applicable	not applicable	EN 61000-3-2
Noise immunity	EN 61000-6-2	EN 61000-6-2	EN 61000-6-2	EN 61000-6-2
Operating data				
Ambient temperature				
• during operation	-25 ... +70 °C	-25 ... +70 °C	-25 ... +70 °C	-25 ... +70 °C
- Note	with natural convection	with natural convection	with natural convection	with natural convection
• during transport	-40 ... +85 °C	-40 ... +85 °C	-40 ... +85 °C	-40 ... +85 °C
• during storage	-40 ... +85 °C	-40 ... +85 °C	-40 ... +85 °C	-40 ... +85 °C
Humidity class according to EN 60721	Climate class 3K3, no condensation	Climate class 3K3, no condensation	Climate class 3K3, no condensation	Climate class 3K3, no condensation
Mechanics				
Connection technology	screw-type terminals	screw-type terminals	screw-type terminals	screw-type terminals
Connections				
• Supply input	L, N: 1 screw terminal each for 0.5 ... 2.5 mm^2 single-core/finely stranded	L, N: 1 screw terminal each for 0.5 ... 2.5 mm^2 single-core/finely stranded	L, N: 1 screw terminal each for 0.5 ... 2.5 mm^2 single-core/finely stranded	L, N: 1 screw terminal each for 0.5 ... 2.5 mm^2 single-core/finely stranded
• Output	+, -: 1 screw terminal each for 0.5 ... 2.5 mm^2	+, -: 1 screw terminal each for 0.5 ... 2.5 mm^2	+, -: 1 screw terminal each for 0.5 ... 2.5 mm^2	+, -: 1 screw terminal each for 0.5 ... 2.5 mm^2
• Auxiliary	-	-	-	-
Width of the enclosure	18 mm	36 mm	54 mm	72 mm
Height of the enclosure	90 mm	90 mm	90 mm	90 mm
Depth of the enclosure	53 mm	53 mm	53 mm	53 mm
Required spacing				
• top	20 mm	20 mm	20 mm	20 mm
• bottom	20 mm	20 mm	20 mm	20 mm
• left	0 mm	0 mm	0 mm	0 mm
• right	0 mm	0 mm	0 mm	0 mm
Weight, approx.	0.07 kg	0.12 kg	0.2 kg	0.29 kg

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Technical specifications (continued)

Article number	6EP3330-6SB00-0AY0	6EP3331-6SB00-0AY0	6EP3332-6SB00-0AY0	6EP3333-6SB00-0AY0
Product	LOGO!Power	LOGO!Power	LOGO!Power	LOGO!Power
Power supply, type	24 V/0.6 A	24 V/1.3 A	24 V/2.5 A	24 V/4 A
Product feature of the enclosure housing for side-by-side mounting	Yes	Yes	Yes	Yes
Installation	Snaps onto DIN rail EN 60715 35x7.5/15, direct mounting in different mounting positions	Snaps onto DIN rail EN 60715 35x7.5/15, direct mounting in different mounting positions	Snaps onto DIN rail EN 60715 35x7.5/15, direct mounting in different mounting positions	Snaps onto DIN rail EN 60715 35x7.5/15, direct mounting in different mounting positions
MTBF at 40 °C	4 415 040 h	3 094 996 h	2 864 520 h	2 391 480 h
Other information	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)

Ordering data

	Article No.		Article No.
LOGO!Power 1-phase, 24 V DC/0.6 A Stabilized power supply Input: 100 … 240 V AC (110 ... 300 V DC) Output: 24 V DC/0.6 A	**6EP3330-6SB00-0AY0**	**LOGO!Power 1-phase, 24 V DC/2.5 A** Stabilized power supply Input: 100 … 240 V AC (110 ... 300 V DC) Output: 24 V DC/2.5 A	**6EP3332-6SB00-0AY0**
LOGO!Power 1-phase, 24 V DC/1.3 A Stabilized power supply Input: 100 … 240 V AC (110 ... 300 V DC) Output: 24 V DC/1.3 A	**6EP3331-6SB00-0AY0**	**LOGO!Power 1-phase, 24 V DC/4 A** Stabilized power supply Input: 100 … 240 V AC (110 ... 300 V DC) Output: 24 V DC/4 A	**6EP3333-6SB00-0AY0**

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Overview



Thanks to its stepped profile design, the SIPLUS LOGO!Power product family is ideally suited for low installation depths, such as in miniature distribution boards. The stabilized power supplies with a wide range input of 100 … 240 V AC (85 … 264 V) and 110 ... 300 V DC are available with an output voltage of 24 V in four performance classes. The 24 V versions are ideal for supplying SIPLUS LOGO! controllers with the corresponding voltage input. The high level of efficiency across the entire load range as well as the low no-load losses result in lower overall energy consumption. Greater convenience when commissioning and servicing thanks to integrated current monitor (for devices at least 36 mm wide). The extended temperature range enables a host of additional applications.

Main product highlights

- 24 V DC / 0.6 A, 1.3 A, 2.5 A and 4.0 A
- Narrow unit with width of 18 mm, 36 mm, 54 mm or 72 mm and overall depth of 53 mm in LOGO! design
- Flexible mounting: DIN rail or wall mounting in a range of installation positions
- Higher energy efficiency: up to 90% efficiency over the entire load range as well as no-load power losses of < 0.3 W
- Integrated current monitor: Actual output current measurement directly at the power supply unit (for devices at least 36 mm wide)
- Global use: International certifications such as UL, CSA, FM or ATEX

Technical specifications

Article number	**6AG1331-6SB00-7AY0**	**6AG1332-6SB00-7AY0**	**6AG1333-6SB00-7AY0**
Based on	**6EP3331-6SB00-0AY0**	**6EP3332-6SB00-0AY0**	**6EP3333-6SB00-0AY0**
Product	SIPLUS LOGO!Power	SIPLUS LOGO!Power	SIPLUS LOGO!Power
Power supply, type	24 V/1.3 A	24 V/2.5 A	24 V/4 A
Operating data			
Ambient temperature			
• during operation	-40 ... +70 °C	-40 ... +70 °C	-40 ... +70 °C
- Note	with natural convection	with natural convection	with natural convection
• during transport	-40 ... +85 °C	-40 ... +85 °C	-40 ... +85 °C
• during storage	-40 ... +85 °C	-40 ... +85 °C	-40 ... +85 °C
• on cold restart minimum	-25 °C	-25 °C	-25 °C
Relative humidity with condensation maximum	100 %; Relative humidity, incl. condensation/frost permitted (no commissioning under condensation conditions)	100 %; Relative humidity, incl. condensation/frost permitted (no commissioning under condensation conditions)	100 %; Relative humidity, incl. condensation/frost permitted (no commissioning under condensation conditions)
Resistance to biologically active substances conformity acc. to EN 60721-3-3	Yes	Yes	Yes
Resistance to chemically active substances conformity acc. to EN 60721-3-3	Yes	Yes	Yes
Resistance to mechanically active substances conformity acc. to EN 60721-3-3	Yes	Yes	Yes

Ordering data

	Article No.
SIPLUS LOGO!Power 24 V 1.3 A Extended temperature range and exposure to environmental substances Input 100 ... 240 V AC Output 24 V DC, 1.3 A	**6AG1331-6SB00-7AY0**
SIPLUS LOGO!Power 24 V 2.5 A Extended temperature range and exposure to environmental substances Input 100 ... 240 V AC Output 24 V DC, 2.5 A	**6AG1332-6SB00-7AY0**
SIPLUS LOGO!Power 24 V 4 A Extended temperature range and exposure to environmental substances Input 100 ... 240 V AC Output 24 V DC, 4 A	**6AG1333-6SB00-7AY0**

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LOGO!Contact switching module

Overview



- Switching module for the direct switching of resistive loads and motors

Technical specifications

Article number	**6ED1057-4CA00-0AA0** LOGO! Contact Mod., 24 V DC, 3NO/1NC	**6ED1057-4EA00-0AA0** LOGO! Contact Mod., 230 V AC, 3NO/1NC
Standards, approvals, certificates		
CE mark	Yes	Yes
Ambient conditions		
Ambient temperature during operation		
• min.	-25 °C	-25 °C
• max.	55 °C	55 °C
Weights		
Weight, approx.	160 g	160 g

Ordering data

	Article No.
LOGO!Contact	
Switching module for direct switching of resistive loads up to 20 A and motors up to 4 kW	
Switching voltage 24 V	**6ED1057-4CA00-0AA0**
Switching voltage 230 V	**6ED1057-4EA00-0AA0**

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Overview



LOGO! and SIPLUS LOGO! are designed for quick and easy mounting on DIN rails. With the mounting kit, these devices can also be easily and safely installed in front panels.
If the supplied washer and seals are used, the devices are reliably protected against harsh environmental conditions up to the IP65 degree of protection.

Ordering data

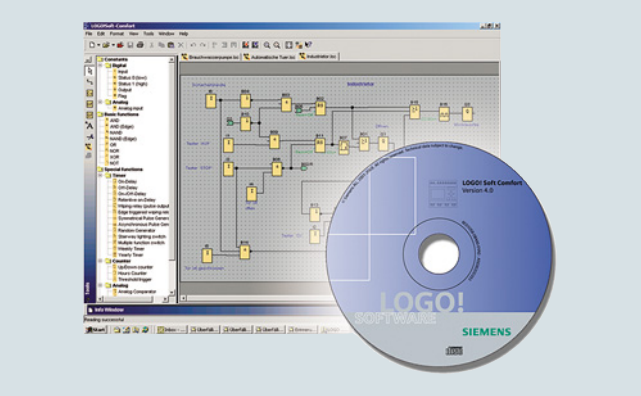
	Article No.
Front panel mounting kit	
Width 4 U, with keys	**6AG1057-1AA00-0AA3**
Width 8 U, with keys	**6AG1057-1AA00-0AA2**

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LOGO! software

2

Overview



- The user-friendly software for generating switching programs on the PC for single-user mode and network mode
- Generation of switching programs in a function block diagram (FBD) or ladder logic (LAD)
- Furthermore, testing, simulation, online testing and archiving of the switching programs
- Professional documentation due to manifold comment and print functions

Minimum system requirements

Windows XP (32-bit), 7 (32/64-bit) or 8 (32/64-bit)

- PC Pentium IV.
- 150 MB free disk capacity.
- 256 MB RAM.
- SVGA graphics card with minimum resolution 800 x 600 (256 colors).
- DVD-ROM

Mac OS X

- Mac OS X 10.4

Linux

- Tested with SUSE Linux 11.3 SP2, kernel 3.0.76
- Runs on all Linux distributions on which Java 2 runs.
- Please refer to your relevant Linux distribution for the necessary hardware requirements.

Ordering data

	Article No.
LOGO!Soft Comfort V8 for programming on the PC in LAD/FBD; executes on Windows 8, 7, XP, Linux and Mac OSX; on DVD	**6ED1058-0BA08-0YA1**

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3/2 Introduction
3/2 S7-1200

3/4 Central processing units
3/4 Standard CPUs
3/4 CPU 1211C
3/8 CPU 1212C
3/12 CPU 1214C
3/16 CPU 1215C
3/20 CPU 1217C
3/23 SIPLUS standard CPUs
3/23 SIPLUS CPU 1211C
3/27 SIPLUS CPU 1212C
3/32 SIPLUS CPU 1214C
3/38 SIPLUS CPU 1215C
3/44 Fail-safe CPUs
3/49 SIPLUS fail-safe CPUs

3/52 I/O modules
3/52 Digital modules
3/52 SM 1221 digital input modules
3/54 SB 1221 digital input modules
3/56 SM 1222 digital output modules
3/59 SB 1222 digital output modules
3/61 SM 1223 digital input/output modules
3/65 SB 1223 digital input/output modules
3/68 SIPLUS digital modules
3/68 SIPLUS SM 1221 digital input modules
3/70 SIPLUS SB 1221 digital input modules
3/72 SIPLUS SM 1222 digital output modules
3/76 SIPLUS SB 1222 digital output modules
3/78 SIPLUS SM 1223 digital input/output modules
3/82 SIPLUS SB 1223 digital input/output modules
3/84 Analog modules
3/84 SM 1231 analog input modules
3/87 SB 1231 analog input modules
3/89 SM 1232 analog output modules
3/91 SB 1232 analog output modules
3/93 SM 1234 analog input/output modules
3/95 SM 1231 thermocouple modules
3/98 SB 1231 thermocouple signal board
3/100 SM 1231 RTD signal modules
3/103 SB 1231 RTD signal board
3/105 SM 1238 Energy Meter 480 V AC analog input modules
3/107 SIPLUS analog modules
3/107 SIPLUS SM 1231 analog input modules
3/109 SIPLUS SM 1232 analog output modules
3/111 SIPLUS SB 1232 analog output modules
3/113 SIPLUS SM 1234 analog input/output modules
3/115 SIPLUS SM 1231 thermocouple modules
3/117 SIPLUS RTD SM 1231 signal modules
3/119 SIPLUS RTD SB 1231 signal board
3/120 Special modules
3/120 SM 1278 4xIO-Link Master
3/121 SIPLUS CMS1200 SM 1281 Condition Monitoring
3/123 SIM 1274 simulators
3/124 BB 1297 battery board

Special modules (cont.)
3/125 SIWAREX WP231
3/128 SIWAREX WP241
3/130 SIWAREX WP251
3/133 Communication
3/133 CM 1241 communication module
3/135 CB 1241 RS485 communication board
3/136 CM 1242-5
3/138 AS-Interface communication
3/138 - CM 1243-2 AS-i Master
3/140 - DCM 1271 AS-i data decoupling module
3/142 CM 1243-5
3/144 CSM 1277 unmanaged
3/146 CP 1243-1
3/149 CP 1242-7 GPRS
3/152 CP 1243-7 LTE
3/155 CP 1243-8 IRC
3/158 SIMATIC RF120C
3/160 SIPLUS communication
3/160 SIPLUS CM 1241 communication modules
3/162 SIPLUS CB 1241 communication board RS485
3/163 SIPLUS CM 1242-5 communication modules
3/164 SIPLUS CM 1243-2 communication modules
3/165 SIPLUS CM 1243-5 communication modules
3/166 SIPLUS NET CSM 1277
3/167 Fail-safe I/O modules
3/167 SM 1226 fail-safe digital input
3/169 SM 1226 fail-safe digital output
3/171 SM 1226 fail-safe relay output
3/173 SIPLUS fail-safe digital inputs and outputs
3/173 SIPLUS SM 1226 fail-safe digital input
3/175 SIPLUS SM 1226 fail-safe digital output
3/176 SIPLUS SM 1226 fail-safe relay output

3/177 Power supplies
3/177 1-phase, 24 V DC (for S7-1200)

3/179 SIPLUS power supplies
3/179 1-phase, 24 V DC (for SIPLUS S7-1200)

3/181 Operator control and monitoring
3/181 Basic Panels
3/182 Comfort Panels

3/184 SIPLUS operator control and monitoring
3/184 SIPLUS Basic Panels (2nd Generation)
3/187 SIPLUS Basic Panels (1st Generation)
3/190 SIPLUS Comfort Panels Standard

3/195 Add-on products from third-party manufacturers
3/195 SIMATIC S7-1200 CM CANopen

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Overview



- Compact controllers for the low to mid-performance ranges
- Large-scale integration, space-saving, powerful
- With exceptional real-time performance and powerful communication options:
  - Controller with integrated PROFINET IO controller interface for communication between SIMATIC controllers, HMI, programming device or other automation components
- All CPUs can be used in stand-alone mode, in networks and within distributed structures
- Extremely simple installation, programming and operation
- Integrated web server with standard and user-specific web pages
- Data logging functionality for archiving of data at runtime from the user program
- Powerful, integrated technology functions such as counting, measuring, closed-loop control, and motion control
- Integrated digital and analog inputs/outputs
- Flexible expansion facilities
  - Signal boards for direct use in a controller
  - Signal modules for expansion of controllers with input/output channels;
    including an Energy Meter module for recording and preparing energy data
  - Accessories, e.g. power supply, switch module or SIMATIC Memory Card

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Technical specifications

General technical specifications SIMATIC S7-1200	
Degree of protection	IP20 acc. to IEC 529
Ambient temperature	
• Operation (95% humidity)	
- Horizontal installation	-20 ... +60 °C
- Vertical installation	-20 ... +50 °C
• Transportation and storage	-40 ... +70 °C
- With 95% humidity	25 ... 55 °C
Insulation	
• 5/24 V DC circuits	500 V AC test voltage
• 115/230 V AC circuits to ground	1500 V AC test voltage
• 115/230 V AC circuits to 115/230 V AC circuits	1500 V AC test voltage
• 230 V AC circuits to 5/24 V DC circuits	1500 V AC test voltage
• 115 V AC circuits to 5/24 V DC circuits	1500 V AC test voltage
Electromagnetic compatibility	Requirements of the EMC directive
• Noise immunity acc. to EN 50082-2	Test acc. to: IEC 801-2, IEC 801-3, IEC 801-4, EN 50141, EN 50204, IEC 801-5, VDE 0160
• Emitted interference acc. to EN 50081-1 and EN 50081-2	Test according to EN 55011, Class A, Group 1
Mechanical strength	
• Vibrations, test acc. to / tested with	IEC 68, Part 2-6: 10 ... 57 Hz; constant amplitude 0.3 mm; 58 ... 150 Hz; constant acceleration 1 g (mounted on DIN rail) or 2 g (mounted in switchboard); mode of vibration: frequency sweeps with a sweep rate of 1 octave/minute; duration of vibration: 10 frequency sweeps per axis in each direction of the three mutually perpendicular axes
• Shocks, test acc. to / tested with	IEC 68, Part 2-27/half-sine: magnitude of shock 15 g (peak value), duration 11 ms, 6 shocks in each of the three mutually perpendicular axes

General technical data of SIPLUS S7-1200	
Ambient temperature range	-40/-25/-20 ... +55/+60/+70 °C
Conformal coating	Coating of the printed circuit boards and the electronic components
Technical specifications	The technical specifications of the standard product apply except for the ambient conditions.
Ambient conditions	
Extended range of environmental conditions	
• with reference to ambient temperature, air pressure and altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
• At cold restart, min.	0° C
Relative humidity	
• with condensation, max.	100 %; RH incl. bedewing/frost (no commissioning in bedewed state)
Resistance	
• to biologically active substances/ compliance with EN 60721-3-3	Yes; Class 3B2 mold and fungal spores (except fauna); the supplied plug covers must remain in place on the unused interfaces during operation.
• to chemically active substances/ compliance with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray in accordance with EN 60068-2-52 (severity 3); the supplied plug covers must remain in place on the unused interfaces during operation.
• to mechanically active substances, compliance with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust; the supplied plug covers must remain in place on unused interfaces during operation.

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CPU 1211C

Overview



- Controller for intro to S7
- Expandable by:
  - 1 signal board (SB), battery board (BB) or communication board (CB)
  - Max. 3 communication modules (CM)

Technical specifications

Article number	**6ES7211-1BE40-0XB0** CPU 1211C, AC/DC/Relay, 6DI/4DQ/2AI	**6ES7211-1AE40-0XB0** CPU 1211C, DC/DC/DC, 6DI/4DQ/2AI	**6ES7211-1HE40-0XB0** CPU 1211C, DC/DC/Relay, 6DI/4DQ/2AI
General information			
Product type designation	CPU 1211C AC/DC/relay	CPU 1211C DC/DC/DC	CPU 1211C DC/DC/relay
Engineering with			
• Programming package	STEP 7 V14 or higher	STEP 7 V14 or higher	STEP 7 V14 or higher
Supply voltage			
Rated value (DC)			
• 24 V DC		Yes	Yes
Rated value (AC)			
• 120 V AC	Yes		
• 230 V AC	Yes		
Encoder supply			
24 V encoder supply			
• 24 V	20.4 to 28.8V	L+ minus 4 V DC min.	L+ minus 4 V DC min.
Power loss			
Power loss, typ.	10 W	8 W	8 W
Memory			
Work memory			
• integrated	50 kbyte	50 kbyte	50 kbyte
Load memory			
• integrated	1 Mbyte	1 Mbyte	1 Mbyte
• Plug-in (SIMATIC Memory Card), max.	with SIMATIC memory card	with SIMATIC memory card	with SIMATIC memory card
Backup			
• without battery	Yes	Yes	Yes
CPU processing times			
for bit operations, typ.	0.08 µs; / instruction	0.08 µs; / instruction	0.08 µs; / instruction
for word operations, typ.	1.7 µs; / instruction	1.7 µs; / instruction	1.7 µs; / instruction
for floating point arithmetic, typ.	2.3 µs; / instruction	2.3 µs; / instruction	2.3 µs; / instruction
Data areas and their retentivity			
Flag			
• Number, max.	4 kbyte; Size of bit memory address area	4 kbyte; Size of bit memory address area	4 kbyte; Size of bit memory address area
Process image			
• Inputs, adjustable	1 kbyte	1 kbyte	1 kbyte
• Outputs, adjustable	1 kbyte	1 kbyte	1 kbyte
Time of day			
Clock			
• Hardware clock (real-time)	Yes	Yes	Yes

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Technical specifications (continued)

Article number	**6ES7211-1BE40-0XB0** CPU 1211C, AC/DC/Relay, 6DI/4DQ/2AI	**6ES7211-1AE40-0XB0** CPU 1211C, DC/DC/DC, 6DI/4DQ/2AI	**6ES7211-1HE40-0XB0** CPU 1211C, DC/DC/Relay, 6DI/4DQ/2AI
Digital inputs			
Number of digital inputs	6; Integrated	6; Integrated	6; Integrated
• of which inputs usable for technological functions	3; HSC (High Speed Counting)	3; HSC (High Speed Counting)	3; HSC (High Speed Counting)
Digital outputs			
Number of digital outputs	4; Relays	4	4; Relays
• of which high-speed outputs		4; 100 kHz Pulse Train Output	
Analog inputs			
Number of analog inputs	2	2	2
Input ranges			
• Voltage	Yes	Yes	Yes
Analog outputs			
Number of analog outputs	0	0	0
1. Interface			
Interface type	PROFINET	PROFINET	PROFINET
Physics	Ethernet	Ethernet	Ethernet
Protocols			
• PROFINET IO Controller	Yes	Yes	Yes
• PROFINET IO Device	Yes	Yes	Yes
• SIMATIC communication	Yes	Yes	Yes
• Open IE communication	Yes	Yes	Yes
• Web server	Yes	Yes	Yes
• Media redundancy	No	No	No
Protocols			
Open IE communication			
• TCP/IP	Yes	Yes	Yes
• ISO-on-TCP (RFC1006)	Yes	Yes	Yes
• UDP	Yes	Yes	Yes
Web server			
• supported	Yes	Yes	Yes
Communication functions			
S7 communication			
• supported	Yes	Yes	Yes
Number of connections			
• overall	16; dynamically	16; dynamically	16; dynamically
Integrated Functions			
Number of counters	3	6	3
Counting frequency (counter) max.	100 kHz	100 kHz	100 kHz
Frequency measurement	Yes	Yes	Yes
controlled positioning	Yes	Yes	Yes
Number of position-controlled positioning axes, max.	8	8	8
Number of positioning axes via pulse-direction interface	Up to 4 with SB 1222	4; With integrated outputs	Up to 4 with SB 1222
PID controller	Yes	Yes	Yes
Number of alarm inputs	4	4	4
Number of pulse outputs		4	
Limit frequency (pulse)		100 kHz	
Ambient conditions			
Ambient temperature during operation			
• min.	-20 °C	-20 °C	-20 °C
• max.	60 °C	60 °C	60 °C
Pollutant concentrations			
• SO2 at RH < 60% without condensation	S02: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free	S02: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free	S02: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free

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Technical specifications (continued)

Article number	6ES7211-1BE40-0XB0 CPU 1211C, AC/DC/Relay, 6DI/4DQ/2AI	6ES7211-1AE40-0XB0 CPU 1211C, DC/DC/DC, 6DI/4DQ/2AI	6ES7211-1HE40-0XB0 CPU 1211C, DC/DC/Relay, 6DI/4DQ/2AI
Configuration			
Programming			
Programming language			
- LAD	Yes	Yes	Yes
- FBD	Yes	Yes	Yes
- SCL	Yes	Yes	Yes
Dimensions			
Width	90 mm	90 mm	90 mm
Height	100 mm	100 mm	100 mm
Depth	75 mm	75 mm	75 mm
Weights			
Weight, approx.	420 g	370 g	380 g

Ordering data

	Article No.
CPU 1211C	
Compact CPU, AC/DC/relay; Integrated program/data memory 50 KB, load memory 1 MB; Wide-range power supply 85 ... 264 V AC; Boolean execution times 0.1 µs per operation; 6 digital inputs, 4 digital outputs (relays), 2 analog inputs; Expandable by up to 3 communication modules and 1 signal board/communication board; Digital inputs can be used as HSC at 100 kHz	**6ES7211-1BE40-0XB0**
Compact CPU, DC/DC/DC; Integrated program/data memory 50 KB, load memory 1 MB; Power supply 24 V DC; Boolean execution times 0.1 µs per operation; 6 digital inputs, 4 digital outputs, 2 analog inputs; Expandable by up to 3 communication modules and 1 signal board/communication board; Digital inputs can be used as HSC at 100 kHz, 24 V DC digital outputs can be used as pulse outputs (PTO) or pulse-width modulated outputs (PWM) at 100 kHz	**6ES7211-1AE40-0XB0**
Compact CPU, DC/DC/relay; Integrated program/data memory 50 KB, load memory 1 MB; Power supply 24 V DC; Boolean execution times 0.1 µs per operation; 6 digital inputs, 4 digital outputs (relays), 2 analog inputs; Expandable by up to 3 communication modules and 1 signal board/communication board; Digital inputs can be used as HSC at 100 kHz	**6ES7211-1HE40-0XB0**

	Article No.
SB 1221 signal board	
4 inputs, 5 V DC, 200 kHz	**6ES7221-3AD30-0XB0**
4 inputs, 24 V DC, 200 kHz	**6ES7221-3BD30-0XB0**
SB 1222 signal board	
4 outputs, 5 V DC, 0.1 A, 200 kHz	**6ES7222-1AD30-0XB0**
4 outputs, 24 V DC, 0.1 A, 200 kHz	**6ES7222-1BD30-0XB0**
SB 1223 signal board	
2 inputs, 24 V DC, IEC type 1 current sinking; 2 x 24 V DC transistor outputs, 0.5 A, 5 W; can be used as HSC at up to 30 kHz	**6ES7223-0BD30-0XB0**
2 inputs, 5 V DC, 200 kHz 2 outputs 5 V DC, 0.1 A, 200 kHz	**6ES7223-3AD30-0XB0**
2 inputs, 24 V DC, 200 kHz 2 outputs 24 V DC, 0.1 A, 200 kHz	**6ES7223-3BD30-0XB0**
SB 1231 signal board	**6ES7231-4HA30-0XB0**
1 analog input, ±10 V with 12 bits or 0 ... 20 mA with 11 bits	
SB 1231 thermocouple signal board	**6ES7231-5QA30-0XB0**
1 input +/- 80 mV, resolution 15 bits + sign, thermocouples type J, K	
SB 1231 RTD signal board	**6ES7231-5PA30-0XB0**
1 input for resistance temperature sensors Pt 100, Pt 200, Pt 500, Pt 1000, resolution 15 bits + sign	
SB 1232 signal board	**6ES7232-4HA30-0XB0**
1 analog output, ±10 V with 12 bits or 0 to 20 mA with 11 bits	
CB 1241 RS 485 communication board	**6ES7241-1CH30-1XB0**
For point-to-point connection with 1 RS 485 interface	

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Ordering data

	Article No.
BB1297 battery board	**6ES7297-0AX30-0XA0**
For long-term backup of real-time clock, can be plugged into the signal board slot; battery (CR1025) is not included in scope of supply	
Digital input simulator SIM 1274 simulator module (optional)	
8 input switches, for CPU 1211C / CPU 1212C	**6ES7274-1XF30-0XA0**
Analog input simulator SIM 1274 simulator module (optional)	
2 potentiometers	**6ES7274-1XA30-0XA0**
SIMATIC Memory Card (optional)	
4 MB	**6ES7954-8LC03-0AA0**
12 MB	**6ES7954-8LE03-0AA0**
24 MB	**6ES7954-8LF03-0AA0**
256 MB	**6ES7954-8LL03-0AA0**
2 GB	**6ES7954-8LP02-0AA0**
32 GB	**6ES7954-8LT03-0AA0**
Terminal block (spare part)	
For CPU 1211C AC/DC/relay	
• For DI, with 14 screws, tin-coated, coded; 4 units	**6ES7292-1AP40-0XA0**
• For DQ, with 8 screws, tin-coated, coded; 4 units	**6ES7292-1AH40-0XA0**
• For AI, with 3 screws, gold-plated; 4 units	**6ES7292-1BC30-0XA0**
For CPU 1211C DC/DC/DC	
• For DI, with 14 screws, tin-coated; 4 units	**6ES7292-1AP30-0XA0**
• For DQ, with 8 screws, tin-coated; 4 units	**6ES7292-1AH30-0XA0**
• For AI, with 3 screws, gold-plated; 4 units	**6ES7292-1BC30-0XA0**
For CPU 1211C DC/DC/relay	
• For DI, with 14 screws, tin-coated; 4 units	**6ES7292-1AP30-0XA0**
• For DQ, with 8 screws, tin-coated, coded; 4 units	**6ES7292-1AH40-0XA0**
• For AI, with 3 screws, gold-plated; 4 units	**6ES7292-1BC30-0XA0**
RJ45 cable grip	
4 units per pack	
Single port	**6ES7290-3AA30-0XA0**
Front flap set (spare part)	
For CPU 1211C/1212C	**6ES7291-1AA30-0XA0**

	Article No.
STEP 7 Professional / Basic V15.1	
Target system: SIMATIC S7-1200, S7-1500, S7-300, S7-400, WinAC	
Requirement: Windows 7 Home Premium SP1 (64-bit) Windows 7 Professional SP1 (64-bit) Windows 7 Enterprise SP1 (64-bit) Windows 7 Ultimate SP1 (64-bit) Windows 10 Home Version 1709, 1803 Windows 10 Professional Version 1709, 1803 Windows 10 Enterprise Version 1709, 1803 Windows 10 Enterprise 2016 LTSB Windows 10 IoT Enterprise 2015 LTSB Windows 10 IoT Enterprise 2016 LTSB Windows Server 2012 R2 StdE (full installation) Windows Server 2016 Standard (full installation)	
Type of delivery: en, de, fr, it, es, zh	
STEP 7 Professional V15.1, floating license	**6ES7822-1AA05-0YA5**
STEP 7 Professional V15.1, floating license software download incl. license key [1]	**6ES7822-1AE05-0YA5**
Email address required for delivery	
STEP 7 Basic V15.1, floating license	**6ES7822-0AA05-0YA5**
STEP 7 Basic V15.1, floating license, software download incl. license key[1]	**6ES7822-0AE05-0YA5**
Email address required for delivery	

[1] For up-to-date information and download availability, see: http://www.siemens.com/tia-online-software-delivery

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CPU 1212C

Overview



- Controller for intro to S7 with basic expansion options
- Expandable by:
  - 1 signal board (SB), battery board (BB) or communication board (CB)
  - 2 signal modules (SM)
  - Max. 3 communication modules (CM)

Technical specifications

Article number	**6ES7212-1BE40-0XB0** CPU 1212C, AC/DC/Relay, 8DI/6DQ/2AI	**6ES7212-1AE40-0XB0** CPU 1212C ,DC/DC/DC, 8DI/6DQ/2AI	**6ES7212-1HE40-0XB0** CPU 1212C, DC/DC/Relay, 8DI/6DQ/2AI
General information			
Product type designation	CPU 1212C AC/DC/relay	CPU 1212C DC/DC/DC	CPU 1212C DC/DC/relay
Engineering with			
• Programming package	STEP 7 V14 or higher	STEP 7 V14 or higher	STEP 7 V14 or higher
Supply voltage			
Rated value (DC)			
• 24 V DC		Yes	Yes
Rated value (AC)			
• 120 V AC	Yes		
• 230 V AC	Yes		
Encoder supply			
24 V encoder supply			
• 24 V	20.4 to 28.8V	L+ minus 4 V DC min.	L+ minus 4 V DC min.
Power loss			
Power loss, typ.	11 W	9 W	9 W
Memory			
Work memory			
• integrated	75 kbyte	75 kbyte	75 kbyte
Load memory			
• integrated	2 Mbyte	2 Mbyte	2 Mbyte
• Plug-in (SIMATIC Memory Card), max.	with SIMATIC memory card	with SIMATIC memory card	with SIMATIC memory card
Backup			
• without battery	Yes	Yes	Yes
CPU processing times			
for bit operations, typ.	0.08 µs; / instruction	0.08 µs; / instruction	0.08 µs; / instruction
for word operations, typ.	1.7 µs; / instruction	1.7 µs; / instruction	1.7 µs; / instruction
for floating point arithmetic, typ.	2.3 µs; / instruction	2.3 µs; / instruction	2.3 µs; / instruction
Data areas and their retentivity			
Flag			
• Number, max.	4 kbyte; Size of bit memory address area	4 kbyte; Size of bit memory address area	4 kbyte; Size of bit memory address area
Process image			
• Inputs, adjustable	1 kbyte	1 kbyte	1 kbyte
• Outputs, adjustable	1 kbyte	1 kbyte	1 kbyte

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Technical specifications (continued)

Article number	**6ES7212-1BE40-0XB0** CPU 1212C, AC/DC/Relay, 8DI/6DQ/2AI	**6ES7212-1AE40-0XB0** CPU 1212C ,DC/DC/DC, 8DI/6DQ/2AI	**6ES7212-1HE40-0XB0** CPU 1212C, DC/DC/Relay, 8DI/6DQ/2AI
Time of day			
Clock			
• Hardware clock (real-time)	Yes	Yes	Yes
Digital inputs			
Number of digital inputs	8; Integrated	8; Integrated	8; Integrated
• of which inputs usable for technological functions	4; HSC (High Speed Counting)	4; HSC (High Speed Counting)	4; HSC (High Speed Counting)
Digital outputs			
Number of digital outputs	6; Relays	6	6; Relays
• of which high-speed outputs		4; 100 kHz Pulse Train Output	
Analog inputs			
Number of analog inputs	2	2	2
Input ranges			
• Voltage	Yes	Yes	Yes
Analog outputs			
Number of analog outputs	0	0	0
1. Interface			
Interface type	PROFINET	PROFINET	PROFINET
Physics	Ethernet	Ethernet	Ethernet
Protocols			
• PROFINET IO Controller	Yes	Yes	Yes
• PROFINET IO Device	Yes	Yes	Yes
• SIMATIC communication	Yes	Yes	Yes
• Open IE communication	Yes	Yes	Yes
• Web server	Yes	Yes	Yes
• Media redundancy	No	No	No
Protocols			
Open IE communication			
• TCP/IP	Yes	Yes	Yes
• ISO-on-TCP (RFC1006)	Yes	Yes	Yes
• UDP	Yes	Yes	Yes
Web server			
• supported	Yes	Yes	Yes
Communication functions			
S7 communication			
• supported	Yes	Yes	Yes
Number of connections			
• overall	16; dynamically	16; dynamically	16; dynamically
Integrated Functions			
Number of counters	4	4	4
Counting frequency (counter) max.	100 kHz	100 kHz	100 kHz
Frequency measurement	Yes	Yes	Yes
controlled positioning	Yes	Yes	Yes
Number of position-controlled positioning axes, max.	8	8	8
Number of positioning axes via pulse-direction interface	Up to 4 with SB 1222	4; With integrated outputs	Up to 4 with SB 1222
PID controller	Yes	Yes	Yes
Number of alarm inputs	4	4	4
Number of pulse outputs		4	
Limit frequency (pulse)		100 kHz	

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Technical specifications (continued)

Article number	6ES7212-1BE40-0XB0 CPU 1212C, AC/DC/Relay, 8DI/6DQ/2AI	6ES7212-1AE40-0XB0 CPU 1212C ,DC/DC/DC, 8DI/6DQ/2AI	6ES7212-1HE40-0XB0 CPU 1212C, DC/DC/Relay, 8DI/6DQ/2AI
Ambient conditions			
Ambient temperature during operation			
• min.	-20 °C	-20 °C	-20 °C
• max.	60 °C; Number of simultaneously activated inputs or outputs 4 or 3 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 8 or 6 at 55 °C horizontal or 45 °C vertical	60 °C; Number of simultaneously activated inputs or outputs 4 or 3 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 8 or 6 at 55 °C horizontal or 45 °C vertical	60 °C; Number of simultaneously activated inputs or outputs 4 or 3 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 8 or 6 at 55 °C horizontal or 45 °C vertical
Pollutant concentrations			
• SO2 at RH < 60% without condensation	S02: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free	S02: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free	S02: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free
Configuration			
Programming			
Programming language			
- LAD	Yes	Yes	Yes
- FBD	Yes	Yes	Yes
- SCL	Yes	Yes	Yes
Dimensions			
Width	90 mm	90 mm	90 mm
Height	100 mm	100 mm	100 mm
Depth	75 mm	75 mm	75 mm
Weights			
Weight, approx.	425 g	370 g	385 g

Ordering data

	Article No.
CPU 1212C	
Compact CPU, AC/DC/relay; Integrated program/data memory 75 KB, load memory 2 MB; Wide-range power supply 85 ... 264 V AC; Boolean execution times 0.1 µs per operation; 8 digital inputs, 6 digital outputs (relays), 2 analog inputs; Expandable by up to 3 communication modules, 2 signal modules and 1 signal board/communication board; Digital inputs can be used as HSC at 100 kHz	**6ES7212-1BE40-0XB0**
Compact CPU, DC/DC/DC; Integrated program/data memory 75 KB, load memory 2 MB; Power supply 24 V DC; Boolean execution times 0.1 µs per operation; 8 digital inputs, 6 digital outputs, 2 analog inputs; Expandable by up to 3 communication modules, 2 signal modules, and 1 signal board/communication board; Digital inputs can be used as HSC at 100 kHz, 24 V DC digital outputs can be used as pulse outputs (PTO) or pulse-width modulated outputs (PWM) at 100 kHz	**6ES7212-1AE40-0XB0**
Compact CPU, DC/DC/relay; Integrated program/data memory 75 KB, load memory 2 MB; power supply 24 V DC; Boolean execution times 0.1 µs per operation; 8 digital inputs, 6 digital outputs (relays), 2 analog inputs; expandable by up to 3 communication modules, 2 signal modules, and 1 signal board/communication board; digital inputs can be used as HSC at 100 kHz	**6ES7212-1HE40-0XB0**
SB 1221 signal board	
4 inputs, 5 V DC, 200 kHz	**6ES7221-3AD30-0XB0**
4 inputs, 24 V DC, 200 kHz	**6ES7221-3BD30-0XB0**
SB 1222 signal board	
4 outputs, 5 V DC, 0.1 A, 200 kHz	**6ES7222-1AD30-0XB0**
4 outputs, 24 V DC, 0.1 A, 200 kHz	**6ES7222-1BD30-0XB0**
SB 1223 signal board	
2 inputs, 24 V DC, IEC type 1 current sinking; 2 x 24 V DC transistor outputs, 0.5 A, 5 W; can be used as HSC at up to 30 kHz	**6ES7223-0BD30-0XB0**
2 inputs, 5 V DC, 200 kHz 2 outputs 5 V DC, 0.1 A, 200 kHz	**6ES7223-3AD30-0XB0**
2 inputs, 24 V DC, 200 kHz 2 outputs 24 V DC, 0.1 A, 200 kHz	**6ES7223-3BD30-0XB0**
SB 1231 signal board	**6ES7231-4HA30-0XB0**
1 analog input, ±10 V with 12 bits or 0 ... 20 mA with 11 bits	

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Ordering data	Article No.
SB 1231 thermocouple signal board 1 input +/- 80 mV, resolution 15 bits + sign, thermocouples type J, K	**6ES7231-5QA30-0XB0**
SB 1231 RTD signal board 1 input for resistance temperature sensors Pt 100, Pt 200, Pt 500, Pt 1000, resolution 15 bits + sign	**6ES7231-5PA30-0XB0**
SB 1232 signal board 1 analog output, ±10 V with 12 bits or 0 to 20 mA with 11 bits	**6ES7232-4HA30-0XB0**
CB 1241 RS 485 communication board For point-to-point connection, with 1 RS 485 interface	**6ES7241-1CH30-1XB0**
BB1297 battery board For long-term backup of real-time clock, can be plugged into the signal board slot; battery (CR1025) is not included in scope of supply	**6ES7297-0AX30-0XA0**
Digital input simulator SIM 1274 simulator module (optional) 8 input switches, for CPU 1211C / CPU 1212C	**6ES7274-1XF30-0XA0**
Analog input simulator SIM 1274 simulator module (optional) 2 potentiometers	**6ES7274-1XA30-0XA0**
SIMATIC Memory Card (optional)	
4 MB	**6ES7954-8LC03-0AA0**
12 MB	**6ES7954-8LE03-0AA0**
24 MB	**6ES7954-8LF03-0AA0**
256 MB	**6ES7954-8LL03-0AA0**
2 GB	**6ES7954-8LP02-0AA0**
32 GB	**6ES7954-8LT03-0AA0**
Extension cable for two-tier configuration For connecting digital/analog signal modules; length 2 m	**6ES7290-6AA30-0XA0**
Starter box CPU 1212C AC/DC/relay Complete offer SIMATIC S7-1200, starter box, comprising: CPU 1212C AC/DC/relay, simulator, STEP 7 BASIC CD, manual CD, info material, in Systainer	**6ES7212-1BD34-4YB0**
Terminal block (spare part) For CPU 1212C AC/DC/relay	
• For DI, with 14 screws, tin-coated, coded; 4 units	**6ES7292-1AP40-0XA0**
• For DQ, with 8 screws, tin-coated, coded; 4 units	**6ES7292-1AH40-0XA0**
• For AI, with 3 screws, gold-plated; 4 units	**6ES7292-1BC30-0XA0**

	Article No.
Terminal block (spare part) (cont.)	
For CPU 1212C DC/DC/DC	
• For DI, with 14 screws, tin-coated; 4 units	**6ES7292-1AP30-0XA0**
• For DQ, with 8 screws, tin-coated; 4 units	**6ES7292-1AH30-0XA0**
• For AI, with 3 screws, gold-plated; 4 units	**6ES7292-1BC30-0XA0**
For CPU 1212C DC/DC/relay	
• For DI, with 14 screws, tin-coated; 4 units	**6ES7292-1AP30-0XA0**
• For DQ, with 8 screws, tin-coated, coded; 4 units	**6ES7292-1AH40-0XA0**
• For AI, with 3 screws, gold-plated; 4 units	**6ES7292-1BC30-0XA0**
RJ45 cable grip 4 units per pack	
Single port	**6ES7290-3AA30-0XA0**
Front flap set (spare part)	
For CPU 1211C/1212C	**6ES7291-1AA30-0XA0**
STEP 7 Professional / Basic V15.1 Target system: SIMATIC S7-1200, S7-1500, S7-300, S7-400, WinAC Requirement: Windows 7 Home Premium SP1 (64-bit) Windows 7 Professional SP1 (64-bit) Windows 7 Enterprise SP1 (64-bit) Windows 7 Ultimate SP1 (64-bit) Windows 10 Home Version 1709, 1803 Windows 10 Professional Version 1709, 1803 Windows 10 Enterprise Version 1709, 1803 Windows 10 Enterprise 2016 LTSB Windows 10 IoT Enterprise 2015 LTSB Windows 10 IoT Enterprise 2016 LTSB Windows Server 2012 R2 StdE (full installation) Windows Server 2016 Standard (full installation) Type of delivery: en, de, fr, it, es, zh	
STEP 7 Professional V15.1, floating license	**6ES7822-1AA05-0YA5**
STEP 7 Professional V15.1, floating license software download incl. license key [1] Email address required for delivery	**6ES7822-1AE05-0YA5**
STEP 7 Basic V15.1, floating license	**6ES7822-0AA05-0YA5**
STEP 7 Basic V15.1, floating license, software download incl. license key [1] Email address required for delivery	**6ES7822-0AE05-0YA5**

[1] For up-to-date information and download availability, see: http://www.siemens.com/tia-online-software-delivery

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CPU 1214C

Overview



- Controller for intro to S7 with flexible expansion options
- Expandable by:
  - 1 signal board (SB), battery board (BB) or communication board (CB)
  - 8 signal modules (SM)
  - Max. 3 communication modules (CM)

Technical specifications

Article number	**6ES7214-1BG40-0XB0** CPU 1214C, AC/DC/Relay, 14DI/10DQ/2AI	**6ES7214-1AG40-0XB0** CPU 1214C, DC/DC/DC, 14DI/10DQ/2AI	**6ES7214-1HG40-0XB0** CPU 1214C, DC/DC/Relay, 14DI/10DQ/2AI
General information			
Product type designation	CPU 1214C AC/DC/relay	CPU 1214C DC/DC/DC	CPU 1214C DC/DC/relay
Engineering with			
• Programming package	STEP 7 V14 or higher	STEP 7 V14 or higher	STEP 7 V14 or higher
Supply voltage			
Rated value (DC)			
• 24 V DC		Yes	Yes
Rated value (AC)			
• 120 V AC	Yes		
• 230 V AC	Yes		
Encoder supply			
24 V encoder supply			
• 24 V	20.4 to 28.8V	L+ minus 4 V DC min.	L+ minus 4 V DC min.
Power loss			
Power loss, typ.	14 W	12 W	12 W
Memory			
Work memory			
• integrated	100 kbyte	100 kbyte	100 kbyte
Load memory			
• integrated	4 Mbyte	4 Mbyte	4 Mbyte
• Plug-in (SIMATIC Memory Card), max.	with SIMATIC memory card	with SIMATIC memory card	with SIMATIC memory card
Backup			
• without battery	Yes	Yes	Yes
CPU processing times			
for bit operations, typ.	0.08 µs; / instruction	0.08 µs; / instruction	0.08 µs; / instruction
for word operations, typ.	1.7 µs; / instruction	1.7 µs; / instruction	1.7 µs; / instruction
for floating point arithmetic, typ.	2.3 µs; / instruction	2.3 µs; / instruction	2.3 µs; / instruction
Data areas and their retentivity			
Flag			
• Number, max.	8 kbyte; Size of bit memory address area	8 kbyte; Size of bit memory address area	8 kbyte; Size of bit memory address area
Process image			
• Inputs, adjustable	1 kbyte	1 kbyte	1 kbyte
• Outputs, adjustable	1 kbyte	1 kbyte	1 kbyte
Time of day			
Clock			
• Hardware clock (real-time)	Yes	Yes	Yes

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Technical specifications (continued)

Article number	**6ES7214-1BG40-0XB0** CPU 1214C, AC/DC/Relay, 14DI/10DQ/2AI	**6ES7214-1AG40-0XB0** CPU 1214C, DC/DC/DC, 14DI/10DQ/2AI	**6ES7214-1HG40-0XB0** CPU 1214C, DC/DC/Relay, 14DI/10DQ/2AI
Digital inputs			
Number of digital inputs	14; Integrated	14; Integrated	14; Integrated
• of which inputs usable for technological functions	6; HSC (High Speed Counting)	6; HSC (High Speed Counting)	6; HSC (High Speed Counting)
Digital outputs			
Number of digital outputs	10; Relays	10	10; Relays
• of which high-speed outputs		4; 100 kHz Pulse Train Output	
Analog inputs			
Number of analog inputs	2	2	2
Input ranges			
• Voltage	Yes	Yes	Yes
Analog outputs			
Number of analog outputs	0	0	0
1. Interface			
Interface type	PROFINET	PROFINET	PROFINET
Physics	Ethernet	Ethernet	Ethernet
Protocols			
• PROFINET IO Controller	Yes	Yes	Yes
• PROFINET IO Device	Yes	Yes	Yes
• SIMATIC communication	Yes	Yes	Yes
• Open IE communication	Yes	Yes	Yes
• Web server	Yes	Yes	Yes
• Media redundancy	No	No	No
Protocols			
Open IE communication			
• TCP/IP	Yes	Yes	Yes
• ISO-on-TCP (RFC1006)	Yes	Yes	Yes
• UDP	Yes	Yes	Yes
Web server			
• supported	Yes	Yes	Yes
Communication functions			
S7 communication			
• supported	Yes	Yes	Yes
Number of connections			
• overall	16; dynamically	16; dynamically	16; dynamically
Integrated Functions			
Number of counters	6	6	6
Counting frequency (counter) max.	100 kHz	100 kHz	100 kHz
Frequency measurement	Yes	Yes	Yes
controlled positioning	Yes	Yes	Yes
Number of position-controlled positioning axes, max.	8	8	8
Number of positioning axes via pulse-direction interface	Up to 4 with SB 1222	4; With integrated outputs	Up to 4 with SB 1222
PID controller	Yes	Yes	Yes
Number of alarm inputs	4	4	4
Number of pulse outputs		4	
Limit frequency (pulse)		100 kHz	
Ambient conditions			
Ambient temperature during operation			
• min.	-20 °C	-20 °C	-20 °C
• max.	60 °C; Number of simultaneously activated inputs or outputs 7 or 5 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 14 or 10 at 55 °C horizontal or 45 °C vertical	60 °C; Number of simultaneously activated inputs or outputs 7 or 5 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 14 or 10 at 55 °C horizontal or 45 °C vertical	60 °C; Number of simultaneously activated inputs or outputs 7 or 5 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 14 or 10 at 55 °C horizontal or 45 °C vertical
Pollutant concentrations			
• SO2 at RH < 60% without condensation	S02: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free	S02: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free	S02: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free

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Technical specifications (continued)

Article number	6ES7214-1BG40-0XB0 CPU 1214C, AC/DC/Relay, 14DI/10DQ/2AI	6ES7214-1AG40-0XB0 CPU 1214C, DC/DC/DC, 14DI/10DQ/2AI	6ES7214-1HG40-0XB0 CPU 1214C, DC/DC/Relay, 14DI/10DQ/2AI
Configuration			
Programming			
Programming language			
- LAD	Yes	Yes	Yes
- FBD	Yes	Yes	Yes
- SCL	Yes	Yes	Yes
Dimensions			
Width	110 mm	110 mm	110 mm
Height	100 mm	100 mm	100 mm
Depth	75 mm	75 mm	75 mm
Weights			
Weight, approx.	455 g	415 g	435 g

Ordering data

	Article No.
CPU 1214C	
Compact CPU, AC/DC/relay; Integrated program/data memory 100 KB, load memory 2 MB; Wide-range power supply 85 ... 264 V AC; Boolean execution times 0.1 µs per operation; 14 digital inputs, 10 digital outputs (relays), 2 analog inputs; Expandable by up to 3 communication modules, 8 signal modules and 1 signal board/communication board; Digital inputs can be used as HSC at 100 kHz	**6ES7214-1BG40-0XB0**
Compact CPU, DC/DC/DC; Integrated program/data memory 100 KB, load memory 2 MB; Power supply 24 V DC; Boolean execution times 0.1 µs per operation; 14 digital inputs, 10 digital outputs, 2 analog inputs; expandable by up to 3 communication modules, 8 signal modules, and 1 signal board/communication board; Digital inputs can be used as HSC at 100 kHz, 24 V DC digital outputs can be used as pulse outputs (PTO) or pulse-width modulated outputs (PWM) at 100 kHz	**6ES7214-1AG40-0XB0**
Compact CPU, DC/DC/relay; Integrated program/data memory 100 KB, load memory 2 MB; Power supply 24 V DC; Boolean execution times 0.1 µs per operation; 14 digital inputs, 10 digital outputs (relays), 2 analog inputs; Expandable by up to 3 communication modules, 8 signal modules, and 1 signal board/communication board; Digital inputs can be used as HSC at 100 kHz	**6ES7214-1HG40-0XB0**

	Article No.
SB 1221 signal board	
4 inputs, 5 V DC, 200 kHz	**6ES7221-3AD30-0XB0**
4 inputs, 24 V DC, 200 kHz	**6ES7221-3BD30-0XB0**
SB 1222 signal board	
4 outputs, 5 V DC, 0.1 A, 200 kHz	**6ES7222-1AD30-0XB0**
4 outputs, 24 V DC, 0.1 A, 200 kHz	**6ES7222-1BD30-0XB0**
SB 1223 signal board	
2 inputs, 24 V DC, IEC type 1 current sinking; 2 x 24 V DC transistor outputs, 0.5 A, 5 W; can be used as HSC at up to 30 kHz	**6ES7223-0BD30-0XB0**
2 inputs, 5 V DC, 200 kHz 2 outputs 5 V DC, 0.1 A, 200 kHz	**6ES7223-3AD30-0XB0**
2 inputs, 24 V DC, 200 kHz 2 outputs 24 V DC, 0.1 A, 200 kHz	**6ES7223-3BD30-0XB0**
SB 1231 signal board	**6ES7231-4HA30-0XB0**
1 analog input, ±10 V with 12 bits or 0 ... 20 mA with 11 bits	
SB 1231 thermocouple signal board	**6ES7231-5QA30-0XB0**
1 input +/- 80 mV, resolution 15 bits + sign, thermocouples type J, K	
SB 1231 RTD signal board	**6ES7231-5PA30-0XB0**
1 input for resistance temperature sensors Pt 100, Pt 200, Pt 500, Pt 1000, resolution 15 bits + sign	
SB 1232 signal board	**6ES7232-4HA30-0XB0**
1 analog output, ±10 V with 12 bits or 0 to 20 mA with 11 bits	
CB 1241 RS 485 communication board	**6ES7241-1CH30-1XB0**
For point-to-point connection, with 1 RS 485 interface	

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Ordering data

	Article No.
BB1297 battery board	**6ES7297-0AX30-0XA0**
For long-term backup of real-time clock, can be plugged into the signal board slot; battery (CR1025) is not included in scope of supply	
Digital input simulator SIM 1274 simulator module (optional)	
14 input switches, for CPU 1214C/1215C	**6ES7274-1XH30-0XA0**
Analog input simulator SIM 1274 simulator module (optional)	
2 potentiometers	**6ES7274-1XA30-0XA0**
SIMATIC Memory Card (optional)	
4 MB	**6ES7954-8LC03-0AA0**
12 MB	**6ES7954-8LE03-0AA0**
24 MB	**6ES7954-8LF03-0AA0**
256 MB	**6ES7954-8LL03-0AA0**
2 GB	**6ES7954-8LP02-0AA0**
32 GB	**6ES7954-8LT03-0AA0**
Extension cable for two-tier configuration	**6ES7290-6AA30-0XA0**
For connecting digital/analog signal modules; length 2 m	
Terminal block (spare part)	
For CPU 1214C AC/DC/relay	
• For DI, with 20 screws, tin-coated, coded; 4 units	**6ES7292-1AV40-0XA0**
• For DQ, with 12 screws, tin-coated, coded; 4 units	**6ES7292-1AM40-0XA0**
• For AI, with 3 screws, gold-plated; 4 units	**6ES7292-1BC30-0XA0**
For CPU 1214C DC/DC/DC	
• For DI, with 20 screws, tin-coated; 4 units	**6ES7292-1AV30-0XA0**
• For DQ, with 12 screws, tin-coated; 4 units	**6ES7292-1AM30-0XA0**
• For AI, with 3 screws, gold-plated; 4 units	**6ES7292-1BC30-0XA0**
For CPU 1214C DC/DC/relay	
• For DI, with 20 screws, tin-coated; 4 units	**6ES7292-1AV30-0XA0**
• For DQ, with 12 screws, tin-coated, coded; 4 units	**6ES7292-1AM40-0XA0**
• For AI, with 3 screws, gold-plated; 4 units	**6ES7292-1BC30-0XA0**

	Article No.
RJ45 cable grip	
4 units per pack	
Single port	**6ES7290-3AA30-0XA0**
Front flap set (spare part)	
For CPU 1214C	**6ES7291-1AB30-0XA0**
STEP 7 Professional / Basic V15.1	
Target system: SIMATIC S7-1200, S7-1500, S7-300, S7-400, WinAC	
Requirement: Windows 7 Home Premium SP1 (64-bit) Windows 7 Professional SP1 (64-bit) Windows 7 Enterprise SP1 (64-bit) Windows 7 Ultimate SP1 (64-bit) Windows 10 Home Version 1709, 1803 Windows 10 Professional Version 1709, 1803 Windows 10 Enterprise Version 1709, 1803 Windows 10 Enterprise 2016 LTSB Windows 10 IoT Enterprise 2015 LTSB Windows 10 IoT Enterprise 2016 LTSB Windows Server 2012 R2 StdE (full installation) Windows Server 2016 Standard (full installation)	
Type of delivery: en, de, fr, it, es, zh	
STEP 7 Professional V15.1, floating license	**6ES7822-1AA05-0YA5**
STEP 7 Professional V15.1, floating license software download incl. license key [1]	**6ES7822-1AE05-0YA5**
Email address required for delivery	
STEP 7 Basic V15.1, floating license	**6ES7822-0AA05-0YA5**
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Email address required for delivery	

[1] For up-to-date information and download availability, see: http://www.siemens.com/tia-online-software-delivery

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CPU 1215C

Overview



- Powerful controller with enhanced networking option
- Expandable by:
  - 1 signal board (SB), battery board (BB) or communication board (CB)
  - 8 signal modules (SM)
  - Max. 3 communication modules (CM)

Technical specifications

Article number	**6ES7215-1BG40-0XB0** CPU 1215C, AC/DC/RLY, 14DI/10DQ/2AI/2AQ	**6ES7215-1AG40-0XB0** CPU 1215C, DC/DC/DC, 14DI/10DQ/2AI/2AQ	**6ES7215-1HG40-0XB0** CPU 1215C, DC/DC/RLY, 14DI/10DQ/2AI/2AQ
General information			
Product type designation	CPU 1215C AC/DC/relay	CPU 1215C DC/DC/DC	CPU 1215C DC/DC/relay
Engineering with			
• Programming package	STEP 7 V14 or higher	STEP 7 V14 or higher	STEP 7 V14 or higher
Supply voltage			
Rated value (DC)			
• 24 V DC		Yes	Yes
Rated value (AC)			
• 120 V AC	Yes		
• 230 V AC	Yes		
Encoder supply			
24 V encoder supply			
• 24 V	20.4 to 28.8V	L+ minus 4 V DC min.	L+ minus 4 V DC min.
Power loss			
Power loss, typ.	14 W	12 W	12 W
Memory			
Work memory			
• integrated	125 kbyte	125 kbyte	125 kbyte
Load memory			
• integrated	4 Mbyte	4 Mbyte	4 Mbyte
• Plug-in (SIMATIC Memory Card), max.	with SIMATIC memory card	with SIMATIC memory card	with SIMATIC memory card
Backup			
• without battery	Yes	Yes	Yes
CPU processing times			
for bit operations, typ.	0.08 µs; / instruction	0.08 µs; / instruction	0.08 µs; / instruction
for word operations, typ.	1.7 µs; / instruction	1.7 µs; / instruction	1.7 µs; / instruction
for floating point arithmetic, typ.	2.3 µs; / instruction	2.3 µs; / instruction	2.3 µs; / instruction
Data areas and their retentivity			
Flag			
• Number, max.	8 kbyte; Size of bit memory address area	8 kbyte; Size of bit memory address area	8 kbyte; Size of bit memory address area
Process image			
• Inputs, adjustable	1 kbyte	1 kbyte	1 kbyte
• Outputs, adjustable	1 kbyte	1 kbyte	1 kbyte
Time of day			
Clock			
• Hardware clock (real-time)	Yes	Yes	Yes

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Technical specifications (continued)

Article number	**6ES7215-1BG40-0XB0** CPU 1215C, AC/DC/RLY, 14DI/10DQ/2AI/2AQ	**6ES7215-1AG40-0XB0** CPU 1215C, DC/DC/DC, 14DI/10DQ/2AI/2AQ	**6ES7215-1HG40-0XB0** CPU 1215C, DC/DC/RLY, 14DI/10DQ/2AI/2AQ
Digital inputs			
Number of digital inputs	14; Integrated	14; Integrated	14; Integrated
• of which inputs usable for technological functions	6; HSC (High Speed Counting)	6; HSC (High Speed Counting)	6; HSC (High Speed Counting)
Digital outputs			
Number of digital outputs	10; Relays	10	10; Relays
• of which high-speed outputs		4; 100 kHz Pulse Train Output	
Analog inputs			
Number of analog inputs	2	2	2
Input ranges			
• Voltage	Yes	Yes	Yes
Analog outputs			
Number of analog outputs	2	2	2
Output ranges, current			
• 0 to 20 mA	Yes	Yes	Yes
1. Interface			
Interface type	PROFINET	PROFINET	PROFINET
Physics	Ethernet	Ethernet	Ethernet
Protocols			
• PROFINET IO Controller	Yes	Yes	Yes
• PROFINET IO Device	Yes	Yes	Yes
• SIMATIC communication	Yes	Yes	Yes
• Open IE communication	Yes	Yes	Yes
• Web server	Yes	Yes	Yes
• Media redundancy	Yes; as MRP client	Yes; as MRP client	Yes; as MRP client
Protocols			
Open IE communication			
• TCP/IP	Yes	Yes	Yes
• ISO-on-TCP (RFC1006)	Yes	Yes	Yes
• UDP	Yes	Yes	Yes
Web server			
• supported	Yes	Yes	Yes
Communication functions			
S7 communication			
• supported	Yes	Yes	Yes
Number of connections			
• overall	16; dynamically	16; dynamically	16; dynamically
Integrated Functions			
Number of counters	6	6	6
Counting frequency (counter) max.	100 kHz	100 kHz	100 kHz
Frequency measurement	Yes	Yes	Yes
controlled positioning	Yes	Yes	Yes
Number of position-controlled positioning axes, max.	8	8	8
Number of positioning axes via pulse-direction interface	Up to 4 with SB 1222	4; With integrated outputs	Up to 4 with SB 1222
PID controller	Yes	Yes	Yes
Number of alarm inputs	4	4	4
Number of pulse outputs		4	
Limit frequency (pulse)		100 kHz	
Ambient conditions			
Ambient temperature during operation			
• min.	-20 °C	-20 °C	-20 °C
• max.	60 °C; Number of simultaneously activated inputs or outputs 7 or 5 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 14 or 10 at 55 °C horizontal or 45 °C vertical	60 °C; Number of simultaneously activated inputs or outputs 7 or 5 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 14 or 10 at 55 °C horizontal or 45 °C vertical	60 °C; Number of simultaneously activated inputs or outputs 7 or 5 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 14 or 10 at 55 °C horizontal or 45 °C vertical
Pollutant concentrations			
• SO2 at RH < 60% without condensation	S02: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free	S02: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free	S02: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free

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Technical specifications (continued)

Article number	6ES7215-1BG40-0XB0 CPU 1215C, AC/DC/RLY, 14DI/10DQ/2AI/2AQ	6ES7215-1AG40-0XB0 CPU 1215C, DC/DC/DC, 14DI/10DQ/2AI/2AQ	6ES7215-1HG40-0XB0 CPU 1215C, DC/DC/RLY, 14DI/10DQ/2AI/2AQ
Configuration			
Programming			
Programming language			
- LAD	Yes	Yes	Yes
- FBD	Yes	Yes	Yes
- SCL	Yes	Yes	Yes
Dimensions			
Width	130 mm	130 mm	130 mm
Height	100 mm	100 mm	100 mm
Depth	75 mm	75 mm	75 mm
Weights			
Weight, approx.	550 g	500 g	585 g

Ordering data

	Article No.
CPU 1215C	
Compact CPU, AC/DC/relay; Integrated program/data memory 125 KB, load memory 4 MB; Wide-range power supply 85 ... 264 V AC; Boolean execution times 0.085 µs per operation; 14 digital inputs, 10 digital outputs (relays), 2 analog inputs, 2 analog outputs; Expandable by up to 3 communication modules, 8 signal modules and 1 signal board/communication board; Digital inputs can be used as HSC at 100 kHz	**6ES7215-1BG40-0XB0**
Compact CPU, DC/DC/DC; Integrated program/data memory 125 KB, load memory 4 MB; Power supply 24 V DC; Boolean execution times 0.085 µs per operation; 14 digital inputs, 10 digital outputs, 2 analog inputs, 2 analog outputs; Expandable by up to 3 communication modules, 8 signal modules, and 1 signal board/communication board; Digital inputs can be used as HSC at 100 kHz, 24 V DC digital outputs can be used as pulse outputs (PTO) or pulse-width modulated outputs (PWM) at 100 kHz	**6ES7215-1AG40-0XB0**
Compact CPU, DC/DC/relay; Integrated program/data memory 125 KB, load memory 4 MB; Power supply 24 V DC; Boolean execution times 0.085 µs per operation; 14 digital inputs, 10 digital outputs (relays), 2 analog inputs, 2 analog outputs; Expandable by up to 3 communication modules, 8 signal modules, and 1 signal board/communication board; Digital inputs can be used as HSC at 100 kHz	**6ES7215-1HG40-0XB0**

	Article No.
SB 1221 signal board	
4 inputs, 5 V DC, 200 kHz	**6ES7221-3AD30-0XB0**
4 inputs, 24 V DC, 200 kHz	**6ES7221-3BD30-0XB0**
SB 1222 signal board	
4 outputs, 5 V DC, 0.1 A, 200 kHz	**6ES7222-1AD30-0XB0**
4 outputs, 24 V DC, 0.1 A, 200 kHz	**6ES7222-1BD30-0XB0**
SB 1223 signal board	
2 inputs, 24 V DC, IEC type 1 current sinking; 2 x 24 V DC transistor outputs, 0.5 A, 5 W; can be used as HSC at up to 30 kHz	**6ES7223-0BD30-0XB0**
2 inputs, 5 V DC, 200 kHz 2 outputs 5 V DC, 0.1 A, 200 kHz	**6ES7223-3AD30-0XB0**
2 inputs, 24 V DC, 200 kHz 2 outputs 24 V DC, 0.1 A, 200 kHz	**6ES7223-3BD30-0XB0**
SB 1231 signal board	**6ES7231-4HA30-0XB0**
1 analog input, ±10 V with 12 bits or 0 ... 20 mA with 11 bits	
SB 1231 thermocouple signal board	**6ES7231-5QA30-0XB0**
1 input +/- 80 mV, resolution 15 bits + sign, thermocouples type J, K	
SB 1231 RTD signal board	**6ES7231-5PA30-0XB0**
1 input for resistance temperature sensors Pt 100, Pt 200, Pt 500, Pt 1000, resolution 15 bits + sign	
SB 1232 signal board	**6ES7232-4HA30-0XB0**
1 analog output, ±10 V with 12 bits or 0 to 20 mA with 11 bits	
CB 1241 RS 485 communication board	**6ES7241-1CH30-1XB0**
For point-to-point connection, with 1 RS 485 interface	
BB 1297 battery board	**6ES7297-0AX30-0XA0**
For long-term backup of real-time clock; can be plugged into the signal board slot; battery (CR 1025) is not included	

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Ordering data	Article No.
Digital input simulator SIM 1274 simulator module (optional)	
14 input switches, for CPU 1214C/1215C	**6ES7274-1XH30-0XA0**
Analog input simulator SIM 1274 simulator module (optional)	
2 potentiometers	**6ES7274-1XA30-0XA0**
SIMATIC Memory Card (optional)	
4 MB	**6ES7954-8LC03-0AA0**
12 MB	**6ES7954-8LE03-0AA0**
24 MB	**6ES7954-8LF03-0AA0**
256 MB	**6ES7954-8LL03-0AA0**
2 GB	**6ES7954-8LP02-0AA0**
32 GB	**6ES7954-8LT03-0AA0**
Extension cable for two-tier configuration	**6ES7290-6AA30-0XA0**
For connecting digital/analog signal modules; length 2 m	
Terminal block (spare part)	
For CPU 1215C AC/DC/relay	
• For DI, with 20 screws, tin-coated, coded; 4 units	**6ES7292-1AV40-0XA0**
• For DQ, with 12 screws, tin-coated, coded; 4 units	**6ES7292-1AM40-0XA0**
• For analog units, with 6 screws, gold-plated; 4 units	**6ES7292-1BF30-0XB0**
For CPU 1215C DC/DC/DC	
• For DI, with 20 screws, tin-coated; 4 units	**6ES7292-1AV30-0XA0**
• For DQ, with 12 screws, tin-coated; 4 units	**6ES7292-1AM30-0XA0**
• For analog units, with 6 screws, gold-plated; 4 units	**6ES7292-1BF30-0XB0**
For CPU 1215C DC/DC/relay	
• For DI, with 20 screws, tin-coated; 4 units	**6ES7292-1AV30-0XA0**
• For DQ, with 12 screws, tin-coated, coded; 4 units	**6ES7292-1AM40-0XA0**
• For analog units, with 6 screws, gold-plated; 4 units	**6ES7292-1BF30-0XB0**

	Article No.
Front flap set (spare part)	
For CPU 1215C	**6ES7291-1AC30-0XA0**
RJ45 cable grip	
4 units per pack	
Dual port	**6ES7290-3AB30-0XA0**
STEP 7 Professional / Basic V15.1	
Target system: SIMATIC S7-1200, S7-1500, S7-300, S7-400, WinAC	
Requirement: Windows 7 Home Premium SP1 (64-bit) Windows 7 Professional SP1 (64-bit) Windows 7 Enterprise SP1 (64-bit) Windows 7 Ultimate SP1 (64-bit) Windows 10 Home Version 1709, 1803 Windows 10 Professional Version 1709, 1803 Windows 10 Enterprise Version 1709, 1803 Windows 10 Enterprise 2016 LTSB Windows 10 IoT Enterprise 2015 LTSB Windows 10 IoT Enterprise 2016 LTSB Windows Server 2012 R2 StdE (full installation) Windows Server 2016 Standard (full installation)	
Type of delivery: en, de, fr, it, es, zh	
STEP 7 Professional V15.1, floating license	**6ES7822-1AA05-0YA5**
STEP 7 Professional V15.1, floating license software download incl. license key [1]	**6ES7822-1AE05-0YA5**
Email address required for delivery	
STEP 7 Basic V15.1, floating license	**6ES7822-0AA05-0YA5**
STEP 7 Basic V15.1, floating license, software download incl. license key [1]	**6ES7822-0AE05-0YA5**
Email address required for delivery	

[1] For up-to-date information and download availability, see: http://www.siemens.com/tia-online-software-delivery

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CPU 1217C

Overview



- Powerful controller for extremely fast signal processing
- Expandable by:
  - 1 signal board (SB), battery board (BB) or communication board (CB)
  - 8 signal modules (SM)
  - Max. 3 communication modules (CM)

Technical specifications

Article number	**6ES7217-1AG40-0XB0** CPU 1217C, DC/DC/DC, 14DI/10DQ/2AI/2AQ
General information	
Product type designation	CPU 1217C DC/DC/DC
Engineering with	
• Programming package	STEP 7 V14 or higher
Supply voltage	
Rated value (DC)	
• 24 V DC	Yes
Encoder supply	
24 V encoder supply	
• 24 V	L+ minus 4 V DC min.
Power loss	
Power loss, typ.	12 W
Memory	
Work memory	
• integrated	150 kbyte
Load memory	
• integrated	4 Mbyte
• Plug-in (SIMATIC Memory Card), max.	with SIMATIC memory card
Backup	
• without battery	Yes
CPU processing times	
for bit operations, typ.	0.08 µs; / instruction
for word operations, typ.	1.7 µs; / instruction
for floating point arithmetic, typ.	2.3 µs; / Operation
Data areas and their retentivity	
Flag	
• Number, max.	8 kbyte; Size of bit memory address area
Process image	
• Inputs, adjustable	1 kbyte
• Outputs, adjustable	1 kbyte

Article number	**6ES7217-1AG40-0XB0** CPU 1217C, DC/DC/DC, 14DI/10DQ/2AI/2AQ
Time of day	
Clock	
• Hardware clock (real-time)	Yes
Digital inputs	
Number of digital inputs	14; Integrated
• of which inputs usable for technological functions	6; HSC (High Speed Counting)
Digital outputs	
Number of digital outputs	10
• of which high-speed outputs	4; 100 kHz Pulse Train Output
Analog inputs	
Number of analog inputs	2
Input ranges	
• Voltage	Yes
Analog outputs	
Number of analog outputs	2
Output ranges, current	
• 0 to 20 mA	Yes
1. Interface	
Interface type	PROFINET
Physics	Ethernet
Protocols	
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes
• Web server	Yes
• Media redundancy	Yes; as MRP client

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Technical specifications (continued)

Article number	**6ES7217-1AG40-0XB0**
	CPU 1217C, DC/DC/DC, 14DI/10DQ/2AI/2AQ
Protocols	
Open IE communication	
• TCP/IP	Yes
• ISO-on-TCP (RFC1006)	Yes
• UDP	Yes
Web server	
• supported	Yes
Communication functions	
S7 communication	
• supported	Yes
Number of connections	
• overall	16; dynamically
Integrated Functions	
Number of counters	6
Counting frequency (counter) max.	1 MHz
Frequency measurement	Yes
controlled positioning	Yes
Number of position-controlled positioning axes, max.	8
Number of positioning axes via pulse-direction interface	4; With integrated outputs
PID controller	Yes
Number of alarm inputs	4
Number of pulse outputs	4
Limit frequency (pulse)	1 MHz
Ambient conditions	
Ambient temperature during operation	
• min.	-20 °C
• max.	60 °C; Number of simultaneously activated inputs or outputs 7 or 5 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 14 or 10 at 55 °C horizontal or 45 °C vertical
Pollutant concentrations	
• SO2 at RH < 60% without condensation	S02: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free
Configuration	
Programming	
Programming language	
- LAD	Yes
- FBD	Yes
- SCL	Yes
Dimensions	
Width	150 mm
Height	100 mm
Depth	75 mm
Weights	
Weight, approx.	530 g

Ordering data

	Article No.
CPU 1217C	
Compact CPU, DC/DC/DC; Integrated program/data memory 150 KB, load memory 4 MB; Power supply 24 V DC; Boolean execution times 0.085 µs per operation; 14 digital inputs (10 digital 24 V DC inputs, 4 digital 1.5 V DC differential inputs), 10 digital outputs (6 digital 24 V DC outputs, 4 digital 1.5 V DC differential outputs), 2 analog inputs, 2 analog outputs; Expandable by up to 3 communication modules, 8 signal modules, and 1 signal board/communication board; Digital inputs can be used as HSC at 1 MHz, 24 V DC digital outputs can be used as pulse outputs (PTO) or pulse-width modulated outputs (PWM) at 100 kHz	**6ES7217-1AG40-0XB0**
SB 1221 signal board	
4 inputs, 5 V DC, 200 kHz	**6ES7221-3AD30-0XB0**
4 inputs, 24 V DC, 200 kHz	**6ES7221-3BD30-0XB0**
SB 1222 signal board	
4 outputs, 5 V DC, 0.1 A, 200 kHz	**6ES7222-1AD30-0XB0**
4 outputs, 24 V DC, 0.1 A, 200 kHz	**6ES7222-1BD30-0XB0**
SB 1223 signal board	
2 inputs, 24 V DC, IEC type 1 current sinking; 2 x 24 V DC transistor outputs, 0.5 A, 5 W; can be used as HSC at up to 30 kHz	**6ES7223-0BD30-0XB0**
2 inputs, 5 V DC, 200 kHz 2 outputs 5 V DC, 0.1 A, 200 kHz	**6ES7223-3AD30-0XB0**
2 inputs, 24 V DC, 200 kHz 2 outputs 24 V DC, 0.1 A, 200 kHz	**6ES7223-3BD30-0XB0**
SB 1231 signal board	**6ES7231-4HA30-0XB0**
1 analog input, ±10 V with 12 bits or 0 ... 20 mA with 11 bits	
SB 1231 thermocouple signal board	**6ES7231-5QA30-0XB0**
1 input +/- 80 mV, resolution 15 bits + sign, thermocouples type J, K	
SB 1231 RTD signal board	**6ES7231-5PA30-0XB0**
1 input for resistance temperature sensors Pt 100, Pt 200, Pt 500, Pt 1000, resolution 15 bits + sign	
SB 1232 signal board	**6ES7232-4HA30-0XB0**
1 analog output, ±10 V with 12 bits or 0 to 20 mA with 11 bits	

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CPU 1217C

Ordering data	Article No.
CB 1241 RS 485 communication board	**6ES7241-1CH30-1XB0**
For point-to-point connection, with 1 RS 485 interface	
BB 1297 battery board	**6ES7297-0AX30-0XA0**
For long-term backup of real-time clock; can be plugged into the signal board slot; battery (CR 1025) is not included	
Digital input simulator SIM 1274 simulator module (optional)	
14 input switches, for CPU 1217C	**6ES7274-1XK30-0XA0**
Analog input simulator SIM 1274 simulator module (optional)	
2 potentiometers	**6ES7274-1XA30-0XA0**
SIMATIC Memory Card (optional)	
4 MB	**6ES7954-8LC03-0AA0**
12 MB	**6ES7954-8LE03-0AA0**
24 MB	**6ES7954-8LF03-0AA0**
256 MB	**6ES7954-8LL03-0AA0**
2 GB	**6ES7954-8LP02-0AA0**
32 GB	**6ES7954-8LT03-0AA0**
Extension cable for two-tier configuration	**6ES7290-6AA30-0XA0**
For connecting digital/analog signal modules; length 2 m	
Terminal block (spare part)	
For CPU 1217C	
• For DI, with 10 screws, tin-coated; 4 units	**6ES7292-1AK30-0XA0**
• For DI, with 10 screws, tin-coated; 4 units	**6ES7292-1AR30-0XA0**
• For DQ, with 18 screws, tin-coated; 4 units	**6ES7292-1AT30-0XA0**
• For analog units, with 6 screws, gold-plated; 4 units	**6ES7292-1BF30-0XB0**
Front flap set (spare part)	
For CPU 1217C	**6ES7291-1AD30-0XA0**
RJ45 cable grip	
4 units per pack	
Dual port	**6ES7290-3AB30-0XA0**

	Article No.
STEP 7 Professional / Basic V15.1	
Target system: SIMATIC S7-1200, S7-1500, S7-300, S7-400, WinAC	
Requirement: Windows 7 Home Premium SP1 (64-bit) Windows 7 Professional SP1 (64-bit) Windows 7 Enterprise SP1 (64-bit) Windows 7 Ultimate SP1 (64-bit) Windows 10 Home Version 1709, 1803 Windows 10 Professional Version 1709, 1803 Windows 10 Enterprise Version 1709, 1803 Windows 10 Enterprise 2016 LTSB Windows 10 IoT Enterprise 2015 LTSB Windows 10 IoT Enterprise 2016 LTSB Windows Server 2012 R2 StdE (full installation) Windows Server 2016 Standard (full installation)	
Type of delivery: en, de, fr, it, es, zh	
STEP 7 Professional V15.1, floating license	**6ES7822-1AA05-0YA5**
STEP 7 Professional V15.1, floating license software download incl. license key [1]	**6ES7822-1AE05-0YA5**
Email address required for delivery	
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Email address required for delivery	

[1] For up-to-date information and download availability, see: http://www.siemens.com/tia-online-software-delivery

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Overview



- The clever compact solution
- With 10 integrated I/Os
- Expandable with:
  - 1 signal board (SB) or communication board (CB); not possible with: 6AG1211-1AE31-2XB0, 6AG1211-1BE31-2XB0, 6AG1211-1HE31-2XB0
  - Max. 3 communication modules (CM)

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

Technical specifications

Article number	**6AG1211-1AE31-4XB0**
Based on	**6ES7211-1AE31-0XB0** SIPLUS S7-1200 CPU1211 DC/DC/DC
Ambient conditions	
Ambient temperature during operation	
• min.	-20 °C; = Tmin; Startup @ 0 °C
• max.	60 °C; = Tmax
• At cold restart, min.	0 °C
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance	
Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *

Article number	**6AG1211-1AE31-4XB0**
Based on	**6ES7211-1AE31-0XB0** SIPLUS S7-1200 CPU1211 DC/DC/DC
Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
Remark	
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A
Configuration	
Programming	
Programming language	
- LAD	Yes
- FBD	Yes
- SCL	Yes
Dimensions	
Width	90 mm
Height	100 mm
Depth	75 mm
Weights	
Weight, approx.	370 g

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Technical specifications (continued)

Article number	**6AG1211-1BE31-4XB0**	**6AG1211-1BE31-2XB0**
Based on	**6ES7211-1BE31-0XB0**	**6ES7211-1BE31-0XB0**
	SIPLUS S7-1200 CPU1211 AC/DC/RLY	SIPLUS S7-1200 CPU1211 AC/DC/RLY
Ambient conditions		
Ambient temperature during operation		
• min.	-20 °C; = Tmin; Startup @ 0 °C	-40 °C; = Tmin; Startup @ -25 °C
• max.	60 °C; = Tmax	70 °C; = Tmax; > +60 °C Number of simultaneously controllable inputs and outputs max. 50%; no signal board can be used
• At cold restart, min.	0 °C	-25 °C
Altitude during operation relating to sea level		
• Installation altitude above sea level, max.	2 000 m	2 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m); above 2 000 m max. 132 V AC	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m); above 2 000 m max. 132 V AC
Relative humidity		
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance		
Coolants and lubricants		
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems		
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
Use on ships/at sea		
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Remark		
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating		
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability	Yes; Class 2 for high availability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

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Technical specifications (continued)

Article number	**6AG1211-1HE31-4XB0**	**6AG1211-1HE31-2XB0**
Based on	**6ES7211-1HE31-0XB0**	**6ES7211-1HE31-0XB0**
	SIPLUS S7-1200 CPU1211 DC/DC/RLY	SIPLUS S7-1200 CPU1211 DC/DC/RLY
Ambient conditions		
Ambient temperature during operation		
• min.	-20 °C; = Tmin; Startup @ 0 °C	-40 °C; = Tmin; Startup @ -25 °C
• max.	60 °C; = Tmax	70 °C; = Tmax; > +60 °C Number of simultaneously controllable inputs and outputs max. 50%; no signal board can be used
• At cold restart, min.	0 °C	-25 °C
Altitude during operation relating to sea level		
• Installation altitude above sea level, max.	2 000 m	2 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m); above 2 000 m max. 132 V AC	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m); above 2 000 m max. 132 V AC
Relative humidity		
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance		
Coolants and lubricants		
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems		
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
Use on ships/at sea		
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Remark		
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating		
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability	Yes; Class 2 for high availability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

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SIPLUS CPU 1211C

3

Ordering data	Article No.
SIPLUS CPU 1211C compact CPU, AC/DC/relay	
(Extended temperature range and exposure to environmental substances)	
Integrated program and data memory of 25 KB, load memory of 1 MB; wide-range alternating voltage supply 85 ... 264 V AC; Boolean execution times of 0.1 ms per operation; 6 digital inputs, 4 digital outputs (relay), 2 analog inputs; expandable with up to 3 communication modules and 1 signal board/communication board; digital inputs usable as HSC with 100 kHz	
• For areas with extreme exposure to media (conformal coating); ambient temperature -20 ... +60 °C	**6AG1211-1BE31-4XB0**
• For areas with extreme exposure to media (conformal coating); ambient temperature -40 ... +70 °C	**6AG1211-1BE31-2XB0**
SIPLUS CPU 1211C compact CPU, DC/DC/DC	
(Extended temperature range and exposure to environmental substances)	
Integrated program and data memory of 25 KB, load memory of 1 MB; power supply 24 V DC; Boolean execution times of 0.1 ms per operation; 6 digital inputs, 4 digital outputs, 2 analog inputs; expandable with up to 3 communication modules and 1 signal board/communication board; digital inputs usable as HSC with 100 kHz, 24 V DC digital outputs usable as pulse outputs (PTO) or pulse-width-modulated outputs (PWM) with 100 kHz	
• For areas with extreme exposure to media (conformal coating); ambient temperature -20 ... +60 °C	**6AG1211-1AE31-4XB0**
SIPLUS CPU 1211C compact CPU, DC/DC/relay	
(Extended temperature range and exposure to environmental substances)	
Integrated program and data memory of 25 KB, load memory of 1 MB; power supply 24 V DC; Boolean execution times of 0.1 ms per operation; 6 digital inputs, 4 digital outputs (relay), 2 analog inputs; expandable with up to 3 communication modules and 1 signal board/communication board; digital inputs usable as HSC with 100 kHz	
• For areas with extreme exposure to media (conformal coating); ambient temperature -20 ... +60 °C	**6AG1211-1HE31-4XB0**
• For areas with extreme exposure to media (conformal coating); ambient temperature -40 ... +70 °C	**6AG1211-1HE31-2XB0**
Accessories	
SIPLUS SB 1221 digital input signal board	
(Extended temperature range and exposure to media; cannot be used with 6AG1211-1....-**2**XB0)	
4 inputs, 5 V DC, 200 kHz, sourcing	**6AG1221-3AD30-5XB0**
4 inputs, 24 V DC, 200 kHz, sourcing	**6AG1221-3BD30-5XB0**
SIPLUS SB 1222 digital output signal board	
(Extended temperature range and exposure to media; cannot be used with 6AG1211-1....-**2**XB0)	
4 outputs, 5 V DC, 0.1 A, 200 kHz	**6AG1222-1AD30-5XB0**
4 outputs, 24 V DC, 0.1 A, 200 kHz	**6AG1222-1BD30-5XB0**
SIPLUS SB 1223 digital input/output signal board	
(Extended temperature range and exposure to media; cannot be used with 6AG1211-1....-**2**XB0)	
2 inputs, 24 V DC, IEC type 1 current sinking; 2 x 24 V DC transistor outputs, 0.5 A, 5 W; can be used as HSC at up to 30 kHz	
• Suitable for areas with extreme exposure to media (conformal coating)	**6AG1223-0BD30-4XB0**
• Ambient temperature -25 ... +55 °C	**6AG1223-0BD30-5XB0**
2 inputs, 5 V DC, 200 kHz 2 outputs 5 V DC, 0.1 A, 200 kHz	**6AG1223-3AD30-5XB0**
2 inputs, 24 V DC, 200 kHz 2 outputs 24 V DC, 0.1 A, 200 kHz	**6AG1223-3BD30-5XB0**
SIPLUS SB 1232 analog output signal board	
(Extended temperature range and exposure to media; cannot be used with 6AG1211-1....-**2**XB0)	
Ambient temperature range -25 ... +55 °C	
1 analog output, ±10 V with 12 bits or 0 ... 20 mA with 11 bits	**6AG1232-4HA30-5XB0**
Ambient temperature range 0 ... +55 °C	
1 analog output, ±10 V with 12 bits or 0 ... 20 mA with 11 bits	**6AG1232-4HA30-4XB0**
SIPLUS CB 1241 RS 485 communication board	
(Extended temperature range and exposure to media; cannot be used with 6AG1211-1....-**2**XB0)	
for point-to-point connection, with 1 RS 485 interface	**6AG1241-1CH30-5XB1**
Other accessories	See SIMATIC S7-1200 CPU 1211C, page 3/6

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Overview



- The superior compact solution
- With 14 integral input/outputs
- Expandable with:
  - 1 signal board (SB) or communication board (CB); not possible with: 6AG1212-1AE40-2XB0, 6AG1212-1BE40-2XB0, 6AG1212-1HE40-2XB0
  - 2 signal modules (SM)
  - Max. 3 communication modules (CM)

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

Technical specifications

Article number	**6AG1212-1AE40-4XB0**	**6AG1212-1AE40-2XB0**
Based on	**6ES7212-1AE40-0XB0**	**6ES7212-1AE40-0XB0**
	SIPLUS S7-1200 CPU 1212C DC/DC/DC	SIPLUS S7-1200 CPU 1212C DC/DC/DC
Ambient conditions		
Ambient temperature during operation		
• min.	-20 °C; = Tmin (incl. condensation/frost); start-up @ 0 °C	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C
• max.	60 °C; Number of simultaneously activated inputs or outputs 4 or 3 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 8 or 6 at 55 °C horizontal or 45 °C vertical	70 °C; = Tmax; Tmax > +55 °C number of simultaneously switched-on digital inputs 4, digital outputs 3, analog inputs 2 (no adjacent points) with horizontal mounting position; Tmax > +60 °C number of simultaneously switched-on digital inputs 3, digital outputs 2, analog inputs 0 (no adjacent points) with horizontal mounting position
• At cold restart, min.	0 °C	-25 °C
Altitude during operation relating to sea level		
• Installation altitude above sea level, max.	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity		
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance		
Coolants and lubricants		
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems		
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *

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Technical specifications (continued)

Article number	6AG1212-1AE40-4XB0	6AG1212-1AE40-2XB0
Based on	6ES7212-1AE40-0XB0	6ES7212-1AE40-0XB0
	SIPLUS S7-1200 CPU 1212C DC/DC/DC	SIPLUS S7-1200 CPU 1212C DC/DC/DC
Use on ships/at sea		
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Remark		
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating		
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability	Yes; Class 2 for high availability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

Article number	6AG1212-1BE40-4XB0	6AG1212-1BE40-2XB0
Based on	6ES7212-1BE40-0XB0	6ES7212-1BE40-0XB0
	SIPLUS S7-1200 CPU 1212C AC/DC/RLY	SIPLUS S7-1200 CPU 1212C AC/DC/RLY
Ambient conditions		
Ambient temperature during operation		
• min.	-20 °C; = Tmin; Startup @ 0 °C	-40 °C; = Tmin; Startup @ -25 °C
• max.	60 °C; Number of simultaneously activated inputs or outputs 4 or 3 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 8 or 6 at 55 °C horizontal or 45 °C vertical	70 °C; = Tmax; Tmax > +55 °C number of simultaneously switched-on digital inputs 4, digital outputs 3, analog inputs 2 (no adjacent points) with horizontal mounting position; Tmax > +60 °C number of simultaneously switched-on digital inputs 3, digital outputs 2, analog inputs 0 (no adjacent points) with horizontal mounting position
• At cold restart, min.	0 °C	-25 °C
Altitude during operation relating to sea level		
• Installation altitude above sea level, max.	2 000 m	2 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m); above 2 000 m max. 132 V AC	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m); above 2 000 m max. 132 V AC
Relative humidity		
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance		
Coolants and lubricants		
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems		
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *

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Technical specifications (continued)

Article number	**6AG1212-1BE40-4XB0**	**6AG1212-1BE40-2XB0**
Based on	**6ES7212-1BE40-0XB0**	**6ES7212-1BE40-0XB0**
	SIPLUS S7-1200 CPU 1212C AC/DC/RLY	SIPLUS S7-1200 CPU 1212C AC/DC/RLY
Use on ships/at sea		
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Remark		
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating		
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability	Yes; Class 2 for high availability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

Article number	**6AG1212-1HE40-4XB0**	**6AG1212-1HE40-2XB0**
Based on	**6ES7212-1HE40-0XB0**	**6ES7212-1HE40-0XB0**
	SIPLUS S7-1200 CPU 1212C DC/DC/RLY	SIPLUS S7-1200 CPU 1212C DC/DC/RLY
Ambient conditions		
Ambient temperature during operation		
• min.	-20 °C; = Tmin; Startup @ 0 °C	-40 °C; = Tmin; Startup @ -25 °C
• max.	60 °C; Number of simultaneously activated inputs or outputs 4 or 3 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 8 or 6 at 55 °C horizontal or 45 °C vertical	70 °C; = Tmax; Tmax > +55 °C number of simultaneously switched-on digital inputs 4, digital outputs 3, analog inputs 2 (no adjacent points) with horizontal mounting position; Tmax > +60 °C number of simultaneously switched-on digital inputs 3, digital outputs 2, analog inputs 0 (no adjacent points) with horizontal mounting position
• At cold restart, min.	0 °C	-25 °C
Altitude during operation relating to sea level		
• Installation altitude above sea level, max.	2 000 m	2 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m); above 2 000 m max. 132 V AC	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m); above 2 000 m max. 132 V AC
Relative humidity		
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance		
Coolants and lubricants		
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems		
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *

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Technical specifications (continued)

Article number	6AG1212-1HE40-4XB0	6AG1212-1HE40-2XB0
Based on	6ES7212-1HE40-0XB0 SIPLUS S7-1200 CPU 1212C DC/DC/RLY	6ES7212-1HE40-0XB0 SIPLUS S7-1200 CPU 1212C DC/DC/RLY
Use on ships/at sea		
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Remark		
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating		
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability	Yes; Class 2 for high availability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

Ordering data

	Article No.
SIPLUS CPU 1212C compact CPU, AC/DC/relay	
(Extended temperature range and exposure to media)	
Integrated program/data memory 75 KB, load memory 1 MB; Wide-range power supply 85 ... 264 V AC; Boolean execution times 0.1 µs per operation; 8 digital inputs, 6 digital outputs (relays), 2 analog inputs; Expandable by up to 3 communication modules, 2 signal modules and 1 signal board/communication board; Digital inputs can be used as HSC at 100 kHz	
• For areas with extreme exposure to media (conformal coating); ambient temperature -20 ... +60 °C	**6AG1212-1BE40-4XB0**
• For areas with extreme exposure to media (conformal coating); ambient temperature -40 ... +70 °C	**6AG1212-1BE40-2XB0**

	Article No.
SIPLUS CPU 1212C compact CPU, DC/DC/DC	
(Extended temperature range and exposure to media)	
Integrated program/data memory 75 KB, load memory 1 MB; Power supply 24 V DC; Boolean execution times 0.1 µs per operation; 8 digital inputs, 6 digital outputs, 2 analog inputs; Expandable by up to 3 communication modules, 2 signal modules, and 1 signal board/communication board; Digital inputs can be used as HSC at 100 kHz, 24 V DC digital outputs can be used as pulse outputs (PTO) or pulse-width modulated outputs (PWM) at 100 kHz	
• For areas with extreme exposure to media (conformal coating); ambient temperature -20 ... +60 °C	**6AG1212-1AE40-4XB0**
• For areas with extreme exposure to media (conformal coating); ambient temperature -40 ... +70 °C	**6AG1212-1AE40-2XB0**

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Ordering data

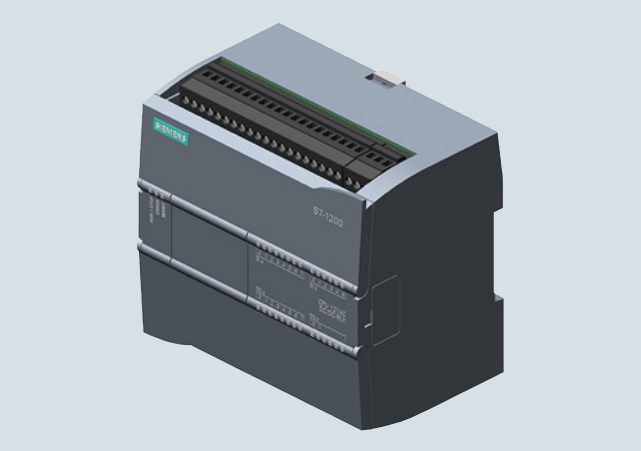
	Article No.
SIPLUS CPU 1212C compact CPU, DC/DC/relay	
(Extended temperature range and exposure to media)	
Integrated program/data memory 75 KB, load memory 1 MB; Power supply 24 V DC; Boolean execution times 0.1 µs per operation; 8 digital inputs, 6 digital outputs (relays), 2 analog inputs; Expandable by up to 3 communication modules, 2 signal modules, and 1 signal board/communication board; Digital inputs can be used as HSC at 100 kHz	
• For areas with extreme exposure to media (conformal coating); ambient temperature -20 ... +60 °C	**6AG1212-1HE40-4XB0**
• For areas with extreme exposure to media (conformal coating); ambient temperature -40 ... +70 °C	**6AG1212-1HE40-2XB0**
Accessories	
SIPLUS SB 1221 digital input signal board	
(Extended temperature range and exposure to media; cannot be used with 6AG1212-1....-**2**XB0)	
4 inputs, 5 V DC, 200 kHz, sourcing	**6AG1221-3AD30-5XB0**
4 inputs, 24 V DC, 200 kHz, sourcing	**6AG1221-3BD30-5XB0**
SIPLUS SB 1222 digital output signal board	
(Extended temperature range and exposure to media; cannot be used with 6AG1212-1....-**2**XB0)	
4 outputs, 5 V DC, 0.1 A, 200 kHz	**6AG1222-1AD30-5XB0**
4 outputs, 24 V DC, 0.1 A, 200 kHz	**6AG1222-1BD30-5XB0**

	Article No.
SIPLUS SB 1223 digital input/output signal board	
(Extended temperature range and exposure to media; cannot be used with 6AG1212-1....-**2**XB0)	
2 inputs, 24 V DC, IEC type 1 current sinking; 2 x 24 V DC transistor outputs, 0.5 A, 5 W; can be used as HSC at up to 30 kHz	
• Suitable for areas with extreme exposure to media (conformal coating)	**6AG1223-0BD30-4XB0**
• Ambient temperature -25 ... +55 °C	**6AG1223-0BD30-5XB0**
2 inputs, 5 V DC, 200 kHz 2 outputs 5 V DC, 0.1 A, 200 kHz	**6AG1223-3AD30-5XB0**
2 inputs, 24 V DC, 200 kHz 2 outputs 24 V DC, 0.1 A, 200 kHz	**6AG1223-3BD30-5XB0**
SIPLUS SB 1232 analog output signal board	
(Extended temperature range and exposure to media; cannot be used with 6AG1212-1....-**2**XB0)	
Ambient temperature range -25 ... +55 °C	
1 analog output, ±10 V with 12 bits or 0 ... 20 mA with 11 bits	**6AG1232-4HA30-5XB0**
Ambient temperature range 0 ... +55 °C	
1 analog output, ±10 V with 12 bits or 0 ... 20 mA with 11 bits	**6AG1232-4HA30-4XB0**
SIPLUS CB 1241 RS 485 communication board	
(Extended temperature range and exposure to media; cannot be used with 6AG1212-1....-**2**XB0)	
For point-to-point connection, with 1 RS 485 interface	**6AG1241-1CH30-5XB1**
Additional accessories	See SIMATIC S7-1200 CPU 1212C, page 3/10

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SIPLUS CPU 1214C

Overview



- The compact high-performance CPU
- With 24 integrated I/Os
- Expandable with:
  - 1 signal board (SB) or communication board (CB); not possible with: 6AG1214-1AG40-2XB0, 6AG1214-1BG40-2XB0, 6AG1214-1HG40-2XB0
  - 8 signal modules (SM)
  - Max. 3 communication modules (CM)

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

Technical specifications

Article number	**6AG1214-1AG40-4XB0**	**6AG1214-1AG40-5XB0**	**6AG1214-1AG40-2XB0**
Based on	**6ES7214-1AG40-0XB0**	**6ES7214-1AG40-0XB0**	**6ES7214-1AG40-0XB0**
	SIPLUS S7-1200 CPU 1214C DC/DC/DC	SIPLUS S7-1200 CPU 1214C DC/DC/DC	SIPLUS S7-1200 CPU 1214C DC/DC/DC
Ambient conditions			
Ambient temperature during operation			
• min.	-20 °C; = Tmin; Startup @ 0 °C	-40 °C; = Tmin (incl. condensation/ frost); start-up @ -25 °C	-40 °C; = Tmin (incl. condensation/ frost); start-up @ -25 °C
• max.	60 °C; Number of simultaneously activated inputs or outputs 7 or 5 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 14 or 10 at 55 °C horizontal or 45 °C vertical	60 °C; = Tmax; Tmax > +55 °C number of simultaneously switched-on digital inputs 7, digital outputs 5, analog inputs 2 (no adjacent points) with horizontal mounting position	70 °C; = Tmax; Tmax > +55 °C number of simultaneously switched-on digital inputs 7, digital outputs 5, analog inputs 2 (no adjacent points) with horizontal mounting position; Tmax > +60 °C number of simultaneously switched-on digital inputs 7, digital outputs 5, analog inputs 1 (no adjacent points) with horizontal mounting position
• At cold restart, min.	0 °C	-25 °C	-25 °C
Altitude during operation relating to sea level			
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity			
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance			
Coolants and lubricants			
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air

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Technical specifications (continued)

Article number	**6AG1214-1AG40-4XB0**	**6AG1214-1AG40-5XB0**	**6AG1214-1AG40-2XB0**
Based on	**6ES7214-1AG40-0XB0**	**6ES7214-1AG40-0XB0**	**6ES7214-1AG40-0XB0**
	SIPLUS S7-1200 CPU 1214C DC/DC/DC	SIPLUS S7-1200 CPU 1214C DC/DC/DC	SIPLUS S7-1200 CPU 1214C DC/DC/DC
Use in stationary industrial systems			
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
Use on ships/at sea			
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Remark			
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating			
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability	Yes; Class 2 for high availability	Yes; Class 2 for high availability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

Article number	**6AG1214-1BG40-4XB0**	**6AG1214-1BG40-5XB0**	**6AG1214-1BG40-2XB0**
Based on	**6ES7214-1BG40-0XB0**	**6ES7214-1BG40-0XB0**	**6ES7214-1BG40-0XB0**
	SIPLUS S7-1200 CPU 1214C AC/DC/RLY	SIPLUS S7-1200 CPU 1214C AC/DC/RLY	SIPLUS S7-1200 CPU 1214C AC/DC/RLY
Ambient conditions			
Ambient temperature during operation			
• min.	-20 °C; = Tmin (incl. condensation/ frost); start-up @ 0 °C	-40 °C; = Tmin (incl. condensation/ frost); start-up @ -25 °C	-40 °C; = Tmin (incl. condensation/ frost); start-up @ -25 °C
• max.	60 °C; = Tmax	60 °C; = Tmax; Tmax > +55 °C number of simultaneously switched-on digital inputs 7, digital outputs 5, analog inputs 2 (no adjacent points) with horizontal mounting position	70 °C; = Tmax; Tmax > +55 °C number of simultaneously switched-on digital inputs 7, digital outputs 5, analog inputs 2 (no adjacent points) with horizontal mounting position; Tmax > +60 °C number of simultaneously switched-on digital inputs 7, digital outputs 5, analog inputs 1 (no adjacent points) with horizontal mounting position
• At cold restart, min.	0 °C	-25 °C	-25 °C

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Technical specifications (continued)

Article number	6AG1214-1BG40-4XB0	6AG1214-1BG40-5XB0	6AG1214-1BG40-2XB0
Based on	6ES7214-1BG40-0XB0	6ES7214-1BG40-0XB0	6ES7214-1BG40-0XB0
	SIPLUS S7-1200 CPU 1214C AC/DC/RLY	SIPLUS S7-1200 CPU 1214C AC/DC/RLY	SIPLUS S7-1200 CPU 1214C AC/DC/RLY
Altitude during operation relating to sea level			
• Installation altitude above sea level, max.	2 000 m	2 000 m	2 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m); above 2 000 m max. 132 V AC	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m); above 2 000 m max. 132 V AC	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m); above 2 000 m max. 132 V AC
Relative humidity			
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance			
Coolants and lubricants			
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems			
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
Use on ships/at sea			
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Remark			
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating			
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability	Yes; Class 2 for high availability	Yes; Class 2 for high availability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

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Technical specifications (continued)

Article number	**6AG1214-1HG40-4XB0**	**6AG1214-1HG40-5XB0**	**6AG1214-1HG40-2XB0**
Based on	**6ES7214-1HG40-0XB0**	**6ES7214-1HG40-0XB0**	**6ES7214-1HG40-0XB0**
	SIPLUS S7-1200 CPU 1214C DC/DC/RLY	SIPLUS S7-1200 CPU 1214C DC/DC/RLY	SIPLUS S7-1200 CPU 1214C DC/DC/RLY
Ambient conditions			
Ambient temperature during operation			
• min.	-20 °C; = Tmin (incl. condensation/ frost); start-up @ 0 °C	-40 °C; = Tmin (incl. condensation/ frost); start-up @ -25 °C	-40 °C; = Tmin (incl. condensation/ frost); start-up @ -25 °C
• max.	60 °C; Number of simultaneously activated inputs or outputs 7 or 5 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 14 or 10 at 55 °C horizontal or 45 °C vertical	60 °C; = Tmax; Tmax > +55 °C number of simultaneously switched-on digital inputs 7, digital outputs 5, analog inputs 2 (no adjacent points) with horizontal mounting position	70 °C; = Tmax; Tmax > +55 °C number of simultaneously switched-on digital inputs 7, digital outputs 5, analog inputs 2 (no adjacent points) with horizontal mounting position; Tmax > +60 °C number of simultaneously switched-on digital inputs 7, digital outputs 5, analog inputs 1 (no adjacent points) with horizontal mounting position
• At cold restart, min.	0 °C	-25 °C	-25 °C
Altitude during operation relating to sea level			
• Installation altitude above sea level, max.	2 000 m	2 000 m	2 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m); above 2 000 m max. 132 V AC	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m); above 2 000 m max. 132 V AC	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m); above 2 000 m max. 132 V AC
Relative humidity			
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance			
Coolants and lubricants			
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems			
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
Use on ships/at sea			
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Remark			
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating			
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability	Yes; Class 2 for high availability	Yes; Class 2 for high availability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

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SIPLUS CPU 1214C

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Ordering data	Article No.
SIPLUS CPU 1214C compact CPU, AC/DC/relay	
(Extended temperature range and exposure to media)	
Integrated program/data memory 100 KB, load memory 2 MB; Wide-range power supply 85 ... 264 V AC; Boolean execution times 0.1 µs per operation; 14 digital inputs, 10 digital outputs (relays), 2 analog inputs; Expandable by up to 3 communication modules, 8 signal modules and 1 signal board/communication board; Digital inputs can be used as HSC at 100 kHz	
• For areas with extreme exposure to media (conformal coating); ambient temperature -20 ... +60 °C	**6AG1214-1BG40-4XB0**
• For areas with extreme exposure to media (conformal coating); ambient temperature -40 ... +60 °C	**6AG1214-1BG40-5XB0**
• For areas with extreme exposure to media (conformal coating); ambient temperature -40 ... +70 °C	**6AG1214-1BG40-2XB0**
SIPLUS CPU 1214C compact CPU, DC/DC/DC	
(Extended temperature range and exposure to media)	
Integrated program/data memory 100 KB, load memory 2 MB; Power supply 24 V DC; Boolean execution times 0.1 µs per operation; 14 digital inputs, 10 digital outputs, 2 analog inputs; expandable by up to 3 communication modules, 8 signal modules, and 1 signal board/communication board; Digital inputs can be used as HSC at 100 kHz, 24 V DC digital outputs can be used as pulse outputs (PTO) or pulse-width modulated outputs (PWM) at 100 kHz	
• For areas with extreme exposure to media (conformal coating); ambient temperature -20 ... +60 °C	**6AG1214-1AG40-4XB0**
• For areas with extreme exposure to media (conformal coating); ambient temperature -40 ... +60 °C	**6AG1214-1AG40-5XB0**
• For areas with extreme exposure to media (conformal coating); ambient temperature -40 ... +70 °C	**6AG1214-1AG40-2XB0**

	Article No.
SIPLUS CPU 1214C compact CPU, DC/DC/relay	
(Extended temperature range and exposure to media)	
Integrated program/data memory 100 KB, load memory 2 MB; Power supply 24 V DC; Boolean execution times 0.1 µs per operation; 14 digital inputs, 10 digital outputs (relays), 2 analog inputs; Expandable by up to 3 communication modules, 8 signal modules, and 1 signal board/communication board; Digital inputs can be used as HSC at 100 kHz	
• For areas with extreme exposure to media (conformal coating); ambient temperature -20 ... +60 °C	**6AG1214-1HG40-4XB0**
• For areas with extreme exposure to media (conformal coating); ambient temperature -40 ... +60 °C	**6AG1214-1HG40-5XB0**
• For areas with extreme exposure to media (conformal coating); ambient temperature -40 ... +70 °C	**6AG1214-1HG40-2XB0**
Accessories	
SIPLUS SB 1221 digital input signal board	
(Extended temperature range and exposure to media; cannot be used with 6AG1214-1....-**2**XB0)	
4 inputs, 5 V DC, 200 kHz, sourcing	**6AG1221-3AD30-5XB0**
4 inputs, 24 V DC, 200 kHz, sourcing	**6AG1221-3BD30-5XB0**
SIPLUS SB 1222 digital output signal board	
(Extended temperature range and exposure to media; cannot be used with 6AG1214-1....-**2**XB0)	
4 outputs, 5 V DC, 0.1 A, 200 kHz	**6AG1222-1AD30-5XB0**
4 outputs, 24 V DC, 0.1 A, 200 kHz	**6AG1222-1BD30-5XB0**

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Ordering data

	Article No.
SIPLUS SB 1223 digital input/output signal board	
(Extended temperature range and exposure to media; cannot be used with 6AG1214-1....-**2**XB0)	
2 inputs, 24 V DC, IEC type 1 current sinking; 2 x 24 V DC transistor outputs, 0.5 A, 5 W; can be used as HSC at up to 30 kHz	
• Suitable for areas with extreme exposure to media (conformal coating)	**6AG1223-0BD30-4XB0**
• Ambient temperature -25 ... +55 °C	**6AG1223-0BD30-5XB0**
2 inputs, 5 V DC, 200 kHz 2 outputs 5 V DC, 0.1 A, 200 kHz	**6AG1223-3AD30-5XB0**
2 inputs, 24 V DC, 200 kHz 2 outputs 24 V DC, 0.1 A, 200 kHz	**6AG1223-3BD30-5XB0**

	Article No.
SIPLUS SB 1232 analog output signal board	
(Extended temperature range and exposure to media; cannot be used with 6AG1214-1....-**2**XB0)	
Ambient temperature range -25 ... +55 °C	
1 analog output, ±10 V with 12 bits or 0 ... 20 mA with 11 bits	**6AG1232-4HA30-5XB0**
Ambient temperature range 0 ... +55 °C	
1 analog output, ±10 V with 12 bits or 0 ... 20 mA with 11 bits	**6AG1232-4HA30-4XB0**
SIPLUS CB 1241 RS 485 communication board	
(Extended temperature range and exposure to media; cannot be used with 6AG1214-1....-**2**XB0)	
For point-to-point connection, with 1 RS 485 interface	**6AG1241-1CH30-5XB1**
Additional accessories	See SIMATIC S7-1200 CPU 1214C, page 3/14

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SIPLUS CPU 1215C

Overview



- The compact high-performance CPU
- With 24 integrated I/Os
- Expandable with:
  - 1 signal board (SB) or communication board (CB); not possible with: 6AG1215-1AG40-2XB0, 6AG1215-1BG40-2XB0, 6AG1215-1HG40-2XB0
  - 8 signal modules (SM)
  - Max. 3 communication modules (CM)

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

Technical specifications

Article number	**6AG1215-1AG40-4XB0**	**6AG1215-1AG40-5XB0**	**6AG1215-1AG40-2XB0**
Based on	**6ES7215-1AG40-0XB0**	**6ES7215-1AG40-0XB0**	**6ES7215-1AG40-0XB0**
	SIPLUS S7-1200 CPU 1215C DC/DC/DC	SIPLUS S7-1200 CPU 1215C DC/DC/DC	SIPLUS S7-1200 CPU 1215C DC/DC/DC
Ambient conditions			
Ambient temperature during operation			
• min.	-20 °C; = Tmin (incl. condensation/ frost); start-up @ 0 °C	-40 °C; = Tmin (incl. condensation/ frost); start-up @ -25 °C	-40 °C; = Tmin (incl. condensation/ frost); start-up @ -25 °C
• max.	60 °C; Number of simultaneously activated inputs or outputs 7 or 5 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 14 or 10 at 55 °C horizontal or 45 °C vertical	60 °C; = Tmax; Tmax > +55 °C number of simultaneously switched-on digital inputs 7, digital outputs 5, analog inputs 2, analog outputs 2 (no adjacent points) with horizontal mounting position	70 °C; = Tmax; Tmax > +55 °C number of simultaneously switched-on digital inputs 7, digital outputs 5, analog inputs 2, analog outputs 2 (no adjacent points) with horizontal mounting position; Tmax > +60 °C number of simultaneously switched-on digital inputs 7, digital outputs 5, analog inputs 1, analog outputs 1 (no adjacent points) with horizontal mounting position
• At cold restart, min.	0 °C	-25 °C	-25 °C
Altitude during operation relating to sea level			
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity			
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance			
Coolants and lubricants			
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems			
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *

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Technical specifications (continued)

Article number	6AG1215-1AG40-4XB0	6AG1215-1AG40-5XB0	6AG1215-1AG40-2XB0
Based on	6ES7215-1AG40-0XB0	6ES7215-1AG40-0XB0	6ES7215-1AG40-0XB0
	SIPLUS S7-1200 CPU 1215C DC/DC/DC	SIPLUS S7-1200 CPU 1215C DC/DC/DC	SIPLUS S7-1200 CPU 1215C DC/DC/DC
Use on ships/at sea			
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Remark			
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating			
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability	Yes; Class 2 for high availability	Yes; Class 2 for high availability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

Article number	6AG1215-1BG40-4XB0	6AG1215-1BG40-5XB0	6AG1215-1BG40-2XB0
Based on	6ES7215-1BG40-0XB0	6ES7215-1BG40-0XB0	6ES7215-1BG40-0XB0
	SIPLUS S7-1200 CPU 1215C AC/DC/RLY	SIPLUS S7-1200 CPU 1215C AC/DC/RLY	SIPLUS S7-1200 CPU 1215C AC/DC/RLY
Ambient conditions			
Ambient temperature during operation			
• min.	-20 °C; = Tmin (incl. condensation/ frost); start-up @ 0 °C	-40 °C; = Tmin (incl. condensation/ frost); start-up @ -25 °C	-40 °C; = Tmin (incl. condensation/ frost); start-up @ -25 °C
• max.	60 °C; Number of simultaneously activated inputs or outputs 7 or 5 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 14 or 10 at 55 °C horizontal or 45 °C vertical	60 °C; = Tmax; Tmax > +55 °C number of simultaneously switched-on digital inputs 7, digital outputs 5, analog inputs 2, analog outputs 2 (no adjacent points) with horizontal mounting position	70 °C; = Tmax; Tmax > +55 °C number of simultaneously switched-on digital inputs 7, digital outputs 5, analog inputs 2, analog outputs 2 (no adjacent points) with horizontal mounting position; Tmax > +60 °C number of simultaneously switched-on digital inputs 7, digital outputs 5, analog inputs 1, analog outputs 1 (no adjacent points) with horizontal mounting position
• At cold restart, min.	0 °C	-25 °C	-25 °C
Altitude during operation relating to sea level			
• Installation altitude above sea level, max.	2 000 m	2 000 m	2 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m); above 2 000 m max. 132 V AC	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m); above 2 000 m max. 132 V AC	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m); above 2 000 m max. 132 V AC
Relative humidity			
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance			
Coolants and lubricants			
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air

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Technical specifications (continued)

Article number	6AG1215-1BG40-4XB0	6AG1215-1BG40-5XB0	6AG1215-1BG40-2XB0
Based on	6ES7215-1BG40-0XB0	6ES7215-1BG40-0XB0	6ES7215-1BG40-0XB0
	SIPLUS S7-1200 CPU 1215C AC/DC/RLY	SIPLUS S7-1200 CPU 1215C AC/DC/RLY	SIPLUS S7-1200 CPU 1215C AC/DC/RLY
Use in stationary industrial systems			
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
Use on ships/at sea			
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Remark			
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating			
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability	Yes; Class 2 for high availability	Yes; Class 2 for high availability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

Article number	6AG1215-1HG40-4XB0	6AG1215-1HG40-5XB0	6AG1215-1HG40-2XB0
	SIPLUS S7-1200 CPU 1215C DC/DC/RLY	SIPLUS S7-1200 CPU 1215C DC/DC/RLY	SIPLUS S7-1200 CPU 1215C DC/DC/RLY
Ambient conditions			
Ambient temperature during operation			
• min.	-20 °C; = Tmin (incl. condensation/ frost); start-up @ 0 °C	-40 °C; = Tmin (incl. condensation/ frost); start-up @ -25 °C	-40 °C; = Tmin (incl. condensation/ frost); start-up @ -25 °C
• max.	60 °C; Number of simultaneously activated inputs or outputs 7 or 5 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 14 or 10 at 55 °C horizontal or 45 °C vertical	60 °C; = Tmax; Tmax > +55 °C number of simultaneously switched-on digital inputs 7, digital outputs 5, analog inputs 2, analog outputs 2 (no adjacent points) with horizontal mounting position	70 °C; = Tmax; Tmax > +55 °C number of simultaneously switched-on digital inputs 7, digital outputs 5, analog inputs 2, analog outputs 2 (no adjacent points) with horizontal mounting position; Tmax > +60 °C number of simultaneously switched-on digital inputs 7, digital outputs 5, analog inputs 1, analog outputs 1 (no adjacent points) with horizontal mounting position
• At cold restart, min.	0 °C	-25 °C	-25 °C
Altitude during operation relating to sea level			
• Installation altitude above sea level, max.	2 000 m	2 000 m	2 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m); above 2 000 m max. 132 V AC	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m); above 2 000 m max. 132 V AC	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m); above 2 000 m max. 132 V AC

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Technical specifications (continued)

Article number	**6AG1215-1HG40-4XB0** SIPLUS S7-1200 CPU 1215C DC/DC/RLY	**6AG1215-1HG40-5XB0** SIPLUS S7-1200 CPU 1215C DC/DC/RLY	**6AG1215-1HG40-2XB0** SIPLUS S7-1200 CPU 1215C DC/DC/RLY
Relative humidity			
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance			
Coolants and lubricants			
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems			
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
Use on ships/at sea			
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Remark			
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating			
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability	Yes; Class 2 for high availability	Yes; Class 2 for high availability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

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SIPLUS CPU 1215C

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Ordering data	Article No.
SIPLUS CPU 1215C compact CPU, AC/DC/relay	
(Extended temperature range and exposure to media)	
Integrated program and data memory 125 KB, load memory 4 MB; wide-range power supply 85 ... 264 V AC; Boolean execution times 0.085 µs per operation; 14 digital inputs, 10 digital outputs (relay), 2 analog inputs, 2 analog outputs; expandable by up to 3 communication modules, 8 signal modules and 1 signal board/communication board; digital inputs usable as HSC with 100 kHz	
• For areas with extreme exposure to media (conformal coating); ambient temperature -20 ... +60 °C	**6AG1215-1BG40-4XB0**
• For areas with extreme exposure to media (conformal coating); ambient temperature -40 ... +60 °C	**6AG1215-1BG40-5XB0**
• For areas with extreme exposure to media (conformal coating); ambient temperature -40 ... +70 °C	**6AG1215-1BG40-2XB0**
SIPLUS CPU 1215C compact CPU, DC/DC/DC	
(Extended temperature range and exposure to media)	
Integrated program and data memory 125 KB, load memory 4 MB; power supply 24 V DC; Boolean execution times 0.085 µs per operation; 14 digital inputs, 10 digital outputs, 2 analog inputs, 2 analog outputs; expandable by up to 3 communication modules, 8 signal modules and 1 signal board/communication board; digital inputs usable as HSC with 100 kHz; 24 V DC digital outputs usable as pulse outputs (PTO) or pulse-width-modulated outputs (PWM) with 100 kHz	
• For areas with extreme exposure to media (conformal coating); ambient temperature -20 ... +60 °C	**6AG1215-1AG40-4XB0**
• For areas with extreme exposure to media (conformal coating); ambient temperature -40 ... +60 °C	**6AG1215-1AG40-5XB0**
• For areas with extreme exposure to media (conformal coating); ambient temperature -40 ... +70 °C	**6AG1215-1AG40-2XB0**

	Article No.
SIPLUS CPU 1215C compact CPU, DC/DC/relay	
(Extended temperature range and exposure to media)	
Integrated program and data memory 125 KB, load memory 4 MB; power supply 24 V DC; Boolean execution times 0.085 µs per operation; 14 digital inputs, 10 digital outputs (relay), 2 analog inputs, 2 analog outputs; expandable by up to 3 communication modules, 8 signal modules and 1 signal board/communication board; digital inputs usable as HSC with 100 kHz	
• For areas with extreme exposure to media (conformal coating); ambient temperature -20 ... +60 °C	**6AG1215-1HG40-4XB0**
• For areas with extreme exposure to media (conformal coating); ambient temperature -40 ... +60 °C	**6AG1215-1HG40-5XB0**
• For areas with extreme exposure to media (conformal coating); ambient temperature -40 ... +70 °C	**6AG1215-1HG40-2XB0**
Accessories	
SIPLUS SB 1221 digital input signal board	
(Extended temperature range and exposure to media; cannot be used with 6AG1215-1....-**2**XB0)	
4 inputs, 5 V DC, 200 kHz, sourcing	**6AG1221-3AD30-5XB0**
4 inputs, 24 V DC, 200 kHz, sourcing	**6AG1221-3BD30-5XB0**
SIPLUS SB 1222 digital output signal board	
(Extended temperature range and exposure to media; cannot be used with 6AG1215-1....-**2**XB0)	
4 outputs, 5 V DC, 0.1 A, 200 kHz	**6AG1222-1AD30-5XB0**
4 outputs, 24 V DC, 0.1 A, 200 kHz	**6AG1222-1BD30-5XB0**

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Ordering data

	Article No.
SIPLUS SB 1223 digital input/output signal board	
(Extended temperature range and exposure to media; cannot be used with 6AG1215-1....-**2**XB0)	
2 inputs, 24 V DC, IEC type 1 current sinking; 2 x 24 V DC transistor outputs, 0.5 A, 5 W; can be used as HSC at up to 30 kHz	
• Suitable for areas with extreme exposure to media (conformal coating)	**6AG1223-0BD30-4XB0**
• Ambient temperature -25 ... +55 °C	**6AG1223-0BD30-5XB0**
2 inputs, 5 V DC, 200 kHz 2 outputs 5 V DC, 0.1 A, 200 kHz	**6AG1223-3AD30-5XB0**
2 inputs, 24 V DC, 200 kHz 2 outputs 24 V DC, 0.1 A, 200 kHz	**6AG1223-3BD30-5XB0**

	Article No.
SIPLUS SB 1232 analog output signal board	
(Extended temperature range and exposure to media; cannot be used with 6AG1215-1....-**2**XB0)	
Ambient temperature range -25 ... +55 °C	
1 analog output, ±10 V with 12 bits or 0 ... 20 mA with 11 bits	**6AG1232-4HA30-5XB0**
Ambient temperature range 0 ... +55 °C	
1 analog output, ±10 V with 12 bits or 0 ... 20 mA with 11 bits	**6AG1232-4HA30-4XB0**
SIPLUS CB 1241 RS 485 communication board	
(Extended temperature range and exposure to media; cannot be used with 6AG1215-1....-**2**XB0)	
for point-to-point connection, with 1 RS 485 interface	**6AG1241-1CH30-5XB1**
Additional accessories	See SIMATIC S7-1200 CPU 1215C, page 3/18

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Overview



The fail-safe SIMATIC S7-1200 Controllers are based on the S7-1200 standard CPUs and offer additional safety-related functions.

They can be used for safety-oriented tasks according to IEC 61508 up to SIL 3 and ISO 13849-1 up to PL e.

Safety-related programs are created in the TIA Portal. The STEP 7 Safety engineering tool offers commands, operations and blocks for safety-related programs in the LAD and FBD languages. To this end, there is a library with pre-configured, TÜV-approved blocks for safety-related functions.

- Standard controller with integrated safety functions:
  - Standardized and convenient diagnostic functions for standard and safety
  - Uniform symbols, data consistency, ...
- Modular system with scalable range of CPUs and expandable I/O quantity structure:
  - One engineering for standard and fail-safe automation
  - Use of the standard I/O modules together with the fail-safe I/O modules in the central system
  - Integrated standard PROFINET functionalities for PROFINET controllers and PROFINET iDevice services
  - Connection of distributed standard I/O via field bus such as PROFINET or PROFIBUS
  - F-library certified by the German Technical Inspectorate (TÜV) for all common safety functions
  - Free programming of the safety logic using FBD and LAD
  - Standard-compliant printout of the F-program
- One integrated engineering for both standard and safety from S7-1200 to S7-300/400/1500 and WinAC RTX F:
  - STEP 7 Safety Basic for easy engineering of the CPU 1200 FC
  - STEP 7 Safety Advanced for the entire fail-safe SIMATIC S7 portfolio
- Integrated system diagnosis of the CPUs, for standard and safety:
  - Consistent plain text display of system diagnostic information in the TIA Portal, HMI and web server
  - Messages are updated even if the CPU is in STOP state
  - System diagnostics integrated in the CPU firmware. Configuration by user not required
  - The diagnostics is automatically updated on configuration changes.
- 2 fail-safe compact controllers with graded performances in the versions DC/DC/DC and DC/DC/relay

Characteristics	CPU 1212 FC	CPU 1214FC	CPU 1215FC
Variants	DC/DC/DC, DC/DC/relay	DC/DC/DC, DC/DC/relay	DC/DC/DC, DC/DC/relay
Main memory, integrated	100 KB	125 KB	150 KB
Load memory, integrated	2 MB	4 MB	4 MB
Memory card	SIMATIC Memory Card (optional)	SIMATIC Memory Card (optional)	SIMATIC Memory Card (optional)
Standard digital inputs/outputs, integrated	8/6	14/10	14/10
Standard analog inputs, integrated	2	2	2
Standard analog outputs, integrated	-	-	2
Process image	1024 bytes for inputs, 1024 bytes for outputs	1024 bytes for inputs, 1024 bytes for outputs	1024 bytes for inputs, 1024 bytes for outputs
Expansion by signal board	Max. 1	Max. 1	Max. 1
Expansion by signal modules	Max. 2	Max. 8	Max. 8
Expansion by communication modules	Max. 3	Max. 3	Max. 3

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Technical specifications

Article number	**6ES7212-1AF40-0XB0**	**6ES7212-1HF40-0XB0**	**6ES7214-1AF40-0XB0**	**6ES7214-1HF40-0XB0**	**6ES7215-1AF40-0XB0**	**6ES7215-1HF40-0XB0**
	CPU 1212FC, DC/DC/DC, 8DI/6DQ/2AI	CPU 1212FC, DC/DC/Relay, 8DI/6DQ/2AI	CPU 1214FC, DC/DC/DC, 14DI/10DQ/2AI	CPU 1214FC, DC/DC/Relay, 14DI/10DQ/2AI	CPU 1215FC, DC/DC/DC, 14DI/10DQ/2AI/2AQ	CPU 1215FC, DC/DC/RLY,14DI/10DQ/2AI/2AQ
General information						
Product type designation	CPU 1212FC DC/DC/DC	CPU 1212FC DC/DC/relay	CPU 1214FC DC/DC/DC	CPU 1214FC DC/DC/Relay	CPU 1215FC DC/DC/DC	CPU 1215FC DC/DC/relay
Engineering with						
• Programming package	STEP 7 V14 or higher	STEP 7 V14 or higher	STEP 7 V14 or higher	STEP 7 V14 or higher	STEP 7 V14 or higher	STEP 7 V14 or higher
Supply voltage						
Rated value (DC)						
• 24 V DC	Yes	Yes	Yes	Yes	Yes	Yes
Encoder supply						
24 V encoder supply						
• 24 V	Permissible range: 20.4V to 28.8V	Permissible range: 20.4V to 28.8V	L+ minus 4 V DC min.	L+ minus 4 V DC min.	L+ minus 4 V DC min.	L+ minus 4 V DC min.
Power loss						
Power loss, typ.	9 W	9 W	12 W	12 W	12 W	12 W
Memory						
Work memory						
• integrated	100 kbyte	100 kbyte	125 kbyte	125 kbyte	150 kbyte	150 kbyte
Load memory						
• integrated	2 Mbyte	2 Mbyte	4 Mbyte	4 Mbyte	4 Mbyte	4 Mbyte
• Plug-in (SIMATIC Memory Card), max.	with SIMATIC memory card	with SIMATIC memory card	with SIMATIC memory card	with SIMATIC memory card	with SIMATIC memory card	with SIMATIC memory card
Backup						
• without battery	Yes	Yes	Yes	Yes	Yes	Yes
CPU processing times						
for bit operations, typ.	0.08 µs; / instruction	0.08 µs; / instruction	0.08 µs; / instruction	0.08 µs; / instruction	0.08 µs; / instruction	0.08 µs; / instruction
for word operations, typ.	1.7 µs; / instruction	1.7 µs; / instruction	1.7 µs; / instruction	1.7 µs; / instruction	1.7 µs; / instruction	1.7 µs; / instruction
for floating point arithmetic, typ.	2.5 µs; / instruction	2.5 µs; / instruction	2.3 µs; / instruction	2.3 µs; / instruction	2.3 µs; / instruction	2.3 µs; / instruction
Data areas and their retentivity						
Flag						
• Number, max.	4 kbyte; Size of bit memory address area	4 kbyte; Size of bit memory address area	8 kbyte; Size of bit memory address area	8 kbyte; Size of bit memory address area	8 kbyte; Size of bit memory address area	8 kbyte; Size of bit memory address area
Address area						
I/O address area						
• Inputs	1 024 byte	1 024 byte				
• Outputs	1 024 byte	1 024 byte				
Process image						
• Inputs, adjustable	1 kbyte	1 kbyte	1 kbyte	1 kbyte	1 kbyte	1 kbyte
• Outputs, adjustable	1 kbyte	1 kbyte	1 kbyte	1 kbyte	1 kbyte	1 kbyte
Time of day						
Clock						
• Hardware clock (real-time)	Yes	Yes	Yes	Yes	Yes	Yes
Digital inputs						
Number of digital inputs	8; Integrated	8; Integrated	14	14	14; Integrated	14; Integrated
• of which inputs usable for technological functions	4; HSC (High Speed Counting)	4; HSC (High Speed Counting)	6; HSC (High Speed Counting)	6; HSC (High Speed Counting)	6; HSC (High Speed Counting)	6; HSC (High Speed Counting)
Digital outputs						
Number of digital outputs	6	6	10	10	10	10; Relays
• of which high-speed outputs	4; 100 kHz Pulse Train Output		4; 100 kHz Pulse Train Output		4; 100 kHz Pulse Train Output	
Analog inputs						
Number of analog inputs	2	2	2	2	2	2
Input ranges						
• Voltage	Yes	Yes	Yes	Yes	Yes	Yes
Analog outputs						
Number of analog outputs	0	0	0	0	2	2
Output ranges, current						
• 0 to 20 mA				Yes	Yes	Yes

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Technical specifications (continued)

Article number	6ES7212-1AF40-0XB0	6ES7212-1HF40-0XB0	6ES7214-1AF40-0XB0	6ES7214-1HF40-0XB0	6ES7215-1AF40-0XB0	6ES7215-1HF40-0XB0
	CPU 1212FC, DC/DC/DC, 8DI/6DQ/2AI	CPU 1212FC, DC/DC/Relay, 8DI/6DQ/2AI	CPU 1214FC, DC/DC/DC, 14DI/10DQ/2AI	CPU 1214FC, DC/DC/Relay, 14DI/10DQ/2AI	CPU 1215FC, DC/DC/DC, 14DI/10DQ/2AI/2AQ	CPU 1215FC, DC/DC/RLY,14DI/10DQ/2AI/2AQ
1. Interface						
Interface type	PROFINET	PROFINET	PROFINET	PROFINET	PROFINET	PROFINET
Physics	Ethernet	Ethernet	Ethernet	Ethernet	Ethernet	Ethernet
Protocols						
• PROFINET IO Controller	Yes	Yes	Yes	Yes	Yes	Yes
• PROFINET IO Device	Yes	Yes	Yes	Yes	Yes	Yes
• SIMATIC communication	Yes	Yes	Yes	Yes	Yes	Yes
• Open IE communication	Yes	Yes	Yes	Yes	Yes	Yes
• Web server	Yes	Yes	Yes	Yes	Yes	Yes
• Media redundancy			No	No	Yes; as MRP client	Yes; as MRP client
Protocols						
Open IE communication						
• TCP/IP	Yes	Yes	Yes	Yes	Yes	Yes
• ISO-on-TCP (RFC1006)	Yes	Yes	Yes	Yes	Yes	Yes
• UDP	Yes	Yes	Yes	Yes	Yes	Yes
Web server						
• supported	Yes	Yes	Yes	Yes	Yes	Yes
Communication functions						
S7 communication						
• supported	Yes	Yes	Yes	Yes	Yes	Yes
Number of connections						
• overall			16; dynamically	16; dynamically	16; dynamically	16; dynamically
Integrated Functions						
Number of counters	4	4	6	6	6	6
Counting frequency (counter) max.	100 kHz	100 kHz	100 kHz	100 kHz	100 kHz	100 kHz
Frequency measurement	Yes	Yes	Yes	Yes	Yes	Yes
controlled positioning	Yes	Yes	Yes	Yes	Yes	Yes
Number of position-controlled positioning axes, max.	8	8	8	8	8	8
Number of positioning axes via pulse-direction interface	Up to 4 with SB 1222	Up to 4 with SB 1222	Up to 4 with SB 1222	Up to 4 with SB 1222	4; With integrated outputs	Up to 4 with SB 1222
PID controller	Yes	Yes	Yes	Yes	Yes	Yes
Number of alarm inputs	4		4	4	4	4
Number of pulse outputs	4	4			4	
Limit frequency (pulse)	100 kHz				100 kHz	
Ambient conditions						
Ambient temperature during operation						
• min.	0 °C	0 °C	0 °C	0 °C	0 °C	0 °C
• max.	55 °C	55 °C	55 °C	55 °C	55 °C	55 °C
Pollutant concentrations						
• SO2 at RH < 60% without condensation	S02: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free	S02: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free	S02: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free	S02: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free	S02: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free	S02: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free
Configuration						
Programming						
Programming language						
- LAD	Yes; incl. failsafe	Yes; incl. failsafe	Yes; incl. failsafe	Yes; incl. failsafe	Yes; incl. failsafe	Yes; incl. failsafe
- FBD	Yes; incl. failsafe	Yes; incl. failsafe	Yes; incl. failsafe	Yes; incl. failsafe	Yes; incl. failsafe	Yes; incl. failsafe
- SCL	Yes	Yes	Yes	Yes	Yes	Yes
Dimensions						
Width	90 mm	90 mm	110 mm	110 mm	130 mm	130 mm
Height	100 mm	100 mm	100 mm	100 mm	100 mm	100 mm
Depth	75 mm	75 mm	75 mm	75 mm	75 mm	75 mm
Weights						
Weight, approx.	370 g	385 g	435 g	435 g	585 g	585 g

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Ordering data	Article No.
CPU 1212 FC	
Fail-safe compact CPU, DC/DC/DC; integrated program/data memory 100 KB, load memory 2 MB; supply voltage 24 V DC; Boolean execution times 0.085 µs per operation; 8 digital inputs, 6 digital outputs, 2 analog inputs; expandable by up to 3 communication modules, 2 signal modules, and 1 signal board/communication board; digital inputs can be used as HSC at 100 kHz, 24 V DC digital outputs can be used as pulse outputs (PTO) or pulse-width modulated outputs (PWM) at 100 kHz	**6ES7212-1AF40-0XB0**
Fail-safe compact CPU, DC/DC/relay; integrated program/data memory 125 KB, load memory 2 MB; supply voltage 24 V DC; Boolean execution times 0.085 µs per operation; 8 digital inputs, 6 digital outputs (relays), 2 analog inputs; expandable by up to 3 communication modules, 2 signal modules, and 1 signal board/communication board; digital inputs can be used as HSC at 100 kHz	**6ES7212-1HF40-0XB0**
CPU 1214FC	
Fail-safe compact CPU, DC/DC/DC; integrated program/data memory 125 KB, load memory 4 MB; supply voltage 24 V DC; Boolean execution times 0.085 µs per operation; 14 digital inputs, 10 digital outputs, 2 analog inputs; expandable by up to 3 communication modules, 8 signal modules, and 1 signal board/communication board; digital inputs can be used as HSC at 100 kHz, 24 V DC digital outputs can be used as pulse outputs (PTO) or pulse-width modulated outputs (PWM) at 100 kHz	**6ES7214-1AF40-0XB0**
Fail-safe compact CPU, DC/DC/relay; integrated program/data memory 125 KB, load memory 4 MB; supply voltage 24 V DC; Boolean execution times 0.085 µs per operation; 14 digital inputs, 10 digital outputs (relays), 2 analog inputs; expandable by up to 3 communication modules, 8 signal modules, and 1 signal board/communication board; digital inputs can be used as HSC at 100 kHz	**6ES7214-1HF40-0XB0**

	Article No.
CPU 1215FC	
Fail-safe compact CPU, DC/DC/DC; integrated program/data memory 150 KB, load memory 4 MB; supply voltage 24 V DC; Boolean execution times 0.085 µs per operation; 14 digital inputs, 10 digital outputs, 2 analog inputs; 2 analog outputs; expandable by up to 3 communication modules, 8 signal modules, and 1 signal board/communication board; digital inputs can be used as HSC at 100 kHz, 24 V DC digital outputs can be used as pulse outputs (PTO) or pulse-width modulated outputs (PWM) at 100 kHz	**6ES7215-1AF40-0XB0**
Fail-safe compact CPU, DC/DC/relay; integrated program/data memory 150 KB, load memory 4 MB; supply voltage 24 V DC; Boolean execution times 0.085 µs per operation; 14 digital inputs, 10 digital outputs (relays), 2 analog inputs; 2 analog outputs; expandable by up to 3 communication modules, 8 signal modules, and 1 signal board/communication board; digital inputs can be used as HSC at 100 kHz	**6ES7215-1HF40-0XB0**
Accessories	
SIMATIC S7-1200 Fail-Safe Starter Kit	
With CPU 1212FC DC/DC/relay; also includes: F digital input SM 1226 16 x 24 V DC, F digital output SM 1226 4 x 24 V DC, input simulator, STEP 7 Basic and STEP 7 Safety Basic on CD, manual on CD, info material; in Systainer	**6ES7212-1HF41-4YB0**
With CPU 1214FC DC/DC/relay; also includes: F digital input SM 1226 16 x 24 V DC, F digital output SM 1226 4 x 24 V DC, input simulator, STEP 7 Safety Basic on CD, manual on CD, info material; in Systainer	**6ES7212-1HF42-4YB0**
Simulator (optional)	**6ES7274-1XH30-0XA0**
14 incoming circuit breakers	
SIMATIC Memory Card (optional)	
4 MB	**6ES7954-8LC03-0AA0**
12 MB	**6ES7954-8LE03-0AA0**
24 MB	**6ES7954-8LF03-0AA0**
256 MB	**6ES7954-8LL03-0AA0**
2 GB	**6ES7954-8LP02-0AA0**
32 GB	**6ES7954-8LT03-0AA0**

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Fail-safe CPUs

Ordering data	Article No.
Extension cable for two-tier configuration	**6ES7290-6AA30-0XA0**
For connecting digital/analog signal modules; length 2 m	
Terminal block (spare part)	
For CPU 1214FC, DC/DC/DC	
• For DI, with 20 screws, tin-coated; 4 units	**6ES7292-1AV30-0XA0**
• For DQ, with 12 screws, tin-coated; 4 units	**6ES7292-1AM30-0XA0**
• For AI, with 3 screws, gold-plated; 4 units	**6ES7292-1BC30-0XA0**
For CPU 1214FC, DC/DC/relay	
• For DI, with 20 screws, tin-coated; 4 units	**6ES7292-1AV30-0XA0**
• For DQ, with 12 screws, tin-coated, coded; 4 units	**6ES7292-1AM40-0XA0**
• For AI, with 3 screws, gold-plated; 4 units	**6ES7292-1BC30-0XA0**
For CPU 1215FC, DC/DC/DC	
• For DI, with 20 screws, tin-coated; 4 units	**6ES7292-1AV30-0XA0**
• For DQ, with 12 screws, tin-coated; 4 units	**6ES7292-1AM30-0XA0**
• For AI, with 6 screws, gold-plated; 4 units	**6ES7292-1BF30-0XB0**
For CPU 1215FC, DC/DC/relay	
• For DI, with 20 screws, tin-coated; 4 units	**6ES7292-1AV30-0XA0**
• For DQ, with 12 screws, tin-coated, coded; 4 units	**6ES7292-1AM40-0XA0**
• For AI, with 6 screws, gold-plated; 4 units	**6ES7292-1BF30-0XB0**
Front flap set (spare part)	
for CPU 1214FC	**6ES7291-1AB30-0XA0**
for CPU 1215FC	**6ES7291-1AC30-0XA0**
RJ45 cable grip	
4 units per pack	
Single port	**6ES7290-3AA30-0XA0**
Dual port	**6ES7290-3AB30-0XA0**

	Article No.
STEP 7 Safety Advanced V15.1	
Task: Engineering tool for configuring and programming fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-1500F Software Controller, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller and the fail-safe ET 200SP, ET 200MP, ET 200S, ET 200M, ET 200iSP, ET 200pro and ET 200eco I/O Requirement: STEP 7 Professional V15.1	
Floating license for 1 user; software and documentation on DVD; license key on USB flash drive	**6ES7833-1FA15-0YA5**
Floating license for 1 user; software, documentation and license key for download[1]; email address required for delivery	**6ES7833-1FA15-0YH5**
STEP 7 Safety Basic V15.1	
Task: Engineering tool for configuring fail-safe user programs for SIMATIC S7-1200 FC Requirement: STEP 7 Basic V15.1 and higher	
Floating license for 1 user; software and documentation on DVD; license key on USB flash drive	**6ES7833-1FB15-0YA5**
Floating license for 1 user; software, documentation and license key for download[1]; email address required for delivery	**6ES7833-1FB15-0YH5**

[1] For up-to-date information and download availability, see: http://www.siemens.com/tia-online-software-delivery

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Overview



The fail-safe SIPLUS S7-1200 Controllers are based on the SIPLUS S7-1200 standard CPUs and offer additional safety-related functions.

They can be used for safety-oriented tasks according to IEC 61508 up to SIL 3 and ISO 13849-1 up to PL e.

Safety-related programs are created in the TIA Portal engineering framework. The STEP 7 Safety engineering tool offers commands, operations and blocks for safety-related programs in the LAD and FBD languages. To this end, there is a library with pre-configured blocks for safety-related functions certified by the German Technical Inspectorate (TÜV).

- Standard controller with integrated safety functions:
  - Standardized and convenient diagnostic functions for standard and safety
  - Uniform symbols, data consistency, ...
- Modular system with scalable range of CPUs and expandable I/O quantity structure:
  - One engineering for standard and fail-safe automation
  - Use of the standard I/O modules together with the fail-safe I/O modules in the central system
  - Integrated standard PROFINET functionalities for PROFINET controllers and PROFINET iDevice services
  - Connection of distributed standard I/O via fieldbus such as PROFINET or PROFIBUS
  - TÜV-approved F-library for all common safety functions
  - Free programming of the safety logic using FBD and LAD
  - Standard-compliant printout of the F-program
- One integrated engineering for both standard and safety from S7-1200 to S7-300/400/1500 and WinAC RTX F:
  - STEP 7 Safety Basic for easy engineering of the CPU 1200 FC
  - STEP 7 Safety Advanced for the entire fail-safe SIMATIC S7 portfolio
- Integrated system diagnosis of the CPUs, for standard and safety:
  - Consistent plain text display of system diagnostic information in the TIA Portal, HMI and web server
  - Messages are updated even if the CPU is in STOP state
  - System diagnostics integrated in the CPU firmware. Configuration by user not required
  - The diagnostics is automatically updated on configuration changes.
- 2 fail-safe compact controllers with graded performances in the versions DC/DC/DC and DC/DC/relay

Characteristics	SIPLUS CPU 1214FC	SIPLUS CPU 1215FC
Variants	DC/DC/DC, DC/DC/relay	DC/DC/DC
Work memory, integrated	125 KB	150 KB
Load memory, integrated	4 MB	4 MB
Memory card	SIMATIC Memory Card (optional)	SIMATIC Memory Card (optional)
Standard digital inputs/outputs, integrated	14/10	14/10
Standard analog inputs, integrated	2	2
Standard analog outputs, integrated	-	2
Process image	1024 bytes for inputs, 1024 bytes for outputs	1024 bytes for inputs, 1024 bytes for outputs
Expansion by signal board	Max. 1	Max. 1
Expansion by signal modules	Max. 8	Max. 8
Expansion by communication modules	Max. 3	Max. 3

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

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Technical specifications

Article number	**6AG1214-1AF40-5XB0**	**6AG1214-1HF40-5XB0**	**6AG1215-1AF40-5XB0**
Based on	**6ES7214-1AF40-0XB0**	**6ES7214-1HF40-0XB0**	**6ES7215-1AF40-0XB0**
	SIPLUS S7-1200 CPU 1214FC DC/DC/DC	SIPLUS S7-1200 CPU 1214FC DC/DC/RLY	SIPLUS S7-1200 CPU 1215FC DC/DC/DC
Ambient conditions			
Ambient temperature during operation			
• min.	-25 °C; = Tmin	-25 °C; = Tmin	-25 °C; = Tmin
• max.	55 °C; = Tmax	55 °C; = Tmax	55 °C; = Tmax
Altitude during operation relating to sea level			
• Installation altitude above sea level, max.	2 000 m	2 000 m	2 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)
Relative humidity			
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; incl. condensation / frost permitted (no commissioning under condensation conditions)
Resistance			
Coolants and lubricants			
- Resistant to commercially available coolants and lubricants	Yes	Yes	Yes
Use in stationary industrial systems			
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
Use on ships/at sea			
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Remark			
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating			
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability	Yes; Class 2 for high availability	Yes; Class 2 for high availability
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

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Ordering data

	Article No.
CPU 1214FC (Extended temperature range and exposure to environmental substances)	
Fail-safe compact CPU, DC/DC/DC; Integrated program/data memory 125 KB, load memory 4 MB; supply voltage 24 V DC; Boolean execution times 0.085 µs per operation; 14 digital inputs, 10 digital outputs, 2 analog inputs; expandable by up to 3 communication modules, 8 signal modules, and 1 signal board/communication board; digital inputs can be used as HSC at 100 kHz, 24 V DC digital outputs can be used as pulse outputs (PTO) or pulse-width modulated outputs (PWM) at 100 kHz	**6AG1214-1AF40-5XB0**
Fail-safe compact CPU, DC/DC/relay Integrated program/data memory 125 KB, load memory 4 MB; power supply 24 V DC Boolean execution times 0.085 µs per operation 14 digital inputs, 10 digital outputs (relays) 2 analog inputs Expandable by up to 3 communication modules, 8 signal modules, and 1 signal board/communication board Digital inputs can be used as HSC at 100 kHz	**6AG1214-1HF40-5XB0**

	Article No.
CPU 1215 FC (Extended temperature range and exposure to environmental substances)	
Fail-safe compact CPU, DC/DC/DC Integrated program/data memory 150 KB, load memory 4 MB Power supply 24 V DC Boolean execution times 0.085 µs per operation 14 digital inputs, 10 digital outputs 2 analog inputs; 2 analog outputs Expandable by up to 3 communication modules, 8 signal modules, and 1 signal board/communication board Digital inputs can be used as HSC at 100 kHz 24 V DC digital outputs can be used as pulse outputs (PTO) or pulse-width modulated outputs (PWM) at 100 kHz	**6AG1215-1AF40-5XB0**
Accessories	See SIMATIC CPU 121x FC, page 3/47

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SM 1221 digital input modules

Overview



- Digital inputs as supplement to the integral I/O of the CPUs
- For flexible adaptation of the controller to the relevant task
- For subsequent expansion of the system with additional inputs

Technical specifications

Article number	**6ES7221-1BF32-0XB0** Digital Input SM 1221, 8DI, 24V DC	**6ES7221-1BH32-0XB0** Digital Input SM 1221, 16DI, 24V DC
Supply voltage		
Rated value (DC)	24 V	24 V
Input current		
from backplane bus 5 V DC, max.	105 mA	130 mA
Digital inputs		
• from load voltage L+ (without load), max.	4 mA; per channel	4 mA; per channel
Output voltage		
Power supply to the transmitters		
• present	Yes	Yes
Digital inputs		
Number of digital inputs	8	16
• in groups of	2	4
Input characteristic curve in accordance with IEC 61131, type 1	Yes	Yes
Number of simultaneously controllable inputs		
all mounting positions		
- up to 40 °C, max.	8	16
horizontal installation		
- up to 40 °C, max.	8	16
- up to 50 °C, max.	8	16
vertical installation		
- up to 40 °C, max.	8	16
Input voltage		
• Rated value (DC)	24 V	24 V
• for signal "0"	5 V DC at 1 mA	5 V DC at 1 mA
• for signal "1"	15 V DC at 2.5 mA	15 V DC at 2.5 mA
Input current		
• for signal "0", max. (permissible quiescent current)	1 mA	1 mA
• for signal "1", min.	2.5 mA	2.5 mA
• for signal "1", typ.	4 mA	4 mA
Input delay (for rated value of input voltage)		
for standard inputs		
- parameterizable	Yes; 0.2 ms, 0.4 ms, 0.8 ms, 1.6 ms, 3.2 ms, 6.4 ms and 12.8 ms, selectable in groups of four	Yes; 0.2 ms, 0.4 ms, 0.8 ms, 1.6 ms, 3.2 ms, 6.4 ms and 12.8 ms, selectable in groups of four
for interrupt inputs		
- parameterizable	Yes	Yes

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Technical specifications (continued)

Article number	**6ES7221-1BF32-0XB0** Digital Input SM 1221, 8DI, 24V DC	**6ES7221-1BH32-0XB0** Digital Input SM 1221, 16DI, 24V DC
Interrupts/diagnostics/ status information		
Alarms		
• Diagnostic alarm	Yes	Yes
Diagnostics indication LED		
• for status of the inputs	Yes	Yes
Potential separation		
Potential separation digital inputs		
• between the channels, in groups of	2	4
Degree and class of protection		
IP degree of protection	IP20	IP20
Ambient conditions		
Free fall		
• Fall height, max.	0.3 m; five times, in product package	0.3 m; five times, in product package
Ambient temperature during operation		
• min.	-20 °C	-20 °C
• max.	60 °C	60 °C
Connection method		
required front connector	Yes	Yes
Mechanics/material		
Enclosure material (front)		
• Plastic	Yes	Yes
Dimensions		
Width	45 mm	45 mm
Height	100 mm	100 mm
Depth	75 mm	75 mm
Weights		
Weight, approx.	170 g	210 g

Ordering data

	Article No.
SM 1221 digital input signal module	
8 inputs, 24 V DC, isolated, current sourcing/sinking	**6ES7221-1BF32-0XB0**
16 inputs, 24 V DC, isolated, current sourcing/sinking	**6ES7221-1BH32-0XB0**
Extension cable for two-tier configuration	**6ES7290-6AA30-0XA0**
For connecting digital/analog signal modules; length 2 m	

	Article No.
Terminal block (spare part)	
For 6ES7221-1BF32-0XB0, 6ES7221-1BH32-0XB0	
• With 7 screws, zinc-plated; 4 pcs.	**6ES7292-1AG30-0XA0**
Front flap set (spare part)	
For modules with a width of 45 mm	**6ES7291-1BA30-0XA0**

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SB 1221 digital input modules

Overview



- Digital inputs as a supplement to the integral I/O of SIMATIC S7-1200 CPUs
- Can be plugged directly into the CPU

Technical specifications

Article number	**6ES7221-3AD30-0XB0** Signal Board SB 1221, 4 DI 5VDC 200KHz	**6ES7221-3BD30-0XB0** Signal Board SB 1221, 4 DI 24VDC 200KHz
General information		
Product type designation	SB 1221, DI 4x5 V DC 200 kHz	SB 1221, DI 4x24 V DC 200 kHz
Input current		
from backplane bus 5 V DC, typ.	40 mA	40 mA
Power loss		
Power loss, typ.	1 W	1 W
Digital inputs		
Number of digital inputs	4; Current-sourcing	4; Current-sourcing
• in groups of	4	4
Input voltage		
• Type of input voltage	DC	DC
• Rated value (DC)	5 V	24 V
• for signal "0"	(L+ minus 1.0 V DC) ... L+ (2.2 ... 0 mA)	(L+ minus 5.0 V DC) ... L+ (1.4 ... 0 mA)
• for signal "1"	0 V ... (L+ minus 2.0 V DC (20 ... 5.1 mA))	0 V ... (L+ minus 10 V DC (10 ... 2.9 mA))
Input current		
• for signal "0", max. (permissible quiescent current)	2.2 mA	1.4 mA
• for signal "1", min.	5.1 mA	2.9 mA
• for signal "1", typ.		7 mA
Input delay (for rated value of input voltage)		
for standard inputs		
- parameterizable	Yes; 0.1 / 0.2 / 0.4 / 0.8 / 1.6 / 3.2 / 6.4 / 10.0 / 12.8 / 20.0 µs; 0.05 / 0.1 / 0.2 / 0.4 / 0.8 / 1.6 / 3.2 / 6.4 / 10.0 / 12.8 / 20.0 ms	Yes; 0.1 / 0.2 / 0.4 / 0.8 / 1.6 / 3.2 / 6.4 / 10.0 / 12.8 / 20.0 µs; 0.05 / 0.1 / 0.2 / 0.4 / 0.8 / 1.6 / 3.2 / 6.4 / 10.0 / 12.8 / 20.0 ms
for interrupt inputs		
- parameterizable	Yes	Yes
for technological functions		
- parameterizable	Yes	Yes
Cable length		
• shielded, max.	50 m; shielded, twisted pair	50 m; shielded, twisted pair
Diagnostics indication LED		
• for status of the inputs	Yes	Yes

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Technical specifications (continued)

Article number	**6ES7221-3AD30-0XB0** Signal Board SB 1221, 4 DI 5VDC 200KHz	**6ES7221-3BD30-0XB0** Signal Board SB 1221, 4 DI 24VDC 200KHz
Degree and class of protection		
Degree of protection acc. to EN 60529		
• IP20	Yes	Yes
Ambient conditions		
Free fall		
• Fall height, max.	0.3 m; five times, in product package	0.3 m; five times, in product package
Ambient temperature during operation		
• min.	-20 °C	-20 °C
• max.	60 °C	60 °C
Mechanics/material		
Enclosure material (front)		
• Plastic	Yes	Yes
Dimensions		
Width	38 mm	38 mm
Height	62 mm	62 mm
Depth	21 mm	21 mm
Weights		
Weight, approx.	35 g	35 g

Ordering data

	Article No.
SB 1221 Signal Board digital input modules	
4 inputs, 5 V DC, 200 kHz, sourcing	**6ES7221-3AD30-0XB0**
4 inputs, 24 V DC, 200 kHz, sourcing	**6ES7221-3BD30-0XB0**

	Article No.
Terminal block (spare part)	
for Signal Board	
with 6 screws, gold-plated; 4 pcs.	**6ES7292-1BF30-0XA0**

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SM 1222 digital output modules

Overview



- Digital outputs as supplement to the integral I/O of the CPUs
- For flexible adaptation of the controller to the relevant task
- For subsequent expansion of the system with additional outputs

Technical specifications

Article number	**6ES7222-1BF32-0XB0** Digital Output SM1222, 8 DQ, 24V DC	**6ES7222-1BH32-0XB0** Digital Output SM1222, 16 DQ, 24V DC	**6ES7222-1HF32-0XB0** Digital Output SM 1222, 8 DQ, Relay	**6ES7222-1HH32-0XB0** Digital Output SM1222, 16 DQ, Relay	**6ES7222-1XF32-0XB0** Digital Output SM 1222, 8 DQ, Changeover
Input current					
from backplane bus 5 V DC, max.	120 mA	140 mA	120 mA	135 mA	140 mA
Digital outputs					
• from load voltage L+, max.			11 mA/relay coil	11 mA/relay coil	16.7 mA/relay coil
Digital outputs					
Number of digital outputs	8	16	8	16	8
• in groups of	1	1	2	1	1
Short-circuit protection	No; to be provided externally	No; to be provided externally	No; to be provided externally	No; to be provided externally	No; to be provided externally
Limitation of inductive shutdown voltage to	typ. (L+) -48 V	typ. (L+) -48 V			
Switching capacity of the outputs					
• with resistive load, max.	0.5 A	0.5 A	2 A	2 A	2 A
• on lamp load, max.	5 W	5 W	30 W with DC, 200 W with AC	30 W with DC, 200 W with AC	30 W with DC, 200 W with AC
Output voltage					
• Rated value (DC)	24 V	24 V	5 V DC to 30 V DC	5 V DC to 30 V DC	5 V DC to 30 V DC
• Rated value (AC)			5 V AC to 250 V AC	5 V AC to 250 V AC	5 V AC to 250 V AC
• for signal "0", max.	0.1 V; with 10 kOhm load	0.1 V; with 10 kOhm load			
• for signal "1", min.	20 V DC	20 V DC			
Output current					
• for signal "1" rated value	0.5 A	0.5 A	2 A	2 A	2 A
• for signal "0" residual current, max.	10 µA	10 µA			
Output delay with resistive load					
• "0" to "1", max.	50 µs	50 µs	10 ms	10 ms	10 ms
• "1" to "0", max.	200 µs	200 µs	10 ms	10 ms	10 ms
Total current of the outputs (per group)					
horizontal installation					
- up to 50 °C, max.	4 A; Current per mass	8 A; Current per mass	10 A; Current per mass	10 A; Current per mass	2 A; Current per mass

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Technical specifications (continued)

Article number	**6ES7222-1BF32-0XB0** Digital Output SM1222, 8 DQ, 24V DC	**6ES7222-1BH32-0XB0** Digital Output SM1222, 16 DQ, 24V DC	**6ES7222-1HF32-0XB0** Digital Output SM 1222, 8 DQ, Relay	**6ES7222-1HH32-0XB0** Digital Output SM1222, 16 DQ, Relay	**6ES7222-1XF32-0XB0** Digital Output SM 1222, 8 DQ, Changeover
Relay outputs					
• Number of relay outputs			8	16	8
• Rated supply voltage of relay coil L+ (DC)			24 V	24 V	24 V
• Number of operating cycles, max.			mechanically 10 million, at rated load voltage 100 000	mechanically 10 million, at rated load voltage 100 000	mechanically 10 million, at rated load voltage 100 000
Switching capacity of contacts					
- with inductive load, max.	0.5 A	0.5 A	2 A	2 A	2 A
- on lamp load, max.	5 W	5 W	30 W with DC, 200 W with AC	30 W with DC, 200 W with AC	30 W with DC, 200 W with AC
- with resistive load, max.	0.5 A	0.5 A	2 A	2 A	2 A
Cable length					
• shielded, max.	500 m	500 m	500 m	500 m	500 m
• unshielded, max.	150 m	150 m	150 m	150 m	150 m
Interrupts/diagnostics/ status information					
Alarms					
• Diagnostic alarm	Yes	Yes	Yes	Yes	Yes
Diagnostics indication LED					
• for status of the outputs	Yes	Yes	Yes	Yes	Yes
Potential separation					
Potential separation digital outputs					
• between the channels			Relays	Relays	Relays
• between the channels, in groups of	1	1	2	4	1
• between the channels and backplane bus	500 V AC	500 V AC	1500 V AC for 1 minute	1500 V AC for 1 minute	1500 V AC for 1 minute
Degree and class of protection					
Degree of protection acc. to EN 60529					
• IP20	Yes	Yes	Yes	Yes	Yes
Standards, approvals, certificates					
CE mark	Yes	Yes	Yes	Yes	Yes
CSA approval	Yes	Yes	Yes	Yes	Yes
UL approval	Yes	Yes	Yes	Yes	Yes
cULus	Yes	Yes	Yes	Yes	Yes
FM approval	Yes	Yes	Yes	Yes	Yes
RCM (formerly C-TICK)	Yes	Yes	Yes	Yes	Yes
Marine approval	Yes	Yes	Yes	Yes	Yes
Ambient conditions					
Free fall					
• Fall height, max.	0.3 m; five times, in product package	0.3 m; five times, in product package	0.3 m; five times, in product package	0.3 m; five times, in product package	0.3 m; five times, in product package
Ambient temperature during operation					
• min.	-20 °C	-20 °C	-20 °C	-20 °C	-20 °C
• max.	60 °C	60 °C	60 °C	60 °C; Number of simultaneously activated outputs: 8 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 16 at 55 °C horizontal or 45 °C vertical	60 °C; Number of simultaneously activated outputs: 4 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 8 at 55 °C horizontal or 45 °C vertical

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Technical specifications (continued)

Article number	6ES7222-1BF32-0XB0 Digital Output SM1222, 8 DQ, 24V DC	6ES7222-1BH32-0XB0 Digital Output SM1222, 16 DQ, 24V DC	6ES7222-1HF32-0XB0 Digital Output SM 1222, 8 DQ, Relay	6ES7222-1HH32-0XB0 Digital Output SM1222, 16 DQ, Relay	6ES7222-1XF32-0XB0 Digital Output SM 1222, 8 DQ, Changeover
Connection method					
required front connector	Yes	Yes	Yes	Yes	Yes
Mechanics/material					
Enclosure material (front)					
• Plastic	Yes	Yes	Yes	Yes	Yes
Dimensions					
Width	45 mm	45 mm	45 mm	45 mm	70 mm
Height	100 mm	100 mm	100 mm	100 mm	100 mm
Depth	75 mm	75 mm	75 mm	75 mm	75 mm
Weights					
Weight, approx.	180 g	220 g	190 g	260 g	310 g

Ordering data

	Article No.
SM 1222 digital output signal module	
8 outputs, 24 V DC; 0.5 A, 5 W, isolated	**6ES7222-1BF32-0XB0**
16 outputs, 24 V DC; 0.5 A, 5 W, isolated	**6ES7222-1BH32-0XB0**
8 relay outputs, 5 ... 30 V DC / 5 ... 250 V AC, 2 A, 30 W DC / 200 W AC	**6ES7222-1HF32-0XB0**
8 relay outputs, change-over contact, 5 ... 30 V DC / 5 ... 250 V AC, 2 A, 30 W DC / 200 W AC	**6ES7222-1XF32-0XB0**
16 relay outputs, 5 ... 30 V DC / 5 ... 250 V AC, 2 A, 30 W DC / 200 W AC	**6ES7222-1HH32-0XB0**
Extension cable for two-tier configuration For connecting digital/analog signal modules; length 2 m	**6ES7290-6AA30-0XA0**

	Article No.
Terminal block (spare part)	
For 6ES7222-1BF32-0XB0, 6ES7222-1BH32-0XB0	
• With 7 screws, zinc-plated; 4 pcs.	**6ES7292-1AG30-0XA0**
For 6ES7222-1HF32-0XB0	
• With 7 screws, tin-coated, left coded; 4 units	**6ES7292-1AG40-0XA1**
For 6ES7222-1HH32-0XB0	
• With 7 screws, tin-coated, right coded; 4 units	**6ES7292-1AG40-0XA0**
For 6ES7222-1XF32-0XB0	
• With 11 screws, tin-coated; 4 units	**6ES7292-1AL30-0XA0**
Front flap set (spare part)	
For modules with a width of 45 mm	**6ES7291-1BA30-0XA0**
For modules with a width of 70 mm	**6ES7291-1BB30-0XA0**

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Overview



- Digital outputs as a supplement to the integral I/O of SIMATIC S7-1200 CPUs
- Can be plugged directly into the CPU

Technical specifications

Article number	**6ES7222-1AD30-0XB0** Signal Board SB1222, 4 DQ 5VDC 200KHz	**6ES7222-1BD30-0XB0** Signal Board SB1222, 4 DQ 24VDC 200KHz
General information		
Product type designation	SB 1222, DQ 4x5 V DC 200 kHz	SB 1222, DQ 4x24 V DC 200 kHz
Input current		
from backplane bus 5 V DC, typ.	35 mA	35 mA
Power loss		
Power loss, typ.	0.5 W	0.5 W
Digital outputs		
Number of digital outputs	4; MOSFET, solid-state (current-sinking/current-sourcing)	4; MOSFET, solid-state (current-sinking/current-sourcing)
• in groups of	4	4
Short-circuit protection	No	No
Switching capacity of the outputs		
• with resistive load, max.	0.1 A	0.1 A
Load resistance range		
• upper limit	7 Ω	11 Ω
Output voltage		
• Rated value (DC)	5 V	24 V
• for signal "0", max.	0.2 V	1 V; with 10 kOhm load
• for signal "1", min.	L+ minus 0.7 V DC	L+ (-1.5 V)
• for signal "1", max.	6 V	
Output current		
• for signal "1" permissible range, max.	0.1 A	0.1 A
Cable length		
• shielded, max.	50 m	50 m
Diagnostics indication LED		
• for status of the outputs	Yes	Yes
Degree and class of protection		
Degree of protection acc. to EN 60529		
• IP20	Yes	Yes

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Technical specifications (continued)

Article number	**6ES7222-1AD30-0XB0** Signal Board SB1222, 4 DQ 5VDC 200KHz	**6ES7222-1BD30-0XB0** Signal Board SB1222, 4 DQ 24VDC 200KHz
Ambient conditions		
Free fall		
• Fall height, max.	0.3 m; five times, in product package	0.3 m; five times, in product package
Ambient temperature during operation		
• min.	-20 °C	-20 °C
• max.	60 °C	60 °C
Mechanics/material		
Enclosure material (front)		
• Plastic	Yes	Yes
Dimensions		
Width	38 mm	38 mm
Height	62 mm	62 mm
Depth	21 mm	21 mm
Weights		
Weight, approx.	35 g	35 g

Ordering data

	Article No.
SB 1222 Signal Board digital output modules	
4 outputs, 5 V DC, 0.1 A, 200 kHz	**6ES7222-1AD30-0XB0**
4 outputs, 24 V DC, 0.1 A, 200 kHz	**6ES7222-1BD30-0XB0**

	Article No.
Terminal block (spare part)	
for Signal Board	
with 6 screws, gold-plated; 4 pcs.	**6ES7292-1BF30-0XA0**

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Overview



- Digital inputs and outputs as supplement to the integral I/O of the CPUs
- For flexible adaptation of the controller to the relevant task
- For subsequent expansion of the system with additional inputs and outputs

Technical specifications

Article number	**6ES7223-1BH32-0XB0**	**6ES7223-1BL32-0XB0**	**6ES7223-1PH32-0XB0**	**6ES7223-1PL32-0XB0**	**6ES7223-1QH32-0XB0**
	Digital I/O SM 1223, 8 DI / 8 DQ	Digital I/O SM 1223, 16DI/16DQ	Digital I/O SM 1223, 8DI/8DQ	Digital I/O SM 1223, 16DI/16DQ	Digital I/O SM 1223, 8DI AC/8DQ Rly
General information					
Product type designation	SM 1223, DI 8x24 V DC, DQ 8x24 V DC	SM 1223, DI 16x24 V DC, DQ 16x24 V DC	SM 1223, DI 8x24 V DC, DQ 8x relay	SM 1223, DI 16x24 V DC, DQ 16x relay	SM 1223, DI 8x120/ 230 V AC, DQ 8x relay
Supply voltage					
Rated value (DC)					
• 24 V DC	Yes	Yes	Yes	Yes	Yes
Input current					
from backplane bus 5 V DC, max.	145 mA	185 mA	145 mA	180 mA	120 mA
Digital inputs					
• from load voltage L+ (without load), max.	4 mA; per channel	4 mA; per channel	4 mA/input 11 mA/ relay	4 mA/input 11 mA/ relay	
Output voltage					
Power supply to the transmitters					
• present	Yes	Yes	Yes	Yes	Yes
Power loss					
Power loss, typ.	2.5 W	4.5 W	5.5 W	10 W	7.5 W
Digital inputs					
Number of digital inputs	8	16	8	16	8
• in groups of	2	2	2	2	4
Input characteristic curve in accordance with IEC 61131, type 1	Yes	Yes	Yes	Yes	Yes
Number of simultaneously controllable inputs					
all mounting positions					
- up to 40 °C, max.	8	16	8	16	8
horizontal installation					
- up to 40 °C, max.	8	16	8	16	8
- up to 50 °C, max.	8	16	8	16	8
vertical installation					
- up to 40 °C, max.	8	16	8	16	8
Input voltage					
• Type of input voltage	DC	DC	DC	DC	AC
• Rated value (DC)	24 V	24 V	24 V	24 V	
• Rated value (AC)					120/230 V AC
• for signal "0"	5 V DC at 1 mA	5 V DC at 1 mA	5 V DC at 1 mA	5 V DC at 1 mA	20 V AC at 1 mA
• for signal "1"	15 V DC at 2.5 mA	15 V DC at 2.5 mA	15 V DC at 2.5 mA	15 V DC at 2.5 mA	79 V AC at 2.5 mA

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Technical specifications (continued)

Article number	6ES7223-1BH32-0XB0	6ES7223-1BL32-0XB0	6ES7223-1PH32-0XB0	6ES7223-1PL32-0XB0	6ES7223-1QH32-0XB0
	Digital I/O SM 1223, 8 DI / 8 DQ	Digital I/O SM 1223, 16DI/16DQ	Digital I/O SM 1223, 8DI/8DQ	Digital I/O SM 1223, 16DI/16DQ	Digital I/O SM 1223, 8DI AC/8DQ Rly
Input current					
• for signal "0", max. (permissible quiescent current)	1 mA	1 mA	1 mA	1 mA	1 mA
• for signal "1", min.	2.5 mA	2.5 mA	2.5 mA	2.5 mA	2.5 mA
• for signal "1", typ.	4 mA	4 mA	4 mA	4 mA	9 mA
Input delay (for rated value of input voltage)					
for standard inputs					
- parameterizable	Yes; 0.2 ms, 0.4 ms, 0.8 ms, 1.6 ms, 3.2 ms, 6.4 ms and 12.8 ms, selectable in groups of four	Yes; 0.2 ms, 0.4 ms, 0.8 ms, 1.6 ms, 3.2 ms, 6.4 ms and 12.8 ms, selectable in groups of four	Yes; 0.2 ms, 0.4 ms, 0.8 ms, 1.6 ms, 3.2 ms, 6.4 ms and 12.8 ms, selectable in groups of four	Yes; 0.2 ms, 0.4 ms, 0.8 ms, 1.6 ms, 3.2 ms, 6.4 ms and 12.8 ms, selectable in groups of four	Yes; 0.2 ms, 0.4 ms, 0.8 ms, 1.6 ms, 3.2 ms, 6.4 ms and 12.8 ms, selectable in groups of four
for interrupt inputs					
- parameterizable	Yes	Yes	Yes	Yes	Yes
Cable length					
• shielded, max.	500 m	500 m	500 m	500 m	500 m
• unshielded, max.	300 m	300 m	300 m	300 m	300 m
Digital outputs					
Number of digital outputs	8	16	8	16	8
• in groups of	1	1	2	4	4
Short-circuit protection	No; to be provided externally	No; to be provided externally	No; to be provided externally	No; to be provided externally	No; to be provided externally
Limitation of inductive shutdown voltage to	L+ (-48 V)	L+ (-48 V)			
Switching capacity of the outputs					
• with resistive load, max.	0.5 A	0.5 A	2 A	2 A	2 A
• on lamp load, max.	5 W	5 W	30 W with DC, 200 W with AC	30 W with DC, 200 W with AC	30 W with DC, 200 W with AC
Output voltage					
• Rated value (DC)	24 V	24 V	5 V DC to 30 V DC	5 V DC to 30 V DC	5 V DC to 30 V DC
• Rated value (AC)			5 V AC to 250 V AC	5 V AC to 250 V AC	5 V AC to 250 V AC
• for signal "0", max.	0.1 V; with 10 kOhm load	0.1 V; with 10 kOhm load			
• for signal "1", min.	20 V DC	20 V DC			
Output current					
• for signal "1" permissible range, max.	0.5 A	0.5 A	2 A	2 A	2 A
• for signal "0" residual current, max.	10 µA	10 µA			
Output delay with resistive load					
• "0" to "1", max.	50 µs	50 µs	10 ms	10 ms	10 ms
• "1" to "0", max.	200 µs	200 µs	10 ms	10 ms	10 ms
Total current of the outputs (per group)					
horizontal installation					
- up to 50 °C, max.	4 A; Current per mass	8 A; Current per mass	10 A; Current per mass	8 A; Current per mass	8 A; Current per mass
Relay outputs					
• Number of relay outputs			8	16	8
• Rated supply voltage of relay coil L+ (DC)			24 V	24 V	24 V
• Number of operating cycles, max.			mechanically 10 million, at rated load voltage 100 000	mechanically 10 million, at rated load voltage 100 000	mechanically 10 million, at rated load voltage 100 000
Switching capacity of contacts					
- with inductive load, max.		0.5 A	2 A	2 A	2 A
- on lamp load, max.		5 W	30 W with DC, 200 W with AC	30 W with DC, 200 W with AC	30 W with DC, 200 W with AC
- with resistive load, max.		0.5 A	2 A	2 A	2 A
Cable length					
• shielded, max.	500 m	500 m	500 m	500 m	500 m
• unshielded, max.	150 m	150 m	150 m	150 m	150 m

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Technical specifications (continued)

Article number	**6ES7223-1BH32-0XB0** Digital I/O SM 1223, 8 DI / 8 DQ	**6ES7223-1BL32-0XB0** Digital I/O SM 1223, 16DI/16DQ	**6ES7223-1PH32-0XB0** Digital I/O SM 1223, 8DI/8DQ	**6ES7223-1PL32-0XB0** Digital I/O SM 1223, 16DI/16DQ	**6ES7223-1QH32-0XB0** Digital I/O SM 1223, 8DI AC/8DQ Rly
Interrupts/diagnostics/ status information					
Alarms					
• Diagnostic alarm	Yes	Yes	Yes	Yes	Yes
Diagnostics indication LED					
• for status of the inputs	Yes	Yes	Yes	Yes	Yes
• for status of the outputs	Yes	Yes	Yes	Yes	Yes
Potential separation					
Potential separation digital inputs					
• between the channels, in groups of	2	2	2	2	2
Potential separation digital outputs					
• between the channels			Relays	Relays	Relays
• between the channels, in groups of	1	1	2	4	2
• between the channels and backplane bus	500 V AC	500 V AC	1500 V AC for 1 minute	1500 V AC for 1 minute	1500 V AC for 1 minute
Degree and class of protection					
Degree of protection acc. to EN 60529					
• IP20	Yes	Yes	Yes	Yes	Yes
Standards, approvals, certificates					
CE mark	Yes	Yes	Yes	Yes	Yes
CSA approval	Yes	Yes	Yes	Yes	Yes
cULus	Yes	Yes	Yes	Yes	Yes
FM approval	Yes	Yes	Yes	Yes	Yes
RCM (formerly C-TICK)	Yes	Yes	Yes	Yes	Yes
Marine approval	Yes		Yes	Yes	Yes
Ambient conditions					
Free fall					
• Fall height, max.	0.3 m; five times, in product package	0.3 m; five times, in product package	0.3 m; five times, in product package	0.3 m; five times, in product package	0.3 m; five times, in product package
Ambient temperature during operation					
• min.	-20 °C	-20 °C	-20 °C	-20 °C	-20 °C
• max.	60 °C	60 °C	60 °C	60 °C; Number of simultaneously activated outputs: 8 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 16 at 55 °C horizontal or 45 °C vertical	60 °C; Number of simultaneously activated outputs: 4 (no adjacent points) at 60 °C horizontal or 50 °C vertical, 8 at 55 °C horizontal or 45 °C vertical
Connection method					
required front connector	Yes	Yes	Yes	Yes	Yes
Mechanics/material					
Enclosure material (front)					
• Plastic	Yes	Yes	Yes	Yes	Yes
Dimensions					
Width	45 mm	70 mm	45 mm	70 mm	45 mm
Height	100 mm	100 mm	100 mm	100 mm	100 mm
Depth	75 mm	75 mm	75 mm	75 mm	75 mm
Weights					
Weight, approx.	210 g	310 g	230 g	350 g	230 g

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SM 1223 digital input/output modules

Ordering data	Article No.
SM 1223 digital input/output signal module	
8 inputs, 24 V DC, IEC type 1 current sinking; 8 x 24 V DC transistor outputs, 0.5 A, 5 W	**6ES7223-1BH32-0XB0**
16 inputs, 24 V DC, IEC type 1 current sinking; 16 x 24 V DC transistor outputs, 0.5 A, 5 W	**6ES7223-1BL32-0XB0**
8 inputs, 24 V DC, IEC type 1 current sinking; 8 relay outputs, 5 ... 30 V DC/5 ... 250 V AC, 2 A, 30 W DC/200 W AC	**6ES7223-1PH32-0XB0**
16 inputs, 24 V DC, IEC type 1 current sinking; 16 relay outputs, 5 ... 30 V DC/5 ... 250 V AC, 2 A, 30 W DC/200 W AC	**6ES7223-1PL32-0XB0**
8 inputs, 120/230 V AC; 8 relay outputs, 5 ... 30 V DC/5 ... 250 V AC, 2 A, 30 W DC/200 W AC	**6ES7223-1QH32-0XB0**
Extension cable for two-tier configuration	**6ES7290-6AA30-0XA0**
for connecting digital/analog signal modules; length 2 m	

	Article No.
Terminal block (spare part)	
For 6ES7223-1BH32-0XB0	
• With 7 screws, tin-coated; 4 units	**6ES7292-1AG30-0XA0**
For 6ES7223-1BL32-0XB0	
• With 11 screws, tin-coated; 4 units	**6ES7292-1AL30-0XA0**
For 6ES7223-1PH32-0XB0	
• With 7 screws, zinc-plated; 4 pcs.	**6ES7292-1AG30-0XA0**
• With 7 screws, tin-coated, right coded; 4 units	**6ES7292-1AG40-0XA0**
For 6ES7223-1PL32-0XB0	
• With 11 screws, tin-coated; 4 units	**6ES7292-1AL30-0XA0**
• With 11 screws, tin-coated, coded; 4 units	**6ES7292-1AL40-0XA0**
For 6ES7223-1PL32-0XB0	
• With 7 screws, tin-coated, right coded; 4 units	**6ES7292-1AG40-0XA0**
Front flap set (spare part)	
For modules with a width of 45 mm	**6ES7291-1BA30-0XA0**
For modules with a width of 70 mm	**6ES7291-1BB30-0XA0**

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Overview



- Digital inputs and outputs as supplement to the integral I/O of the SIMATIC S7-1200 CPUs
- Can be plugged direct into the CPU

Technical specifications

Article number	**6ES7223-0BD30-0XB0** Signal Board SB1223, 2 DI/2 DQ	**6ES7223-3AD30-0XB0** Signal Board SB 1223, 2DI/2DQ 5V 200KHz	**6ES7223-3BD30-0XB0** Signal Board SB 1223, 2DI/2DQ 24V 200KHz
General information			
Product type designation	SB 1223, DI 2x24 V DC/DQ 2x24 V DC	SB 1223, DI 2x5 V DC/DQ 2x5 V DC 200 kHz	SB 1223, DI 2x24 V DC/DQ 2x24 V DC 200 kHz
Input current			
from backplane bus 5 V DC, typ.	50 mA	35 mA	35 mA
Output voltage			
Power supply to the transmitters			
• Supply current, max.	4 mA; per channel		
Power loss			
Power loss, typ.	1 W	0.5 W	0.5 W
Digital inputs			
Number of digital inputs	2; Current-sinking	2; Current-sourcing	2; Current-sourcing
• in groups of	1	2	2
Input characteristic curve in accordance with IEC 61131, type 1	Yes		
Number of simultaneously controllable inputs			
all mounting positions			
- up to 40 °C, max.	2		2
Input voltage			
• Type of input voltage	DC	DC	DC
• Rated value (DC)	24 V	5 V	24 V
• for signal "0"	0 to 5 V	(L+ minus 1.0 V DC) ... L+	(L+ minus 5.0 V DC) ... L+
• for signal "1"	+15 to +30V	0 V ... (L+ minus 2.0 V DC)	0 V ... (L+ minus 10 V DC)
Input current			
• for signal "0", max. (permissible quiescent current)	1 mA	2.2 mA	1.4 mA
• for signal "1", min.		5.1 mA	2.9 mA
• for signal "1", typ.	0.5 A		7 mA

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Technical specifications (continued)

Article number	**6ES7223-0BD30-0XB0** Signal Board SB1223, 2 DI/2 DQ	**6ES7223-3AD30-0XB0** Signal Board SB 1223, 2DI/2DQ 5V 200KHz	**6ES7223-3BD30-0XB0** Signal Board SB 1223, 2DI/2DQ 24V 200KHz
Input delay (for rated value of input voltage)			
for standard inputs			
- parameterizable	Yes; 0.2 ms, 0.4 ms, 0.8 ms, 1.6 ms, 3.2 ms, 6.4 ms and 12.8 ms, selectable in groups of four	Yes; 0.1 / 0.2 / 0.4 / 0.8 / 1.6 / 3.2 / 6.4 / 10.0 / 12.8 / 20.0 µs; 0.05 / 0.1 / 0.2 / 0.4 / 0.8 / 1.6 / 3.2 / 6.4 / 10.0 / 12.8 / 20.0 ms	Yes; 0.1 / 0.2 / 0.4 / 0.8 / 1.6 / 3.2 / 6.4 / 10.0 / 12.8 / 20.0 µs; 0.05 / 0.1 / 0.2 / 0.4 / 0.8 / 1.6 / 3.2 / 6.4 / 10.0 / 12.8 / 20.0 ms
- at "0" to "1", max.	2 µs		
- at "1" to "0", max.	10 µs		
for interrupt inputs			
- parameterizable	Yes	Yes	Yes
for technological functions			
- parameterizable	Yes	Yes	Yes
Cable length			
• shielded, max.	500 m	50 m; shielded, twisted pair	50 m; shielded, twisted pair
• unshielded, max.	300 m		
Digital outputs			
Number of digital outputs	2; MOSFET, solid-state (current-sinking/current-sourcing)	2; MOSFET, solid-state (current-sinking/current-sourcing)	2; MOSFET, solid-state (current-sinking/current-sourcing)
• in groups of	1	2	2
Short-circuit protection	No	No	No
Switching capacity of the outputs			
• with resistive load, max.	0.5 A	0.1 A	0.1 A
• on lamp load, max.	5 W		
Load resistance range			
• upper limit	0.6 Ω	7 Ω	
Output voltage			
• Rated value (DC)	24 V	5 V	24 V
• for signal "0", max.	0.1 V; with 10 kOhm load	0.2 V	1 V
• for signal "1", min.	20 V	L+ minus 0.7 V DC	L+ (-1.5 V)
• for signal "1", max.		6 V	
Output current			
• for signal "1" permissible range, max.	0.5 A	0.1 A	0.1 A
• for signal "0" residual current, max.	10 µA		
Cable length			
• shielded, max.	500 m	50 m	50 m
• unshielded, max.	150 m		
Interrupts/diagnostics/ status information			
Alarms	Yes		
Diagnostics function	Yes		
Diagnostics indication LED			
• for status of the inputs	Yes	Yes	Yes
• for status of the outputs	Yes	Yes	Yes
Degree and class of protection			
Degree of protection acc. to EN 60529			
• IP20	Yes	Yes	Yes

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Technical specifications (continued)

Article number	**6ES7223-0BD30-0XB0** Signal Board SB1223, 2 DI/2 DQ	**6ES7223-3AD30-0XB0** Signal Board SB 1223, 2DI/2DQ 5V 200KHz	**6ES7223-3BD30-0XB0** Signal Board SB 1223, 2DI/2DQ 24V 200KHz
Ambient conditions			
Free fall			
• Fall height, max.	0.3 m; five times, in product package	0.3 m; five times, in product package	0.3 m; five times, in product package
Ambient temperature during operation			
• min.	-20 °C	-20 °C	-20 °C
• max.	60 °C	60 °C	60 °C
Mechanics/material			
Enclosure material (front)			
• Plastic	Yes	Yes	Yes
Dimensions			
Width	38 mm	38 mm	38 mm
Height	62 mm	62 mm	62 mm
Depth	21 mm	21 mm	21 mm
Weights			
Weight, approx.	40 g	35 g	35 g

Ordering data

	Article No.
SB 1223 digital input/output signal board	
2 inputs, 24 V DC, IEC type 1 current sinking; 2 x 24 V DC transistor outputs, 0.5 A, 5 W; can be used as HSC at up to 30 kHz	**6ES7223-0BD30-0XB0**
2 inputs, 5 V DC, 200 kHz 2 outputs 5 V DC, 0.1 A, 200 kHz	**6ES7223-3AD30-0XB0**
2 inputs, 24 V DC, 200 kHz 2 outputs 24 V DC, 0.1 A, 200 kHz	**6ES7223-3BD30-0XB0**

	Article No.
Terminal block (spare part)	
for signal board	
with 6 screws, gold-plated; 4 pcs.	**6ES7292-1BF30-0XA0**

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SIPLUS SM 1221 digital input modules

Overview



- Digital inputs as supplement to the integral I/O of the CPUs
- For flexible adaptation of the controller to the corresponding task
- For subsequent expansion of the system with additional inputs
- From +60 °C to +70 °C, max. 50% of the inputs can be controlled simultaneously

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

Technical specifications

Article number	**6AG1221-1BF32-2XB0**	**6AG1221-1BF32-4XB0**	**6AG1221-1BH32-2XB0**	**6AG1221-1BH32-4XB0**
Based on	**6ES7221-1BF32-0XB0**	**6ES7221-1BF32-0XB0**	**6ES7221-1BH32-0XB0**	**6ES7221-1BH32-0XB0**
	SIPLUS S7-1200 SM 1221 8DI	SIPLUS S7-1200 SM 1221 8DI	SIPLUS S7-1200 SM 1221 16DI	SIPLUS S7-1200 SM 1221 16DI
Ambient conditions				
Free fall				
• Fall height, max.	0.3 m; five times, in product package	0.3 m; five times, in product package	0.3 m; five times, in product package	0.3 m; five times, in product package
Ambient temperature during operation				
• min.	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-20 °C; = Tmin (incl. condensation/frost); start-up @ 0 °C	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-20 °C; = Tmin (incl. condensation/frost); start-up @ 0 °C
• max.	70 °C; = Tmax; Tmax > +60 °C number of simultaneously activated inputs 4 (no adjacent points) for horizontal mounting position	60 °C; = Tmax	70 °C; = Tmax; Tmax > +60 °C number of simultaneously activated inputs 8 (no adjacent points) for horizontal mounting position	60 °C; = Tmax
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity				
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance				
Coolants and lubricants				
- Resistant to commercially available coolants and lubricants	Yes	Yes	Yes	Yes

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Technical specifications (continued)

Article number	6AG1221-1BF32-2XB0	6AG1221-1BF32-4XB0	6AG1221-1BH32-2XB0	6AG1221-1BH32-4XB0
Based on	6ES7221-1BF32-0XB0	6ES7221-1BF32-0XB0	6ES7221-1BH32-0XB0	6ES7221-1BH32-0XB0
	SIPLUS S7-1200 SM 1221 8DI	SIPLUS S7-1200 SM 1221 8DI	SIPLUS S7-1200 SM 1221 16DI	SIPLUS S7-1200 SM 1221 16DI
Use in stationary industrial systems				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
Use on ships/at sea				
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Remark				
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating				
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability	Yes; Class 2 for high availability	Yes; Class 2 for high availability	Yes; Class 2 for high availability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

Ordering data

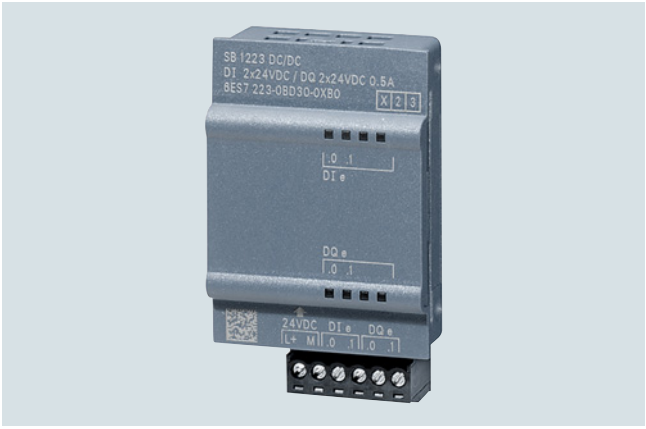
	Article No.
Digital input SIPLUS signal module SM 1221	
(Extended temperature range and exposure to media)	
8 inputs, 24 V DC, isolated, current sourcing/sinking	
• Suitable for areas with extraordinary exposure to media (conformal coating)	**6AG1221-1BF32-4XB0**
• -25 ... +70 °C, from +60 … +70 °C number of simultaneously controllable inputs and outputs max. 50 %	**6AG1221-1BF32-2XB0**
16 inputs, 24 V DC, isolated, current sourcing/sinking	
• Suitable for areas with extraordinary exposure to media (conformal coating)	**6AG1221-1BH32-4XB0**
• -25 ... +70 °C, from +60 … +70 °C number of simultaneously controllable inputs and outputs max. 50 %	**6AG1221-1BH32-2XB0**

	Article No.
Accessories	See SIMATIC S7-1200 SM 1221 digital input modules, page 3/53

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SIPLUS SB 1221 digital input modules

Overview



- Digital inputs as a supplement to the integral I/O of SIMATIC S7-1200 CPUs
- Can be plugged directly into the CPU

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were adopted from the respective standard products. SIPLUS extreme specific information was added.

Technical specifications

Article number	**6AG1221-3AD30-5XB0**	**6AG1221-3BD30-5XB0**
Based on	**6ES7221-3AD30-0XB0**	**6ES7221-3BD30-0XB0**
	SIPLUS S7-1200 SB 1221 4DI 5VDC	SIPLUS S7-1200 SB 1221 4DI 24VDC
Ambient temperature		
Ambient temperature during operation		
• min.	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C
• max.	60 °C; = Tmax; Tmax > 55 °C number of simultaneously activated inputs 2 (no adjacent points) for horizontal mounting position	60 °C; = Tmax; Tmax > 55 °C number of simultaneously activated inputs 2 (no adjacent points) for horizontal mounting position
Altitude during operation relating to sea level		
• Installation altitude above sea level, max.	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity		
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance		
Coolants and lubricants		
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems		
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spore s (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
Use on ships/at sea		
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Remark		
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!

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Technical specifications (continued)

Article number	**6AG1221-3AD30-5XB0**	**6AG1221-3BD30-5XB0**
Based on	**6ES7221-3AD30-0XB0** SIPLUS S7-1200 SB 1221 4DI 5VDC	**6ES7221-3BD30-0XB0** SIPLUS S7-1200 SB 1221 4DI 24VDC
Conformal coating		
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability	Yes; Class 2 for high availability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

Ordering data

	Article No.
SIPLUS SB 1221 digital input signal board	
(Extended temperature range and exposure to media)	
4 inputs, 5 V DC, 200 kHz, sourcing	**6AG1221-3AD30-5XB0**
4 inputs, 24 V DC, 200 kHz, sourcing	**6AG1221-3BD30-5XB0**

	Article No.
Accessories	See SIMATIC S7-1200 digital input SB 1221, page 3/55

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SIPLUS SM 1222 digital output modules

Overview



- Digital outputs as a supplement to the integral I/O of the CPUs
- For flexible adaptation of the controller to the corresponding task
- For subsequent expansion of the system with additional outputs
- From +60 °C to +70 °C, max. 50% of the inputs can be controlled simultaneously

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

Technical specifications

Article number	**6AG1222-1BF32-2XB0**	**6AG1222-1BF32-4XB0**	**6AG1222-1BH32-2XB0**	**6AG1222-1BH32-4XB0**
Based on	**6ES7222-1BF32-0XB0**	**6ES7222-1BF32-0XB0**	**6ES7222-1BH32-0XB0**	**6ES7222-1BH32-0XB0**
	SIPLUS S7-1200 SM 1222 8DQ	SIPLUS S7-1200 SM 1222 8DQ	SIPLUS S7-1200 SM 1222 16DQ	SIPLUS S7-1200 SM 1222 16DQ
Ambient conditions				
Free fall				
• Fall height, max.	0.3 m; five times, in product package	0.3 m; five times, in product package	0.3 m; five times, in product package	0.3 m; five times, in product package
Ambient temperature during operation				
• min.	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-20 °C; = Tmin (incl. condensation/frost); start-up @ 0 °C	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-20 °C; = Tmin (incl. condensation/frost); start-up @ 0 °C
• max.	70 °C; = Tmax; Tmax > +60 °C number of simultaneously activated outputs 4 (no adjacent points) for horizontal mounting position	60 °C; = Tmax	70 °C; = Tmax; Tmax > +60 °C number of simultaneously activated outputs 8 (no adjacent points) for horizontal mounting position	60 °C; = Tmax
• At cold restart, min.	-25 °C	0 °C	-25 °C	0 °C
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity				
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)

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Technical specifications (continued)

Article number	6AG1222-1BF32-2XB0	6AG1222-1BF32-4XB0	6AG1222-1BH32-2XB0	6AG1222-1BH32-4XB0
Based on	6ES7222-1BF32-0XB0	6ES7222-1BF32-0XB0	6ES7222-1BH32-0XB0	6ES7222-1BH32-0XB0
	SIPLUS S7-1200 SM 1222 8DQ	SIPLUS S7-1200 SM 1222 8DQ	SIPLUS S7-1200 SM 1222 16DQ	SIPLUS S7-1200 SM 1222 16DQ
Resistance				
Coolants and lubricants				
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
Use on ships/at sea				
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Remark				
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating				
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability	Yes; Class 2 for high availability	Yes; Class 2 for high availability	Yes; Class 2 for high availability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

Article number	6AG1222-1HF32-2XB0	6AG1222-1HF32-4XB0	6AG1222-1HH32-2XB0	6AG1222-1HH32-4XB0
Based on	6ES7222-1HF32-0XB0	6ES7222-1HF32-0XB0	6ES7222-1HH32-0XB0	6ES7222-1HH32-0XB0
	SIPLUS S7-1200 SM 1222 8DQ RLY	SIPLUS S7-1200 SM 1222 8DQ RLY	SIPLUS S7-1200 SM 1222 16DQ RLY	SIPLUS S7-1200 SM 1222 16DQ RLY
Ambient conditions				
Free fall				
• Fall height, max.	0.3 m; five times, in product package	0.3 m; five times, in product package	0.3 m; five times, in product package	0.3 m; five times, in product package
Ambient temperature during operation				
• min.	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-20 °C; = Tmin (incl. condensation/frost); start-up @ 0 °C	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-20 °C; = Tmin (incl. condensation/frost); start-up @ 0 °C
• max.	70 °C; = Tmax; Tmax > +60 °C number of simultaneously activated outputs 4 (no adjacent points) for horizontal mounting position	60 °C; = Tmax	70 °C; = Tmax; Tmax > +60 °C number of simultaneously activated outputs 8 (no adjacent points) for horizontal mounting position	60 °C; = Tmax
• At cold restart, min.	-25 °C	0 °C	-25 °C	0 °C

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Technical specifications (continued)

Article number	6AG1222-1HF32-2XB0	6AG1222-1HF32-4XB0	6AG1222-1HH32-2XB0	6AG1222-1HH32-4XB0
Based on	6ES7222-1HF32-0XB0	6ES7222-1HF32-0XB0	6ES7222-1HH32-0XB0	6ES7222-1HH32-0XB0
	SIPLUS S7-1200 SM 1222 8DQ RLY	SIPLUS S7-1200 SM 1222 8DQ RLY	SIPLUS S7-1200 SM 1222 16DQ RLY	SIPLUS S7-1200 SM 1222 16DQ RLY
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.	2 000 m	2 000 m	2 000 m	2 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m); above 2 000 m max. 132 V AC	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m); above 2 000 m max. 132 V AC	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m); above 2 000 m max. 132 V AC	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m); above 2 000 m max. 132 V AC
Relative humidity				
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance				
Coolants and lubricants				
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
Use on ships/at sea				
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Remark				
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating				
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability	Yes; Class 2 for high availability	Yes; Class 2 for high availability	Yes; Class 2 for high availability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

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Ordering data	Article No.
Digital output SIPLUS signal module SM 1222	
(Extended temperature range and exposure to media)	
8 outputs, 24 V DC; 0.5 A, 5 W, isolated	
• Suitable for areas with extraordinary exposure to media (conformal coating)	**6AG1222-1BF32-4XB0**
• -25 ... +70 °C, from +60 … +70°C number of simultaneously controllable inputs and outputs max. 50%	**6AG1222-1BF32-2XB0**
16 outputs, 24 V DC; 0.5 A, 5 W, isolated	
• Suitable for areas with extraordinary exposure to media (conformal coating)	**6AG1222-1BH32-4XB0**
• -25 ... +70 °C, from +60 … +70°C number of simultaneously controllable inputs and outputs max. 50%	**6AG1222-1BH32-2XB0**
8 outputs, 5 ... 30 V DC/5 ... 250 V AC, relay 2 A, 30 W DC/200 W AC	
• Suitable for areas with extraordinary exposure to media (conformal coating)	**6AG1222-1HF32-4XB0**
• -25 ... +70 °C, from +60 … +70°C number of simultaneously controllable inputs and outputs max. 50%	**6AG1222-1HF32-2XB0**
16 outputs, 5 ... 30 V DC/5 ... 250 V AC, relay 2 A, 30 W DC/200 W AC	
• Suitable for areas with extraordinary exposure to media (conformal coating)	**6AG1222-1HH32-4XB0**
• -25 ... +70 °C, from +60 … +70°C number of simultaneously controllable inputs and outputs max. 50%	**6AG1222-1HH32-2XB0**
Accessories	See SIMATIC S7-1200 digital output SM 1222, page 3/58

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SIPLUS SB 1222 digital output modules

Overview



- Digital outputs as a supplement to the integral I/O of the CPUs
- For flexible adaptation of the controller to the respective task
- For subsequent expansion of the system with additional outputs
- Can be plugged directly into the CPU
- From +60 °C to +70 °C, max. 50% of the inputs can be controlled simultaneously

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

Technical specifications

Article number	**6AG1222-1AD30-5XB0**	**6AG1222-1BD30-5XB0**
Based on	**6ES7222-1AD30-0XB0**	**6ES7222-1BD30-0XB0**
	SIPLUS S7-1200 SB 1222 4DQ 5VDC	SIPLUS S7-1200 SB 1222 4DQ 24VDC
Ambient temperature		
Ambient temperature during operation		
• min.	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C
• max.	60 °C; = Tmax; Tmax > 55 °C number of simultaneously activated outputs 2 (no adjacent points) for horizontal mounting position	60 °C; = Tmax; Tmax > 55 °C number of simultaneously activated outputs 2 (no adjacent points) for horizontal mounting position
Altitude during operation relating to sea level		
• Installation altitude above sea level, max.	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity		
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance		
Coolants and lubricants		
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems		
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *

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Technical specifications (continued)

Article number	**6AG1222-1AD30-5XB0**	**6AG1222-1BD30-5XB0**
Based on	**6ES7222-1AD30-0XB0**	**6ES7222-1BD30-0XB0**
	SIPLUS S7-1200 SB 1222 4DQ 5VDC	SIPLUS S7-1200 SB 1222 4DQ 24VDC
Use on ships/at sea		
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Remark		
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating		
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability	Yes; Class 2 for high availability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

Ordering data

	Article No.
SIPLUS SB 1222 digital output signal board	
(Extended temperature range and exposure to media)	
4 outputs, 5 V DC, 0.1 A, 200 kHz	**6AG1222-1AD30-5XB0**
4 outputs, 24 V DC, 0.1 A, 200 kHz	**6AG1222-1BD30-5XB0**

	Article No.
Accessories	See SIMATIC S7-1200 digital output module SB 1222, page 3/60

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SIPLUS SM 1223 digital input/output modules

Overview



- Digital inputs and outputs as supplement to the integral I/O of the CPUs
- For flexible adaptation of the controller to the corresponding task
- For subsequent expansion of the system with additional inputs and outputs
- From +60 °C to +70 °C, max. 50% of the inputs can be controlled simultaneously

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

Technical specifications

Article number	**6AG1223-1BH32-2XB0**	**6AG1223-1BH32-4XB0**	**6AG1223-1PH32-2XB0**	**6AG1223-1PH32-4XB0**
Based on	**6ES7223-1BH32-0XB0**	**6ES7223-1BH32-0XB0**	**6ES7223-1PH32-0XB0**	**6ES7223-1PH32-0XB0**
	SIPLUS S7-1200 SM 1223 8DI/8DQ	SIPLUS S7-1200 SM 1223 8DI/8DQ	SIPLUS S7-1200 SM 1223 8DI/8DQ RLY	SIPLUS S7-1200 SM 1223 8DI/8DQ RLY
Ambient conditions				
Free fall				
• Fall height, max.	0.3 m; five times, in product package	0.3 m; five times, in product package	0.3 m; five times, in product package	0.3 m; five times, in product package
Ambient temperature during operation				
• min.	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-20 °C; = Tmin (incl. condensation/frost); start-up @ 0 °C	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-20 °C; = Tmin (incl. condensation/frost); start-up @ 0 °C
• max.	70 °C; = Tmax; Tmax > +60 °C number of simultaneously activated outputs 4, inputs 4 (no adjacent points) for horizontal mounting position	60 °C; = Tmax	70 °C; = Tmax; Tmax > +60 °C number of simultaneously activated outputs 4, inputs 4 (no adjacent points) for horizontal mounting position	60 °C; = Tmax
• At cold restart, min.	-25 °C	0 °C	-25 °C	0 °C
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.	5 000 m	5 000 m	2 000 m	2 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m); above 2 000 m max. 132 V AC	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m); above 2 000 m max. 132 V AC
Relative humidity				
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance				
Coolants and lubricants				
- Resistant to commercially available coolants and lubricants	Yes	Yes	Yes	Yes

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Technical specifications (continued)

Article number	6AG1223-1BH32-2XB0	6AG1223-1BH32-4XB0	6AG1223-1PH32-2XB0	6AG1223-1PH32-4XB0
Based on	6ES7223-1BH32-0XB0	6ES7223-1BH32-0XB0	6ES7223-1PH32-0XB0	6ES7223-1PH32-0XB0
	SIPLUS S7-1200 SM 1223 8DI/8DQ	SIPLUS S7-1200 SM 1223 8DI/8DQ	SIPLUS S7-1200 SM 1223 8DI/8DQ RLY	SIPLUS S7-1200 SM 1223 8DI/8DQ RLY
Use in stationary industrial systems				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
Use on ships/at sea				
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Remark				
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating				
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability	Yes; Class 2 for high availability	Yes; Class 2 for high availability	Yes; Class 2 for high availability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

Article number	6AG1223-1PL32-2XB0	6AG1223-1PL32-4XB0	6AG1223-1BL32-2XB0	6AG1223-1BL32-4XB0
Based on	6ES7223-1PL32-0XB0	6ES7223-1PL32-0XB0	6ES7223-1BL32-0XB0	6ES7223-1BL32-0XB0
	SIPLUS S7-1200 SM 1223 16DI/16DQ RLY	SIPLUS S7-1200 SM 1223 16DI/16DQ RLY	SIPLUS S7-1200 SM 1223 16DI/16DQ	SIPLUS S7-1200 SM 1223 16DI/16DQ
Ambient conditions				
Free fall				
• Fall height, max.	0.3 m; five times, in product package	0.3 m; five times, in product package	0.3 m; five times, in product package	0.3 m; five times, in product package
Ambient temperature during operation				
• min.	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-20 °C; = Tmin (incl. condensation/frost); start-up @ 0 °C	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-20 °C; = Tmin (incl. condensation/frost); start-up @ 0 °C
• max.	70 °C; = Tmax; Tmax > +60 °C number of simultaneously activated outputs 8, inputs 8 (no adjacent points) for horizontal mounting position	60 °C; = Tmax	70 °C; = Tmax; Tmax > +60 °C number of simultaneously activated outputs 8, inputs 8 (no adjacent points) for horizontal mounting position	60 °C; = Tmax
• At cold restart, min.	-25 °C	0 °C	-25 °C	0 °C

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Technical specifications (continued)

Article number	6AG1223-1PL32-2XB0	6AG1223-1PL32-4XB0	6AG1223-1BL32-2XB0	6AG1223-1BL32-4XB0
Based on	6ES7223-1PL32-0XB0	6ES7223-1PL32-0XB0	6ES7223-1BL32-0XB0	6ES7223-1BL32-0XB0
	SIPLUS S7-1200 SM 1223 16DI/16DQ RLY	SIPLUS S7-1200 SM 1223 16DI/16DQ RLY	SIPLUS S7-1200 SM 1223 16DI/16DQ	SIPLUS S7-1200 SM 1223 16DI/16DQ
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.	2 000 m	2 000 m	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m); above 2 000 m max. 132 V AC	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m); above 2 000 m max. 132 V AC	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity				
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance				
Coolants and lubricants				
- Resistant to commercially available coolants and lubricants	Yes	Yes	Yes	Yes
Use in stationary industrial systems				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
Use on ships/at sea				
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Remark				
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating				
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability	Yes; Class 2 for high availability	Yes; Class 2 for high availability	Yes; Class 2 for high availability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

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Technical specifications (continued)

Article number	**6AG1223-1QH32-4XB0**
Based on	**6ES7223-1QH32-0XB0**
	SIPLUS S7-1200 SM 1223 8DI AC/8DQ RLY
Ambient temperature	
Ambient temperature during operation	
• min.	-20 °C; = Tmin (incl. condensation/ frost); start-up @ 0 °C
• max.	60 °C; = Tmax
Altitude during operation relating to sea level	

• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at
	1 080 hPa ... 795 hPa
	(-1 000 m ... +2 000 m) //
	Tmin ... (Tmax - 10 K) at
	795 hPa ... 658 hPa
	(+2 000 m ... +3 500 m) //
	Tmin ... (Tmax - 20 K) at
	658 hPa ... 540 hPa
	(+3 500 m ... +5 000 m)

Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance	
Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
Remark	
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A

Ordering data

	Article No.
Digital input/output SIPLUS signal module SM 1223	
(Extended temperature range and exposure to media)	
8 inputs, 24 V DC, IEC type 1 current sinking; 8 transistor outputs, 24 V DC, 0.5 A, 5 W	
• For areas with exceptional exposure to media (conformal coating)	**6AG1223-1BH32-4XB0**
• -25 ... +70 °C, from +60 … +70 °C number of simultaneously controllable inputs and outputs max. 50 %	**6AG1223-1BH32-2XB0**
16 inputs, 24 V DC, IEC type 1 current sinking; 16 transistor outputs, 24 V DC, 0.5 A, 5 W	
• For areas with exceptional exposure to media (conformal coating)	**6AG1223-1BL32-4XB0**
• -25 ... +70 °C, from +60 … +70 °C number of simultaneously controllable inputs and outputs max. 50 %	**6AG1223-1BL32-2XB0**
8 inputs, 24 V DC, IEC type 1 current sinking; 8 relay outputs, 5 ... 30 V DC / 5 ... 250 V AC, 2 A, 30 W DC / 200 W AC	
• For areas with exceptional exposure to media (conformal coating)	**6AG1223-1PH32-4XB0**
• -25 ... +70 °C, from +60 … +70 °C number of simultaneously controllable inputs and outputs max. 50 %	**6AG1223-1PH32-2XB0**
16 inputs, 24 V DC, IEC type 1 current sinking; 16 relay outputs, 5 ... 30 V DC / 5 ... 250 V AC, 2 A, 30 W DC / 200 W AC	
• For areas with exceptional exposure to media (conformal coating)	**6AG1223-1PL32-4XB0**
• -25 ... +70 °C, from +60 … +70 °C number of simultaneously controllable inputs and outputs max. 50 %	**6AG1223-1PL32-2XB0**
8 inputs, 120/230 V AC; 8 relay outputs, 5 ... 30 V DC/ 5 ... 250 V AC, 2 A, 30 W DC/ 200 W AC	
• For areas with exceptional exposure to media (conformal coating)	**6AG1223-1QH32-4XB0**
Accessories	See SIMATIC S7-1200 digital input/output SM 1223, page 3/64

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SIPLUS SB 1223 digital input/output modules

Overview



- Digital inputs and outputs as supplement to the integral I/O of the SIPLUS S7-1200 CPUs
- Can be plugged directly into the CPU (cannot be used for +70 °C version)

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

Technical specifications

Article number	**6AG1223-0BD30-4XB0**	**6AG1223-0BD30-5XB0**	**6AG1223-3AD30-5XB0**	**6AG1223-3BD30-5XB0**
Based on	**6ES7223-0BD30-0XB0**	**6ES7223-0BD30-0XB0**	**6ES7223-3AD30-0XB0**	**6ES7223-3BD30-0XB0**
	SIPLUS S7-1200 SB 1223 2DI/2DQ 24VDC	SIPLUS S7-1200 SB 1223 2DI/2DQ 24VDC	SIPLUS S7-1200 SB 1223 2DI/2DQ 5VDC	SIPLUS S7-1200 SB 1223 2DI/2DQ, 24VDC
Ambient conditions				
Free fall				
• Fall height, max.	0.3 m; five times, in product package			
Ambient temperature during operation				
• min.	0 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C
• max.	55 °C; = Tmax	60 °C; = Tmax	60 °C; = Tmax	60 °C; = Tmax
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity				
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost permitted (no commissioning in bedewed state)	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance				
Coolants and lubricants				
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *

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Technical specifications (continued)

Article number	**6AG1223-0BD30-4XB0**	**6AG1223-0BD30-5XB0**	**6AG1223-3AD30-5XB0**	**6AG1223-3BD30-5XB0**
Based on	**6ES7223-0BD30-0XB0**	**6ES7223-0BD30-0XB0**	**6ES7223-3AD30-0XB0**	**6ES7223-3BD30-0XB0**
	SIPLUS S7-1200 SB 1223 2DI/2DQ 24VDC	SIPLUS S7-1200 SB 1223 2DI/2DQ 24VDC	SIPLUS S7-1200 SB 1223 2DI/2DQ 5VDC	SIPLUS S7-1200 SB 1223 2DI/2DQ, 24VDC
Use on ships/at sea				
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Remark				
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating				
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability	Yes; Class 2 for high availability	Yes; Class 2 for high availability	Yes; Class 2 for high availability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

Ordering data

	Article No.
Digital input/output SIPLUS signal board SB 1223	
(Extended temperature range and exposure to media)	
2 inputs, 24 V DC, IEC type 1 current sinking; 2 x 24 V DC transistor outputs, 0.5 A, 5 W; can be used as HSC at up to 30 kHz	
• Suitable for areas with extreme exposure to media (conformal coating)	**6AG1223-0BD30-4XB0**
• Ambient temperature -25 ... +55 °C	**6AG1223-0BD30-5XB0**
2 inputs, 5 V DC, 200 kHz 2 outputs 5 V DC, 0.1 A, 200 kHz	**6AG1223-3AD30-5XB0**
2 inputs, 24 V DC, 200 kHz 2 outputs 24 V DC, 0.1 A, 200 kHz	**6AG1223-3BD30-5XB0**

	Article No.
Accessories	See SIMATIC S7-1200 digital input/output SB 1223, page 3/67

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SM 1231 analog input modules

Overview



- Analog inputs for SIMATIC S7-1200
- Extremely short conversion times
- For the connection of analog sensors without additional amplifiers
- For solving even more complex automation tasks

Technical specifications

Article number	**6ES7231-4HD32-0XB0** Analog Input SM 1231, 4AI	**6ES7231-4HF32-0XB0** Analog Input SM 1231, 8AI	**6ES7231-5ND32-0XB0** Analog Input SM 1231, 4AI 16bit
General information			
Product type designation	SM 1231, AI 4x13 bit	SM 1231, AI 8x13 bit	SM 1231, AI 4x16 bit
Supply voltage			
Rated value (DC)			
• 24 V DC	Yes	Yes	Yes
Input current			
Current consumption, typ.	45 mA	45 mA	65 mA
from backplane bus 5 V DC, typ.	80 mA	90 mA	80 mA
Analog inputs			
Number of analog inputs	4; Current or voltage differential inputs	8; Current or voltage differential inputs	4; Current or voltage differential inputs
permissible input voltage for voltage input (destruction limit), max.	35 V	35 V	±35 V
permissible input current for current input (destruction limit), max.	40 mA	40 mA	40 mA
Cycle time (all channels) max.	625 µs	625 µs	100 µs
Input ranges			
• Voltage	Yes; ±10V, ±5V, ±2.5V	Yes; ±10V, ±5V, ±2.5V	Yes; ±10V, ±5V, ±2.5V or ±1.25V
• Current	Yes; 4 to 20 mA, 0 to 20 mA	Yes; 4 to 20 mA, 0 to 20 mA	Yes; 4 to 20 mA, 0 to 20 mA
• Thermocouple	No	No	No
• Resistance thermometer	No	No	No
• Resistance	No	Yes	No
Input ranges (rated values), voltages			
• -1.25 V to +1.25 V			Yes
• -10 V to +10 V	Yes	Yes	Yes
• -2.5 V to +2.5 V	Yes	Yes	Yes
• -5 V to +5 V	Yes	Yes	Yes
Input ranges (rated values), currents			
• 0 to 20 mA	Yes	Yes	Yes
• 4 mA to 20 mA	Yes	Yes	Yes
Thermocouple (TC)			
Temperature compensation			
- parameterizable		No	

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Technical specifications (continued)

Article number	6ES7231-4HD32-0XB0	6ES7231-4HF32-0XB0	6ES7231-5ND32-0XB0
	Analog Input SM 1231, 4AI	Analog Input SM 1231, 8AI	Analog Input SM 1231, 4AI 16bit
Analog value generation for the inputs			
Integration and conversion time/ resolution per channel			
• Resolution with overrange (bit including sign), max.	12 bit; + sign	12 bit; + sign	15 bit; + sign
• Integration time, parameterizable	Yes	Yes	Yes
• Interference voltage suppression for interference frequency f1 in Hz	40 dB, DC to 60 V for interference frequency 50 / 60 Hz	40 dB, DC to 60 V for interference frequency 50 / 60 Hz	40 dB, DC to 60 V for interference frequency 50 / 60 Hz
Smoothing of measured values			
• parameterizable	Yes	Yes	Yes
• Step: None	Yes	Yes	Yes
• Step: low	Yes	Yes	Yes
• Step: Medium	Yes	Yes	Yes
• Step: High	Yes	Yes	Yes
Errors/accuracies			
Temperature error (relative to input range), (+/-)	25 °C ±0.1%, to 55 °C ±0.2% total measurement range	25 °C ±0.1%, to 55 °C ±0.2% total measurement range	25 °C ±0.1% / ±0.3% total measurement range
Basic error limit (operational limit at 25 °C)			
• Voltage, relative to input range, (+/-)	0.1 %	0.1 %	0.1 %
• Current, relative to input range, (+/-)	0.1 %	0.1 %	0.1 %
Interference voltage suppression for f = n x (f1 +/- 1 %), f1 = interference frequency			
• Common mode voltage, max.	12 V	12 V	12 V
Interrupts/diagnostics/ status information			
Alarms	Yes	Yes	Yes
Diagnostics function	Yes	Yes	Yes
Alarms			
• Diagnostic alarm	Yes	Yes	Yes
Diagnostic messages			
• Monitoring the supply voltage	Yes	Yes	Yes
• Wire-break	Yes	Yes	Yes
Diagnostics indication LED			
• for status of the inputs	Yes	Yes	Yes
• for maintenance	Yes	Yes	Yes
Degree and class of protection			
Degree of protection acc. to EN 60529			
• IP20	Yes	Yes	Yes
Standards, approvals, certificates			
CE mark	Yes	Yes	Yes
CSA approval	Yes	Yes	Yes
FM approval	Yes	Yes	Yes
RCM (formerly C-TICK)	Yes	Yes	Yes
Marine approval	Yes	Yes	Yes
Ambient conditions			
Free fall			
• Fall height, max.	0.3 m; five times, in product package	0.3 m; five times, in product package	0.3 m; five times, in product package
Ambient temperature during operation			
• min.	-20 °C	-20 °C	-20 °C
• max.	60 °C	60 °C	60 °C
Pollutant concentrations			
• SO2 at RH < 60% without condensation	S02: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free	S02: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free	S02: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free

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Technical specifications (continued)

Article number	6ES7231-4HD32-0XB0 Analog Input SM 1231, 4AI	6ES7231-4HF32-0XB0 Analog Input SM 1231, 8AI	6ES7231-5ND32-0XB0 Analog Input SM 1231, 4AI 16bit
Connection method			
required front connector	Yes	Yes	Yes
Mechanics/material			
Enclosure material (front)			
• Plastic	Yes	Yes	Yes
Dimensions			
Width	45 mm	45 mm	45 mm
Height	100 mm	100 mm	100 mm
Depth	75 mm	75 mm	75 mm
Weights			
Weight, approx.	180 g	180 g	180 g

Ordering data

	Article No.
SM 1231 analog input signal module	
4 analog inputs, ±10V, ±5V, ±2.5V, or 0 ... 20 mA, 16 bits	**6ES7231-5ND32-0XB0**
4 analog inputs, ±10V, ±5V, ±2.5V, or 0 ... 20 mA,12 bits + sign	**6ES7231-4HD32-0XB0**
8 analog inputs, ±10V, ±5V, ±2.5V, or 0 ... 20 mA,12 bits + sign	**6ES7231-4HF32-0XB0**
Extension cable for two-tier configuration	**6ES7290-6AA30-0XA0**
For connecting digital/analog signal modules; length 2 m	

	Article No.
Terminal block (spare part)	
For 6ES7231-5ND32-0XB0, 6ES7231-4HD32-0XB0, 6ES7231-4HF32-0XB0	
• With 7 screws, gold-plated; 4 pcs.	**6ES7292-1BG30-0XA0**
Front flap set (spare part)	
For modules with a width of 45 mm	**6ES7291-1BA30-0XA0**

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Overview

- Analog input for SIMATIC S7-1200
- Extremely short conversion times
- For the connection of analog sensors without additional amplifiers
- For solving even more complex automation tasks
- Can be plugged directly into the CPU

Technical specifications

Article number	**6ES7231-4HA30-0XB0**
	Signal Board SB 1231, 1 AI
General information	
Product type designation	SB 1231, AI 1x12 bit
Supply voltage	
Rated value (DC)	
• 24 V DC	Yes
Input current	
from backplane bus 5 V DC, typ.	55 mA
Power loss	
Power loss, typ.	0.4 W
Analog inputs	
Number of analog inputs	1; Current or voltage differential inputs
permissible input voltage for current input (destruction limit), max.	±35 V
permissible input voltage for voltage input (destruction limit), max.	35 V
permissible input current for voltage input (destruction limit), max.	40 mA
permissible input current for current input (destruction limit), max.	40 mA
Cycle time (all channels) max.	156.25 µs; 400 Hz suppression
Input ranges	
• Voltage	Yes; ±10V, ±5V, ±2.5V
• Current	Yes; 0 to 20 mA
• Thermocouple	No
• Resistance thermometer	No
• Resistance	No
Input ranges (rated values), voltages	
• -10 V to +10 V	Yes
• -2.5 V to +2.5 V	Yes
• -5 V to +5 V	Yes
Input ranges (rated values), currents	
• 0 to 20 mA	Yes
Analog outputs	
Number of analog outputs	0
Cable length	
• shielded, max.	100 m; shielded, twisted pair

Article number	**6ES7231-4HA30-0XB0**
	Signal Board SB 1231, 1 AI
Analog value generation for the inputs	
Measurement principle	integrating
Integration and conversion time/ resolution per channel	
• Resolution with overrange (bit including sign), max.	11 bit; + sign
• Integration time, parameterizable	Yes
• Interference voltage suppression for interference frequency f1 in Hz	40 dB, DC to 60 Hz
Smoothing of measured values	
• parameterizable	Yes
• Step: None	Yes
• Step: low	Yes
• Step: Medium	Yes
• Step: High	Yes
Errors/accuracies	
Temperature error (relative to input range), (+/-)	25 °C ±0.3%, to 55 °C ±0.6% total measurement range
Interrupts/diagnostics/ status information	
Alarms	Yes
Diagnostics function	Yes
Alarms	
• Diagnostic alarm	Yes
Diagnostic messages	
• Wire-break	No
Diagnostics indication LED	
• for status of the inputs	Yes
• for maintenance	Yes
Degree and class of protection	
Degree of protection acc. to EN 60529	
• IP20	Yes
Standards, approvals, certificates	
CE mark	Yes
CSA approval	Yes
FM approval	Yes
RCM (formerly C-TICK)	Yes

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Technical specifications (continued)

Article number	**6ES7231-4HA30-0XB0** Signal Board SB 1231, 1 AI
Ambient conditions	
Free fall	
• Fall height, max.	0.3 m; five times, in product package
Ambient temperature during operation	
• min.	-20 °C
• max.	60 °C
Pollutant concentrations	
• SO2 at RH < 60% without condensation	S02: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free
Connection method	
required front connector	Yes
Mechanics/material	
Enclosure material (front)	
• Plastic	Yes
Dimensions	
Width	38 mm
Height	62 mm
Depth	21 mm
Weights	
Weight, approx.	35 g

Ordering data

	Article No.
SB 1231 signal board analog input module	
1 analog input, ±10 V with 12 bits or 0 ... 20 mA with 11 bits	**6ES7231-4HA30-0XB0**
Terminal block (spare part)	
for signal board	
with 6 screws, gold-plated; 4 pcs.	**6ES7292-1BF30-0XA0**

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Overview



- Analog outputs for SIMATIC S7-1200
- Extremely short conversion times
- For connecting analog actuators without additional amplifiers
- For solving even more complex automation tasks

Technical specifications

Article number	**6ES7232-4HB32-0XB0** Analog Output SM 1232, 2AQ	**6ES7232-4HD32-0XB0** Analog Output SM 1232, 4AQ
General information		
Product type designation	SM 1232, AQ 2x14 bit	SM 1232, AQ 4x14 bit
Supply voltage		
Rated value (DC)		
• 24 V DC	Yes	Yes
Input current		
Current consumption, typ.	45 mA	45 mA
from backplane bus 5 V DC, typ.	80 mA	80 mA
Analog outputs		
Number of analog outputs	2; Current or voltage	4; Current or voltage
Output ranges, voltage		
• -10 V to +10 V	Yes	Yes
Output ranges, current		
• 0 to 20 mA	Yes	Yes
Load impedance (in rated range of output)		
• with voltage outputs, min.	1 000 Ω	1 000 Ω
• with current outputs, max.	600 Ω	600 Ω
Cable length		
• shielded, max.	100 m; shielded, twisted pair	100 m; shielded, twisted pair
Analog value generation for the outputs		
Integration and conversion time/ resolution per channel		
• Resolution (incl. overrange)	Voltage: 14 bit; Current : 13 bit	Voltage: 14 bit; Current : 13 bit
Errors/accuracies		
Temperature error (relative to output range), (+/-)	25 °C ±0.3%, to 55 °C ±0.6% total measurement range	25 °C ±0.3%, to 55 °C ±0.6% total measurement range
Basic error limit (operational limit at 25 °C)		
• Voltage, relative to output range, (+/-)	0.3 %	0.3 %
• Current, relative to output range, (+/-)	0.3 %	0.3 %
Interference voltage suppression for f = n x (f1 +/- 1 %), f1 = interference frequency		
• Common mode voltage, max.	12 V	12 V

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Technical specifications (continued)

Article number	**6ES7232-4HB32-0XB0** Analog Output SM 1232, 2AQ	**6ES7232-4HD32-0XB0** Analog Output SM 1232, 4AQ
Interrupts/diagnostics/ status information		
Alarms	Yes	Yes
Diagnostics function	Yes	Yes
Alarms		
• Diagnostic alarm	Yes	Yes
Diagnostic messages		
• Monitoring the supply voltage	Yes	Yes
• Wire-break	Yes	Yes
• Short-circuit	Yes	Yes
Diagnostics indication LED		
• for status of the outputs	Yes	Yes
• for maintenance	Yes	Yes
Degree and class of protection		
Degree of protection acc. to EN 60529		
• IP20	Yes	Yes
Standards, approvals, certificates		
CE mark	Yes	Yes
CSA approval	Yes	Yes
FM approval	Yes	Yes
RCM (formerly C-TICK)	Yes	Yes
Ambient conditions		
Free fall		
• Fall height, max.	0.3 m; five times, in product package	0.3 m; five times, in product package
Ambient temperature during operation		
• min.	-20 °C	-20 °C
• max.	60 °C	60 °C
Pollutant concentrations		
• SO2 at RH < 60% without condensation	S02: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free	S02: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free
Connection method		
required front connector	Yes	Yes
Mechanics/material		
Enclosure material (front)		
• Plastic	Yes	Yes
Dimensions		
Width	45 mm	45 mm
Height	100 mm	100 mm
Depth	75 mm	75 mm
Weights		
Weight, approx.	180 g	180 g

Ordering data

	Article No.
SM 1232 analog output signal module	
2 analog outputs, ±10 V with 14 bits or 0 ... 20 mA with 13 bits	**6ES7232-4HB32-0XB0**
4 analog outputs, ±10 V with 14 bits or 0 ... 20 mA with 13 bits	**6ES7232-4HD32-0XB0**
Terminal block (spare part)	
For 6ES7232-4HB32-0XB0, 6ES7232-4HD32-0XB0	
with 7 screws, gold-plated; 4 units	**6ES7292-1BG30-0XA0**
Extension cable for two-tier configuration	**6ES7290-6AA30-0XA0**
for connecting digital/analog signal modules; length 2 m	
Front flap set (spare part)	
For modules with a width of 45 mm	**6ES7291-1BA30-0XA0**

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Overview



- Analog output for SIMATIC S7-1200
- Can be plugged directly into the CPU

Technical specifications

Article number	**6ES7232-4HA30-0XB0** Signal Board SB 1232, 1 AQ
General information	
Product type designation	SB 1232, AQ 1x12 bit
Input current	
from backplane bus 5 V DC, typ.	15 mA
Output voltage	
Power supply to the transmitters	
• Supply current, max.	25 mA
Power loss	
Power loss, typ.	1.5 W
Analog inputs	
Number of analog inputs	0
Analog outputs	
Number of analog outputs	1
Cycle time (all channels) max.	Voltage: 300 µS (R), 750 µS (1 uF) Current: 600 ms (1 mH); 2 ms (10 mH)
Output ranges, voltage	
• -10 V to +10 V	Yes
Output ranges, current	
• 0 to 20 mA	Yes
Load impedance (in rated range of output)	
• with voltage outputs, min.	1 000 Ω
• with current outputs, max.	600 Ω
Cable length	
• shielded, max.	100 m; shielded, twisted pair

Article number	**6ES7232-4HA30-0XB0** Signal Board SB 1232, 1 AQ
Analog value generation for the outputs	
Conversion principle	Differential
Integration and conversion time/ resolution per channel	
• Resolution with overrange (bit including sign), max.	12 bit
Errors/accuracies	
Temperature error (relative to output range), (+/-)	25 °C ±0.5%, to 55 °C ±1%
Interrupts/diagnostics/ status information	
Alarms	Yes
Diagnostics function	Yes
Diagnostics indication LED	
• for status of the outputs	Yes
Degree and class of protection	
Degree of protection acc. to EN 60529	
• IP20	Yes
Standards, approvals, certificates	
CE mark	Yes
CSA approval	Yes
FM approval	Yes
RCM (formerly C-TICK)	Yes
Ambient conditions	
Free fall	
• Fall height, max.	0.3 m; five times, in product package
Ambient temperature during operation	
• min.	-20 °C
• max.	60 °C

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SB 1232 analog output modules

Technical specifications (continued)

Article number	**6ES7232-4HA30-0XB0**
	Signal Board SB 1232, 1 AQ
Pollutant concentrations	
• SO2 at RH < 60% without condensation	S02: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free
Mechanics/material	
Enclosure material (front)	
• Plastic	Yes
Dimensions	
Width	38 mm
Height	62 mm
Depth	21 mm
Weights	
Weight, approx.	40 g

Ordering data

	Article No.
SB 1232 analog output signal board	
1 analog output, ±10 V with 12 bits or 0 ... 20 mA with 11 bits	**6ES7232-4HA30-0XB0**
Terminal block (spare part)	
for signal board	
with 6 screws, gold-plated; 4 pcs.	**6ES7292-1BF30-0XA0**

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Overview



- Analog inputs and outputs for the SIMATIC S7-1200
- Extremely short conversion times
- For connecting analog actuators and sensors without additional amplifiers
- For solving even more complex automation tasks

Technical specifications

Article number	**6ES7234-4HE32-0XB0** Analog I/O SM 1234, 4AI/2AQ
General information	
Product type designation	SM 1234, AI 4x13 bit/AQ 2x14 bit
Supply voltage	
Rated value (DC)	
• 24 V DC	Yes
Input current	
Current consumption, typ.	60 mA
from backplane bus 5 V DC, typ.	80 mA
Analog inputs	
Number of analog inputs	4; Current or voltage differential inputs
permissible input voltage for voltage input (destruction limit), max.	35 V
permissible input current for current input (destruction limit), max.	40 mA
Cycle time (all channels) max.	625 µs
Input ranges	
• Voltage	Yes; ±10V, ±5V, ±2.5V
• Current	Yes; 4 to 20 mA, 0 to 20 mA
Input ranges (rated values), voltages	
• -10 V to +10 V	Yes
• -2.5 V to +2.5 V	Yes
• -5 V to +5 V	Yes
Input ranges (rated values), currents	
• 0 to 20 mA	Yes
• 4 mA to 20 mA	Yes
Analog outputs	
Number of analog outputs	2; Current or voltage
Output ranges, voltage	
• -10 V to +10 V	Yes
Output ranges, current	
• 0 to 20 mA	Yes
• 4 mA to 20 mA	Yes
Load impedance (in rated range of output)	
• with voltage outputs, min.	1 000 Ω
• with current outputs, max.	600 Ω
Cable length	
• shielded, max.	100 m; shielded, twisted pair

Article number	**6ES7234-4HE32-0XB0** Analog I/O SM 1234, 4AI/2AQ
Analog value generation for the inputs	
Measurement principle	Differential
Integration and conversion time/ resolution per channel	
• Resolution with overrange (bit including sign), max.	12 bit; + sign
• Integration time, parameterizable	Yes
• Interference voltage suppression for interference frequency f1 in Hz	40 dB, DC to 60 V for interference frequency 50 / 60 Hz
Smoothing of measured values	
• parameterizable	Yes
• Step: None	Yes
• Step: low	Yes
• Step: Medium	Yes
• Step: High	Yes
Analog value generation for the outputs	
Integration and conversion time/ resolution per channel	
• Resolution (incl. overrange)	Voltage: 14 bit; Current : 13 bit
Errors/accuracies	
Temperature error (relative to input range), (+/-)	25 °C ±0.1%, to 55 °C ±0.2% total measurement range
Temperature error (relative to output range), (+/-)	25 °C ±0.3%, to 55 °C ±0.6% total measurement range
Basic error limit (operational limit at 25 °C)	
• Voltage, relative to input range, (+/-)	0.1 %
• Current, relative to input range, (+/-)	0.1 %
• Voltage, relative to output range, (+/-)	0.3 %
• Current, relative to output range, (+/-)	0.3 %
Interference voltage suppression for f = n x (f1 +/- 1 %), f1 = interference frequency	
• Common mode voltage, max.	12 V

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Technical specifications (continued)

Article number	6ES7234-4HE32-0XB0 Analog I/O SM 1234, 4AI/2AQ
Interrupts/diagnostics/ status information	
Alarms	Yes
Diagnostics function	Yes
Alarms	
• Diagnostic alarm	Yes
Diagnostic messages	
• Monitoring the supply voltage	Yes
• Wire-break	Yes
• Short-circuit	Yes
Diagnostics indication LED	
• for status of the inputs	Yes
• for status of the outputs	Yes
• for maintenance	Yes
Potential separation analog outputs	
• between the channels and the power supply of the electronics	No
Degree and class of protection	
Degree of protection acc. to EN 60529	
• IP20	Yes
Standards, approvals, certificates	
CE mark	Yes
CSA approval	Yes
FM approval	Yes
RCM (formerly C-TICK)	Yes
Marine approval	Yes
Ambient conditions	
Free fall	
• Fall height, max.	0.3 m; five times, in product package
Ambient temperature during operation	
• min.	-20 °C
• max.	60 °C
Pollutant concentrations	
• SO2 at RH < 60% without condensation	S02: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free
Connection method	
required front connector	Yes
Mechanics/material	
Enclosure material (front)	
• Plastic	Yes
Dimensions	
Width	45 mm
Height	100 mm
Depth	75 mm
Weights	
Weight, approx.	220 g

Ordering data

	Article No.
SM 1234 analog input/output signal module	
4 analog inputs, ±10 V, ±5 V, ±2.5 V, or 0 ... 20 mA, 12 bits + sign; 2 analog outputs, ±10 V with 14 bits or 0 ... 20 mA with 13 bits	**6ES7234-4HE32-0XB0**
Terminal block (spare part)	
For 6ES7234-4HE32-0XB0	
with 7 screws, gold-plated; 4 pcs.	**6ES7292-1BG30-0XA0**
Extension cable for two-tier configuration	**6ES7290-6AA30-0XA0**
for connecting digital/analog signal modules; length 2 m	
Front flap set (spare part)	
For modules with a width of 45 mm	**6ES7291-1BA30-0XA0**

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Overview

- For the convenient recording of temperatures with great accuracy
- 7 common thermocouple types can be used
- Also for the measurement of analog signals with a low level (±80 mV)
- Can easily be retrofitted to existing plant

Technical specifications

Article number	**6ES7231-5QD32-0XB0**	**6ES7231-5QF32-0XB0**
	S7-1200, Analog Input SM 1231 TC, 4 AI	S7-1200, Analog Input SM 1231 TC, 8 AI
General information		
Product type designation	SM 1231, AI 4x16 bit TC	SM 1231, AI 8x16 bit TC
Supply voltage		
Rated value (DC)		
• 24 V DC	Yes	Yes
Input current		
Current consumption, typ.	40 mA	40 mA
from backplane bus 5 V DC, typ.	80 mA	80 mA
Analog inputs		
Number of analog inputs	4; Thermocouples	8; Thermocouples
permissible input voltage for voltage input (destruction limit), max.	±35 V	±35 V
Technical unit for temperature measurement adjustable	Degrees Celsius/degrees Fahrenheit	Degrees Celsius/degrees Fahrenheit
Input ranges		
• Voltage	Yes	Yes
• Current	No	No
• Thermocouple	Yes; J, K, T, E, R, S, N, C, TXK/XK(L); voltage range: ±80 mV	Yes; J, K, T, E, R & S, B, N, C, TXK/XK(L); voltage range: ±80 mV
• Resistance thermometer	No	No
• Resistance	No	No
Input ranges (rated values), voltages		
• -80 mV to +80 mV	Yes	Yes
Input ranges (rated values), thermocouples		
• Type B	Yes	Yes
• Type C	Yes	Yes
• Type E	Yes	Yes
• Type J	Yes	Yes
• Type K	Yes	Yes
• Type N	Yes	Yes
• Type R	Yes	Yes
• Type S	Yes	Yes
• Type T	Yes	Yes
• Type TXK/TXK(L) to GOST	Yes	Yes
Thermocouple (TC)		
Temperature compensation		
- parameterizable	No	No

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Technical specifications (continued)

Article number	**6ES7231-5QD32-0XB0** S7-1200, Analog Input SM 1231 TC, 4 AI	**6ES7231-5QF32-0XB0** S7-1200, Analog Input SM 1231 TC, 8 AI
Analog value generation for the inputs		
Measurement principle	integrating	integrating
Integration and conversion time/ resolution per channel		
• Resolution with overrange (bit including sign), max.	15 bit; + sign	15 bit; + sign
• Integration time, parameterizable	No	No
• Interference voltage suppression for interference frequency f1 in Hz	85 dB at 50 / 60 / 400 Hz	85 dB at 50 / 60 / 400 Hz
Smoothing of measured values		
• parameterizable	Yes	Yes
Errors/accuracies		
Temperature error (relative to input range), (+/-)	25 °C ±0.1%, to 55 °C ±0.2% total measurement range	25 °C ±0.1%, to 55 °C ±0.2% total measurement range
Repeat accuracy in steady state at 25 °C (relative to output range), (+/-)	0.5 %	0.5 %
Interference voltage suppression for f = n x (f1 +/- 1 %), f1 = interference frequency		
• Common mode interference, min.	120 dB	120 dB
Interrupts/diagnostics/ status information		
Alarms	Yes	Yes
Diagnostics function	Yes; Can be read out	Yes; Can be read out
Alarms		
• Diagnostic alarm	Yes	Yes
Diagnostic messages		
• Monitoring the supply voltage	Yes	Yes
• Wire-break	Yes	Yes
Diagnostics indication LED		
• for status of the inputs	Yes	Yes
• for maintenance	Yes	Yes
Degree and class of protection		
Degree of protection acc. to EN 60529		
• IP20	Yes	Yes
Standards, approvals, certificates		
CE mark	Yes	Yes
CSA approval	Yes	Yes
FM approval	Yes	Yes
RCM (formerly C-TICK)	Yes	Yes
Ambient conditions		
Free fall		
• Fall height, max.	0.3 m; five times, in product package	0.3 m; five times, in product package
Ambient temperature during operation		
• min.	-20 °C	-20 °C
• max.	60 °C	60 °C
Pollutant concentrations		
• SO2 at RH < 60% without condensation	S02: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free	S02: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free
Connection method		
required front connector	Yes	Yes

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Technical specifications (continued)

Article number	**6ES7231-5QD32-0XB0** S7-1200, Analog Input SM 1231 TC, 4 AI	**6ES7231-5QF32-0XB0** S7-1200, Analog Input SM 1231 TC, 8 AI
Mechanics/material		
Enclosure material (front)		
• Plastic	Yes	Yes
Dimensions		
Width	45 mm	45 mm
Height	100 mm	100 mm
Depth	75 mm	75 mm
Weights		
Weight, approx.	180 g	220 g

Ordering data

	Article No.
SM 1231 thermocouple module	
4 inputs +/- 80 mV, resolution 15 bits + sign, thermocouple types J, K, S, T, R, E, N	**6ES7231-5QD32-0XB0**
8 inputs +/- 80 mV, resolution 15 bits + sign, thermocouple types J, K, T, E, R, S, N, C, TXK/XK(L)	**6ES7231-5QF32-0XB0**
Accessories	
Terminal block (spare part)	
For 6ES7231-5QD32-0XB0, 6ES7231-5QF32-0XB0	
With 7 screws, gold-plated; 4 units	**6ES7292-1BG30-0XA0**
Extension cable for two-tier configuration	**6ES7290-6AA30-0XA0**
for connecting digital/analog signal modules; length 2 m	
Front flap set (spare part)	
For modules with a width of 45 mm	**6ES7291-1BA30-0XA0**

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SB 1231 thermocouple signal board

Overview

- For the convenient recording of temperatures with great accuracy
- 1 input with 16-bit resolution
- Common thermocouple types can be used
- Also for the measurement of analog signals with a low level (±80 mV)
- Can easily be retrofitted to existing plant
- Can be plugged directly into the CPU

Technical specifications

Article number	**6ES7231-5QA30-0XB0**
	Signal Board SB 1231 TC, 1 AI
General information	
Product type designation	SB 1231, AI 1x16 bit TC
Supply voltage	
Rated value (DC)	
• 24 V DC	Yes
Input current	
Current consumption, typ.	5 mA
from backplane bus 5 V DC, typ.	20 mA
Power loss	
Power loss, typ.	0.5 W
Analog inputs	
Number of analog inputs	1; Thermocouples
permissible input voltage for current input (destruction limit), max.	±35 V
permissible input voltage for voltage input (destruction limit), max.	±35 V
Technical unit for temperature measurement adjustable	Degrees Celsius/degrees Fahrenheit
Input ranges	
• Voltage	Yes
• Current	No
• Thermocouple	Yes; J, K, T, E, R & S, B, N, C, TXK/XK(L); voltage range: ±80 mV
• Resistance thermometer	No
• Resistance	No
Input ranges (rated values), voltages	
• -80 mV to +80 mV	Yes
Input ranges (rated values), thermocouples	
• Type J	Yes
• Type K	Yes
Thermocouple (TC)	
Temperature compensation	
- parameterizable	No
Analog outputs	
Number of analog outputs	0
Cable length	
• shielded, max.	100 m; shielded, twisted pair

Article number	**6ES7231-5QA30-0XB0**
	Signal Board SB 1231 TC, 1 AI
Analog value generation for the inputs	
Measurement principle	integrating
Integration and conversion time/ resolution per channel	
• Resolution with overrange (bit including sign), max.	15 bit; + sign
• Integration time, parameterizable	No
• Interference voltage suppression for interference frequency f1 in Hz	85 dB at 10 / 50 / 60 / 400 Hz
Smoothing of measured values	
• parameterizable	Yes
Errors/accuracies	
Temperature error (relative to input range), (+/-)	25 °C ±0.1%, to 55 °C ±0.2% total measurement range
Repeat accuracy in steady state at 25 °C (relative to output range), (+/-)	0.5 %
Interference voltage suppression for f = n x (f1 +/- 1 %), f1 = interference frequency	
• Common mode interference, min.	120 dB
Interrupts/diagnostics/ status information	
Alarms	Yes
Diagnostics function	Yes; Can be read out
Alarms	
• Diagnostic alarm	Yes
Diagnostic messages	
• Wire-break	Yes
Diagnostics indication LED	
• for status of the inputs	Yes
• for maintenance	Yes
Degree and class of protection	
Degree of protection acc. to EN 60529	
• IP20	Yes
Standards, approvals, certificates	
CE mark	Yes
CSA approval	Yes
FM approval	Yes
RCM (formerly C-TICK)	Yes

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Technical specifications (continued)

Article number	**6ES7231-5QA30-0XB0** Signal Board SB 1231 TC, 1 AI
Ambient conditions	
Free fall	
• Fall height, max.	0.3 m; five times, in product package
Ambient temperature during operation	
• min.	-20 °C
• max.	60 °C
Pollutant concentrations	
• SO2 at RH < 60% without condensation	S02: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free
Connection method	
required front connector	Yes
Mechanics/material	
Enclosure material (front)	
• Plastic	Yes
Dimensions	
Width	38 mm
Height	62 mm
Depth	21 mm
Weights	
Weight, approx.	35 g

Ordering data

	Article No.
SB 1231 thermocouple signal board	**6ES7231-5QA30-0XB0**
1 input +/- 80 mV, resolution 15 bits + sign, thermocouples type J, K	
Accessories	
Terminal block (spare part)	
for signal board	
with 6 screws, gold-plated; 4 pcs.	**6ES7292-1BF30-0XA0**

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SM 1231 RTD signal module

Overview

- For the convenient recording of temperatures with great accuracy
- 4 inputs
- Most popular resistance temperature sensors can be used
- Can easily be retrofitted to existing installation

Technical specifications

Article number	**6ES7231-5PD32-0XB0**	**6ES7231-5PF32-0XB0**
	S7-1200, Analog Input SM 1231 RTD, 4 AI	S7-1200, Analog Input SM 1231 RTD, 8 AI
General information		
Product type designation	SM 1231, AI 4x16 bit RTD	SM 1231, AI 8x16 bit RTD
Supply voltage		
Rated value (DC)		
• 24 V DC	Yes	Yes
Input current		
Current consumption, typ.	40 mA	40 mA
from backplane bus 5 V DC, typ.	80 mA	80 mA
Analog inputs		
Number of analog inputs	4; Resistance thermometer	8; Resistance thermometer
permissible input voltage for voltage input (destruction limit), max.	±35 V	±35 V
Technical unit for temperature measurement adjustable	Degrees Celsius/degrees Fahrenheit	Degrees Celsius/degrees Fahrenheit
Input ranges		
• Voltage	No	No
• Current	No	No
• Thermocouple	No	No
• Resistance thermometer	Yes; Resistance-type transmitter: Pt10, Pt50, Pt100, Pt200, Pt500, Pt1000, Ni100, Ni120, Ni200, Ni500, Ni1000, Cu10, Cu50, Cu100, LG-Ni1000	Yes; Resistance-type transmitter: Pt10, Pt50, Pt100, Pt200, Pt500, Pt1000, Ni100, Ni120, Ni200, Ni500, Ni1000, Cu10, Cu50, Cu100, LG-Ni1000
• Resistance	Yes; 150 Ω, 300 Ω, 600 Ω	Yes; 150 Ω, 300 Ω, 600 Ω
Input ranges (rated values), resistance thermometer		
• Cu 10	Yes	Yes
• Ni 100	Yes	Yes
• Ni 1000	Yes	Yes
• LG-Ni 1000	Yes	Yes
• Ni 120	Yes	Yes
• Ni 200	Yes	Yes
• Ni 500	Yes	Yes
• Pt 100	Yes	Yes
• Pt 1000	Yes	Yes
• Pt 200	Yes	Yes
• Pt 500	Yes	Yes
Input ranges (rated values), resistors		
• 0 to 150 ohms	Yes	Yes
• 0 to 300 ohms	Yes	Yes
• 0 to 600 ohms	Yes	Yes
Thermocouple (TC)		
Temperature compensation		
- parameterizable	No	No

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Technical specifications (continued)

Article number	**6ES7231-5PD32-0XB0** S7-1200, Analog Input SM 1231 RTD, 4 AI	**6ES7231-5PF32-0XB0** S7-1200, Analog Input SM 1231 RTD, 8 AI
Analog value generation for the inputs		
Measurement principle	integrating	integrating
Integration and conversion time/ resolution per channel		
• Resolution with overrange (bit including sign), max.	15 bit; + sign	15 bit; + sign
• Integration time, parameterizable	No	No
• Interference voltage suppression for interference frequency f1 in Hz	85 dB at 50 / 60 / 400 Hz	85 dB at 50 / 60 / 400 Hz
Errors/accuracies		
Temperature error (relative to input range), (+/-)	25 °C ±0.1%, to 55 °C ±0.2% total measurement range	25 °C ±0.1%, to 55 °C ±0.2% total measurement range
Repeat accuracy in steady state at 25 °C (relative to output range), (+/-)	0.05 %	0.05 %
Interference voltage suppression for f = n x (f1 +/- 1 %), f1 = interference frequency		
• Common mode interference, min.	120 dB	120 dB
Interrupts/diagnostics/ status information		
Alarms	Yes	Yes
Diagnostics function	Yes; Can be read out	Yes; Can be read out
Alarms		
• Diagnostic alarm	Yes	Yes
Diagnostic messages		
• Monitoring the supply voltage	Yes	Yes
• Wire-break	Yes	Yes
Diagnostics indication LED		
• for status of the inputs	Yes	Yes
• for maintenance	Yes	Yes
Degree and class of protection		
Degree of protection acc. to EN 60529		
• IP20	Yes	Yes
Standards, approvals, certificates		
CE mark	Yes	Yes
CSA approval	Yes	Yes
FM approval	Yes	Yes
RCM (formerly C-TICK)	Yes	Yes
Ambient conditions		
Free fall		
• Fall height, max.	0.3 m; five times, in product package	0.3 m; five times, in product package
Ambient temperature during operation		
• min.	-20 °C	-20 °C
• max.	60 °C	60 °C
Pollutant concentrations		
• SO2 at RH < 60% without condensation	S02: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free	S02: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free
Connection method		
required front connector	Yes	Yes
Mechanics/material		
Enclosure material (front)		
• Plastic	Yes	Yes
Dimensions		
Width	45 mm	70 mm
Height	100 mm	100 mm
Depth	75 mm	75 mm
Weights		
Weight, approx.	220 g	220 g

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SM 1231 RTD signal module

Ordering data

	Article No.
SM 1231 RTD signal module	
4 inputs for resistance temperature sensors Pt10/50/100/200/500/1000, Ni100/120/200/500/1000, Cu10/50/100, LG-Ni1000; resistance 150/300/600 ohms, resolution 15 bits + sign	**6ES7231-5PD32-0XB0**
8 inputs for resistance temperature sensors Pt10/50/100/200/500/1000, Ni100/120/200/500/1000, Cu10/50/100, LG-Ni1000; resistance 150/300/600 ohms, resolution 15 bits + sign	**6ES7231-5PF32-0XB0**

	Article No.
Accessories	
Terminal block (spare part)	
For 6ES7231-5PD32-0XB0	
• With 7 screws, gold-plated; 4 units	**6ES7292-1BG30-0XA0**
For 6ES7231-5PF32-0XB0	
• With 11 screws, gold-plated; 4 units	**6ES7292-1BL30-0XA0**
Extension cable for two-tier configuration	**6ES7290-6AA30-0XA0**
for connecting digital/analog signal modules; length 2 m	
Front flap set (spare part)	
For modules with a width of 45 mm	**6ES7291-1BA30-0XA0**
For modules with a width of 70 mm	**6ES7291-1BB30-0XA0**

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Overview

- For the convenient recording of temperatures with great accuracy
- 1 input with 16-bit resolution
- Common resistance temperature sensors can be used
- Can easily be retrofitted to existing plant
- Can be plugged directly into the CPU

Technical specifications

Article number	**6ES7231-5PA30-0XB0**
	Signal Board SB 1231 RTD
General information	
Product type designation	SB 1231, AI 1x16 bit RTD
Supply voltage	
Rated value (DC)	
• 24 V DC	Yes
Input current	
Current consumption, typ.	5 mA
from backplane bus 5 V DC, typ.	20 mA
Power loss	
Power loss, typ.	0.5 W
Analog inputs	
Number of analog inputs	1; Resistance thermometer
permissible input voltage for current input (destruction limit), max.	±35 V
Technical unit for temperature measurement adjustable	Degrees Celsius/degrees Fahrenheit
Input ranges	
• Voltage	Yes
• Current	No
• Thermocouple	No
• Resistance thermometer	Yes; Platinum (Pt)
• Resistance	Yes; 150 Ω, 300 Ω, 600 Ω
Input ranges (rated values), resistance thermometer	
• Pt 100	Yes
• Pt 1000	Yes
• Pt 200	Yes
• Pt 500	Yes
Input ranges (rated values), resistors	
• 0 to 150 ohms	Yes
• 0 to 300 ohms	Yes
• 0 to 600 ohms	Yes
Thermocouple (TC)	
Temperature compensation	
- parameterizable	No
Analog outputs	
Number of analog outputs	0
Cable length	
• shielded, max.	100 m; shielded, twisted pair

Article number	**6ES7231-5PA30-0XB0**
	Signal Board SB 1231 RTD
Analog value generation for the inputs	
Measurement principle	integrating
Integration and conversion time/ resolution per channel	
• Resolution with overrange (bit including sign), max.	15 bit; + sign
• Integration time, parameterizable	No
• Interference voltage suppression for interference frequency f1 in Hz	85 dB at 10 / 50 / 60 / 400 Hz
Errors/accuracies	
Temperature error (relative to input range), (+/-)	25 °C ±0.1%, to 55 °C ±0.2% total measurement range
Repeat accuracy in steady state at 25 °C (relative to output range), (+/-)	0.05 %
Interference voltage suppression for f = n x (f1 +/- 1 %), f1 = interference frequency	
• Common mode interference, min.	120 dB
Interrupts/diagnostics/ status information	
Alarms	Yes
Diagnostics function	Yes; Can be read out
Alarms	
• Diagnostic alarm	Yes
Diagnostic messages	
• Wire-break	Yes
Diagnostics indication LED	
• for status of the inputs	Yes
• for maintenance	Yes
Degree and class of protection	
Degree of protection acc. to EN 60529	
• IP20	Yes
Standards, approvals, certificates	
CE mark	Yes
CSA approval	Yes
FM approval	Yes
RCM (formerly C-TICK)	Yes

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Technical specifications (continued)

Article number	**6ES7231-5PA30-0XB0** Signal Board SB 1231 RTD
Ambient conditions	
Free fall	
• Fall height, max.	0.3 m; five times, in product package
Ambient temperature during operation	
• min.	-20 °C
• max.	60 °C
Pollutant concentrations	
• SO2 at RH < 60% without condensation	S02: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free
Connection method	
required front connector	Yes
Mechanics/material	
Enclosure material (front)	
• Plastic	Yes
Dimensions	
Width	38 mm
Height	62 mm
Depth	21 mm
Weights	
Weight, approx.	35 g

Ordering data

	Article No.
RTD signal board SB 1231	**6ES7231-5PA30-0XB0**
1 input for resistance temperature sensors Pt 100, Pt 200, Pt 500, Pt 1000, resolution 15 bits + sign	
Accessories	
Terminal block (spare part)	
for signal board	
with 6 screws, gold-plated; 4 pcs.	**6ES7292-1BF30-0XA0**

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Overview

- Energy management based on SIMATIC S7-1200
- Data acquisition of electrical characteristics in 1 and 3-phase networks up to 480 V AC
- Direct connection of voltage inputs
- Current measurement performed by 1 A and 5 A current transformers
- Can be used in TN and TT networks
- Data backup of measurement data in the event of a power failure

Technical specifications

Article number	**6ES7238-5XA32-0XB0**
	SM 1238 Energy Meter 480V AC
General information	
Product type designation	SM 1238, AI energy meter 480 V AC
Product function	
• Voltage measurement	Yes
- with voltage transformer	Yes
• Current measurement	Yes
- without current transformer	No
- with current transformer	Yes
• Energy measurement	Yes
• Frequency measurement	Yes
• Power measurement	Yes
• Active power measurement	Yes
• Reactive power measurement	Yes
• I&M data	Yes; I&M 0
• Isochronous mode	No
Engineering with	
• STEP 7 TIA Portal configurable/ integrated as of version	V13 SP1
Operating mode	
• cyclic measurement	Yes
• acyclic measurement	Yes
• Acyclic measured value access	Yes
• Fixed measured value sets	Yes
• Freely definable measured value sets	No
CiR – Configuration in RUN	
Reparameterization possible in RUN	Yes
Calibration possible in RUN	Yes
Installation type/mounting	
Mounting position	Horizontal, vertical
Supply voltage	
Design of the power supply	from CPU
Type of supply voltage	DC
Input current	
Current consumption, max.	180 mA
Power loss	
Power loss, typ.	0.75 W
Address area	
Address space per module	
• Address space per module, max.	124 byte; 112 byte input / 12 byte output

Article number	**6ES7238-5XA32-0XB0**
	SM 1238 Energy Meter 480V AC
Analog inputs	
Cycle time (all channels), typ.	50 ms; Time for consistent update of all measured and calculated values (cyclic and acyclic data)
Interrupts/diagnostics/ status information	
Alarms	
• Diagnostic alarm	Yes
• Limit value alarm	Yes
• Hardware interrupt	No
Diagnostics indication LED	
• Monitoring of the supply voltage (PWR-LED)	Yes
• Channel status display	Yes; Green LED
• for channel diagnostics	Yes; red Fn LED
• for module diagnostics	Yes; green/red DIAG LED
Integrated Functions	
Measuring functions	
• Measuring procedure for voltage measurement	TRMS
• Measuring procedure for current measurement	TRMS
• Type of measured value acquisition	seamless
• Curve shape of voltage	Sinusoidal or distorted
• Buffering of measured variables	Yes
• Parameter length	74 byte
• Bandwidth of measured value acquisition	2 kHz; Harmonics: 39 / 50 Hz, 32 / 60 Hz
Measuring range	
- Frequency measurement, min.	45 Hz
- Frequency measurement, max.	65 Hz
Measuring inputs for voltage	
- Measurable line voltage between phase and neutral conductor	277 V
- Measurable line voltage between the line conductors	480 V
- Measurable line voltage between phase and neutral conductor, min.	0 V
- Measurable line voltage between phase and neutral conductor, max.	293 V
- Measurable line voltage between the line conductors, min.	0 V
- Measurable line voltage between the line conductors, max.	508 V
- Measurement category for voltage measurement in accordance with IEC 61010-2-030	CAT II; CAT III in case of guaranteed protection level of 1.5 kV
- Internal resistance line conductor and neutral conductor	3.4 MΩ
- Power consumption per phase	20 mW
- Impulse voltage resistance 1,2/50µs	1 kV

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SM 1238 Energy Meter 480 V AC analog input modules

Technical specifications (continued)

Article number	**6ES7238-5XA32-0XB0**
	SM 1238 Energy Meter 480V AC
Measuring inputs for current	
- measurable relative current (AC), min.	1 %; Relative to the secondary rated current 5 A
- measurable relative current (AC), max.	100 %; Relative to the secondary rated current 5 A
- Continuous current with AC, maximum permissible	5 A
- Apparent power consumption per phase for measuring range 5 A	0.6 V·A
- Rated value short-time withstand current restricted to 1 s	100 A
- Input resistance measuring range 0 to 5 A	25 mΩ; At the terminal
- Zero point suppression	Parameterizable: 2 ... 250 mA, default 50 mA
- Surge strength	10 A; for 1 minute
Accuracy class according to IEC 61557-12	
- Measured variable voltage	0,2
- Measured variable current	0,2
- Measured variable apparent power	0.5
- Measured variable active power	0.5
- Measured variable reactive power	1
- Measured variable power factor	0.5
- Measured variable active energy	0.5
- Measured variable reactive energy	1
- Measured variable neutral current	0.5; calculated
- Measured variable phase angle	±1 °; not covered by IEC 61557-12
- Measured variable frequency	0.05
Potential separation	
Potential separation channels	
• between the channels and backplane bus	Yes; 3 700V AC (type test) CAT III
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-20 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	-20 °C
• vertical installation, max.	50 °C
Dimensions	
Width	45 mm
Height	100 mm
Depth	75 mm
Weights	
Weight (without packaging)	165 g
Data for selecting a current transformer	
• Burden power current transformer x/1A, min.	As a function of cable length and cross section, see device manual
• Burden power current transformer x/5A, min.	As a function of cable length and cross section, see device manual

Ordering data

	Article No.
SM 1238 Energy Meter 480 V AC analog input	
Energy measurement module for data acquisition in 1 and 3-phase networks (TN, TT) up to 480 V AC; current range: 1 A, 5 A; recording of voltage, current, phase angles, power ratings, energy values, frequencies; with channel diagnostics	**6ES7238-5XA32-0XB0**
Extension cable for two-tier configuration	**6ES7290-6AA30-0XA0**
For connecting digital/analog signal modules; length 2 m	
Terminal block (spare part)	
For voltage input (top), 7-pole, tinned, coded in middle	**6ES7292-1AG40-0XA2**
For current input (bottom), 7-pole, tinned	**6ES7292-1AG30-0XA0**
Front flap set (spare part)	
For modules with a width of 45 mm	**6ES7291-1BA30-0XA0**

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Overview



- Analog inputs for SIPLUS S7-1200
- With extremely short conversion times
- For connecting analog actuators and sensors without additional amplifiers
- Even solves more complex automation tasks
- From +60 °C to +70 °C, max. 50% of the inputs can be controlled simultaneously

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

Technical specifications

Article number	**6AG1231-4HD32-4XB0**
Based on	**6ES7231-4HD32-0XB0**
	SIPLUS S7-1200 SM 1231 4AI 13Bit
Ambient conditions	
Free fall	
• Fall height, max.	0.3 m; five times, in product package
Ambient temperature during operation	
• min.	-20 °C; = Tmin (incl. condensation/ frost); start-up @ 0 °C
• max.	60 °C; = Tmax
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance	
Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air

Article number	**6AG1231-4HD32-4XB0**
Based on	**6ES7231-4HD32-0XB0**
	SIPLUS S7-1200 SM 1231 4AI 13Bit
Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
Remark	
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A

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SIPLUS SM 1231 analog input modules

Ordering data	Article No.
Analog input SIPLUS signal module SM 1231	
(Extended temperature range and exposure to media)	
Ambient temperature range 0 ... +55 °C	
4 analog inputs ±10 V, ±5 V, ±2.5 V, or 0 ... 20 mA; 12 bits + sign	**6AG1231-4HD32-4XB0**

	Article No.
Accessories	See SIMATIC S7-1200 analog input SM 1231, page 3/86

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Overview



- Analog outputs for SIPLUS S7-1200
- With extremely short conversion times
- For connecting analog actuators without additional amplifiers
- Even solves more complex automation tasks
- From +60 °C to +70 °C, max. 50% of the outputs can be controlled simultaneously

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

Technical specifications

Article number	**6AG1232-4HB32-4XB0**
Based on	**6ES7232-4HB32-0XB0**
	SIPLUS S7-1200 SM 1232 2AQ 13Bit
Ambient conditions	
Free fall	
• Fall height, max.	0.3 m; five times, in product package
Ambient temperature during operation	
• min.	-20 °C; = Tmin (incl. condensation/ frost); start-up @ 0 °C
• max.	60 °C; = Tmax
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance	
Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air

Article number	**6AG1232-4HB32-4XB0**
Based on	**6ES7232-4HB32-0XB0**
	SIPLUS S7-1200 SM 1232 2AQ 13Bit
Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
Remark	
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A

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SIPLUS SM 1232 analog output modules

Ordering data	Article No.
Analog output SIPLUS signal module SM 1232	
(Extended temperature range and exposure to media)	
Ambient temperature range -20 ... +60 °C	
2 analog outputs, ±10 V with 14 bits or 0 ... 20 mA with 13 bits	**6AG1232-4HB32-4XB0**

	Article No.
Accessories	See SIMATIC S7-1200 analog output SM 1232, page 3/90

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Overview



- Analog output for SIPLUS S7-1200
- Can be plugged directly into the CPU (cannot be used for +70 °C version)

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

3

Technical specifications

Article number	**6AG1232-4HA30-4XB0**	**6AG1232-4HA30-5XB0**
Based on	**6ES7232-4HA30-0XB0**	**6ES7232-4HA30-0XB0**
	SIPLUS S7-1200 SB 1232 1AQ	SIPLUS S7-1200 SB 1232 1AQ
Ambient conditions		
Free fall		
• Fall height, max.	0.3 m; five times, in product package	0.3 m; five times, in product package
Ambient temperature during operation		
• min.	0 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C
• max.	55 °C; = Tmax	55 °C; = Tmax
Altitude during operation relating to sea level		
• Installation altitude above sea level, max.	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity		
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance		
Coolants and lubricants		
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems		
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *

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SIPLUS SB 1232 analog output modules

Technical specifications (continued)

Article number	**6AG1232-4HA30-4XB0**	**6AG1232-4HA30-5XB0**
Based on	**6ES7232-4HA30-0XB0**	**6ES7232-4HA30-0XB0**
	SIPLUS S7-1200 SB 1232 1AQ	SIPLUS S7-1200 SB 1232 1AQ
Use on ships/at sea		
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Remark		
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating		
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability	Yes; Class 2 for high availability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

Ordering data

	Article No.
SIPLUS SB 1232 analog output signal board	
(Extended temperature range and exposure to media)	
Ambient temperature range -25 ... +55 °C	
1 analog output, ±10 V with 12 bits or 0 ... 20 mA with 11 bits	**6AG1232-4HA30-5XB0**
Ambient temperature range 0 ... +55 °C	
1 analog output, ±10 V with 12 bits or 0 ... 20 mA with 11 bits	**6AG1232-4HA30-4XB0**

	Article No.
Accessories	See SIMATIC S7-1200 analog output SB 1232, page 3/92

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Overview



- Analog inputs and outputs for SIPLUS S7-1200
- With extremely short conversion times
- For connecting analog actuators and sensors without additional amplifiers
- Even solves more complex automation tasks
- From +60 °C to +70 °C, max. 50% of the inputs and outputs can be controlled simultaneously

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

Technical specifications

Article number	**6AG1234-4HE32-2XB0**	**6AG1234-4HE32-4XB0**
Based on	**6ES7234-4HE32-0XB0**	**6ES7234-4HE32-0XB0**
	SIPLUS S7-1200 SM 1234 4AI/2AQ 13Bit	SIPLUS S7-1200 SM 1234 4AI/2AQ 13Bit
Ambient conditions		
Free fall		
• Fall height, max.	0.3 m; five times, in product package	0.3 m; five times, in product package
Ambient temperature during operation		
• min.	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-20 °C; = Tmin (incl. condensation/frost); start-up @ 0 °C
• max.	70 °C; = Tmax; Tmax > +60 °C number of simultaneously used outputs 1, inputs 2 (no adjacent points) for horizontal mounting position	60 °C; = Tmax
Altitude during operation relating to sea level		
• Installation altitude above sea level, max.	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity		
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance		
Coolants and lubricants		
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems		
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *

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SIPLUS SM 1234 analog input/output modules

Technical specifications (continued)

Article number	**6AG1234-4HE32-2XB0**	**6AG1234-4HE32-4XB0**
Based on	**6ES7234-4HE32-0XB0**	**6ES7234-4HE32-0XB0**
	SIPLUS S7-1200 SM 1234 4AI/2AQ 13Bit	SIPLUS S7-1200 SM 1234 4AI/2AQ 13Bit
Use on ships/at sea		
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Remark		
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating		
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability	Yes; Class 2 for high availability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

Ordering data

	Article No.
Analog input/output SIPLUS signal module SM 1234	
(Extended temperature range and exposure to media)	
Ambient temperature range -25 ... +70 °C, from +60 … +70 °C number of simultaneously controllable inputs and outputs max. 50%	
4 analog inputs, ±10 V, ±5 V, ±2.5 V, or 0 ... 20 mA, 12 bits + sign; 2 analog outputs, ±10 V with 14 bits or 0 ... 20 mA with 13 bits	**6AG1234-4HE32-2XB0**
Ambient temperature range 0 ... +55 °C	
4 analog inputs, ±10 V, ±5 V, ±2.5 V, or 0 ... 20 mA, 12 bits + sign; 2 analog outputs, ±10 V with 14 bits or 0 ... 20 mA with 13 bits	**6AG1234-4HE32-4XB0**

	Article No.
Accessories	See SIMATIC S7-1200 analog input/output SM 1234, page 3/94

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Overview

- For the convenient recording of temperatures with great accuracy
- 7 common thermocouple types can be used
- Also for the measurement of analog signals with a low level (±80 mV)
- Can easily be retrofitted to existing plant

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

Technical specifications

Article number	**6AG1231-5QF32-4XB0**	**6AG1231-5QD32-4XB0**
Based on	**6ES7231-5QF32-0XB0**	**6ES7231-5QD32-0XB0**
	SIPLUS S7-1200 SM 1231 8AI TC 16Bit	SIPLUS S7-1200 SM 1231 4AI TC 16Bit
Ambient conditions		
Free fall		
• Fall height, max.	0.3 m; five times, in product package	0.3 m; five times, in product package
Ambient temperature during operation		
• min.	-20 °C; = Tmin (incl. condensation/frost); start-up @ 0 °C	-20 °C; = Tmin (incl. condensation/frost); start-up @ 0 °C
• max.	60 °C; = Tmax	60 °C; = Tmax
Altitude during operation relating to sea level		
• Installation altitude above sea level, max.	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity		
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance		
Coolants and lubricants		
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems		
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
Use on ships/at sea		
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Remark		
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating		
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability	Yes; Class 2 for high availability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

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SIPLUS SM 1231 thermocouple modules

Ordering data	Article No.
SIPLUS SM 1231 thermocouple module	
(Extended temperature range and exposure to media)	
Ambient temperature range -40 ... +70 °C	
8 inputs +/- 80 mV, resolution 15 bits + sign, thermocouple types J, K, T, E, R, S, N, C, TXK/XK(L)	**6AG1231-5QF32-4XB0**
4 inputs +/- 80 mV, resolution 15 bits + sign, thermocouple types J, K, T, E, R, S, N, C, TXK/XK(L)	**6AG1231-5QD32-4XB0**

	Article No.
Accessories	See SIMATIC S7-1200 thermocouple module SM 1231, page 3/97

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Overview

- For the convenient recording of temperatures with great accuracy
- 4 inputs
- Most popular resistance temperature sensors can be used
- Can easily be retrofitted to existing plant

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

Technical specifications

Article number	**6AG1231-5PD32-4XB0**	**6AG1231-5PD32-2XB0**	**6AG1231-5PF32-4XB0**	**6AG1231-5PF32-2XB0**
Based on	**6ES7231-5PD32-0XB0**	**6ES7231-5PD32-0XB0**	**6ES7231-5PF32-0XB0**	**6ES7231-5PF32-0XB0**
	SIPLUS S7-1200 SM 1231 4AI RTD 16Bit	SIPLUS S7-1200 SM 1231 4AI RTD 16Bit	SIPLUS S7-1200 SM 1231 8AI RTD 16Bit	SIPLUS S7-1200 SM 1231 8AI RTD 16Bit
Ambient conditions				
Free fall				
• Fall height, max.	0.3 m; five times, in product package	0.3 m; five times, in product package	0.3 m; five times, in product package	0.3 m; five times, in product package
Ambient temperature during operation				
• min.	-20 °C; = Tmin (incl. condensation/frost); start-up @ 0 °C	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-20 °C; = Tmin (incl. condensation/frost); start-up @ 0 °C	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C
• max.	60 °C; = Tmax	70 °C; = Tmax	60 °C; = Tmax	70 °C; = Tmax
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity				
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance				
Coolants and lubricants				
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *

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3

Technical specifications (continued)

Article number	6AG1231-5PD32-4XB0	6AG1231-5PD32-2XB0	6AG1231-5PF32-4XB0	6AG1231-5PF32-2XB0
Based on	6ES7231-5PD32-0XB0	6ES7231-5PD32-0XB0	6ES7231-5PF32-0XB0	6ES7231-5PF32-0XB0
	SIPLUS S7-1200 SM 1231 4AI RTD 16Bit	SIPLUS S7-1200 SM 1231 4AI RTD 16Bit	SIPLUS S7-1200 SM 1231 8AI RTD 16Bit	SIPLUS S7-1200 SM 1231 8AI RTD 16Bit
Use on ships/at sea				
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Remark				
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating				
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability	Yes; Class 2 for high availability	Yes; Class 2 for high availability	Yes; Class 2 for high availability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

Ordering data

	Article No.
SIPLUS RTD SM 1231 signal module	
(Extended temperature range and exposure to media)	
4 inputs for resistance temperature sensors Pt10/50/100/200/500/1000, Ni100/120/200/500/1000, Cu10/50/100, LG-Ni1000; resistance 150/300/600 ohms, resolution 15 bits + sign	
• For areas with extreme exposure to media (conformal coating); ambient temperature -20 ... +60 °C	**6AG1231-5PD32-4XB0**
• For areas with extreme exposure to media (conformal coating); ambient temperature -40 ... +70 °C	**6AG1231-5PD32-2XB0**
8 inputs for resistance temperature sensors Pt10/50/100/200/500/1000, Ni100/120/200/500/1000, Cu10/50/100, LG-Ni1000; resistance 150/300/600 ohms, resolution 15 bits + sign	
• For areas with extreme exposure to media (conformal coating); ambient temperature -20 ... +60 °C	**6AG1231-5PF32-4XB0**
• For areas with extreme exposure to media (conformal coating); ambient temperature -40 ... +70 °C	**6AG1231-5PF32-2XB0**

	Article No.
Accessories	See SIMATIC S7-1200 RTD SM 1231 signal module, page 3/102

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Overview

- For the convenient recording of temperatures with great accuracy
- 1 input with 16-bit resolution
- Common resistance temperature sensors can be used
- Can easily be retrofitted to existing plant
- Can be plugged directly into the CPU

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

Technical specifications

Article number	**6AG1231-5PA30-5XB0**
Based on	**6ES7231-5PA30-0XB0** SIPLUS S7-1200 SB 1231 1AI RTD
Ambient conditions	
Free fall	
• Fall height, max.	0.3 m; five times, in product package
Ambient temperature during operation	
• min.	-40 °C; = Tmin (incl. condensation/ frost); start-up @ -25 °C
• max.	60 °C; = Tmax
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance	
Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air

Article number	**6AG1231-5PA30-5XB0**
Based on	**6ES7231-5PA30-0XB0** SIPLUS S7-1200 SB 1231 1AI RTD
Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
Remark	
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A

Ordering data

	Article No.
SIPLUS RTD SB 1231 signal board (Extended temperature range and exposure to environmental substances) 1 input for resistance temperature sensors Pt 100, Pt 200, Pt 500, Pt 1000, resolution 15 bits + sign	**6AG1231-5PA30-5XB0**

	Article No.
Accessories	See: SIMATIC S7-1200 RTD SB 1231 signal board, page 3/104

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SM 1278 4xIO-Link Master

Overview



- Module for connecting up to 4 IO-Link devices according to IO Link Specification V1.1. The IO-Link parameters are configured using the Port Configuration Tool (PCT), version V3.2 and higher.

Technical specifications

Article number	**6ES7278-4BD32-0XB0** S7-1200, SM1278, 4 X IO-Link Master
General information	
Product type designation	SM 1278 4xIO-Link Master
Supply voltage	
Rated value (DC)	
• 24 V DC	Yes
Power loss	
Power loss, typ.	1 W
Interrupts/diagnostics/ status information	
Diagnostics function	Yes
Degree and class of protection	
Degree of protection acc. to EN 60529	
• IP20	Yes
Standards, approvals, certificates	
FM approval	Yes
RCM (formerly C-TICK)	Yes
Ambient conditions	
Free fall	
• Fall height, max.	0.3 m; five times, in product package
Ambient temperature during operation	
• min.	-20 °C
• max.	60 °C
Connection method	
required front connector	Yes
Mechanics/material	
Enclosure material (front)	
• Plastic	Yes
Dimensions	
Width	45 mm
Height	100 mm
Depth	75 mm
Weights	
Weight, approx.	150 g

Ordering data

	Article No.
SM 1278 signal module 4xIO-Link Master for the connection of up to 4 IO-Link devices according to IO Link Specification V1.1	**6ES7278-4BD32-0XB0**
Terminal block (spare part)	
with 7 screws, tin-coated; 4 units	**6ES7292-1AG30-0XA0**

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Overview



SIPLUS CMS1200 SM 1281 Condition Monitoring forms part of SIMATIC S7-1200 and is used for the:

- Monitoring of motors, generators, pumps, fans, or other mechanical components
- Recording and analysis of vibrations
- Expansion capability of up to 7 modules

Technical specifications

Article number	**6AT8007-1AA10-0AA0**
	SM1281_Condition_Monitoring
General information	
Product brand name	SIPLUS
Product category	Condition Monitoring
Product description	S7-1200 module for the monitoring of vibrations on mechanical components based on parameters and frequency-selective analysis functions
Installation type/mounting	
Mounting type	Rail or wall mounting
Mounting position	Horizontal, vertical
Recommended mounting position	Horizontal
Supply voltage	
Type of supply voltage	DC
Rated value (DC)	
• 24 V DC	Yes
permissible range, lower limit (DC)	20.4 V
permissible range, upper limit (DC)	28.8 V
Input current	
Current consumption, typ.	200 mA
Current consumption, max.	250 mA
from backplane bus 5 V DC, typ.	80 mA
from backplane bus 5 V DC, max.	85 mA
Power loss	
Power loss, typ.	4.8 W
Memory	
Total memory capacity	1 Gbyte
Hardware configuration	
Design of hardware configuration	Modular, up to 7 modules per CPU
Speed input	
Number of speed inputs	1
Input voltage	
• 24 V DC digital	Yes
Sensor input	
Number of IEPE sensor inputs	4
Sampling frequency, max.	46 875 Hz

Article number	**6AT8007-1AA10-0AA0**
	SM1281_Condition_Monitoring
Interfaces	
Type of data transmission	Export of raw data as WAV file for further analysis (e.g. using CMS X-Tools) can be downloaded via browser/FTP, online data transfer to CMS X-Tools
Ethernet interface	Yes
Protocols	
Bus communication	Yes
Web server	
• HTTP	Yes
Interrupts/diagnostics/ status information	
Alarms	
• Diagnostic alarm	Yes
Diagnostics indication LED	
• for status of the inputs	Yes
• for maintenance	Yes
• Status indicator digital input (green)	No
Integrated Functions	
Monitoring functions	
• Monitoring of the sensor inputs	Yes; Cable break and short-circuit
• Vibration characteristic monitoring via RMS value of the vibration speed	Yes
• Vibration characteristic monitoring via RMS value of the vibration acceleration	Yes
• Vibration characteristic monitoring via diagnostic characteristic value	Yes
• Frequency-selective monitoring via vibration speed spectrum	Yes
• Frequency-selective monitoring via vibration acceleration spectrum	Yes
• Frequency-selective monitoring via envelope curve analysis	Yes

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SIPLUS CMS1200 SM 1281 Condition Monitoring

Technical specifications (continued)

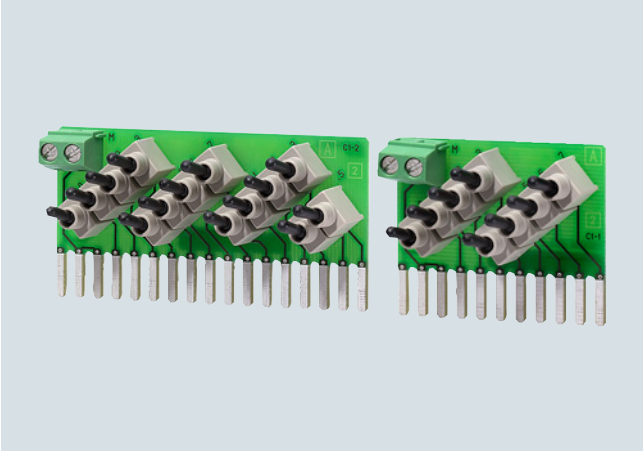
Article number	**6AT8007-1AA10-0AA0** SM1281_Condition_Monitoring
Measuring functions	
• Physical measuring principle	Vibration acceleration
Measuring range	
- Measurement range vibration frequency, min.	0.1 Hz
- Measurement range vibration frequency, max.	10 000 Hz
Degree and class of protection	
Degree of protection acc. to EN 60529	
• IP20	Yes
Standards, approvals, certificates	
Certificate of suitability	CE
Reference designation according to DIN EN 81346-2	P
Ambient conditions	
Free fall	
• Fall height, max.	0.3 m; five times, in product package
Ambient temperature during operation	
• horizontal installation, min.	-20 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	-20 °C
• vertical installation, max.	45 °C
Ambient temperature during storage/transportation	
• min.	-40 °C
• max.	70 °C
Air pressure acc. to IEC 60068-2-13	
• Operation, min.	795 hPa
• Operation, max.	1 080 hPa
• Storage/transport, min.	660 hPa
• Storage/transport, max.	1 080 hPa
Relative humidity	
• Operation without condensation, min.	5 %
• Operation without condensation, max.	95 %
Software	
Browser software required	Web browser Mozilla Firefox (ESR31) or Microsoft Internet Explorer (10/11)
Connection method	
required front connector	Yes
Design of electrical connection	Screw connection
Mechanics/material	
Material of housing	Plastic: polycarbonate, abbreviation: PC- GF 10 FR
Enclosure material (front)	
• Plastic	Yes
Dimensions	
Width	70 mm
Height	112 mm
Depth	75 mm
Weights	
Weight, approx.	260 g

Ordering data

	Article No.
SIPLUS CMS1200 SM 1281 Condition Monitoring Module for SIMATIC S7-1200 for monitoring vibrations in mechanical components based on characteristic values and frequency-selective analysis functions.	**6AT8007-1AA10-0AA0**
Accessories	
SIPLUS CMS1200 SM1281 shield clamp set For the EMC-compliant connection of signal and encoder cables to the SIPLUS CMS1200 SM 1281 Condition Monitoring.	**6AT8007-1AA20-0AA0**
VIB-SENSOR S01 vibration sensor Piezoelectric sensor for connection to the SIPLUS CMS1200 SM 1281 Condition Monitoring.	**6AT8002-4AB00**
SIPLUS CABLE-MIL For connection of the VIB-SENSOR S01 vibration sensor to the SIPLUS CMS1200 SM 1281 Condition Monitoring.	
SIPLUS CABLE-MIL-300; length 3 m	**6AT8002-4AC03**
SIPLUS CABLE-MIL-1000; length 10 m	**6AT8002-4AC10**

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Overview



- Simulator module for program testing during commissioning and ongoing operation
- Simulation of 8 or 14 inputs

Technical specifications

Article number	**6ES7274-1XF30-0XA0** S7-1200 Simulator Module SIM1274, 8 Inp	**6ES7274-1XH30-0XA0** S7-1200 Simulator Module SIM1274, 14 Inp
General information		
Product type designation	SIM 1274, 8DI	SIM 1274, 14 DI
Supply voltage		
Rated value (DC)	24 V	24 V
Digital inputs		
Number of digital inputs	8	14
Digital outputs		
Number of digital outputs	0	0
Degree and class of protection		
Degree of protection acc. to EN 60529		
• IP20	Yes	Yes
Dimensions		
Width	43 mm	67 mm
Height	35 mm	35 mm
Depth	23 mm	23 mm

Ordering data

	Article No.
Digital input simulator SIM 1274 simulator module	
with 8 input switches, for CPU 1211C/1212C	**6ES7274-1XF30-0XA0**
with 14 input switches, for CPU 1214C/1215C	**6ES7274-1XH30-0XA0**
with 14 input switches, for CPU 1217C	**6ES7274-1XK30-0XA0**
Analog input simulator SIM 1274 simulator module	
2 potentiometers	**6ES7274-1XA30-0XA0**

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BB 1297 battery board

Overview

- Battery board for extending the power reserve for the S7-1200 real-time clock

Technical specifications

Article number	**6ES7297-0AX30-0XA0**
	Battery Board BB 1297 f. CPU 12xx
General information	
Product type designation	BB 1297
Interrupts/diagnostics/ status information	
Alarms	Yes
Diagnostics function	Yes
Diagnostics indication LED	
• for maintenance	Yes; The maintenance LED (MAINT) of the PLC signals that the battery needs to be replaced.
Degree and class of protection	
Degree of protection acc. to EN 60529	IP20
Standards, approvals, certificates	
CE mark	Yes
CSA approval	Yes
FM approval	Yes
RCM (formerly C-TICK)	Yes
Marine approval	Yes
Ambient conditions	
Free fall	
• Fall height, max.	0.3 m; five times, in product package
Ambient temperature during operation	
• min.	-20 °C
• max.	60 °C
Ambient temperature during storage/transportation	
• min.	-40 °C
• max.	70 °C
Air pressure acc. to IEC 60068-2-13	
• Operation, min.	795 hPa
• Operation, max.	1 080 hPa
• Storage/transport, min.	660 hPa
• Storage/transport, max.	1 080 hPa
Relative humidity	
• Operation at 25 °C without condensation, max.	95 %
Mechanics/material	
Enclosure material (front)	
• Plastic	Yes
Dimensions	
Width	38 mm
Height	62 mm
Depth	21 mm
Weights	
Weight, approx.	40 g

Ordering data

	Article No.
BB 1297 battery board	**6ES7297-0AX30-0XA0**
For long-term backup of real-time clock; can be plugged into the signal board slot of an S7-1200 CPU in FW version 3.0 or higher; battery (CR 1025) is not included	
Terminal block (spare part)	
For signal board	
with 6 screws, gold-plated; 4 units	**6ES7292-1BF30-0XA0**

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Overview



SIWAREX WP231 is a versatile, legal for trade weighing module for all simple weighing and force measuring tasks. The compact module is easy to install in the SIMATIC S7-1200 automation system. It can also be operated without a SIMATIC CPU.

Technical specifications

SIWAREX WP231	
Integration in automation systems	
S7-1200	SIMATIC S7-1200 system bus
Operator panel and/or automation systems from other vendors	Via Ethernet (Modbus TCP/IP) or RS 485 (Modbus RTU)
Communication interfaces	• SIMATIC S7-1200 backplane bus • RS 485 (Modbus RTU, Siebert remote display) • Ethernet (SIWATOOL V7, Modbus TCP/IP) • Analog output 0/4 - 20 mA • 4 x digital outputs, 24 V DC floating, short-circuit proof • 4 x digital inputs, 24 V DC floating
Commissioning options	• Using SIWATOOL V7 • Using function block in SIMATIC S7-1200 CPU / Touch Panel • Using Modbus TCP/IP • Using Modbus RTU
Measuring accuracy	
EU type approval as non-automatic weighing instrument, trade class III	3000 d ≥ 0.5 µV/e
Error limit according to DIN 1319-1 of full-scale value at 20 °C ± 10 K (68 °F ± 10 K)	0.05%
Internal resolution	Up to ± 4 million parts
Measuring frequency	100 / 120 Hz
Digital filter	Variable adjustable low-pass and average filter
Typical applications	• Non-automatic weighing instruments • Force measurements • Fill-level monitoring • Belt tension monitors
Weighing functions	
Weight values	• Gross • Net • Tare
Limit values	• 2 x min/max • Empty
Zeroing	Per command
Tare	Per command
Tare specification	Per command
Load cells	Full-bridge strain gauges in 4-wire or 6-wire system

SIWAREX WP231	
Load cell powering	
Supply voltage (regulated via feedback)	4.85 V DC
Permissible load resistance	
• R_{Lmin}	> 40 Ω
• R_{Lmax}	< 4 100 Ω
With SIWAREX IS Ex interface	
• R_{Lmin}	> 50 Ω
• R_{Lmax}	< 4 100 Ω
Load cell characteristic	1 … 4 mV/V
Permissible range of the measurement signal (with 4 mV/V sensors)	-21.3 ... +21.3 mV
Max. distance of load cells	500 m (229.66 ft)
Connection to load cells in Ex zone 1	Optionally via SIWAREX IS Ex interface (compatibility of the load cells must be checked)
Approvals/certificates	• ATEX Zone 2 • UL • EAC • KCC • RCM • OIML R76 • Design approval 2009/23/EC (NAWI)
Calibration approval	EU type approval OIML R76
Auxiliary power supply	
Rated voltage	24 V DC
Max. power consumption	200 mA
Max. power consumption SIMATIC Bus	3 mA
IP degree of protection to EN 60529; IEC 60529	IP20
Climatic requirements	
$T_{min(IND)}$ ... $T_{max(IND)}$ (operating temperature)	
• Vertical installation	-10 ... +40 °C (14 ... 104 °F)
• Horizontal installation	-10 ... +55 °C (14 ... 131 °F)
EMC requirements	according to EN 45501
Dimensions	70 x 75 x 100 mm (2.76 x 2.95 x 3.94 in)

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SIWAREX WP231

3

Ordering data	Article No.
SIWAREX WP231 weighing module Single-channel, legal-for-trade, for NAWI non-automatic weighing instruments (e.g. platform or hopper scales) with analog load cells (1–4 mV/V), 1 x LC, 4 x DQ, 4 x DI, 1 x AQ, 1 x RS 485, Ethernet port.	**7MH4960-2AA01**
SIWAREX S7-1200 manual Available in a range of languages Free download on the Internet at: http://www.siemens.com/weighing-technology	
SIWAREX WP231 "Ready for Use" Complete software package for non-automatic weighing instrument (for S7-1200 and a directly connected operator panel). Free download on the Internet at: http://www.siemens.com/weighing-technology	
SIWAREX WP231 "Ready for Use - legal-for-trade" Software package for non-automatic weighing instruments for S7-1200 requiring official calibration. Free download on the Internet at: http://www.siemens.com/weighing-technology	
Software SecureDisplay Software for a legal trade display on Windows CE-based Panel. SIMATIC Basic and Key Panels are excluded. Free download on the Internet at: http://www.siemens.com/weighing-technology	
SIWATOOL V4 & V7 Service and commissioning software for SIWAREX weighing modules	**7MH4900-1AK01**
Calibration set for SIWAREX WP2xx Valid for SIWAREX WP231 K and SIWAREX WP251. For verification of up to 3 scales, comprising: • 3 x inscription foil for labeling • 1 x protective film • 3 x calibration protection plate • Guidelines for verification, certificates and approvals, adaptable label, SIWAREX WP	**7MH4960-0AY10**

	Article No.
Ethernet cable patch cord 2 m (7 ft) For connecting SIWAREX WP231 to a PC (SIWATOOL), SIMATIC CPU, panel, etc.	**6XV1850-2GH20**
Remote display (optional) The digital remote displays can be connected directly to the SIWAREX WP231 via the RS 485 interface. Suitable remote display: S102 Siebert Industrieelektronik GmbH Postfach 1180 D-66565 Eppelborn, Germany Tel.: +49 6806/980-0 Fax: +49 6806/980-999 Internet: http://www.siebert.de Detailed information is available from the manufacturer.	
Accessories	
SIWAREX JB junction box, aluminum housing For connecting up to 4 load cells in parallel, and for connecting multiple junction boxes.	**7MH5001-0AA20**
SIWAREX JB junction box, stainless steel housing For connecting up to 4 load cells in parallel.	**7MH5001-0AA00**
SIWAREX JB junction box, stainless steel housing (ATEX) For parallel connection of up to 4 load cells (for zone allocation, see manual or type-examination certificate).	**7MH4710-1EA01**
Ex interface SIWAREX IS For intrinsically-safe connection of load cells. With ATEX approval (not UL/FM). Suitable for SIWAREX electronic weighing system. Compatibility of load cells must be checked separately. • Short-circuit current < 199 mA DC • Short-circuit current < 137 mA DC	 **7MH4710-5BA** **7MH4710-5CA**

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Ordering data

	Article No.
Cable (optional)	
Cable Li2Y 1 x 2 x 0.75 ST + 2 x (2 x 0.34 ST) – CY For connecting SIWAREX electronic weighing systems to junction box (JB), extension box (EB) and Ex interface or between two EBs. For permanent installation. Occasional bending is possible. External diameter: approx. 10.8 mm (0.43 in) Permissible ambient temperature -40 ... +80 °C (-40 ... +176 °F). Sold by the meter.	
• Sheath color: orange	**7MH4702-8AG**
• For hazardous atmospheres. Sheath color: blue.	**7MH4702-8AF**
Ground terminal for connecting the load cell cable shield to the grounded DIN rail	**6ES5728-8MA11**

	Article No.
Commissioning	
Commissioning charge for one static scale with SIWAREX module (Travel and setup charge must be ordered separately) Scope: • Recording of data • Checking of mechanical installation of the scale • Checking of electrical wiring and function • Static adjustment of the scale Requirements: • Mechanical design functional • Modules electrically wired and tested • Calibration weights available • Free access to scale	**9LA1110-8SN50-0AA0**
Flat charge for travel and setup in Germany	**9LA1110-8RA10-0AA0**

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SIWAREX WP241

Overview



SIWAREX WP241

SIWAREX WP241 is a flexible weighing module for belt scales. The compact module is easy to install in the SIMATIC S7-1200 automation system. It can also be operated as a standalone module, i.e. without a SIMATIC CPU.

Technical specifications

SIWAREX WP241	
Integration in automation systems	
S7-1200	SIMATIC S7-1200 system bus
Operator panel and/or automation systems from other vendors	Via Ethernet (Modbus TCP/IP) or RS 485 (Modbus RTU)
Communication interfaces	• SIMATIC S7-1200 backplane bus • RS 485 (Modbus RTU) • Ethernet (SIWATOOL V7, Modbus TCP/IP) • Analog output 0/4 - 20 mA • 4 x digital outputs, 24 V DC floating, short-circuit proof • 4 x digital outputs, 24 V DC, floating
Commissioning options	• Using SIWATOOL V7 • Using function block in SIMATIC S7-1200 CPU / Touch Panel • Using Modbus TCP/IP • Using Modbus RTU
Measuring accuracy	
Error limit according to DIN 1319-1 of full-scale value at 20 °C ± 10 K (68 °F ± 10 K)	0.05%
Internal resolution	Up to ± 4 million parts
Measuring frequency	100 / 120 Hz
Digital filter	Separate, variable adjustable low-pass and average filter for loading and speed
Filter for conveyor load	Low-pass filter (limit frequency 0.05 ... 50 Hz)
Filter for belt speed	Low-pass filter (limit frequency 0.05 ... 50 Hz)
Weighing functions	
Readout data	• Weight • Belt load • Material flow rate • Accumulated total • Main total • Free totals 1 … 4 • Belt speed
Limits (min/max)	• Belt load • Material flow rate • Belt speed

SIWAREX WP241	
Load cells	Full-bridge strain gauges in 4-wire or 6-wire system
Load cell powering	
Supply voltage (regulated via feedback)	4.85 V DC
Permissible load resistance	
• R_{Lmin}	> 40 Ω
• R_{Lmax}	< 4100 Ω
With SIWAREX IS Ex interface	
• R_{Lmin}	> 50 Ω
• R_{Lmax}	< 4100 Ω
Load cell characteristic	1 … 4 mV/V
Permissible measurement signal range	-21.3 ... +21.3 mV
Max. distance of load cells	500 m (229.66 ft)
Connection to load cells in Ex zone 1	Optionally via SIWAREX IS Ex interface (compatibility of the load cells must be checked)
Approvals/certificates	• ATEX Zone 2 • UL • EAC • KCC • RCM
Auxiliary power supply	
Rated voltage	24 V DC
Max. power consumption	200 mA
Max. power consumption SIMATIC Bus	3 mA
IP degree of protection to EN 60529; IEC 60529	IP20
Climatic requirements	
$T_{min(IND)}$ ... $T_{max(IND)}$ (operating temperature)	
• Vertical installation	-10 ... +40 °C (14 ... 104 °F)
• Horizontal installation	-10 ... +55 °C (14 ... 131 °F)
EMC requirements	according to EN 45501
Dimensions	70 x 75 x 100 mm (2.76 x 2.95 x 3.94 in)

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Ordering data	Article No.
SIWAREX WP241 weighing module Single-channel, for conveyor scales with analog load cells / full-bridge strain gauges (1 - 4 mV/V), 1 x LC, 4 x DQ, 4 x DI, 1 x AQ, 1 x RS 485, Ethernet port.	**7MH4960-4AA01**
SIWAREX S7-1200 manual Available in a range of languages Free download on the Internet at: http://www.siemens.com/weighing-technology	
SIWAREX WP241 "Ready for Use" Complete software package for belt scales (for S7-1200 and a directly connected operator panel) Free download on the Internet at: http://www.siemens.com/weighing-technology	
SIWATOOL V4 & V7 Service and commissioning software for SIWAREX weighing modules	**7MH4900-1AK01**
Ethernet cable patch cord 2 m (7 ft) For connecting SIWAREX WP241 to a PC (SIWATOOL), SIMATIC CPU, panel, etc.	**6XV1850-2GH20**
Accessories	
SIWAREX JB junction box, aluminum housing For connecting up to 4 load cells in parallel, and for connecting multiple junction boxes.	**7MH5001-0AA20**
SIWAREX JB junction box, stainless steel housing For connecting up to 4 load cells in parallel.	**7MH5001-0AA00**
SIWAREX JB junction box, stainless steel housing (ATEX) For parallel connection of up to 4 load cells (for zone allocation, see manual or type-examination certificate).	**7MH4710-1EA01**
Ex interface SIWAREX IS For intrinsically-safe connection of load cells. With ATEX approval (not UL/FM). Suitable for SIWAREX electronic weighing system. Compatibility of load cells must be checked separately.	
• Short-circuit current < 199 mA DC	**7MH4710-5BA**
• Short-circuit current < 137 mA DC	**7MH4710-5CA**

	Article No.
Cable (optional)	
Cable Li2Y 1 x 2 x 0.75 ST + 2 x (2 x 0.34 ST) – CY For connecting SIWAREX electronic weighing systems to junction box (JB), extension box (EB) and Ex interface or between two EBs. For permanent installation. Occasional bending is possible. External diameter: approx. 10.8 mm (0.43 in) Permissible ambient temperature -40 ... +80 °C (-40 ... +176 °F). Sold by the meter.	
• Sheath color: orange	**7MH4702-8AG**
• For hazardous atmospheres. Sheath color: blue.	**7MH4702-8AF**
Ground terminal for connecting the load cell cable shield to the grounded DIN rail	**6ES5728-8MA11**
Commissioning	
Commissioning charge for one belt scale with SIWAREX module (Travel and setup charge must be ordered separately) Scope: • Recording of data • Checking of mechanical installation of the scale • Checking of electrical wiring and function • Dynamic adjustment of the scale Requirements: • Mechanical design functional • Modules electrically wired and tested • Calibration weights available • Free access to scale	**9LA1110-8SM50-0AA0**
Flat charge for travel and setup in Germany	**9LA1110-8RA10-0AA0**

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SIWAREX WP251

Overview



SIWAREX WP251 electronic weighing module

SIWAREX WP251 is a flexible weighing module for dosing and filling processes. The compact module can be installed seamlessly in the SIMATIC S7-1200 automation system. It can also be used without a SIMATIC CPU in stand-alone mode.

Technical specifications

SIWAREX WP251	
Weighing modes	• Non-automatic weighing instrument (NAWI) (filling + removal) (legal-for-trade in accordance with OIML R-76) • Automatic catchweighing instruments (ACI) (filling + removal) (legal-for-trade in accordance with OIML R-51) • Gravimetric filling instruments (GFI) (legal-for-trade in accordance with OIML R-61) • Discontinuous totalizing automatic weighing instruments (THW) — legal-for-trade in accordance with OIML R-107
Integration in automation systems	
S7-1200	SIMATIC S7-1200 system bus
Operator panel and/or automation systems from other vendors	Via Ethernet (Modbus TCP/IP) or RS 485 (Modbus RTU)
Ports	• 1 x SIMATIC S7-1200 system bus • 1 x Ethernet (SIWATOOL and Modbus TCP/IP) • 1 x RS 485 (Modbus RTU or remote display) • 1 x analog output (0/4 ... 20 mA) • 4 x digital inputs (24 V DC, floating) • 4 x digital outputs (24 V DC, floating, short-circuit proof)
Functions	• 3 limits • Tare • Tare specification • Zeroing • Zero adjustment • Statistics • Automatic correction of the shut-off points • Internal protocol memory for 550 000 entries • Trace function for signal analysis • Internal restore point • Stand-alone mode or SIMATIC S7-1200 integrated

SIWAREX WP251	
Parameter assignment	• Full access using function block in SIMATIC S7-1200 • Full access using Modbus TCP/IP • Full access using Modbus RTU
Remote display	
Connection	via RS 485
Scale adjustment	PC software SIWATOOL (Ethernet), S7-1200 function block and touch panel or directly connected operator panel (Modbus)
Measuring accuracy	
Error limit according to DIN 1319-1 of full-scale value at 20 °C ± 10 K (68 °F ± 10 K)	0.05%
Internal resolution	Up to ± 4 million parts
Number of measurements/second	100 or 120 (selectable)
Filter	• Low-pass filter 0.1 ... 50 Hz • Average value filter
Load cells	Strain gauges in 4-wire or 6-wire system
Load cell powering	
Supply voltage (regulated via feedback)	4.85 V DC
Permissible load resistance	
• R_{Lmin}	> 40 Ω
• R_{Lmax}	< 4 100 Ω
With SIWAREX IS Ex interface	
• R_{Lmin}	> 50 Ω
• R_{Lmax}	< 4 100 Ω
Load cell characteristic	1 … 4 mV/V
Permissible range of the measurement signal (with 4 mV/V sensors)	-21.3 ... +21.3 mV
Max. distance of load cells	500 m (229.66 ft)
Connection to load cells in Ex zone 1	Optionally via SIWAREX IS Ex interface
Certificates	• ATEX Zone 2 • UL • KCC • EAC • RCM

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Technical specifications (continued)

SIWAREX WP251	
Calibration approvals	• EU type-examination certificate 2014/31/EU (NAWI) according to OIML R76 • EU type-examination certificate 2014/32/EU (MID) according to OIML R61 and OIML R51 • EU type-examination certificate 2014/32/EU (MID) according to OIML R107
Auxiliary power supply	
Rated voltage	24 V DC
Max. power consumption	200 mA
Max. power consumption SIMATIC Bus	3 mA
IP degree of protection to EN 60529; IEC 60529	IP20

SIWAREX WP251	
Climatic requirements	
$T_{min(IND)} \cdots T_{max(IND)}$ (operating temperature)	
• Vertical installation	-10 ... +40 °C (14 ... 104 °F)
• Horizontal installation	-10 ... +55 °C (14 ... 131 °F)
EMC requirements	according to EN 45501
Dimensions	70 x 75 x 100 mm (2.76 x 2.95 x 3.94 in)

Ordering data

	Article No.
SIWAREX WP251 weighing module Single-channel, legal-for-trade, for automatic dosing and filling scales (GFI, ACI, NAWI) with analog load cells / full-bridge strain gauges (1 - 4 mV/V), 1 x LC, 4 x DQ, 4 x DI, 1 x AQ, 1 x RS 485, Ethernet port.	**7MH4960-6AA01**
SIWAREX WP251 equipment manual Available in a range of languages Free download on the Internet at: http://www.siemens.com/weighing-technology	
SIWAREX WP251 "Ready for Use" Free download on the Internet at: http://www.siemens.com/weighing-technology	
SIWATOOL V4 & V7 Service and commissioning software for SIWAREX weighing modules	**7MH4900-1AK01**
Calibration set for SIWAREX WP2xx Valid for SIWAREX WP231 K and SIWAREX WP251. For verification of up to 3 scales, comprising: • 3 x inscription foil for labeling • 1 x protective film • 3 x calibration protection plate • Guidelines for verification, certificates and approvals, adaptable label, SIWAREX WP	**7MH4960-0AY10**

	Article No.
Ethernet cable patch cord 2 m (7 ft) For connecting SIWAREX WP251 to a PC (SIWATOOL), SIMATIC CPU, panel, etc.	**6XV1850-2GH20**
Remote display (optional) The digital remote displays can be connected directly to the SIWAREX WP251 via the RS 485 interface. Suitable remote display: S102 Siebert Industrieelektronik GmbH Postfach 1180 D-66565 Eppelborn, Germany Tel.: +49 6806/980-0 Fax: +49 6806/980-999 Internet: http://www.siebert.de Detailed information is available from the manufacturer.	

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SIWAREX WP251

Ordering data	Article No.
Accessories	
SIWAREX JB junction box, aluminum housing For connecting up to 4 load cells in parallel, and for connecting multiple junction boxes.	**7MH5001-0AA20**
SIWAREX JB junction box, stainless steel housing For connecting up to 4 load cells in parallel.	**7MH5001-0AA00**
SIWAREX JB junction box, stainless steel housing (ATEX) For parallel connection of up to 4 load cells (for zone allocation, see manual or type-examination certificate).	**7MH4710-1EA01**
Ex interface SIWAREX IS For intrinsically-safe connection of load cells. With ATEX approval (not UL/FM). Suitable for SIWAREX electronic weighing system. Compatibility of load cells must be checked separately.	
• Short-circuit current < 199 mA DC	**7MH4710-5BA**
• Short-circuit current < 137 mA DC	**7MH4710-5CA**

	Article No.
Cable (optional)	
Cable Li2Y 1 x 2 x 0.75 ST + 2 x (2 x 0.34 ST) – CY For connecting SIWAREX electronic weighing systems to junction box (JB), extension box (EB) and Ex interface or between two EBs. For permanent installation. Occasional bending is possible. External diameter: approx. 10.8 mm (0.43 in) Permissible ambient temperature -40 ... +80 °C (-40 ... +176 °F). Sold by the meter.	
• Sheath color: orange	**7MH4702-8AG**
• For hazardous atmospheres. Sheath color: blue.	**7MH4702-8AF**
Ground terminal for connecting the load cell cable shield to the grounded DIN rail	**6ES5728-8MA11**
Commissioning	
Commissioning charge for one static scale with SIWAREX module (Travel and setup charge must be ordered separately) Scope: • Recording of data • Checking of mechanical installation of the scale • Checking of electrical wiring and function • Static adjustment of the scale Requirements: • Mechanical design functional • Modules electrically wired and tested • Calibration weights available • Free access to scale	**9LA1110-8SN50-0AA0**
Flat charge for travel and setup in Germany	**9LA1110-8RA10-0AA0**

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Overview



- For quick, high-performance serial data exchange via point-to-point connection
- Implemented protocols: ASCII, USS drive protocol, Modbus RTU, 3964(R)
- Additional protocols can also be loaded
- Simple parameterization with STEP 7 Basic

Technical specifications

Article number	**6ES7241-1CH32-0XB0** Communication Module CM 1241, RS422/485	**6ES7241-1AH32-0XB0** Communication Module CM 1241, RS232
General information		
Product type designation	CM 1241 RS 422 / 485	CM 1241 RS 232
Supply voltage		
Rated value (DC)		
• 24 V DC	Yes	Yes
Input current		
Current consumption, max.	220 mA; From backplane bus 5 V DC	200 mA; From backplane bus 5 V DC
Power loss		
Power loss, typ.	1.1 W	1.1 W
Interfaces		
Number of interfaces	1	1
Interface physics, RS 232C (V.24)		Yes
Interface (physical) RS 422/485 (X.27)	Yes	
Point-to-point connection		
• Cable length, max.	1 000 m	10 m
Integrated protocol driver		
- Freeport	Yes	Yes
- ASCII	Yes; Available as library function	Yes; Available as library function
- Modbus	Yes	Yes
- Modbus RTU master	Yes	Yes
- MODBUS RTU slave	Yes	Yes
- USS	Yes; Available as library function	
Protocols		
Integrated protocols		
Freeport		
- Telegram length, max.	1 kbyte	1 kbyte
- Bits per character	7 or 8	7 or 8
- Number of stop bits	1 (Standard), 2	1 (Standard), 2
- Parity	No parity (standard); even, uneven, mark (parity bit always 1); space (parity bit always 0)	No parity (standard); even, uneven, mark (parity bit always 1); space (parity bit always 0)
3964 (R)		
- Telegram length, max.	1 kbyte	1 kbyte
- Bits per character	7 or 8	7 or 8
- Number of stop bits	1 (Standard), 2	1 (Standard), 2
- Parity	No parity (standard); even, uneven, mark (parity bit always 1); space (parity bit always 0)	No parity (standard); even, uneven, mark (parity bit always 1); space (parity bit always 0)

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Technical specifications (continued)

Article number	**6ES7241-1CH32-0XB0** Communication Module CM 1241, RS422/485	**6ES7241-1AH32-0XB0** Communication Module CM 1241, RS232
Modbus RTU master		
- Address area	1 through 49 999 (Standard Modbus addressing)	1 through 49 999 (Standard Modbus addressing)
- Number of slaves, max.	247; slave numbers 1 through 247, per MODBUS network segment maximum 32 devices, additional repeaters needed to expand the network to maximum configuration	247; slave numbers 1 through 247, per MODBUS network segment maximum 32 devices, additional repeaters needed to expand the network to maximum configuration
MODBUS RTU slave		
- Address area	1 through 49 999 (Standard Modbus addressing)	1 through 49 999 (Standard Modbus addressing)
Interrupts/diagnostics/ status information		
Diagnostics function	Yes	Yes
Diagnostics indication LED		
• for status of the outputs	Yes	Yes
Degree and class of protection		
Degree of protection acc. to EN 60529		
• IP20	Yes	Yes
Standards, approvals, certificates		
CE mark	Yes	Yes
cULus	Yes	Yes
FM approval	Yes	Yes
RCM (formerly C-TICK)	Yes	Yes
KC approval	Yes	Yes
Ambient conditions		
Free fall		
• Fall height, max.	0.3 m; five times, in product package	0.3 m; five times, in product package
Ambient temperature during operation		
• min.	-20 °C	-20 °C
• max.	60 °C	60 °C
Dimensions		
Width	30 mm	30 mm
Height	100 mm	100 mm
Depth	75 mm	75 mm
Weights		
Weight, approx.	155 g	150 g

Ordering data

	Article No.
CM 1241 communication module	
Communication module for point-to-point connection, with one RS 422/485 interface	**6ES7241-1CH32-0XB0**
Communication module for point-to-point connection, with one RS 232 interface	**6ES7241-1AH32-0XB0**

	Article No.
Accessories	
Front flap set (spare part)	
For communication modules	**6ES7291-1CC30-0XA0**

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Overview

- For fast, high-performance serial data exchange via point-to-point connection
- Implemented protocols: ASCII, USS drive protocol, Modbus RTU
- Additional protocols can be loaded later
- Simple parameterization with STEP 7 Basic
- Can be plugged directly into the CPU

Technical specifications

Article number	**6ES7241-1CH30-1XB0**
	Communication Board CB 1241, RS485
General information	
Product type designation	CB 1241 RS 485
Input current	
from backplane bus 5 V DC, typ.	50 mA
Power loss	
Power loss, typ.	1.5 W
Interfaces	
Point-to-point connection	
• Cable length, max.	1 000 m
Integrated protocol driver	
- Freeport	Yes
- ASCII	Yes; Available as library function
- Modbus	Yes
- Modbus RTU master	Yes
- MODBUS RTU slave	Yes
- USS	Yes; Available as library function
Protocols	
Integrated protocols	
Freeport	
- Telegram length, max.	1 kbyte
- Bits per character	7 or 8
- Number of stop bits	1 (Standard), 2
- Parity	No parity (standard); even, uneven, mark (parity bit always 1); space (parity bit always 0)
3964 (R)	
- Telegram length, max.	1 kbyte
- Bits per character	7 or 8
- Number of stop bits	1 (Standard), 2
- Parity	No parity (standard); even, uneven, mark (parity bit always 1); space (parity bit always 0)
Modbus RTU master	
- Address area	1 through 49 999 (Standard Modbus addressing)
- Number of slaves, max.	247; slave numbers 1 through 247, per MODBUS network segment maximum 32 devices, additional repeaters needed to expand the network to maximum configuration
MODBUS RTU slave	
- Address area	1 through 49 999 (Standard Modbus addressing)

Article number	**6ES7241-1CH30-1XB0**
	Communication Board CB 1241, RS485
Interrupts/diagnostics/ status information	
Diagnostics function	Yes
Degree and class of protection	
Degree of protection acc. to EN 60529	
• IP20	Yes
Standards, approvals, certificates	
CE mark	Yes
cULus	Yes
FM approval	Yes
RCM (formerly C-TICK)	Yes
KC approval	Yes
Ambient conditions	
Free fall	
• Fall height, max.	0.3 m; five times, in product package
Ambient temperature during operation	
• min.	-20 °C
• max.	60 °C
Mechanics/material	
Enclosure material (front)	
• Plastic	Yes
Dimensions	
Width	38 mm
Height	62 mm
Depth	21 mm
Weights	
Weight, approx.	40 g

Ordering data

	Article No.
Communication board CB 1241 RS485	**6ES7241-1CH30-1XB0**
for point-to-point connection, with 1 RS 485 interface	

	Article No.
Accessories	
Terminal block (spare part)	
for signal board	
with 6 screws, gold-plated; 4 pcs.	**6ES7292-1BF30-0XA0**

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CM 1242-5

Overview



DP-M	DP-S	FMS	PG/OP	S7
	●			

The CM 1242-5 communication module is used to connect a SIMATIC S7-1200 to PROFIBUS as a DP slave and has the following characteristics:

- PROFIBUS DPV1 slave in accordance with IEC 61158
- Module replacement without PG supported
- Power is supplied via the backplane bus so that no extra cabling is required
- Support of all standard baud rates from 9.6 kbps to 12 Mbps
- Compact industry-standard enclosure in S7-1200 design for mounting on a DIN rail
- Fast commissioning thanks to easy configuration using STEP 7 without additional programming overhead

The CM 1242-5 is intended for use in factory automation. Low-cost PROFIBUS-based automation solutions can be created on the basis of the SIMATIC S7-1200 for optimal production.

Technical specifications

Article number	**6GK7242-5DX30-0XE0**
Product type designation	CM 1242-5
Transmission rate	
Transfer rate	
• at the 1st interface acc. to PROFIBUS	9.6 kbit/s ... 12 Mbit/s
Interfaces	
Number of interfaces acc. to Industrial Ethernet	0
Number of electrical connections	
• at the 1st interface acc. to PROFIBUS	1
• for power supply	0
Type of electrical connection	
• at the 1st interface acc. to PROFIBUS	9-pin Sub-D socket (RS485)
Supply voltage, current consumption, power loss	
Type of voltage of the supply voltage	DC
Supply voltage 1 from backplane bus	5 V
Consumed current	
• from backplane bus at DC at 5 V typical	0.15 A
Power loss [W]	0.75 W

Article number	**6GK7242-5DX30-0XE0**
Product type designation	CM 1242-5
Permitted ambient conditions	
Ambient temperature	
• for vertical installation during operation	0 ... 45 °C
• for horizontally arranged busbars during operation	0 ... 55 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
Relative humidity at 25 °C without condensation during operation maximum	95 %
Protection class IP	IP20
Design, dimensions and weight	
Module format	Compact module S7-1200 single width
Width	30 mm
Height	100 mm
Depth	75 mm
Net weight	0.115 kg
Mounting type	
• 35 mm DIN rail mounting	Yes
• S7-300 rail mounting	No
• wall mounting	Yes

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Technical specifications (continued)

Article number	**6GK7242-5DX30-0XE0**
Product type designation	CM 1242-5
Product properties, functions, components general	
Number of units	
• per CPU maximum	3
Performance data PROFIBUS DP	
Service as DP slave	
• DPV0	Yes
• DPV1	Yes
Amount of data	
• of the address area of the inputs as DP slave total	240 byte
• of the address area of the outputs as DP slave total	240 byte
Performance data telecontrol	
Protocol is supported	
• TCP/IP	No
Product functions management, configuration	
Configuration software	
• required	STEP 7 Basic/Professional

Ordering data

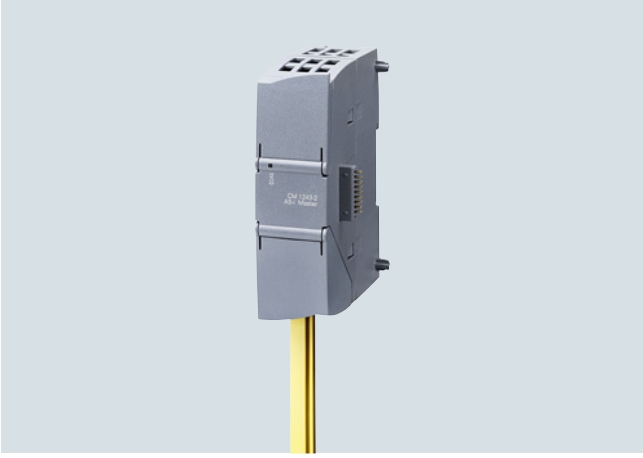
	Article No.
CM 1242-5 communication module	
Communication module for electrical connection of SIMATIC S7-1200 to PROFIBUS as a DP slave module	**6GK7242-5DX30-0XE0**
Accessories	
PROFIBUS FastConnect connection plug RS485	
With 90° cable outlet; insulation displacement technology, max. transmission rate 12 Mbps	
• Without PG interface	**6ES7972-0BA52-0XA0**
• With PG interface	**6ES7972-0BB52-0XA0**
PROFIBUS FC standard cable	
2-core bus cable, shielded, special design for fast mounting, sold by the meter; delivery unit: max. 1000 m, minimum order 20 m, sold by the meter	**6XV1830-0EH10**
PROFIBUS FastConnect stripping tool	
Stripping tool for fast stripping of the PROFIBUS FastConnect bus cable	**6GK1905-6AA00**
PROFIBUS bus terminal 12M	
Bus terminal for connection of PROFIBUS nodes at up to 12 Mbps with connecting cable	**6GK1500-0AA10**

Note:

You can find ordering data for software in the Industry Mall.

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Overview



The CM 1243-2 communication module is the AS-Interface master for the SIMATIC S7-1200 and has the following features:

- As many as 62 AS-Interface slaves can be connected
- Integrated analog value transmission
- Supports all AS-Interface master functions in accordance with the AS-Interface Specification V3.0
- Indication of the operating state on the front of the device displayed via LED
- Display of operating mode, AS-Interface voltage faults, configuration faults and peripheral faults via LED behind the front panel
- Compact enclosure in the design of the SIMATIC S7-1200
- Suitable for AS-Interface with 30 V voltage and AS-i Power24V: In combination with the optional DCM 1271 data decoupling module, a standard 24 V power supply unit can be used
- Configuration and diagnostics via the TIA Portal

Design

The CM 1243-2 communication module is positioned to the left of the S7-1200 CPU and linked to the S7-1200 via lateral contacts.

It has:

- Terminals for two AS-i cables (internally jumpered) via two screw terminals each
- One terminal for connection to the functional ground
- LEDs for indication of the operating state and fault statuses of the connected slaves

The screw terminals (included in scope of supply) can be removed to facilitate installation.

Function

The CM 1243-2 supports all specified functions of the AS-Interface Specification V3.0.

The values of the digital AS-i slaves can be activated via the process image of the S7-1200. During configuration of the slaves in the TIA Portal, the values of the analog AS-i slaves can also be accessed directly in the process image.

It is also possible to exchange all data of the AS-i Master and the connected AS-i slaves with the S7-1200 via the data record interface.

Changeover of the operating mode, automatic application of the slave configuration and the re-addressing of a connected AS-i slave can be implemented via the control panel of the CM 1243-2 in the TIA Portal.

The optional DCM 1271 data decoupling module has an integrated detection unit for detecting ground faults on the AS-Interface cable. The integrated overload protection also disconnects the AS-Interface cable if the drive current required exceeds 4 A.
For more information on DCM 1271, see page 3/140.

Notes on security

In order to protect plants, systems, machines and networks against cyber threats, it is necessary to implement – and continuously maintain – a holistic, state-of-the-art industrial security concept. Siemens products and solutions only represent one component of such a concept.

For more information on Industrial Security, see http://www.siemens.com/industrialsecurity.

Configuration

To configure CM 1243-2, you require STEP 7 V11 + SP2 or higher.

For STEP 7 V11 + SP2 or higher, the additional Hardware Support Package for CM 1243-2 is required. This is available from the Industry Online Support Portal, see https://support.industry.siemens.com/cs/ww/en/view/72341852.

The software enables user-friendly configuration and diagnostics of the AS-i Master and any connected slaves.

Alternatively, you can also apply the AS-Interface ACTUAL configuration at the "touch of a button" via the control panel integrated in the TIA Portal/STEP 7.

When operated on a S7-1200 CPU with firmware version V4.0 or higher, the firmware version V1.1 (or higher) is required for the CM 1243-2.

Benefits

- More flexibility and versatility in the use of SIMATIC S7-1200 as the result of a significant increase in the number of digital and analog inputs/outputs available
- Very easy configuration and diagnostics of the AS-Interface via the TIA Portal (STEP 7 V11 + SP2 or higher)
- Simple operation with AS-Interface power supply unit (see https://mall.industry.siemens.com/mall/en/ww/Catalog/Products/8200165?tree=CatalogTree) possible without restrictions
- Alternatively: No need for the AS-i power supply unit with AS-i Power24V. The AS-Interface cable is powered through an existing 24 V DC PELV power supply unit. For decoupling, the AS-i DCM 1271 data decoupling module is required, see page 3/140.
- LEDs for indication of fault statuses for fast diagnostics
- Monitoring of AS-Interface voltage facilitates diagnostics

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Application

The CM 1243-2 is the AS-Interface master connection for the 12xx CPUs of the SIMATIC S7-1200. Through connection to AS-Interface, the number of digital inputs and outputs available for the S7-1200 is greatly increased (max. 496 DI / 496 DQ on the AS-Interface per CM).

The integrated analog value processing also makes the analog values available at the AS-Interface for the S7-1200. Up to 31 analog slaves with a standard address (each with up to four channels) or up to 62 analog slaves with an A/B address (each with up to two channels) are possible per CM.

Operating conditions

- The CM 1243-2 communication module exchanges data with the S7-1200 CPU with a cycle time of 10 ms.
- The AS-i cycle time depends on the AS-i bus capacity and is up to 5 ms in the case of 31 slave addresses;
  for more information, see manual "AS-i Master CM 1243-2 and AS-i DCM 1271 data decoupling module for SIMATIC S7-1200", https://support.industry.siemens.com/cs/ww/en/view/57358958.
- For calculation of the maximum switching frequency at inputs/outputs of AS-i slaves, these cycle times and the runtime of the user program must be added up.

Ordering data

	Article No.
CM 1243-2 communication module • AS-Interface master for SIMATIC S7-1200 • Corresponds to AS-Interface Specification V3.0 • With screw terminals, removable terminals (included in the scope of supply) • Dimensions (W × H × D / mm): 30 × 100 × 75 Note: The CM 1243-2 communication module is available as a SIPLUS version under Article No. 6AG1243-2AA30-7XB0 in the extended temperature range (from -25 to 70 °C) and for use in harsh environmental conditions (coated according to environment standard IEC 60721). For more information, see www.siemens.com/siplus-extreme.	**3RK7243-2AA30-0XB0**
Accessories	
Screw terminals (replacement) • For screw terminals, 5-pole For AS-i Master CM 1243-2 and AS-i DCM 1271 data decoupling module	**3RK1901-3MA00**
AS-interface addressing unit V3.0 • For AS-Interface modules and sensors and actuators with integrated AS-Interface according to AS-i Specification V3.0 • For setting the AS-i address of standard slaves, and slaves with extended addressing mode (A/B slaves) • With input/output test function and many other commissioning functions • Battery operation with four type AA batteries (IEC LR6, NEDA 15) • Degree of protection IP40 • Dimensions (W × H × D / mm): 84 × 195 × 35 • Scope of supply: - Addressing unit with four batteries - Addressing cable, with M12 plug to addressing plug (hollow plug), length 1.5 m	**3RK1904-2AB02**

More information

More information
Manuals, see https://support.industry.siemens.com/cs/ww/en/ps/15750/man For diagnostics during ongoing operation, diagnostics blocks with clearly arranged visualization on the SIMATIC HMI panel are available or can be downloaded free of charge via a web browser, see https://support.industry.siemens.com/cs/ww/en/view/61892138

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3

Overview

With the aid of the DCM 1271 data decoupling module, the AS-Interface network can also be supplied with 24 V DC or 30 V DC from a standard power supply unit and the transmission of data and power can be implemented on one cable.

The DCM 1271 data decoupling module has the same type of enclosure as an S7-1200 module and can therefore be perfectly combined with the AS-i Master CM 1243-2.

The DCM 1271 data decoupling module has no connection to the backplane bus of the SIMATIC S7-1200 and is therefore not counted as a communication module for the calculation of the maximum configuration.

Features of the DCM 1271 data decoupling module

- Design: S7-1200, 30 mm wide, degree of protection IP20
- Detachable terminals (included in delivery)
- Single data decoupling
- Supply of several AS-i networks with a single power supply unit
- Operation with 24 V DC or 30 V DC, grounded or non-grounded
- Current limitation at 4 A
- Integrated ground-fault detection
- Diagnostic LEDs for ground faults and overloads
- Signaling contact for ground-fault detection

Ground-fault detection

The integrated ground fault detection functions with grounded and non-grounded power supply: The connection of negative pole and ground (upstream from the data decoupling module) customary with 24 V DC power supplies is permitted. A ground fault to the negative or positive pole on the AS-Interface network (behind the data decoupling module) is identified and signaled via LED and a transistor output.

Benefits

- An existing standard power supply unit with 24 V DC or 30 V DC can be used for supplying AS-i networks
- The AS-Interface system can also be used in tightly budgeted applications because no AS-Interface power supply unit needs to be purchased
- Applications benefit in addition from the advantages of a modern bus system:
  - High level of standardization
  - Additional diagnostics and maintenance information
  - Faster commissioning

Application

The AS-Interface data decoupling module is designed for AS-Interface networks with 30 V or 24 V supply (AS-i Power24V).

Operation of an AS-i network with the data decoupling module and a 30 V standard power supply unit is technically equivalent to the use of an AS-Interface power supply unit and offers the service-proven features of AS-Interface for all applications.

AS-i Power24V uses a 24 V power supply unit in conjunction with a data decoupling module and is particularly suitable for

- Compact machines using AS-Interface input/output modules
- Applications in the control cabinet for AS-Interface integration of SIRIUS 3RT2 contactors using 3RA27 function modules

Note:

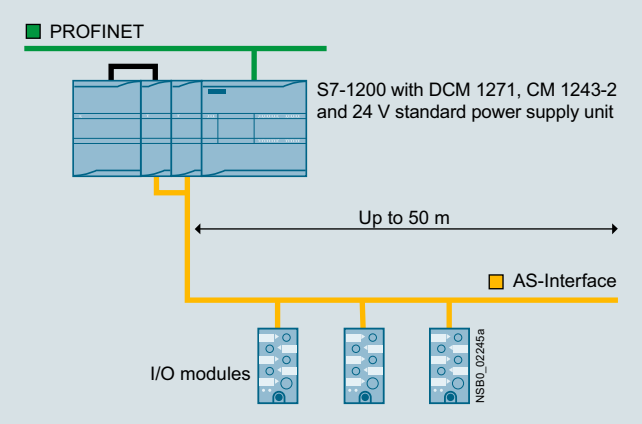
The power supply units must comply with the PELV (Protective Extra Low Voltage) or SELV (Safety Extra Low Voltage) standards, have a residual ripple of < 250 mVpp, and in the event of a fault must limit the output voltage to a maximum of 40 V.
24 V power supply units are recommended, see SITOP power supplies, https://mall.industry.siemens.com/mall/en/WW/Catalog/Products/10244081?tree=CatalogTree, or 30 V power supply units PSN 130S, see https://mall.industry.siemens.com/mall/en/WW/Catalog/Products/10174512?tree=CatalogTree.

Note on AS-i Power24V:

The length of an AS-i Power24V network is restricted to 50 m in order to limit the voltage drop along the cable.

AS-i Masters, AS-i slaves and the sensors and actuators supplied through the AS-i cable must be designed for the reduced voltage. Sensors and actuators for the standard voltage range of 10 to 30 V can be supplied with sufficient voltage.

Please also observe the requirements specified under "AS-i Power24V" for the operation of AS-i Power24V, see https://mall.industry.siemens.com/mall/en/WW/Catalog/Products/10057530?tree=CatalogTree.



Configuration of an AS-i Power24V network with AS-Interface DCM 1271 data decoupling module

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Ordering data

	Article No.
DCM 1271 data decoupling module • With screw terminals, removable terminals (included in the scope of supply) • Dimensions (W × H × D / mm): 30 × 100 × 75	**3RK7271-1AA30-0AA0**
Accessories	
Screw terminals (replacement)	
• With screw terminals, 5-pole For AS-i Master CM 1243-2 and AS-i DCM 1271 data decoupling module	**3RK1901-3MA00**
• With screw terminals, 3-pole for AS-i DCM 1271 data decoupling module for connecting the power supply unit	**3RK1901-3MB00**

More information

More information
More information on AS-i Power24V, see "System Manual AS-Interface", https://support.industry.siemens.com/cs/ww/en/view/26250840
Manual for AS-i Master CM 1234-2 and AS-i DCM 1271 data decoupling module, see https://support.industry.siemens.com/cs/ww/en/view/57358958

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CM 1243-5

Overview



DP-M	DP-S	FMS	PG/OP	S7
●			●	●

The CM 1243-5 communication module is used to connect a SIMATIC S7-1200 to PROFIBUS as a DP master and has the following characteristics:

- PROFIBUS DPV1 master in accordance with IEC 61158
- Support of up to 16 PROFIBUS DP slaves
- Communication with other S7 controllers based on S7 communication
- Allows programming devices and operator panels with PROFIBUS interfaces to be connected to the SIMATIC S7-1200
- Module replacement without PG supported
- Support of all standard baud rates from 9.6 kbps to 12 Mbps
- Compact industrial enclosure in SIMATIC S7-1200 design for mounting on a DIN rail
- Fast commissioning thanks to easy configuration using STEP 7 without additional programming overhead

The CM 1243-5 is intended for use in factory automation. Low-cost PROFIBUS-based automation solutions can be created on the basis of the SIMATIC S7-1200 for optimal production.

Technical specifications

Article number	**6GK7243-5DX30-0XE0**
Product type designation	CM 1243-5
Transmission rate	
Transfer rate	
• at the 1st interface acc. to PROFIBUS	9.6 kbit/s ... 12 Mbit/s
Interfaces	
Number of interfaces acc. to Industrial Ethernet	0
Number of electrical connections	
• at the 1st interface acc. to PROFIBUS	1
• for power supply	1
Type of electrical connection	
• at the 1st interface acc. to PROFIBUS	9-pin Sub-D socket (RS485)
• for power supply	3-pole terminal block
Supply voltage, current consumption, power loss	
Type of voltage of the supply voltage	DC
Supply voltage external	24 V
Supply voltage external at DC Rated value	24 V
Relative positive tolerance at DC at 24 V	20 %
Relative negative tolerance at DC at 24 V	20 %
Consumed current	
• from external supply voltage at DC at 24 V typical	0.1 A
Power loss [W]	2.4 W

Article number	**6GK7243-5DX30-0XE0**
Product type designation	CM 1243-5
Permitted ambient conditions	
Ambient temperature	
• for vertical installation during operation	0 ... 45 °C
• for horizontally arranged busbars during operation	0 ... 55 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
Relative humidity at 25 °C without condensation during operation maximum	95 %
Protection class IP	IP20
Design, dimensions and weight	
Module format	Compact module S7-1200 single width
Width	30 mm
Height	100 mm
Depth	75 mm
Net weight	0.134 kg
Mounting type	
• 35 mm DIN rail mounting	Yes
• S7-300 rail mounting	No
• wall mounting	Yes
Product properties, functions, components general	
Number of units	
• per CPU maximum	3

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Technical specifications (continued)

Article number	**6GK7243-5DX30-0XE0**
Product type designation	CM 1243-5
Performance data PROFIBUS DP	
Service as DP master	
• DPV1	Yes
Number of DP slaves on DP master usable	16
Amount of data	
• of the address area of the inputs as DP master total	512 byte
• of the address area of the outputs as DP master total	512 byte
• of the address area of the inputs per DP slave	244 byte
• of the address area of the outputs per DP slave	244 byte
• of the address area of the diagnostic data per DP slave	240 byte
Service as DP slave	
• DPV0	No
• DPV1	No
Performance data S7 communication	
Number of possible connections for S7 communication	
• maximum	8
• with PG connections maximum	1
• with PG/OP connections maximum	3
• Note	max. 4 connections to other S7 stations
Performance data multi-protocol mode	
Number of active connections with multi-protocol mode	
• without DP maximum	8
• with DP maximum	8
Performance data telecontrol	
Protocol is supported	
• TCP/IP	No
Product functions management, configuration	
Configuration software	
• required	STEP 7 Basic/Professional

Ordering data

	Article No.
CM 1243-5 communication module	
Communication module for electrical connection of SIMATIC S7-1200 to PROFIBUS as a DPV1 master	**6GK7243-5DX30-0XE0**
Accessories	
PROFIBUS FastConnect connection plug RS485	
With 90° cable outlet; insulation displacement technology, max. transmission rate 12 Mbps	
• Without PG interface	**6ES7972-0BA52-0XA0**
• With PG interface	**6ES7972-0BB52-0XA0**
PROFIBUS FC standard cable	
2-core bus cable, shielded, special design for fast mounting, delivery unit: max. 1000 m, minimum order 20 m, sold by the meter	**6XV1830-0EH10**
PROFIBUS FastConnect stripping tool	
Stripping tool for fast stripping of the PROFIBUS FastConnect bus cable	**6GK1905-6AA00**
PROFIBUS bus terminal 12M	
Bus terminal for connection of PROFIBUS nodes up to 12 Mbps with connecting cable	**6GK1500-0AA10**

Note:

You can find ordering data for software in the Industry Mall.

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CSM 1277 unmanaged

Overview



- Unmanaged switch for connecting a SIMATIC S7-1200 to an Industrial Ethernet network with a line, tree or star topology
- Multiplication of Ethernet interfaces on a SIMATIC S7-1200 for additional connection of up to three programming devices, operator controls, and further Ethernet nodes
- Simple, space-saving mounting on the SIMATIC S7-1200 DIN rail
- Low-cost solution for implementing small, local Ethernet networks
- Connection without any problems using RJ45 standard plug connectors
- Simple and fast status display via LEDs on the device
- Integral autocrossover function permits use of uncrossed connecting cables

Technical specifications

Article number	**6GK7277-1AA10-0AA0**
Product type designation	SCALANCE CSM 1277
Transmission rate	
Transfer rate	10 Mbit/s, 100 Mbit/s
Interfaces for communication integrated	
Number of electrical connections	
• for network components or terminal equipment	4
Number of 100 Mbit/s SC ports	
• for multimode	0
Number of 1000 Mbit/s LC ports	
• for multimode	0
• for single mode (LD)	0
Interfaces others	
Number of electrical connections	
• for power supply	1
Type of electrical connection	
• for power supply	3-pole terminal block
Supply voltage, current consumption, power loss	
Type of voltage of the supply voltage	DC
Supply voltage	
• external	24 V
• external minimum	19.2 V
• external maximum	28.8 V
Product component fusing at power supply input	Yes
Fuse protection type at input for supply voltage	0.5 A / 60 V
Consumed current maximum	0.07 A
Power loss [W]	
• at DC at 24 V	1.6 W

Article number	**6GK7277-1AA10-0AA0**
Product type designation	SCALANCE CSM 1277
Permitted ambient conditions	
Ambient temperature	
• during operation	0 ... 60 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
Relative humidity	
• at 25 °C without condensation during operation maximum	95 %
Protection class IP	IP20
Design, dimensions and weight	
Design	SIMATIC S7-1200 device design
Width	45 mm
Height	100 mm
Depth	75 mm
Net weight	0.15 kg
Mounting type	
• 35 mm DIN rail mounting	Yes
• wall mounting	Yes
• S7-300 rail mounting	No
• S7-1500 rail mounting	No
Product functions management, configuration	
Product function	
• multiport mirroring	No
Product function switch-managed	No
Product functions Redundancy	
Product function	
• Parallel Redundancy Protocol (PRP)/ operation in the PRP-network	Yes
• Parallel Redundancy Protocol (PRP)/ Redundant Network Access (RNA)	No

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Technical specifications (continued)

Article number	**6GK7277-1AA10-0AA0**
Product type designation	SCALANCE CSM 1277
Standards, specifications, approvals	
Standard	
• for FM	FM3611: Class 1, Divison 2, Group A, B, C, D / T.., CL.1, Zone 2, GP. IIC, T.. Ta
• for hazardous zone	EN 600079-15:2005, EN 600079-0:2006, II 3 G Ex nA II T4, KEMA 08 ATEX 0003 X
• for safety from CSA and UL	UL 508, CSA C22.2 No. 142
• for emitted interference	EN 61000-6-4 (Class A)
• for interference immunity	EN 61000-6-2
Standards, specifications, approvals CE	
Certificate of suitability CE marking	Yes
Standards, specifications, approvals miscellaneous	
Certificate of suitability	EN 61000-6-2, EN 61000-6-4
• C-Tick	Yes
• KC approval	No
Standards, specifications, approvals ship classification	
Marine classification association	
• American Bureau of Shipping Europe Ltd. (ABS)	Yes
• Bureau Veritas (BV)	Yes
• Det Norske Veritas (DNV)	Yes
• Germanische Lloyd (GL)	No
• Lloyds Register of Shipping (LRS)	Yes
• Nippon Kaiji Kyokai (NK)	Yes
• Polski Rejestr Statkow (PRS)	No
• Royal Institution of Naval Architects (RINA)	No
Standards, specifications, approvals product conformity	
MTBF	273 y

Ordering data

	Article No.
CSM 1277 compact switch module	
Unmanaged switch for connecting a SIMATIC S7-1200 and up to three further nodes to Industrial Ethernet with 10/100 Mbps; 4 x RJ45 ports; external 24 V DC power supply, diagnostics on LEDs, S7-1200 module including electronic manual on CD-ROM	**6GK7277-1AA10-0AA0**
SIPLUS NET CSM 1277 compact switch module	**6AG1277-1AA10-4AA0**
Unmanaged switch for connection of SIPLUS S7-1200 and up to three further stations to Industrial Ethernet with 10/100 Mbps; 4 x RJ45 ports; external 24 V DC power supply, LED diagnostics, S7-1200 module including electronic manual on CD-ROM	
Accessories	
IE FC TP trailing cable 2 x 2 (Type C)	**6XV1840-3AH10**
4-core, shielded TP installation cable for connection to IE FC outlet RJ45/ IE FC RJ45 plug 180/90 for use as trailing cable; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	
IE FC RJ45 plug 180 2 x 2	
RJ45 plug connector for Industrial Ethernet with a rugged metal housing and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; 180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface	
• 1 pack = 1 unit	**6GK1901-1BB10-2AA0**
• 1 pack = 10 units	**6GK1901-1BB10-2AB0**
• 1 pack = 50 units	**6GK1901-1BB10-2AE0**
IE FC outlet RJ45	**6GK1901-1FC00-0AA0**
For connection of Industrial Ethernet FC cables and TP cords; graduated prices for 10 and 50 units or more	
IE TP cord RJ45/RJ45	
• TP cord pre-assembled with 2 RJ45 plug connectors; length: 0.5 m	**6XV1850-2GE50**
• TP cable 4 x 2 with 2 RJ45 plug connectors; length: 0.5 m	**6XV1870-3QE50**

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Overview



The CP 1243-1 communications processor is used for connecting the SIMATIC S7-1200 to telecontrol centers via remote networks and telecontrol protocols (DNP3, IEC 60870-5-104, TeleControl Basic), and for safe communication via IP-based networks.

The CP has the following features:

- Ethernet-based connection to TeleControl Server Basic, e.g. via Internet
- Data transfer of measured values, control variables, or alarms optimized for telecontrol systems
- Automatic sending of alert emails
- Data buffering of up to 64,000 values ensures a secure database even with temporary connection failures
- Secure communication via VPN connections based on IPSec
- Access protection via stateful inspection firewall
- Support of SINEMA Remote Connect with autoconfiguration
- Clearly laid out LED signaling for fast and easy diagnostics
- Compact industrial enclosure in S7-1200 design for mounting on a DIN rail
- Fast commissioning thanks to easy configuration using STEP 7

Technical specifications

Article number	**6GK7243-1BX30-0XE0**
Product type designation	CP 1243-1
Transmission rate	
Transfer rate	
• at the 1st interface	10 ... 100 Mbit/s
Interfaces	
Number of interfaces acc. to Industrial Ethernet	1
Number of electrical connections	
• at the 1st interface acc. to Industrial Ethernet	1
• for power supply	0
Type of electrical connection	
• at the 1st interface acc. to Industrial Ethernet	RJ45 port
Supply voltage, current consumption, power loss	
Type of voltage of the supply voltage	DC
Supply voltage 1 from backplane bus	5 V
Consumed current	
• from backplane bus at DC at 5 V typical	0.25 A
Power loss [W]	1.25 W

Article number	**6GK7243-1BX30-0XE0**
Product type designation	CP 1243-1
Permitted ambient conditions	
Ambient temperature	
• for vertical installation during operation	-20 ... +60 °C
• for horizontally arranged busbars during operation	-20 ... +70 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
Relative humidity at 25 °C without condensation during operation maximum	95 %
Protection class IP	IP20
Design, dimensions and weight	
Module format	Compact module S7-1200 single width
Width	30 mm
Height	110 mm
Depth	75 mm
Net weight	0.122 kg
Mounting type	
• 35 mm DIN rail mounting	Yes
• wall mounting	Yes
Product properties, functions, components general	
Number of units	
• per CPU maximum	3
Performance data open communication	
Number of possible connections for open communication	
• by means of T blocks maximum	like CPU

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Technical specifications (continued)

Article number	6GK7243-1BX30-0XE0
Product type designation	CP 1243-1
Performance data S7 communication	
Number of possible connections for S7 communication	
• Note	like CPU
Performance data IT functions	
Number of possible connections	
• as e-mail client maximum	1
Performance data telecontrol	
Suitability for use	
• Node station	No
• substation	Yes
• TIM control center	No
Control center connection	For use with TeleControl Server Basic, WinCC and PCS7
• by means of a permanent connection	supported
• Note	Connection to SCADA system via Telecontrol Server Basic and Standard Telecontrol protocols
Protocol is supported	
• DNP3	Yes
• IEC 60870-5	Yes
Product function data buffering if connection is aborted	Yes; 64,000 events (TeleControl Basic, DNP3 or IEC 60870-5-104)
Number of data points per station maximum	200
Number of stations for direct communication with Telecontrol Server Basic	
• in send direction maximum	3
• in receive direction maximum	15
Performance data Teleservice	
Diagnostics function online diagnostics with SIMATIC STEP 7	Yes
Product function	
• program download with SIMATIC STEP 7	Yes
• Remote firmware update	Yes
Product functions management, configuration	
Configuration software	
• required	STEP 7 Basic/Professional
Product functions Diagnosis	
Product function Web-based diagnostics	Yes

Article number	6GK7243-1BX30-0XE0
Product type designation	CP 1243-1
Product functions Security	
Firewall version	stateful inspection
Product function with VPN connection	IPSec, SINEMA RC
Type of encryption algorithms with VPN connection	AES-256, AES-192, AES-128, 3DES-168
Type of authentication procedure with VPN connection	Preshared key (PSK), X.509v3 certificates
Type of hashing algorithms with VPN connection	MD5, SHA-1, SHA-2
Number of possible connections with VPN connection	8
Product function	
• password protection for Web applications	No
• password protection for teleservice access	No
• encrypted data transmission	Yes
• ACL - IP-based	No
• ACL - IP-based for PLC/routing	No
• switch-off of non-required services	Yes
• Blocking of communication via physical ports	No
• log file for unauthorized access	No
Product functions Time	
Protocol is supported	
• NTP	Yes
• NTP (secure)	Yes
time synchronization	
• from NTP-server	Yes
• from control center	Yes

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Ordering data	Article No.
CP 1243-1 communications processor	
CP 1243-1 communications processor for connecting SIMATIC S7-1200 as an additional Ethernet interface and for connection to control centers via telecontrol protocols (DNP3, IEC 60870, TeleControl Basic), security (firewall, VPN)	**6GK7243-1BX30-0XE0**
Accessories	
Compact Switch Module CSM 1277	
Unmanaged switch for connecting a SIMATIC S7-1200 and up to three further nodes to Industrial Ethernet with 10/100 Mbps; 4 x RJ45 ports; external 24 V DC power supply, LED diagnostics, S7-1200 module including electronic device manual on CD-ROM	**6GK7277-1AA10-0AA0**
IE FC RJ45 plugs	
RJ45 connectors for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables	
IE FC RJ45 plug 180	
180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface	
• 1 pack = 1 unit	**6GK1901-1BB10-2AA0**
• 1 pack = 10 units	**6GK1901-1BB10-2AB0**
• 1 pack = 50 units	**6GK1901-1BB10-2AE0**
IE FC TP standard cable GP 2 x 2 (Type A)	
4-core, shielded TP installation cable for connection to IE FC outlet RJ45/IE F RJ45 plug; PROFINET-compatible; with UL approval; sold by the meter; max. length 1 000 m, minimum order quantity 20 m	**6XV1840-2AH10**
IE FC stripping tool	
Pre-adjusted stripping tool for fast stripping of Industrial Ethernet FC cables	**6GK1901-1GA00**

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Overview



The CP 1242-7 GPRS V2 communications processor is used to connect a SIMATIC S7-1200 to the globally available GSM/GPRS mobile radio network and has the following characteristics:

- Worldwide wireless exchange of data between S7-1200 controllers and/or between S7-1200 controllers and control centers with an Internet connection
- Communication based on the GPRS (**G**eneral **P**acket **R**adio **S**ervice) mobile wireless service with data transmission speeds of up to 86 kbps in the downlink and 43 kbps in the uplink
- GPRS mode with fixed IP addresses and dynamic IP addresses with standard mobile phone contract
- Time synchronization based on NTP (**N**etwork **T**ime **P**rotocol)
- Sending and receiving of text messages
- LED signaling for fast diagnostics
- Compact industrial enclosure in S7-1200 design for mounting on a DIN rail
- Fast commissioning thanks to easy configuration using STEP 7

In conjunction with the TeleControl Server Basic software, the CP 1242-7 forms a telecontrol system with additional properties:

- Connection of up to 5000 telecontrol stations to the control center via an OPC interface
- Data buffering in the substations in the event of connection failures
- Central status monitoring of the substations
- No special provider services required for fixed IP addresses
- Teleservice access with STEP 7 to the substations via the Internet

The CP 1242-7 V2 is a new product version of the CP 1242-7. The concept for process data transmission has been expanded with a simple data point configuration, which enables substantially easier commissioning without high programming overhead and minimizes susceptibility to errors during the projects implementation phase. CP 1242-7 has also been equipped with new functions, such as access to the internal web server of the S7-1200. This opens up numerous new application areas.

Technical specifications

Article number	**6GK7242-7KX31-0XE0**
Product type designation	CP 1242-7 V2
Transmission rate	
Transfer rate	
• for GPRS transmission	
- with downlink maximum	86 kbit/s
- with uplink maximum	43 kbit/s
Interfaces	
Number of interfaces acc. to Industrial Ethernet	0
Number of electrical connections	
• for external antenna(s)	1
• for power supply	1
Number of slots	
• for SIM cards	1
Type of electrical connection	
• for external antenna(s)	SMA socket (50 ohms)
• for power supply	3-pole terminal block
Slot version	
• for SIM card	Standard

Article number	**6GK7242-7KX31-0XE0**
Product type designation	CP 1242-7 V2
Wireless technology	
Type of mobile wireless service	
• is supported SMS	Yes
• is supported GPRS	Yes
• Note	GPRS (Multislot Class 10)
Type of mobile network is supported	
• GSM	Yes
• UMTS	No
• LTE	No
Operating frequency	
• 850 MHz	Yes
• 900 MHz	Yes
• 1800 MHz	Yes
• 1900 MHz	Yes
Transmit power	
• at operating frequency 900 MHz	2 W
• at operating frequency 1800 MHz	1 W
• at operating frequency 1900 MHz	1 W

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Technical specifications (continued)

Article number	6GK7242-7KX31-0XE0
Product type designation	CP 1242-7 V2
Supply voltage, current consumption, power loss	
Type of voltage of the supply voltage	DC
Supply voltage external	24 V
Supply voltage external at DC Rated value	24 V
Relative positive tolerance at DC at 24 V	20 %
Relative negative tolerance at DC at 24 V	20 %
Consumed current	
• from external supply voltage at DC at 24 V typical	0.1 A
• from external supply voltage at DC at 24 V maximum	0.22 A
Power loss [W]	2.4 W
Permitted ambient conditions	
Ambient temperature	
• for vertical installation during operation	-20 ... +60 °C
• for horizontally arranged busbars during operation	-20 ... +70 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
Relative humidity at 25 °C without condensation during operation maximum	95 %
Protection class IP	IP20
Design, dimensions and weight	
Module format	Compact module S7-1200 single width
Width	30 mm
Height	100 mm
Depth	75 mm
Net weight	0.133 kg
Mounting type	
• 35 mm DIN rail mounting	Yes
• S7-300 rail mounting	No
• wall mounting	Yes
Product properties, functions, components general	
Number of units	
• per CPU maximum	3
Performance data	
Number of users/telephone numbers definable maximum	10

Article number	6GK7242-7KX31-0XE0
Product type designation	CP 1242-7 V2
Performance data open communication	
Number of possible connections for open communication	
• by means of T blocks maximum	like CPU
Performance data IT functions	
Number of possible connections	
• as e-mail client maximum	1
Performance data telecontrol	
Control center connection	Telecontrol Server Basic
• by means of a permanent connection	supported
• by means of demand-oriented connection	supported
• Note	Connection to SCADA system using OPC interface
Protocol is supported	
• DNP3	No
• IEC 60870-5	No
Product function data buffering if connection is aborted	Yes; 64,000 events
Number of stations for direct communication with Telecontrol Server Basic	
• in send direction maximum	3
• in receive direction maximum	15
Performance data Teleservice	
Diagnostics function online diagnostics with SIMATIC STEP 7	Yes
Product function	
• program download with SIMATIC STEP 7	Yes
• Remote firmware update	Yes
Product functions management, configuration	
Configuration software	
• required	STEP 7 Basic/Professional
Product functions Diagnosis	
Product function Web-based diagnostics	Yes
Product functions Security	
Product function	
• password protection for teleservice access	Yes
• encrypted data transmission	Yes
Product functions Time	
Protocol is supported	
• NTP	Yes
time synchronization	
• from control center	Yes

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Ordering data

	Article No.
Communications processor CP 1242-7 GPRS[1]	
Communications processor CP 1242-7 GPRS V2 for connecting SIMATIC S7-1200 to TeleControl Server Basic via GSM/GPRS mobile radio network	**6GK7242-7KX31-0XE0**

	Article No.
Accessories	
ANT794-4MR antenna	**6NH9860-1AA00**
Omnidirectional antenna for GSM (2G), UMTS (3G) and LTE (4G) networks; omnidirectional; weatherproof for indoor and outdoor use; 5 m cable with fixed connection to antenna; SMA connector; including mounting bracket, screws, wall plugs	
ANT794-3M antenna	**6NH9870-1AA00**
Flat panel antenna for GSM (2G) networks, for triband with 900/1 800/1 900 MHz; weatherproof for indoor/outdoor use, 1.2 m cable with fixed connection to antenna; SMA connector, incl. assembly adhesive tape	

[1] Please note country approvals under:
http://www.siemens.com/wireless-approvals

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CP 1243-7 LTE

Overview



CP 1243-7 LTE is used to connect the S7-1200 to a mobile wireless 4th Generation LTE (Long Term Evolution) network. The increased data rates compared to GPRS and widespread introduction of LTE open up new areas of application.
The CP1243-7 is characterized by the following properties:

- 1 connection to LTE (4G) mobile wireless network (various versions for EU and North America)
- Data transfer of measured values, control variables, or alarms optimized for telecontrol systems
- Operation with fixed IP addresses and dynamic IP addresses with standard cellular phone contract
- Time synchronization based on NTP (Network Time Protocol)
- On-demand connection setup via voice call or text message
- Sending and receiving of text messages
- Teleservice access with STEP 7 to substations via mobile wireless networks
- Compact industrial enclosure in S7-1200 design for mounting on a DIN rail
- Temperature range in operation: -20°C to +70°C
- DIN rail mounting
- Diagnostics LEDs (overall status and details)
- Integrated security functions (VPN and firewall)
- Access to the CPU web server
- Fast commissioning due to simplified configuration with STEP 7
- Data buffering of up to 64,000 values ensures a secure database even with temporary connection failures
- Support of SINEMA Remote Connect with autoconfiguration

Technical specifications

Article number	**6GK7243-7KX30-0XE0**	**6GK7243-7SX30-0XE0**
Product type designation	CP 1243-7 LTE EU	CP 1243-7 LTE US
Transmission rate		
Transfer rate		
• for LTE transmission		
- with downlink maximum	42 Mbit/s	42 Mbit/s
- with uplink maximum	5.76 Mbit/s	5.76 Mbit/s
Interfaces		
Number of interfaces acc. to Industrial Ethernet	0	0
Number of electrical connections		
• for external antenna(s)	1	1
• for power supply	1	1
Number of slots		
• for SIM cards	1	1
Type of electrical connection		
• for external antenna(s)	SMA socket (50 ohms)	SMA socket (50 ohms)
• for power supply	3-pole terminal block	3-pole terminal block
Slot version		
• for SIM card	Standard	Standard
Wireless technology		
Type of mobile wireless service		
• is supported SMS	Yes	Yes
• is supported GPRS	Yes	Yes
• Note	GPRS (Multislot Class 10)	GPRS (Multislot Class 10)
Type of mobile network is supported		
• GSM	Yes	Yes
• UMTS	Yes	Yes
• LTE	Yes	Yes
Operating frequency		
• 850 MHz		Yes
• 1900 MHz		Yes

Article number	**6GK7243-7KX30-0XE0**	**6GK7243-7SX30-0XE0**
Product type designation	CP 1243-7 LTE EU	CP 1243-7 LTE US
Operating frequency		
• for GSM transmission 900 MHz	Yes	
• for GSM transmission 1800 MHz	Yes	
• with UMTS transmission 900 MHz	Yes	
• with UMTS transmission 2100 MHz	Yes	
• for LTE transmission 700 MHz		Yes
• for LTE transmission 800 MHz	Yes	
• for LTE transmission 1700 MHz		Yes
• for LTE transmission 1800 MHz	Yes	
• for LTE transmission 2600 MHz	Yes	
Supply voltage, current consumption, power loss		
Type of voltage of the supply voltage	DC	DC
Supply voltage external	24 V	24 V
Supply voltage external at DC Rated value	24 V	24 V
Relative positive tolerance at DC at 24 V	20 %	20 %
Relative negative tolerance at DC at 24 V	20 %	20 %
Consumed current		
• from external supply voltage at DC at 24 V typical	0.1 A	0.1 A
• from external supply voltage at DC at 24 V maximum	0.22 A	0.22 A

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Technical specifications (continued)

Article number	6GK7243-7KX30-0XE0	6GK7243-7SX30-0XE0
Product type designation	CP 1243-7 LTE EU	CP 1243-7 LTE US
Permitted ambient conditions		
Ambient temperature		
• for vertical installation during operation	-20 ... +60 °C	-20 ... +60 °C
• for horizontally arranged busbars during operation	-20 ... +70 °C	-20 ... +70 °C
• during storage	-40 ... +70 °C	-40 ... +70 °C
• during transport	-40 ... +70 °C	-40 ... +70 °C
Relative humidity at 25 °C without condensation during operation maximum	95 %	95 %
Protection class IP	IP20	IP20
Design, dimensions and weight		
Module format	Compact module S7-1200 single width	Compact module S7-1200 single width
Width	30 mm	30 mm
Height	100 mm	100 mm
Depth	75 mm	75 mm
Net weight	0.133 kg	0.133 kg
Mounting type		
• 35 mm DIN rail mounting	Yes	Yes
• S7-300 rail mounting	No	No
• wall mounting	Yes	Yes
Product properties, functions, components general		
Number of units		
• per CPU maximum	3	3
Performance data		
Number of users/telephone numbers definable maximum	10	10
Performance data open communication		
Number of possible connections for open communication		
• by means of T blocks maximum	like CPU	like CPU
Performance data IT functions		
Number of possible connections		
• as e-mail client maximum	1	1
Performance data telecontrol		
Suitability for use		
• substation	Yes	Yes
Control center connection	Telecontrol Server Basic	Telecontrol Server Basic
• by means of a permanent connection	supported	supported
• by means of demand-oriented connection	supported	supported
• Note	Connection to SCADA system using OPC interface	Connection to SCADA system using OPC interface
Protocol is supported		
• DNP3	No	No
• IEC 60870-5	No	No

Article number	6GK7243-7KX30-0XE0	6GK7243-7SX30-0XE0
Product type designation	CP 1243-7 LTE EU	CP 1243-7 LTE US
Product function data buffering if connection is aborted	Yes; 64,000 events	Yes; 64,000 events
Number of stations for direct communication with Telecontrol Server Basic		
• in send direction maximum	3	3
• in receive direction maximum	15	15
Performance data Teleservice		
Diagnostics function online diagnostics with SIMATIC STEP 7	Yes	Yes
Product function		
• program download with SIMATIC STEP 7	Yes	Yes
• Remote firmware update	Yes	Yes
Product functions management, configuration		
Configuration software		
• required	STEP 7 Basic/ Professional	STEP 7 Basic/ Professional
Product functions Diagnosis		
Product function Web-based diagnostics	Yes	Yes
Product functions Security		
Firewall version	stateful inspection	stateful inspection
Product function with VPN connection	IPSec, SINEMA RC	IPSec, SINEMA RC
Type of encryption algorithms with VPN connection	AES-256, AES-192, AES-128, 3DES-168, DES-56	AES-256, AES-192, AES-128, 3DES-168, DES-56
Type of authentication procedure with VPN connection	Preshared key (PSK), X.509v3 certificates	Preshared key (PSK), X.509v3 certificates
Type of hashing algorithms with VPN connection	MD5, SHA-1	MD5, SHA-1
Number of possible connections with VPN connection	1	1
Product function		
• password protection for teleservice access	Yes	Yes
• encrypted data transmission	Yes	Yes
Product functions Time		
Protocol is supported		
• NTP	Yes	Yes
time synchronization		
• from control center	Yes	Yes

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Ordering data	Article No.
Communication processor CP 1243-7 LTE	
Communication processor for connecting SIMATIC S7-1200 to TeleControl Server Basic via LTE mobile wireless network	
• **CP 1243-7 LTE EU** Frequencies in European band: 700, 1 700 MHz	**6GK7243-7KX30-0XE0**
Frequencies in European band: 700, 1 700 MHz	
• **CP 1243-7 LTE US** Frequencies in North American band: 800, 1 800, 2 600 MHz	**6GK7243-7SX30-0XE0**

Accessories	Article No.
ANT794-4MR antenna	**6NH9860-1AA00**
Omnidirectional antenna for GSM (2G), UMTS (3G) and LTE (4G) networks; omnidirectional; weatherproof for indoor and outdoor use; 5 m cable with fixed connection to antenna; SMA connector; including mounting bracket, screws, wall plugs	

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Overview



The CP 1243-8 IRC (Industrial Remote Communication) communications processor is used for connecting a SIMATIC S7-1200 via the SINAUT ST7 telecontrol protocol to higher-level ST7 stations or to an ST7 control center. The CP 1243-8 IRC (as of HW2 and firmware V3.0) also offers connection to a DNP3 or IEC-capable control center via a corresponding open DNP3 or IEC 60870-5-104 telecontrol protocol. The CP 1243-8 IRC (as of HW2 and firmware V3.0) also offers connection to a DNP3 or IEC-capable control center via a corresponding open DNP3 or IEC 60870-5-104 telecontrol protocol.

The CP has the following features:

- Support for telecontrol protocol SINAUT ST7, DNP3, IEC 60870-5-104
- Two WAN connections for selecting the communication paths:
  - Ethernet-based connection: RJ45 port on the module for connecting external routers, e.g. SCALANCE M
  - Additional connection configurable via plug-in TS modules
- Both WAN interfaces can also be operated simultaneously: Route redundancy
- Data transfer of measured values, control variables, or alarms optimized for telecontrol systems
- Automatic transmission of alarms per email or text message
- Time synchronization based on NTP (Network Time Protocol) or via the SINAUT system
- Data buffering of up to 16,000 data frames prevents data loss in the event of temporary connection failures
- Secure communication via VPN connections based on IPSec
- Access protection via stateful inspection firewall
- Support of SINEMA Remote Connect with autoconfiguration
- Fast and simple diagnostics via clear LED indicators, STEP 7 and web browser
- Compact industrial enclosure in S7-1200 design for mounting on a DIN rail

The integrated Ethernet interface and the option of using the TS modules provide flexible connection options for the CP. The following TS modules are available:

- TS module RS232
- TS module MODEM
- TS module ISDN

Technical specifications

Article number	**6GK7243-8RX30-0XE0**
Product type designation	CP 1243-8 IRC
Transmission rate	
Transfer rate	
• at the 1st interface	10 ... 100 Mbit/s
• at the 2nd interface	0.3 ... 115.2 kbit/s
Interfaces	
Number of interfaces acc. to Industrial Ethernet	1
Number of electrical connections	
• at the 1st interface acc. to Industrial Ethernet	1
• for power supply	1
Type of electrical connection	
• at the 1st interface acc. to Industrial Ethernet	RJ45 port
• at interface 2 for external data transmission	Interface to the TS Module
• for power supply	3-pole terminal block

Article number	**6GK7243-8RX30-0XE0**
Product type designation	CP 1243-8 IRC
Supply voltage, current consumption, power loss	
Type of voltage of the supply voltage	DC
Supply voltage 1 from backplane bus	5 V
Supply voltage external	24 V
Supply voltage external	19.2 ... 28.8 V
Supply voltage external at DC Rated value	24 V
Supply voltage external at DC rated value	19.2 ... 28.8 V
Consumed current	
• from backplane bus at DC at 5 V typical	0.25 A
• from external supply voltage at DC at 24 V typical	0.1 A
Power loss [W] Note	1.25 W from S7-1200 backplane without TS module. 2.4 W from 24 V DC external with TS module
Power loss [W]	2.4 W

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Technical specifications (continued)

Article number	6GK7243-8RX30-0XE0
Product type designation	CP 1243-8 IRC
Permitted ambient conditions	
Ambient temperature	
• for vertical installation during operation	-20 ... +60 °C
• for horizontally arranged busbars during operation	-20 ... +70 °C
• during storage	-40 ... -70 °C
• during transport	-40 ... +70 °C
Relative humidity at 25 °C without condensation during operation maximum	95 %
Protection class IP	IP20
Design, dimensions and weight	
Module format	Compact module S7-1200 single width
Width	30 mm
Height	110 mm
Depth	75 mm
Net weight	0.122 kg
Mounting type	
• 35 mm DIN rail mounting	Yes
• S7-300 rail mounting	No
• wall mounting	Yes
Product properties, functions, components general	
Number of units	
• per CPU maximum	1
• Note	One CP pluggable on left side of CPU, one TS Module pluggable left side of CP.
Performance data open communication	
Number of possible connections for open communication	
• by means of T blocks maximum	like CPU
Performance data S7 communication	
Number of possible connections for S7 communication	
• with PG connections maximum	2
• with OP connections maximum	1
• Note	Configured S7-Connection for ST7-Communication
Service	
• SINAUT ST7 via S7 communication	Yes
Performance data IT functions	
Number of possible connections	
• as e-mail client maximum	1

Article number	6GK7243-8RX30-0XE0
Product type designation	CP 1243-8 IRC
Performance data telecontrol	
Suitability for use	
• Node station	No
• substation	Yes
• TIM control center	No
• Note	Ethernet and TS Module can be operated in parallel
Control center connection	control center with ST7 function
• by means of a permanent connection	supported
Protocol is supported	
• DNP3	Yes
• IEC 60870-5	Yes
• SINAUT ST7 protocol	Yes
Product function data buffering if connection is aborted	Yes; 16,000 data messages (ST7), up to 64.000 events (DNP3 or IEC 60870-5-104)
Number of data points per station maximum	200
Transmission format	
• for SINAUT ST7 protocol with multi-master polling 10-bit	Yes
• for SINAUT ST7 protocol with polling or spontaneous 10-bit or 11-bit	Yes
Operating mode for scanning of data transmission	
• with dedicated line/radio link with SINAUT ST7 protocol	Polling
• with dial-up network with SINAUT ST7 protocol	spontaneous
Hamming distance	
• for SINAUT ST7 protocol	4
Performance data Teleservice	
Diagnostics function online diagnostics with SIMATIC STEP 7	Yes
Product function	
• program download with SIMATIC STEP 7	Yes
• Remote firmware update	Yes
Product functions management, configuration	
Protocol is supported	
• SNMP v3	Yes
• DCP	Yes
Configuration software	
• required	SINAUT ES V5.5 and STEP7 V13 SP1 or higher
• for PG configuring required SINAUT ST7 configuration software for PG	Yes
Product functions Diagnosis	
Product function Web-based diagnostics	Yes

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Technical specifications (continued)

Article number	**6GK7243-8RX30-0XE0**
Product type designation	CP 1243-8 IRC
Product functions Security	
Firewall version	stateful inspection
Suitability for operation Virtual Private Network	Yes
Product function with VPN connection	IPSec, SINEMA RC
Type of encryption algorithms with VPN connection	AES-256, AES-192, AES-128, 3DES-168, DES-56
Type of authentication procedure with VPN connection	Preshared key (PSK), X.509v3 certificates
Type of hashing algorithms with VPN connection	MD5, SHA-1
Number of possible connections with VPN connection	8
Product function	
• password protection for teleservice access	No
• encrypted data transmission	Yes
• MSC client via GPRS modem with MSC capability	Yes
Protocol	
• is supported MSC protocol	Yes
• with Virtual Private Network MSC is supported	TCP/IP
Key length for MSC with Virtual Private Network	128 bit
Number of possible connections	
• as MSC client with VPN connection	1
• as MSC server with VPN connection	0
Product functions Time	
Protocol is supported	
• NTP	Yes
time synchronization	
• from NTP-server	Yes
• from control center	Yes
Accessories	
accessories	TS Module RS232 or TS Module MODEM or TS Module ISDN

Ordering data

	Article No.
CP 1243-8 IRC communications processor Communications processor for connecting a SIMATIC S7-1200 via the SINAUT ST7 telecontrol protocol to higher-level ST7 stations or to an ST7 control center, or a DNP3 or IEC-capable control center via a corresponding DNP3 or IEC 60870-5-104 open telecontrol protocols	**6GK7243-8RX30-0XE0**
Accessories	
SINAUT engineering software V5.5 + SP3 On CD, consisting of: • SINAUT ST7/DNP3 configuration and diagnostic software for STEP 7 V5.6 • SINAUT TD7 block library • Electronic manual in German and English	**6NH7997-0CA55-0AA0**
SINAUT engineering software V5.5 Upgrade from V5.0, V5.1, V5.2, V5.3 or V5.4	**6NH7997-0CA55-0GA0**
TeleService module Connection to TS Adapter IE Basic/ Advanced or CP 1243-8 IRC. Power supply via TS Adapter IE Basic/Advanced or CP 1243-8 IRC.	
TS module RS 232	**6ES7972-0MS00-0XA0**
TS module modem	**6ES7972-0MM00-0XA0**
TS module ISDN	**6ES7972-0MD00-0XA0**
CSM 1277 compact switch module Unmanaged switch for connecting a SIMATIC S7-1200 and up to three further nodes to Industrial Ethernet with 10/100 Mbps; 4 x RJ45 ports; external 24 V DC power supply, LED diagnostics, S7-1200 module including electronic device manual on CD-ROM	**6GK7277-1AA10-0AA0**

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SIMATIC RF120C

Overview



The SIMATIC RF120C is a communication module for connecting the SIMATIC identification systems directly to the SIMATIC S7-1200. The RFID readers as well as the MV400 optical readers can be operated on the SIMATIC RF120C.

Integration into the TIA Portal and the uniform plug-in connection systems permit fast and simple commissioning.

Technical specifications

Article number	**6GT2002-0LA00**
Product type designation	RF120C communication module
Suitability for operation	SIMATIC S7-1200 together with RF200/300/600, MV400, MOBY D/U
Transmission rate	
Transfer rate at the point-to-point connection serial maximum	115.2 kbit/s
Interfaces	
Design of the interface for point-to-point connection	RS422
Number of readers connectable	1
Type of electrical connection	
• of the backplane bus	S7-1200 backplane bus
• for supply voltage	Screw terminals
Design of the interface to the reader for communication	D-sub, 9-pin, socket
Mechanical data	
Material	Xantar MX 1094
Color	Ti-grey 24L01
Tightening torque of the screw for securing the equipment maximum	0.45 N·m
Supply voltage, current consumption, power loss	
Supply voltage	
• at DC Rated value	24 V
• at DC	20 ... 30 V
Consumed current at DC at 24 V	
• without connected devices typical	0.03 A
• with connected devices maximum	1 A

Article number	**6GT2002-0LA00**
Product type designation	RF120C communication module
Permitted ambient conditions	
Ambient temperature	
• during operation	0 ... 55 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
Protection class IP	IP20
Shock resistance	According to IEC 61131-2
Shock acceleration	300 m/s²
Vibrational acceleration	100 m/s²
Design, dimensions and weight	
Width	30 mm
Height	100 mm
Depth	75 mm
Net weight	0.15 kg
Mounting type	S7-1200 rack
Wire length for RS 422 interface maximum	1 000 m
Product properties, functions, components general	
Display version	4 LEDs for reader connection, 1 LED for device status
Product function transponder file handler can be addressed	No
Protocol is supported	
• S7 communication	Yes
Type of parameterization	HSP
Type of programming	ID profile, library with functions
Type of computer-mediated communication	acyclic communication
Standards, specifications, approvals	
Certificate of suitability	CE, FCC, cULus, KCC, C-Tick, FM, Ex: II 3G Ex nAA IIC T4 Gc
MTBF	196 y

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Ordering data

	Article No.
SIMATIC RF120C communication module Integrated in the S7-1200 controller for connection of a reader	**6GT2002-0LA00**
Accessories for all readers	
Reader cable for SIMATIC RF200 / RF300 / RF600 / MV400 PUR material, suitable for cable carriers, straight reader connector	
2 m	**6GT2091-4LH20**
5 m	**6GT2091-4LH50**
10 m	**6GT2091-4LN10**

	Article No.
Accessories for extended use	
Extension cable for all readers PUR material, suitable for cable carriers.	
2 m, straight connector	**6GT2891-4FH20**
5 m, straight connector	**6GT2891-4FH50**
10 m, straight connector	**6GT2891-4FN10**
20 m, straight connector	**6GT2891-4FN20**
50 m, straight connector	**6GT2891-4FN50**
2 m, connector angled at reader	**6GT2891-4JH20**
5 m, connector angled at reader	**6GT2891-4JH50**
10 m, connector angled at reader	**6GT2891-4JN10**
DVD "RFID Systems Software & Documentation"	**6GT2080-2AA20**

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SIPLUS CM 1241 communication modules

Overview



- For fast, high-performance serial data exchange via point-to-point coupling
- Implemented protocols: ASCII, USS drive protocol, Modbus RTU
- Additional protocols can also be loaded
- Simple parameterization with STEP 7 Basic

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

Technical specifications

Article number	**6AG1241-1AH32-4XB0**	**6AG1241-1AH32-2XB0**	**6AG1241-1CH32-4XB0**	**6AG1241-1CH32-2XB0**
Based on	**6ES7241-1AH32-0XB0**	**6ES7241-1AH32-0XB0**	**6ES7241-1CH32-0XB0**	**6ES7241-1CH32-0XB0**
	SIPLUS S7-1200 CM 1241 RS232	SIPLUS S7-1200 CM1241 RS232	SIPLUS S7-1200 CM 1241 RS422/485	SIPLUS S7-1200 CM 1241 RS422/485
Ambient conditions				
Free fall				
• Fall height, max.	0.3 m; five times, in product package	0.3 m; five times, in product package	0.3 m; five times, in product package	0.3 m; five times, in product package
Ambient temperature during operation				
• min.	-20 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-20 °C; = Tmin (incl. condensation/frost); start-up @ 0 °C	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C
• max.	60 °C; = Tmax	70 °C; = Tmax	60 °C; = Tmax	70 °C; Tmax > 60 °C, derating: Max. one module may be configured; this module must be the last module on the CM bus; minimum clearance on the left side of at least 45 mm
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity				
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance				
Coolants and lubricants				
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air

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Technical specifications (continued)

Article number	6AG1241-1AH32-4XB0	6AG1241-1AH32-2XB0	6AG1241-1CH32-4XB0	6AG1241-1CH32-2XB0
Based on	6ES7241-1AH32-0XB0	6ES7241-1AH32-0XB0	6ES7241-1CH32-0XB0	6ES7241-1CH32-0XB0
	SIPLUS S7-1200 CM 1241 RS232	SIPLUS S7-1200 CM1241 RS232	SIPLUS S7-1200 CM 1241 RS422/485	SIPLUS S7-1200 CM 1241 RS422/485
Use in stationary industrial systems				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
Use on ships/at sea				
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Remark				
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating				
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability	Yes; Class 2 for high availability	Yes; Class 2 for high availability	Yes; Class 2 for high availability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

Ordering data

	Article No.
SIPLUS CM 1241 communication module	
(Extended temperature range and exposure to media)	
Ambient temperature -40 ... +70° C	
Communication module for point-to-point connection, with one RS 232 interface	**6AG1241-1AH32-2XB0**
Communication module for point-to-point connection, with one RS 485 interface	**6AG1241-1CH32-2XB0**
Suitable for areas with extreme exposure to media (conformal coating)	
Communication module for point-to-point connection, with one RS 232 interface	**6AG1241-1AH32-4XB0**
Communication module for point-to-point connection, with one RS 485 interface	**6AG1241-1CH32-4XB0**

	Article No.
Accessories	See SIMATIC S7-1200 communication module CM 1241, page 3/134

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SIPLUS CB 1241 communication board RS485

Overview

- For fast, high-performance serial data exchange via point-to-point connection
- Implemented protocols: ASCII, USS drive protocol, Modbus RTU
- Additional protocols can be loaded later
- Simple parameterization with STEP 7 Basic
- Can be plugged directly into the CPU

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

Technical specifications

Article number	**6AG1241-1CH30-5XB1**
Based on	**6ES7241-1CH30-1XB1** SIPLUS S7-1200 CB 1241 RS485
Ambient conditions	
Free fall	
• Fall height, max.	0.3 m; five times, in product package
Ambient temperature during operation	
• min.	-40 °C; = Tmin (incl. condensation/ frost); start-up @ -25 °C
• max.	55 °C; = Tmax
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance	
Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air

Article number	**6AG1241-1CH30-5XB1**
Based on	**6ES7241-1CH30-1XB1** SIPLUS S7-1200 CB 1241 RS485
Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
Remark	
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A

Ordering data

	Article No.
SIPLUS CB 1241 RS485 communication board for point-to-point connection, with 1 RS 485 interface	**6AG1241-1CH30-5XB1**

	Article No.
Accessories	See SIMATIC CB 1241 RS485 communication board, page 3/135

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Overview



DP-M	DP-S	FMS	PG/OP	S7
	●			

The SIPLUS CM 1242-5 communication module is used to connect a SIPLUS S7-1200 controller to PROFIBUS as a DP slave and has the following characteristics:

- PROFIBUS DPV1 slave in accordance with IEC 61158
- Module replacement without PG supported
- Power is supplied via the backplane bus so that no extra cabling is required
- Support of all standard baud rates from 9.6 kbps to 12 Mbps
- Compact industry-standard enclosure in S7-1200 design for mounting on a DIN rail
- Fast commissioning thanks to easy configuration using STEP 7 without additional programming overhead

The CM 1242-5 is intended for use in factory automation. Low-cost PROFIBUS-based automation solutions can be created on the basis of S7-1200 for optimal production.

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

SIPLUS S7-1200 CM 1242-5	
Article No.	**6AG1 242-5DX30-2XE0**
Article No. based on	**6GK7 242-5DX30-0XE0**
Ambient temperature range	-25 ... +55 °C
Ambient conditions	Suitable for exceptional exposure to media (e.g. sulfur chlorine atmosphere).
Technical data	The technical data of the standard product applies except for the ambient conditions.
Ambient conditions	
Relative humidity	100%, condensation/frost permissible. No commissioning under condensation conditions.
Biologically active substances, compliance with EN 60721-3-3	Class 3B2 mold and fungal spores (excluding fauna). The supplied plug covers must remain in place over the unused interfaces during operation!
Chemically active substances, compliance with EN 60721-3-3	Class 3C4 incl. salt spray in accordance with EN60068-2-52 (degree of severity 3). The supplied plug covers must remain in place over the unused interfaces during operation!
Mechanically active substances, compliance with EN 60721-3-3	Class 3S4 incl. sand, dust. The supplied plug covers must remain in place over the unused interfaces during operation!
Air pressure (depending on the highest positive temperature range specified)	1 080 ... 795 hPa (-1 000 ... +2 000 m) see ambient temperature range 795 ... 658 hPa (+2 000 ... +3 500 m) derating 10 K 658 ... 540 hPa (+3 500 ... +5 000 m) derating 20 K

For technical documentation on SIPLUS, see:
http://www.siemens.com/siplus-extreme

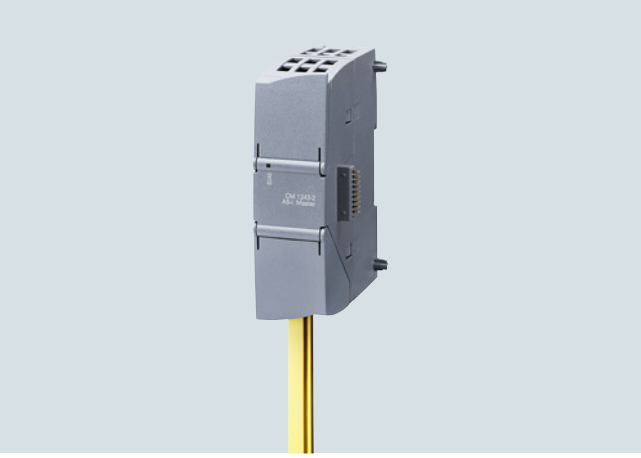
Ordering data

	Article No.
SIPLUS communication module CM 1242-5 (Extended temperature range and exposure to media)	
Communication module for electrical connection of SIMATIC S7-1200 to PROFIBUS as a DPV1 slave	**6AG1242-5DX30-2XE0**
Accessories	See SIMATIC S7-1200 CM 1242-5 communication module, page 3/137

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SIPLUS Communication Module CM 1243-2

Overview



The CM 1243-2 communication module is the AS-Interface master for the SIMATIC S7-1200 and has the following features:

- As many as 62 AS-Interface slaves can be connected
- Integrated analog value transmission
- Supports all AS-Interface master functions according to the AS-Interface Specification V3.0
- Indication of the operating state on the front of the device via LED
- Indication of operating mode, AS-Interface voltage faults, configuration faults and I/O faults via LEDs behind the front panel
- Compact enclosure in the design of the SIMATIC S7-1200
- Suitable for AS-Interface with 30 V voltage and AS-i Power24V: In combination with the optional DCM 1271 data decoupling module, a standard 24 V power supply unit can be used
- Configuration and diagnostics via the TIA Portal

Installation

The CM 1243-2 communication module is positioned to the left of the S7-1200 CPU and linked to the S7-1200 via lateral contacts.

It incorporates:

- Terminals for two AS-i cables (internally jumpered) via two screw terminals each
- One terminal for connection to the functional ground
- LEDs for indication of the operating state and fault statuses of the connected slaves

The screw terminals (included in the scope of supply) can be removed to facilitate installation.

Function

The CM 1243-2 supports all specified functions of the AS-Interface Specification V3.0.

The values of the digital AS-i slaves can be addressed via the process image of the S7-1200. During configuration of the slaves in the TIA Portal, the values of the analog AS-i slaves can also be accessed directly in the process image.

It is also possible to exchange all data of the AS-i Master and the connected AS-i slaves with the S7-1200 via the data record interface.

Changeover of the operating mode, automatic application of the slave configuration and the re-addressing of a connected AS-i slave can be implemented via the control panel of the CM 1243-2 in the TIA Portal.

The optional DCM 1271 data decoupling unit has an integrated detection unit for detecting ground faults on the AS-Interface cable. The integrated overload protection also disconnects the AS-Interface cable if the drive current required exceeds 4 A. For more information on DCM 1271, see page 3/140.

Notes on security

In order to protect plants, systems, machines and networks against cyber threats, it is necessary to implement – and continuously maintain – a holistic, state-of-the-art industrial security concept. Siemens' products and solutions constitute one element of such a concept.

For more information about industrial security, please visit www.siemens.com/industrialsecurity.

Configuration

To configure CM 1243-2, you require STEP 7 V11 + SP2 or higher.

For STEP 7 V11 + SP2 or higher, the additional Hardware Support Package for CM 1243-2 is required. This is available from the Industry Online Support Portal, see https://support.industry.siemens.com/cs/ww/en/view/72341852.

The software enables user-friendly configuration and diagnostics of the AS-i Master and any connected slaves.

Alternatively, you can also apply the AS-Interface ACTUAL configuration at the touch of a button via the control panel integrated in the TIA Portal/STEP 7.

Firmware V1.1 (or higher) is required for the CM 1243-2 module for operation on an S7-1200 CPU from firmware V4.0.

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

Ordering data

Ordering data	Article No.
SIPLUS CM 1243-2 communication module (Extended temperature range and exposure to media) • AS-Interface master for SIMATIC S7-1200 • Corresponds to AS-Interface Specification V3.0 • With screw terminals, removable terminals (included in the scope of supply) • Dimensions (W × H × D/mm) 30 × 100 × 75	**6AG1243-2AA30-7XB0**
Accessories	See S7-1200 CM 1243-2 communication module

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Overview



DP-M	DP-S	FMS	PG/OP	S7
●			●	●

The CM 1243-5 communication module is used to connect a SIMATIC S7-1200 controller to PROFIBUS as a DP master and has the following characteristics:

- PROFIBUS DPV1 master in accordance with IEC 61158
- Support of up to 16 PROFIBUS DP slaves
- Communication with other S7 controllers based on S7 communication
- Allows the connection of programming devices and operator panels with a PROFIBUS interface to S7-1200
- Module replacement without PG supported
- Support of all standard baud rates from 9.6 kbps to 12 Mbps
- Compact industry-standard enclosure in S7-1200 design for mounting on a DIN rail
- Fast commissioning thanks to easy configuration using STEP 7 without additional programming overhead

The CM 1243-5 is intended for use in factory automation. Low-cost PROFIBUS-based automation solutions can be created on the basis of S7-1200 for optimal production.

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

SIPLUS S7-1200 CM 1243-5	
Article No.	**6AG1 243-5DX30-2XE0**
Article No. based on	**6GK7 243-5DX30-0XE0**
Ambient temperature range	-25 ... +70 °C
Ambient conditions	Suitable for exceptional exposure to media (e.g. sulfur chlorine atmosphere).
Technical data	The technical data of the standard product applies except for the ambient conditions.
Ambient conditions	
Relative humidity	100%, condensation/frost permissible. No commissioning under condensation conditions.
Biologically active substances, compliance with EN 60721-3-3	Class 3B2 mold and fungal spores (excluding fauna). The supplied plug covers must remain in place over the unused interfaces during operation!
Chemically active substances, compliance with EN 60721-3-3	Class 3C4 incl. salt spray in accordance with EN60068-2-52 (degree of severity 3). The supplied plug covers must remain in place over the unused interfaces during operation!
Mechanically active substances, compliance with EN 60721-3-3	Class 3S4 incl. sand, dust. The supplied plug covers must remain in place over the unused interfaces during operation!
Air pressure (depending on the highest positive temperature range specified)	1 080 ... 795 hPa (-1 000 ... +2 000 m) see ambient temperature range 795 ... 658 hPa (+2 000 ... +3 500 m) derating 10 K 658 ... 540 hPa (+3 500 ... +5 000 m) derating 20 K

For technical documentation on SIPLUS, see:
http://www.siemens.com/siplus-extreme

Ordering data

	Article No.
SIPLUS CM 1243-5 communication module (Extended temperature range and exposure to media) Communication module for electrical connection of SIMATIC S7-1200 to PROFIBUS as a DPV1 master	**6AG1243-5DX30-2XE0**
Accessories	See SIMATIC S7-1200 CM 1243-5 communication module, page 3/143

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SIPLUS NET CSM 1277

Overview



- Unmanaged switch for connecting a SIPLUS S7-1200 controller to an Industrial Ethernet network with a line, tree or star topology
- Multiplication of Ethernet interfaces on a SIPLUS S7-1200 controller for additional connection of up to three programming devices, operator controls, and further Ethernet nodes
- Simple, space-saving mounting on the SIPLUS S7-1200 DIN rail
- Low-cost solution for implementing small, local Ethernet networks
- Problem-free connection using RJ45 plugs
- Simple and fast status display via LEDs on the device
- Integral autocrossover function permits use of uncrossed connecting cables

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

SIPLUS NET CSM 1277	
Article No.	**6AG1 277-1AA10-4AA0**
Article No. based on	**6GK7 277-1AA10-0AA0**
Ambient temperature range	0 … +60 °C

Ordering data

	Article No.
SIPLUS NET CSM 1277 compact switch module (Extended temperature range and exposure to media) Unmanaged switch for connecting a SIPLUS S7-1200 controller and up to three further nodes to Industrial Ethernet with 10/100 Mbps; 4 x RJ45 ports; external 24 V DC power supply, LED diagnostics, S7-1200 module including electronic device manual on CD-ROM	**6AG1277-1AA10-4AA0**
Accessories	See CSM 1277 unmanaged, page 3/145

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Overview



- Digital inputs as supplement to the integral I/O of the CPUs
- Integrated into the overall automation for the implementation of safety-related requirements
- With integrated safety functions
- Communication with fail-safe CPUs via PROFIsafe mechanisms
- For flexible adaptation of the controller to the corresponding task
- For subsequent expansion of the system with additional inputs
- Operable exclusively in the central system

Technical specifications

Article number	**6ES7226-6BA32-0XB0** Digital Input SM 1226, F-DI 16x 24VDC
Supply voltage	
Rated value (DC)	24 V
Input current	
from backplane bus 5 V DC, max.	155 mA; Current consumption (SM Bus, 5 V DC): 155 mA
Digital inputs	
• from load voltage L+ (without load), max.	130 mA; 130 mA + 6 mA / input used + any Vs1/Vs2 current used
Digital inputs	
Number of digital inputs	16; 16 (1oo1) or 8 (1oo2); Note: You can individually assign each pair of inputs "a.x" and "b.x" as a single (1oo2)-channel or as 2 separate (1oo1)-channels
horizontal installation	
- up to 50 °C, max.	16; 16 inputs at 55 °C horizontal
vertical installation	
- up to 40 °C, max.	16; 16 inputs at 45 °C vertical
Input voltage	
• for signal "0"	-30 V DC to +5 V DC
• for signal "1"	15 V DC to 30 V DC
Input current	
• for signal "0", max. (permissible quiescent current)	0.5 mA
Input delay (for rated value of input voltage)	
for standard inputs	
- parameterizable	Yes; 0.8 / 1.6 / 3.2 / 6.4 / 12.8 ms
Diagnostics indication LED	
• for status of the inputs	Yes

Article number	**6ES7226-6BA32-0XB0** Digital Input SM 1226, F-DI 16x 24VDC
Degree and class of protection	
IP degree of protection	IP20
Standards, approvals, certificates	
Highest safety class achievable in safety mode	
• Performance level according to ISO 13849-1	1-channel, Category 3, PL d; 2-channel, Category 3 or 4, PL e
• SIL acc. to IEC 61508	SIL 2 (single-channel), SIL 3 (two-channel)
Ambient conditions	
Free fall	
• Fall height, max.	0.3 m; five times, in product package
Ambient temperature during operation	
• min.	0 °C
• max.	55 °C
Mechanics/material	
Enclosure material (front)	
• Plastic	Yes
Dimensions	
Width	70 mm
Height	100 mm
Depth	75 mm
Weights	
Weight, approx.	250 g

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SM 1226 fail-safe digital input

Ordering data	Article No.
SM 1226 fail-safe digital input signal module 16 inputs, 24 V DC (SIL 2/category 3/PL d) or 8 inputs 24 V DC (SIL 3/ category 3 or category 4/PL e) or a combination of both	**6ES7226-6BA32-0XB0**
Accessories	
Terminal block (spare part) With 11 screws, tin-coated; 4 units	**6ES7292-1AL30-0XA0**
Front flap set (spare part) For modules with a width of 70 mm	**6ES7291-1BB30-0XA0**

	Article No.
STEP 7 Safety Advanced V15 Task: Engineering tool for configuring and programming fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-1500F Software Controller, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller and the fail-safe ET 200SP, ET 200MP, ET 200S, ET 200M, ET 200iSP, ET 200pro and ET 200eco I/O Requirement: STEP 7 Professional V15	
Floating license for 1 user, software and documentation on DVD; license key on USB flash drive	**6ES7833-1FA15-0YA5**
Floating license for 1 user, software, documentation and license key for download[1]; email address required for delivery	**6ES7833-1FA15-0YH5**
STEP 7 Safety Basic V15 Task: Engineering tool for configuring fail-safe user programs for SIMATIC S7-1200 FC Requirement: STEP 7 Basic V15 and higher	
Floating license for 1 user, software and documentation on DVD; license key on USB flash drive	**6ES7833-1FB15-0YA5**
Floating license for 1 user, software, documentation and license key for download[1] Email address required for delivery	**6ES7833-1FB15-0YH5**

[1] For up-to-date information and download availability, see: http://www.siemens.com/tia-online-software-delivery

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Overview



- Digital outputs as a supplement to the integral I/O of the CPUs
- Integrated into the overall automation for the implementation of safety-related requirements
- With integrated safety functions
- Communication with fail-safe CPUs via PROFIsafe mechanisms
- For flexible adaptation of the controller to the corresponding task
- For subsequent expansion of the system with additional outputs
- Operable exclusively in the central system

Technical specifications

Article number	**6ES7226-6DA32-0XB0** Digital Output SM 1226, F-DQ 4x 24VDC
Input current	
from backplane bus 5 V DC, max.	125 mA
Digital outputs	
• from load voltage L+, max.	170 mA
Digital outputs	
Number of digital outputs	4
• in groups of	1
Short-circuit protection	Yes
Switching capacity of the outputs	
• with resistive load, max.	30 Hz
• on lamp load, max.	10 Hz
Output voltage	
• Rated value (DC)	24 V
Output current	
• for signal "1" rated value	2 A
• for signal "1" permissible range, max.	10 mA to 2.4 A
• for signal "0" residual current, max.	P-switch: 0.5 mA, maximum; M-switch: 0.5 mA, maximum
Cable length	
• shielded, max.	200 m
• unshielded, max.	200 m
Diagnostics indication LED	
• for status of the outputs	Yes
Standards, approvals, certificates	
CE mark	Yes
cULus	Yes
FM approval	Yes
Highest safety class achievable in safety mode	
• Performance level according to ISO 13849-1	Category 4, PL e
• SIL acc. to IEC 61508	SIL 3

Article number	**6ES7226-6DA32-0XB0** Digital Output SM 1226, F-DQ 4x 24VDC
Ambient conditions	
Free fall	
• Fall height, max.	0.3 m; five times, in product package
Ambient temperature during operation	
• min.	0 °C
• max.	55 °C
Mechanics/material	
Enclosure material (front)	
• Plastic	Yes
Dimensions	
Width	70 mm
Height	100 mm
Depth	75 mm
Weights	
Weight, approx.	270 g

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SM 1226 fail-safe digital output

Ordering data	Article No.
SM 1226 fail-safe digital output signal module 4 outputs; 24 V DC, current sourcing/sinking	**6ES7226-6DA32-0XB0**
Accessories	
Terminal block (spare part) With 11 screws, tin-coated; 4 units	**6ES7292-1AL30-0XA0**
Front flap set (spare part) For modules with a width of 70 mm	**6ES7291-1BB30-0XA0**

	Article No.
STEP 7 Safety Advanced V15 Task: Engineering tool for configuring and programming fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-1500F Software Controller, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller and the fail-safe ET 200SP, ET 200MP, ET 200S, ET 200M, ET 200iSP, ET 200pro and ET 200eco I/O Requirement: STEP 7 Professional V15	
Floating license for 1 user, software and documentation on DVD; license key on USB flash drive	**6ES7833-1FA15-0YA5**
Floating license for 1 user, software, documentation and license key for download[1]; email address required for delivery	**6ES7833-1FA15-0YH5**
STEP 7 Safety Basic V15 Task: Engineering tool for configuring fail-safe user programs for SIMATIC S7-1200 FC Requirement: STEP 7 Basic V15 and higher	
Floating license for 1 user, software and documentation on DVD; license key on USB flash drive	**6ES7833-1FB15-0YA5**
Floating license for 1 user, software, documentation and license key for download[1] Email address required for delivery	**6ES7833-1FB15-0YH5**

[1] For up-to-date information and download availability, see: http://www.siemens.com/tia-online-software-delivery

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Overview



- Relay outputs as a supplement to the integral I/O of the CPUs
- Integrated into the overall automation for the implementation of safety-related requirements
- With integrated safety functions
- Communication with fail-safe CPUs via PROFIsafe mechanisms
- For flexible adaptation of the controller to the corresponding task
- For subsequent expansion of the system with additional outputs
- Operable exclusively in the central system

Technical specifications

Article number	**6ES7226-6RA32-0XB0** Digital Output SM 1226, F-DQ 2x Relay
Input current	
from backplane bus 5 V DC, max.	120 mA
Digital outputs	
• from load voltage L+, max.	300 mA
Digital outputs	
Number of digital outputs	2
Short-circuit protection	No
Output voltage	
• Rated value (DC)	5 V DC to 30 V DC
• Rated value (AC)	5 V AC to 250 V AC
Output current	
• for signal "1" permissible range, max.	5 A maximum per circuit and 10 A maximum of all circuits per module
Relay outputs	
• Number of relay outputs	2; 2 circuits per output
Switching capacity of contacts	
- with inductive load, max.	0.1 Hz, accordance with IEC 60947-5-1, DC-13; 2 Hz, accordance with IEC 60947-5-1, AC-15
- with resistive load, max.	2 Hz
Cable length	
• shielded, max.	200 m
• unshielded, max.	200 m
Diagnostics indication LED	
• for status of the outputs	Yes

Article number	**6ES7226-6RA32-0XB0** Digital Output SM 1226, F-DQ 2x Relay
Standards, approvals, certificates	
CE mark	Yes
cULus	Yes
FM approval	Yes
Highest safety class achievable in safety mode	
• Performance level according to ISO 13849-1	Category 4, PL e
• SIL acc. to IEC 61508	SIL 3
Ambient conditions	
Free fall	
• Fall height, max.	0.3 m; five times, in product package
Ambient temperature during operation	
• min.	0 °C
• max.	55 °C
Mechanics/material	
Enclosure material (front)	
• Plastic	Yes
Dimensions	
Width	70 mm
Height	100 mm
Depth	75 mm
Weights	
Weight, approx.	300 g

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SM 1226 fail-safe relay output

Ordering data	Article No.
SM 1226 fail-safe relay output signal module 2 relay outputs	**6ES7226-6RA32-0XB0**
Accessories	
Terminal block (spare part) With 11 screws, tin-coated, coded; 4 units	**6ES7292-1AL40-0XA0**
Front flap set (spare part) For modules with a width of 70 mm	**6ES7291-1BB30-0XA0**

	Article No.
STEP 7 Safety Advanced V15 Task: Engineering tool for configuring and programming fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-1500F Software Controller, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller and the fail-safe ET 200SP, ET 200MP, ET 200S, ET 200M, ET 200iSP, ET 200pro and ET 200eco I/O Requirement: STEP 7 Professional V15	
Floating license for 1 user, software and documentation on DVD; license key on USB flash drive	**6ES7833-1FA15-0YA5**
Floating license for 1 user, software, documentation and license key for download[1]; email address required for delivery	**6ES7833-1FA15-0YH5**
STEP 7 Safety Basic V15 Task: Engineering tool for configuring fail-safe user programs for SIMATIC S7-1200 FC Requirement: STEP 7 Basic V15 and higher	
Floating license for 1 user, software and documentation on DVD; license key on USB flash drive	**6ES7833-1FB15-0YA5**
Floating license for 1 user, software, documentation and license key for download[1] Email address required for delivery	**6ES7833-1FB15-0YH5**

[1] For up-to-date information and download availability, see: http://www.siemens.com/tia-online-software-delivery

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Overview



- Digital inputs as supplement to the integral I/O of the CPUs
- Integrated into the overall automation for the implementation of safety-related requirements
- With integrated safety functions
- Communication with fail-safe CPUs via PROFIsafe mechanisms
- For flexible adaptation of the controller to the corresponding task
- For subsequent expansion of the system with additional inputs
- Operable exclusively in the central system

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the corresponding standard products. SIPLUS extreme specific information was added.

Technical specifications

Article number	**6AG1226-6BA32-5XB0**
Based on	**6ES7226-6BA32-0XB0** SIPLUS S7-1200 SM 1226 F-DI 16x24VDC
Ambient conditions	
Free fall	
• Fall height, max.	0.3 m; five times, in product package
Ambient temperature during operation	
• min.	-25 °C; = Tmin
• max.	55 °C; = Tmax
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	2 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance	
Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes
Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *

Article number	**6AG1226-6BA32-5XB0**
Based on	**6ES7226-6BA32-0XB0** SIPLUS S7-1200 SM 1226 F-DI 16x24VDC
Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
Remark	
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A

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SIPLUS SM 1226 fail-safe digital input

Ordering data	Article No.
SIPLUS SM 1226 fail-safe digital input signal module (Extended temperature range and environmental stress) 16 inputs, 24 V DC (SIL 2/category 3/PL d) or 8 inputs 24 V DC (SIL 3/ category 3 or category 4/PL e) or a combination of both	**6AG1226-6BA32-5XB0**

	Article No.
Accessories	See SIMATIC SM 1226 fail-safe digital input signal module, page 3/168

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Overview



- Digital outputs as a supplement to the integral I/O of the CPUs
- Integrated into the overall automation for the implementation of safety-related requirements
- With integrated safety functions
- Communication with fail-safe CPUs via PROFIsafe mechanisms
- For flexible adaptation of the controller to the corresponding task
- For subsequent expansion of the system with additional outputs
- Operable exclusively in the central system

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the corresponding standard products. SIPLUS extreme specific information was added.

Technical specifications

Article number	**6AG1226-6DA32-5XB0**
Based on	**6ES7226-6DA32-0XB0** SIPLUS S7-1200 SM 1226 F-DQ 4x24VDC
Ambient conditions	
Free fall	
• Fall height, max.	0.3 m; five times, in product package
Ambient temperature during operation	
• min.	-25 °C; = Tmin
• max.	55 °C; = Tmax
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	2 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance	
Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes

Article number	**6AG1226-6DA32-5XB0**
Based on	**6ES7226-6DA32-0XB0** SIPLUS S7-1200 SM 1226 F-DQ 4x24VDC
Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
Remark	
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A

Ordering data

	Article No.
SIPLUS SM 1226 fail-safe digital output module 4 outputs; 24 V DC, current sourcing/sinking	**6AG1226-6DA32-5XB0**

	Article No.
Accessories	See SIMATIC SM 1226 fail-safe digital output signal module, page 3/170

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SIPLUS SM 1226 fail-safe relay output

Overview



- Relay outputs as a supplement to the integral I/O of the CPUs
- Integrated into the overall automation for the implementation of safety-related requirements
- With integrated safety functions
- Communication with fail-safe CPUs via PROFIsafe mechanisms
- For flexible adaptation of the controller to the corresponding task
- For subsequent expansion of the system with additional outputs
- Operable exclusively in the central system

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the corresponding standard products. SIPLUS extreme specific information was added.

Technical specifications

Article number	**6AG1226-6RA32-5XB0**
Based on	**6ES7226-6RA32-0XB0** SIPLUS S7-1200 SM 1226 F-DQ 2xRelay
Ambient conditions	
Free fall	
• Fall height, max.	0.3 m; five times, in product package
Ambient temperature during operation	
• min.	-25 °C; = Tmin
• max.	55 °C; = Tmax
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	2 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance	
Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes

Article number	**6AG1226-6RA32-5XB0**
Based on	**6ES7226-6RA32-0XB0** SIPLUS S7-1200 SM 1226 F-DQ 2xRelay
Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
Remark	
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A

Ordering data

	Article No.
SIPLUS SM 1226 fail-safe relay output signal module 2 relay outputs	**6AG1226-6RA32-5XB0**

	Article No.
Accessories	See SIMATIC SM 1226 fail-safe relay output signal module, page 3/172

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Overview



In terms of design and functionality, the SIMATIC PM 1207 single-phase load power supply (PM = power module) with automatic range selection of the input voltage is an optimal match to the SIMATIC S7-1200 PLC. It provides the supply to CPUs with 24 V input as well as to signal modules, and to 24 V loads connected to the modules. Comprehensive certifications, such as UL, ATEX and DNV GL enable universal use.

Technical specifications

Article number	**6EP1332-1SH71**
Product	S7-1200 PM1207
Power supply, type	24 V/2.5 A
Input	
Input	1-phase AC
• Note	Automatic range selection
Supply voltage	
• 1 at AC Rated value	120 V
• 2 at AC Rated value	230 V
Input voltage	
• 1 at AC	85 ... 132 V
• 2 at AC	176 ... 264 V
Wide-range input	No
Overvoltage resistance	2.3 × $V_{in\ rated}$, 1.3 ms
Mains buffering at $I_{out\ rated}$, min.	20 ms; at V_{in} = 93/187 V
Rated line frequency 1	50 Hz
Rated line frequency 2	60 Hz
Rated line range	47 ... 63 Hz
Input current	
• at rated input voltage 120 V	1.2 A
• at rated input voltage 230 V	0.67 A
Switch-on current limiting (+25 °C), max.	13 A
Duration of inrush current limiting at 25 °C	
• maximum	3 ms
I^2t, max.	0.5 A^2·s
Built-in incoming fuse	T 3,15 A/250 V (not accessible)
Protection in the mains power input (IEC 898)	Recommended miniature circuit breaker: 16 A characteristic B or 10 A characteristic C

Article number	**6EP1332-1SH71**
Product	S7-1200 PM1207
Power supply, type	24 V/2.5 A
Output	
Output	Controlled, isolated DC voltage
Rated voltage V_{out} DC	24 V
Total tolerance, static ±	3 %
Static mains compensation, approx.	0.1 %
Static load balancing, approx.	0.2 %
Residual ripple peak-peak, max.	150 mV
Spikes peak-peak, max. (bandwidth: 20 MHz)	240 mV
Product function Output voltage adjustable	No
Output voltage setting	-
Status display	Green LED for 24 V OK
On/off behavior	No overshoot of V_{out} (soft start)
Startup delay, max.	6 s; 2 s at 230 V, 6 s at 120 V
Voltage rise, typ.	10 ms
Rated current value Iout rated	2.5 A
Current range	0 ... 2.5 A
Supplied active power typical	60 W
Short-term overload current	
• on short-circuiting during the start-up typical	6 A
• at short-circuit during operation typical	6 A
Duration of overloading capability for excess current	
• on short-circuiting during the start-up	100 ms
• at short-circuit during operation	100 ms
Parallel switching for enhanced performance	Yes
Numbers of parallel switchable units for enhanced performance	2

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3

Technical specifications (continued)

Article number	6EP1332-1SH71
Product	S7-1200 PM1207
Power supply, type	24 V/2.5 A
Efficiency	
Efficiency at $V_{out\ rated}$, $I_{out\ rated}$, approx.	83 %
Power loss at $V_{out\ rated}$, $I_{out\ rated}$, approx.	12 W
Closed-loop control	
Dynamic mains compensation ($V_{in\ rated}$ ±15 %), max.	0.3 %
Dynamic load smoothing (I_{out}: 50/100/50 %), U_{out} ± typ.	3 %
Load step setting time 50 to 100%, typ.	5 ms
Load step setting time 100 to 50%, typ.	5 ms
Setting time maximum	5 ms
Protection and monitoring	
Output overvoltage protection	< 33 V
Current limitation, typ.	2.65 A
Property of the output Short-circuit proof	Yes
Short-circuit protection	Constant current characteristic
Enduring short circuit current RMS value	
• typical	2.7 A
Overload/short-circuit indicator	-
Safety	
Primary/secondary isolation	Yes
Galvanic isolation	Safety extra-low output voltage U_{out} acc. to EN 60950-1 and EN 50178
Protection class	Class I
Leakage current	
• maximum	3.5 mA
CE mark	Yes
UL/cUL (CSA) approval	cULus-Listed (UL 508, CSA C22.2 No. 107.1), File E197259; cURus-Recognized (UL 60950-1, CSA C22.2 No. 60950-1) File E151273
Explosion protection	ATEX (EX) II 3G Ex nA II T4; cULus (ISA 12.12.01, CSA C22.2 No.213) Class I, Div. 2, Group ABCD, T4, File E330455
FM approval	Class I, Div. 2, Group ABCD, T4
CB approval	Yes
Marine approval	ABS, BV, DNV GL, LRS, NK
Degree of protection (EN 60529)	IP20

Article number	6EP1332-1SH71
Product	S7-1200 PM1207
Power supply, type	24 V/2.5 A
EMC	
Emitted interference	EN 55022 Class B
Supply harmonics limitation	not applicable
Noise immunity	EN 61000-6-2
Operating data	
Ambient temperature	
• during operation	0 ... 60 °C
- Note	with natural convection
• during transport	-40 ... +85 °C
• during storage	-40 ... +85 °C
Humidity class according to EN 60721	Climate class 3K3, no condensation
Mechanics	
Connection technology	screw-type terminals
Connections	
• Supply input	L, N, PE: 1 screw terminal each for 0.5 ... 2.5 mm²
• Output	L+, M: 2 screw terminals each for 0.5 ... 2.5 mm²
• Auxiliary	-
Width of the enclosure	70 mm
Height of the enclosure	100 mm
Depth of the enclosure	75 mm
Required spacing	
• top	20 mm
• bottom	20 mm
• left	0 mm
• right	0 mm
Weight, approx.	0.3 kg
Product feature of the enclosure housing for side-by-side mounting	Yes
Installation	Snaps onto DIN rail EN 60715 35x7.5/15, wall mounting
MTBF at 40 °C	1 492 537 h
Other information	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)

Ordering data

	Article No.
SIMATIC S7-1200 PM 1207 Input: 120/230 V AC Output: 24 V DC/2.5 A	**6EP1332-1SH71**

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Overview



- Stabilized power supply for SIPLUS S7-1200
- In the S7-1200 design
- Input 120/230 V AC, output 24 V DC, 2.5 A (derating: 1.5 A above 60 °C)

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

SIPLUS power supply PM 1207		
Article No.	**6AG1 332-1SH71-4AA0**	**6AG1 332-1SH71-7AA0**
Article No. based on	**6EP1 332-1SH71**	
Ambient temperature range	0 ... +60° C	-40 ... +70° C
Conformal coating	Coating of the printed circuit boards and the electronic components	
Technical data	The technical data of the standard product applies except for the ambient conditions.	
Ambient conditions		
Relative humidity	100%, condensation/frost permissible. No commissioning if condensation present.	
Biologically active substances, compliance with EN 60721-3-3	Class 3B2 mold and fungal spores (excluding fauna). The supplied plug covers must remain in place over the unused interfaces during operation!	
Chemically active substances, compliance with EN 60721-3-3	Class 3C4 incl. salt spray in accordance with EN60068-2-52 (degree of severity 3). The supplied plug covers must remain in place over the unused interfaces during operation!	
Mechanically active substances, compliance with EN 60721-3-3	Class 3S4 incl. sand, dust. The supplied plug covers must remain in place over the unused interfaces during operation!	
Air pressure (depending on the highest positive temperature range specified)	1 080 ... 795 hPa (-1 000 ... +2 000 m) see ambient temperature range 795 ... 658 hPa (+2000 ... +3500 m) derating 10 K 658 ... 540 hPa (+3500 ... +5000 m) derating 20 K	

For technical documentation on SIPLUS, see:
http://www.siemens.com/siplus-extreme

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1-phase, 24 V DC (for SIPLUS S7-1200)

Technical specifications

	SIPLUS PM 1207
Article No.	**6AG1332-1SH71-7AA0** **6AG1332-1SH71-4AA0**
Article No. based on	**6EP1332-1SH71**
Input voltage, nominal value • Range	120/230 V AC (auto-switching) 85 … 132 V/176 ... 264 V AC
Mains buffering	> 20 ms (at 93/187 V)
Line frequency, nominal • Range	50/60 Hz 47 … 63 Hz
Input current, nominal value • Inrush current (25 °C) • Recommended circuit-breaker	1.2/0.67 A <13 A 16 A Charact. B, 10 A Charact. C
Output voltage, nominal value • Tolerance • Residual ripple • Adjustment	24 V DC ± 3% < 150 mVpp No
Output current, nominal value	2.5 A (derating: 1.5 A above 60 °C)
Efficiency at nominal values, approx.	83%
Parallel operation	Yes, 2 units
Electronic short-circuit protection	Yes, automatic restart
Radio interference suppression (EN 55022)	Class B
Operating display	Green LED for "24 V o.k."
Supply-harmonics limitation (EN 61000-3-2)	Not applicable
Degree of protection (EN 60529)	IP20
Protection class	Class 1
Electric isolation	SELV acc. to EN 60950 and EN 50178
Ambient temperature	0 … +60 °C -40 ... +70 °C
Transport and storage temperature	-40 ... +85 °C
Installation	DIN rail EN 60715 35x7.5/15
Dimensions (W x H x D) in mm	70 x 100 x 75
Weight, approx.	0.3 kg
Certifications	CE

Ordering data

	Article No.
SIPLUS S7-1200 PM 1207 power supply	
(Extended temperature range and exposure to media)	
Input 120/230 V AC, output 24 V DC, 2.5 A; derating from +55 °C to +70 °C to 1.2 A output current	
Ambient temperature -40... +70 °C	**6AG1332-1SH71-7AA0**
Ambient temperature 0 ... +60 °C	**6AG1332-1SH71-4AA0**

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Overview



Basic Panels (2nd Generation)

SIMATIC HMI Basic Panels (2nd Generation) with their fully developed HMI basic functions are the ideal entry-level series for simple HMI applications.

The device family offers panels with 4", 7", 9" and 12" displays, as well as combined key and touch operation.

The innovative high-resolution widescreen displays with 64 000 colors are also suitable for upright installation, and they can be dimmed down to 100%. The innovative operator interface with improved usability opens up a diverse range of options thanks to new controls and graphics. The new USB interface enables the connection of keyboard, mouse or barcode scanner, and supports the simple archiving of data on a USB flash drive as well as the manual backup and restoring of the complete panel.

The integrated Ethernet or RS 485/422 interface (version-specific) enables simple connection to the controller.

http://www.siemens.com/basic-panels

Ordering data

	Article No.
SIMATIC HMI Basic Panels (2nd Generation)	
Key and touch devices	
SIMATIC HMI KTP400 Basic Key/touch-screen operation; 4" TFT widescreen display, 65 536 colors, PROFINET interface	**6AV2123-2DB03-0AX0**
SIMATIC HMI KTP700 Basic Key/touch-screen operation; 7" TFT widescreen display, 65 536 colors, PROFINET interface	**6AV2123-2GB03-0AX0**
SIMATIC HMI KTP700 Basic DP Key/touch-screen operation; 7" TFT widescreen display, 65 536 colors, PROFIBUS interface	**6AV2123-2GA03-0AX0**
SIMATIC HMI KTP900 Basic Key/touch-screen operation; 9" TFT widescreen display, 65 536 colors, PROFINET interface	**6AV2123-2JB03-0AX0**
SIMATIC HMI KTP1200 Basic Key/touch-screen operation; 12" TFT widescreen display, 65 536 colors, PROFINET interface	**6AV2123-2MB03-0AX0**
SIMATIC HMI KTP1200 Basic DP Key/touch-screen operation; 12" TFT widescreen display, 65 536 colors, PROFIBUS interface	**6AV2123-2MA03-0AX0**

	Article No.
Starter kits	
Starter kit SIMATIC S7-1200 + KP300 Basic mono PN	**6AV6651-7HA01-3AA4**
Starter Kit SIMATIC S7-1200 + KTP400 Basic	**6AV6651-7KA01-3AA4**
Starter Kit SIMATIC S7-1200 + KTP700 Basic	**6AV6651-7DA01-3AA4**
Starter kits with an S7-1200 consist of: • the respective SIMATIC HMI Basic Panel SIMATIC HMI KP300 Basic mono PN SIMATIC HMI KTP400 Basic SIMATIC HMI KTP700 Basic • SIMATIC S7-1200 CPU 1212C AC/DC/Rly • SIMATIC S7-1200 Simulator Module SIM 12 • SIMATIC STEP 7 BASIC CD • SIMATIC S7-1200 HMI Manual Collection CD • Ethernet CAT5 cable, 2 m	
Starter kit LOGO! + KP300 Basic mono PN	**6AV2132-0HA00-0AA1**
Starter kit LOGO! + KTP400 Basic	**6AV2132-0KA00-0AA1**
Starter kit LOGO! + KTP700 Basic	**6AV2132-3GB00-0AA1**
Starter kits with a LOGO! consist of: • the respective SIMATIC HMI Basic Panel SIMATIC HMI KP300 Basic mono PN SIMATIC HMI KTP400 Basic SIMATIC HMI KTP700 Basic • LOGO! 12/24 RCE • LOGO! POWER 24 V 1.3 A • LOGO! SOFT COMFORT V7 • WINCC BASIC (TIA Portal) • Ethernet CAT5 cable, 2 m	
Documentation	
You can find the manual for the Basic Panels on the Internet at:	http://support.automation.siemens.com
Accessories	See Catalog ST 80 / ST PC or Industry Mall

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Overview



Comfort Panel family, KP, TP, KTP

SIMATIC HMI Comfort Panels - Standard devices

- Excellent HMI functionality for demanding applications
- Widescreen TFT displays with 4", 7", 9", 12", 15", 19" and 22" diagonals (all 16 million colors) with up to 40% more visualization area as compared to the predecessor devices
- Integrated high-end functionality with archives, scripts, PDF/Word/Excel viewer, Internet Explorer, Media Player and Web Server
- Dimmable displays from 0 to 100% via PROFIenergy, via the HMI project or via a controller
- Modern industrial design, cast aluminum fronts for 7" upwards
- Upright installation for all touch devices
- Data security in the event of a power failure for the device and for the SIMATIC HMI Memory Card
- Innovative service and commissioning concept
- Maximum performance with short screen refresh times
- Suitable for extremely harsh industrial environments thanks to extended approvals such as ATEX 2/22 and marine approvals
- All versions can be used as an OPC UA client or as a server
- Key-operated devices with LED in every function key and new text input mechanism, similar to the keypads of mobile phones
- All keys have a service life of 2 million operations
- Configuring with the WinCC engineering software of the TIA Portal engineering framework

Note:

A 7" and a 15" Comfort Outdoor version are available. These devices have been specially designed for outdoor applications in difficult environments. Best display quality, even under sunlight, UV-resistant fronts and much more.

For further information, please go to:

http://www.siemens.com/comfort-panels

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Ordering data

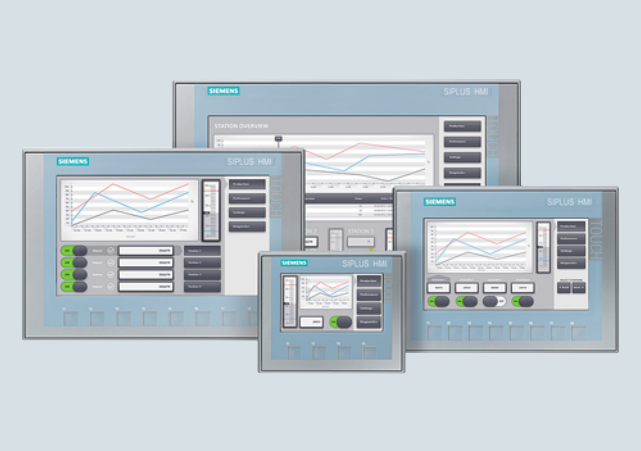
	Article No.
SIMATIC HMI Comfort Panels	
Key and touch devices	
SIMATIC HMI KTP400 Comfort Key/touch-screen operation; 4" widescreen display	**6AV2124-2DC01-0AX0**
Touch devices	
SIMATIC HMI TP700 Comfort Touch-screen operation; 7" widescreen display	**6AV2124-0GC01-0AX0**
SIMATIC HMI TP900 Comfort Touch-screen operation; 9" widescreen display	**6AV2124-0JC01-0AX0**
SIMATIC HMI TP1200 Comfort Touch-screen operation; 12" widescreen display	**6AV2124-0MC01-0AX0**
SIMATIC HMI TP1500 Comfort Touch-screen operation; 15" widescreen display	**6AV2124-0QC02-0AX1**
SIMATIC HMI TP1900 Comfort Touch-screen operation; 19" widescreen display	**6AV2124-0UC02-0AX1**
SIMATIC HMI TP2200 Comfort Touch-screen operation; 22" widescreen display	**6AV2124-0XC02-0AX1**
Key devices	
SIMATIC HMI KP400 Comfort Key operation; 4" widescreen display	**6AV2124-1DC01-0AX0**
SIMATIC HMI KP700 Comfort Key operation; 7" widescreen display	**6AV2124-1GC01-0AX0**
SIMATIC HMI KP900 Comfort Key operation; 9" widescreen display	**6AV2124-1JC01-0AX0**
SIMATIC HMI KP1200 Comfort Key operation; 12" widescreen display	**6AV2124-1MC01-0AX0**
SIMATIC HMI KP1500 Comfort Key operation; 15" widescreen display	**6AV2124-1QC02-0AX1**

	Article No.
Starter kits for SIMATIC HMI Comfort Panels Consisting of: the respective SIMATIC HMI Comfort Panel, SIMATIC WinCC Comfort, Ethernet cable, 2 m SIMATIC HMI Memory Card 2 GB 10 protective films for touch screen devices	
Starter kit for SIMATIC HMI KTP400 Comfort, Key and Touch	**6AV2181-4DB20-0AX0**
Starter kit for SIMATIC HMI TP700 Comfort, Touch	**6AV2181-4GB00-0AX0**
Starter kit for SIMATIC HMI TP900 Comfort, Touch	**6AV2181-4JB00-0AX0**
Starter kit for SIMATIC HMI TP1200 Comfort, Touch	**6AV2181-4MB00-0AX0**
Starter kit for SIMATIC HMI TP1500 Comfort, Touch	**6AV2181-4QB00-0AX0**
Starter kit for SIMATIC HMI TP1900 Comfort, Touch	**6AV2181-4UB00-0AX0**
Starter kit for SIMATIC HMI TP2200 Comfort, Touch	**6AV2181-4XB00-0AX0**
Accessories	See Catalog ST 80 / ST PC or Industry Mall

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SIPLUS Basic Panels (2nd Generation)

Overview



With their fully developed HMI basic functions, 2nd Generation SIPLUS Basic Panels are the ideal entry-level series for simple HMI applications.

The device family offers panels with 4", 7", 9" and 12" displays, as well as combined key and touch operation.

The innovative high-resolution widescreen displays with 64 000 colors are also suitable for upright installation, and they can be dimmed down to 100%. The innovative operator interface with improved usability opens up a diverse range of options thanks to new controls and graphics. The new USB interface enables the connection of keyboard, mouse or barcode scanner, and supports the simple archiving of data on a USB flash drive.

The integrated Ethernet or RS 485/422 interface (version-specific) enables simple connection to the controller.

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

Technical documentation on SIPLUS can be found here:
http://www.siemens.com/siplus-extreme

Technical specifications

Article number	**6AG1123-2DB03-2AX0**	**6AG1123-2GB03-2AX0**	**6AG1123-2GA03-2AX0**
Based on	**6AV2123-2DB03-0AX0**	**6AV2123-2GB03-0AX0**	**6AV2123-2GA03-0AX0**
	SIPLUS HMI KTP400 BASIC	SIPLUS HMI KTP700 BASIC	SIPLUS HMI KTP700 BASIC DP
Ambient conditions			
Suited for indoor use		Yes	Yes
Suited for outdoor use		No	No
Ambient temperature during operation			
• Operation (vertical installation)			
- For vertical installation, min.	-20 °C; = Tmin	-20 °C	-20 °C; = Tmin
- For vertical installation, max.	60 °C; = Tmax	50 °C	50 °C
Altitude during operation relating to sea level			
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity			
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning when condensation present), vertical mounting position
Resistance			
Coolants and lubricants			
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems			
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *

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Technical specifications (continued)

Article number	**6AG1123-2DB03-2AX0**	**6AG1123-2GB03-2AX0**	**6AG1123-2GA03-2AX0**
Based on	**6AV2123-2DB03-0AX0**	**6AV2123-2GB03-0AX0**	**6AV2123-2GA03-0AX0**
	SIPLUS HMI KTP400 BASIC	SIPLUS HMI KTP700 BASIC	SIPLUS HMI KTP700 BASIC DP
Use on ships/at sea			
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Remark			
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating			
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability	Yes; Class 2 for high availability	Yes; Class 2 for high availability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

Article number	**6AG1123-2JB03-2AX0**	**6AG1123-2MB03-2AX0**	**6AG1123-2MA03-2AX0**
Based on	**6AV2123-2JB03-0AX0**	**6AV2123-2MB03-0AX0**	**6AV2123-2MA03-0AX0**
	SIPLUS HMI KTP900 BASIC	SIPLUS HMI KTP1200 BASIC	SIPLUS HMI KTP1200 BASIC DP
Ambient conditions			
Suited for indoor use	Yes	Yes	Yes
Suited for outdoor use	No	No	No
Ambient temperature during operation			
• Operation (vertical installation)			
- For vertical installation, min.	-20 °C	-10 °C; = Tmin	-10 °C; = Tmin
- For vertical installation, max.	50 °C	50 °C	50 °C
Altitude during operation relating to sea level			
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity			
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation/frost (no commissioning when condensation present), vertical mounting position
Resistance			
Coolants and lubricants			
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems			
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *

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Technical specifications (continued)

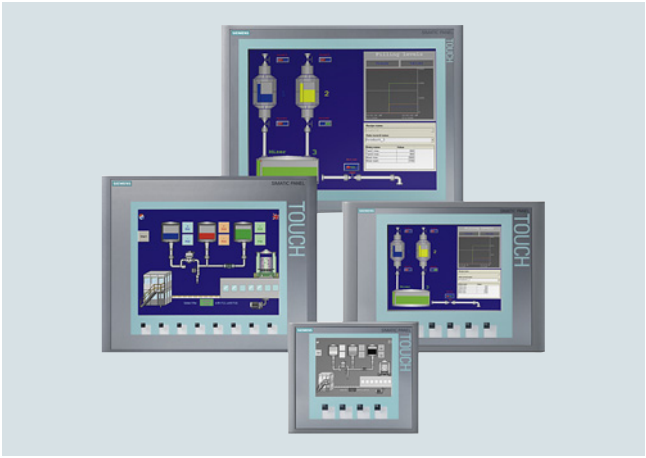
Article number	6AG1123-2JB03-2AX0	6AG1123-2MB03-2AX0	6AG1123-2MA03-2AX0
Based on	6AV2123-2JB03-0AX0	6AV2123-2MB03-0AX0	6AV2123-2MA03-0AX0
	SIPLUS HMI KTP900 BASIC	SIPLUS HMI KTP1200 BASIC	SIPLUS HMI KTP1200 BASIC DP
Use on ships/at sea			
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Remark			
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating			
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability	Yes; Class 2 for high availability	Yes; Class 2 for high availability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

Ordering data

	Article No.
SIPLUS HMI Basic Panels, Key and Touch	
SIPLUS HMI KTP400 Basic For areas with extreme exposure to environmental substances (conformal coating); ambient temperature -20 ... +60 °C	6AG1123-2DB03-2AX0
SIPLUS HMI KTP700 Basic For areas with extreme exposure to environmental substances (conformal coating); ambient temperature -20 ... +50 °C	6AG1123-2GB03-2AX0
SIPLUS HMI KTP700 Basic DP For areas with extreme exposure to environmental substances (conformal coating); ambient temperature -20 ... +50 °C	6AG1123-2GA03-2AX0
SIPLUS HMI KTP900 Basic For areas with extreme exposure to environmental substances (conformal coating); ambient temperature -20 ... +50 °C	6AG1123-2JB03-2AX0
SIPLUS HMI KTP1200 Basic For areas with extreme exposure to environmental substances (conformal coating); ambient temperature -10 ... +50 °C	6AG1123-2MB03-2AX0
SIPLUS HMI KTP1200 Basic DP For areas with extreme exposure to environmental substances (conformal coating); ambient temperature -10 ... +50 °C	6AG1123-2MA03-2AX0
Accessories	See SIMATIC Basic Panels 2nd Generation

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Overview



- Ideal entry-level series of 3.8" to 15" for operating and monitoring compact machines and systems
- Clear process representation through the use of full-graphic displays
- Intuitive operation via touch and tactile function keys
- Equipped with all the necessary basic functions such as reporting, recipe management, curve representation, vector graphics, and language selection
- Easy connection to the controller via integrated Ethernet interface or a separate version with RS 485/422

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

Technical documentation on SIPLUS can be found here:
http://www.siemens.com/siplus-extreme

Technical specifications

Article number	**6AG1647-0AH11-2AX0**	**6AG1647-0AA11-2AX0**	**6AG1647-0AD11-2AX0**
Based on	**6AV6647-0AH11-3AX0**	**6AV6647-0AA11-3AX0**	**6AV6647-0AD11-3AX0**
	SIPLUS HMI KP300 BASIC MONO PN 3.6"	SIPLUS KTP400 BASIC MONO PN 3.8"	SIPLUS KTP600 BASIC COLOR PN
Ambient conditions			
Suited for indoor use	Yes	Yes	Yes
Suited for outdoor use	No	No	No
Ambient temperature during operation			
• Operation (vertical installation)			
- For vertical installation, min.	-25 °C	-10 °C	-25 °C
- For vertical installation, max.	60 °C	60 °C	60 °C
Altitude during operation relating to sea level			
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity			
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance			
Coolants and lubricants			
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems			
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *

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Technical specifications (continued)

Article number	6AG1647-0AH11-2AX0	6AG1647-0AA11-2AX0	6AG1647-0AD11-2AX0
Based on	6AV6647-0AH11-3AX0	6AV6647-0AA11-3AX0	6AV6647-0AD11-3AX0
	SIPLUS HMI KP300 BASIC MONO PN 3.6"	SIPLUS KTP400 BASIC MONO PN 3.8"	SIPLUS KTP600 BASIC COLOR PN
Use on ships/at sea			
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Remark			
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating			
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability	Yes; Class 2 for high availability	Yes; Class 2 for high availability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

Article number	6AG1647-0AE11-4AX0	6AG1647-0AF11-4AX0	6AG1647-0AG11-4AX0
Based on	6AV6647-0AE11-3AX0	6AV6647-0AF11-3AX0	6AV6647-0AG11-3AX0
	SIPLUS KTP1000 BASIC COLOR DP 10,4"	SIPLUS KTP1000 BASIC COLOR PN 10,4"	SIPLUS TP1500 BASIC COLOR PN 15"
Ambient conditions			
Suited for indoor use	Yes	Yes	Yes
Suited for outdoor use	No	No	No
Ambient temperature during operation			
• Operation (vertical installation)	0 to +50 °C	0 to +50 °C	
- For vertical installation, min.	0 °C	0 °C	0 °C; = Tmin
- For vertical installation, max.	50 °C	50 °C	50 °C; = Tmax
Altitude during operation relating to sea level			
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity			
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance			
Coolants and lubricants			
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems			
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *

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Technical specifications (continued)

Article number	**6AG1647-0AE11-4AX0**	**6AG1647-0AF11-4AX0**	**6AG1647-0AG11-4AX0**
Based on	**6AV6647-0AE11-3AX0**	**6AV6647-0AF11-3AX0**	**6AV6647-0AG11-3AX0**
	SIPLUS KTP1000 BASIC COLOR DP 10,4"	SIPLUS KTP1000 BASIC COLOR PN 10,4"	SIPLUS TP1500 BASIC COLOR PN 15"
Use on ships/at sea			
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Remark			
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating			
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability	Yes; Class 2 for high availability	Yes; Class 2 for high availability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

Ordering data

	Article No.		Article No.
SIPLUS HMI KP300 Basic mono PN For areas with extreme exposure to media (conformal coating); ambient temperature -25 ... +60 °C	**6AG1647-0AH11-2AX0**	**SIPLUS HMI KTP1000 Basic color DP** For areas with extreme exposure to media (conformal coating); ambient temperature 0 ... +50 °C	**6AG1647-0AE11-4AX0**
SIPLUS HMI KTP400 Basic mono PN For areas with extreme exposure to media (conformal coating); ambient temperature -10 ... +60 °C	**6AG1647-0AA11-2AX0**	**SIPLUS HMI KTP1000 Basic color PN** For areas with extreme exposure to media (conformal coating); ambient temperature 0 ... +50 °C	**6AG1647-0AF11-4AX0**
SIPLUS HMI KTP600 Basic Color PN For areas with extreme exposure to media (conformal coating); ambient temperature -25 ... +60 °C	**6AG1647-0AD11-2AX0**	**SIPLUS HMI TP1500 Basic color PN** For areas with extreme exposure to media (conformal coating); ambient temperature 0 ... +50 °C	**6AG1647-0AG11-4AX0**
		Accessories	See SIMATIC Basic Panels

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Overview



- Excellent HMI functionality for demanding applications
- Widescreen TFT displays with 4", 7", 9", 12", 15", 19" and 22" diagonals (all 16 million colors) with up to 40% more visualization area as compared to the predecessor devices
- Integrated high-end functionality with archives, scripts, PDF/Word/Excel viewer, Internet Explorer, Media Player
- Dimmable displays from 0 to 100% via PROFIenergy, via the HMI project or via a controller
- Modern industrial design, cast aluminum fronts for 7" upwards
- Upright installation for all touch devices
- Optimal selection option: seven touch and five key versions are available
- Data security in the event of a power failure for the device and for the SIMATIC HMI Memory Card
- Innovative service and commissioning concept through second SD card (automatic backup)
- Easy project transfer via standard cable (standard Ethernet cable, standard USB cable)
- Maximum performance with short screen refresh times
- Suitable for extremely harsh industrial environments thanks to extended approvals such as ATEX 2/22
- Wide range of communication options: PROFIBUS and PROFINET onboard; 2x PROFINET with integrated switch for 7" models or larger; plus 1 additional PROFINET with Gigabit support for 15" models or larger
- All variants can be used as an OPC UA client or as an OPC DA server
- Key-operated devices with LED in every function key and new text input mechanism, similar to the keypads of mobile phones
- Key-operated devices with stamped keys for optimum tactile feedback
- All keys have a service life of 2 million operations
- Configuring with the WinCC engineering software of the TIA Portal

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

Technical specifications

Article number Based on	**6AG1124-2DC01-4AX0** **6AV2124-2DC01-0AX0** SIPLUS HMI KTP400 COMFORT	**6AG1124-0GC01-4AX0** **6AV2124-0GC01-0AX0** SIPLUS HMI TP700 COMFORT	**6AG1124-0JC01-4AX0** **6AV2124-0JC01-0AX0** SIPLUS HMI TP900 COMFORT	**6AG1124-0MC01-4AX0** **6AV2124-0MC01-0AX0** SIPLUS HMI TP1200 COMFORT
Ambient conditions				
Suited for indoor use	Yes	Yes	Yes	Yes
Suited for outdoor use	No	No	No	No
Ambient temperature during operation				
• Operation (vertical installation)				
- For vertical installation, min.	0 °C; = Tmin	0 °C; = Tmin	0 °C; = Tmin	0 °C; = Tmin
- For vertical installation, max.	50 °C; = Tmax	50 °C; = Tmax	50 °C; = Tmax	50 °C; = Tmax
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity				
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance				
Coolants and lubricants				
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air

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Technical specifications (continued)

Article number	6AG1124-2DC01-4AX0	6AG1124-0GC01-4AX0	6AG1124-0JC01-4AX0	6AG1124-0MC01-4AX0
Based on	6AV2124-2DC01-0AX0	6AV2124-0GC01-0AX0	6AV2124-0JC01-0AX0	6AV2124-0MC01-0AX0
	SIPLUS HMI KTP400 COMFORT	SIPLUS HMI TP700 COMFORT	SIPLUS HMI TP900 COMFORT	SIPLUS HMI TP1200 COMFORT
Use in stationary industrial systems				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
Use on ships/at sea				
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Remark				
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating				
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability	Yes; Class 2 for high availability	Yes; Class 2 for high availability	Yes; Class 2 for high availability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

Article number	6AG1124-1DC01-4AX0	6AG1124-1GC01-4AX0	6AG1124-1JC01-4AX0	6AG1124-1MC01-4AX0	6AG1124-1QC02-4AX1
Based on	6AV2124-1DC01-0AX0	6AV2124-1GC01-0AX0	6AV2124-1JC01-0AX0	6AV2124-1MC01-0AX0	6AV2124-1QC02-0AX1
	SIPLUS HMI KP400 COMFORT	SIPLUS HMI KP700 COMFORT	SIPLUS HMI KP900 COMFORT	SIPLUS HMI KP1200 COMFORT	SIPLUS HMI KP1500 Comfort
Ambient conditions					
Suited for indoor use	Yes	Yes	Yes	Yes	Yes
Suited for outdoor use	No	No	No	No	No
Ambient temperature during operation					
• Operation (vertical installation)					
- For vertical installation, min.	0 °C; = Tmin	0 °C; = Tmin	0 °C; = Tmin	0 °C; = Tmin	0 °C
- For vertical installation, max.	50 °C; = Tmax	50 °C; = Tmax	50 °C; = Tmax	50 °C; = Tmax	50 °C; (55 °C, see entry ID: 64847814)
Altitude during operation relating to sea level					
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)				

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Technical specifications (continued)

Article number	6AG1124-1DC01-4AX0	6AG1124-1GC01-4AX0	6AG1124-1JC01-4AX0	6AG1124-1MC01-4AX0	6AG1124-1QC02-4AX1
Based on	6AV2124-1DC01-0AX0	6AV2124-1GC01-0AX0	6AV2124-1JC01-0AX0	6AV2124-1MC01-0AX0	6AV2124-1QC02-0AX1
	SIPLUS HMI KP400 COMFORT	SIPLUS HMI KP700 COMFORT	SIPLUS HMI KP900 COMFORT	SIPLUS HMI KP1200 COMFORT	SIPLUS HMI KP1500 Comfort
Relative humidity					
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance					
Coolants and lubricants					
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems					
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
Use on ships/at sea					
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Remark					
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating					
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability	Yes; Class 2 for high availability	Yes; Class 2 for high availability	Yes; Class 2 for high availability	Yes; Class 2 for high availability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

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Technical specifications (continued)

Article number	**6AG1124-0QC02-4AX1**	**6AG1124-0UC02-4AX1**	**6AG1124-0XC02-4AX1**
Based on	**6AV2124-0QC02-0AX1**	**6AV2124-0UC02-0AX1**	**6AV2124-0XC02-0AX1**
	SIPLUS HMI TP1500 Comfort	SIPLUS HMI TP1900 Comfort	SIPLUS HMI TP2200 Comfort
Ambient conditions			
Suited for indoor use	Yes	Yes	Yes
Suited for outdoor use	No	No	No
Ambient temperature during operation			
• Operation (vertical installation)			
- For vertical installation, min.	0 °C	0 °C; = Tmin	0 °C; = Tmin
- For vertical installation, max.	50 °C; (55 °C, see entry ID: 64847814)	45 °C; = Tmax	45 °C; = Tmax
Altitude during operation relating to sea level			
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 080 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity			
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance			
Coolants and lubricants			
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems			
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
Use on ships/at sea			
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Remark			
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating			
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability	Yes; Class 2 for high availability	Yes; Class 2 for high availability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

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SIPLUS Comfort Panels Standard

Ordering data	Article No.
SIPLUS HMI Comfort Panels, Keys and Touch	
SIPLUS HMI KTP400 Comfort	**6AG1124-2DC01-4AX0**
SIPLUS HMI Comfort Panels, Touch	
SIPLUS HMI TP700 Comfort	**6AG1124-0GC01-4AX0**
SIPLUS HMI TP900 Comfort	**6AG1124-0JC01-4AX0**
SIPLUS HMI TP1200 Comfort	**6AG1124-0MC01-4AX0**
SIPLUS HMI TP1500 Comfort	**6AG1124-0QC02-4AX1**
SIPLUS HMI TP1900 Comfort	**6AG1124-0UC02-4AX1**
SIPLUS HMI TP2200 Comfort	**6AG1124-0XC02-4AX1**

	Article No.
SIPLUS HMI Comfort Panels, Keys	
SIPLUS HMI KP400 Comfort	**6AG1124-1DC01-4AX0**
SIPLUS HMI KP700 Comfort	**6AG1124-1GC01-4AX0**
SIPLUS HMI KP900 Comfort	**6AG1124-1JC01-4AX0**
SIPLUS HMI KP1200 Comfort	**6AG1124-1MC01-4AX0**
SIPLUS HMI KP1500 Comfort	**6AG1124-1QC02-4AX1**
Accessories	See HMI accessories

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Overview



Note

The CM CANopen module is an HMS Industrial Networks product and can only be obtained through HMS.

The following description contains information on supplementary products that are manufactured and marketed, not by Siemens, but by third-parties outside the Siemens group ("external companies"). These external companies organize the manufacture, sale and delivery of their products independently. Their own terms and conditions of business and delivery apply.

Responsibility for these supplementary products and for the associated information presented here rests exclusively with the respective external company. Unless compulsory by law, Siemens assumes no liability and makes no guarantee for supplemental products of external companies. Please refer also to the note on "Exemption from liability/Use of hyperlinks" (see "More information").

Overview

An interface module is available for operating the SIMATIC S7-1200 on CANopen. It can be used together with system and IO components of the S7-1200 automation system.

CiA and CANopen are registered Community Trademarks of CAN in Automation e.V.

Application

CANopen is a widely used industrial bus system and can be used for a variety of different applications. The module allows simple and cost-effective connection of CANopen applications to SIMATIC.

- Control of hydraulic valves/axes in vehicles
- Control of motors in packaging machines or conveyors
- Capturing of angular encoder positions in wind turbines
- Capturing of control devices on machines, e.g. joysticks
- Capturing the measured data of path encoders, inclinometers or angular encoders, e.g. for tower cranes and gantry cranes

The CM CANopen module has the following properties:

- Interface module for CANopen (master/slave) for SIMATIC S7-1200
- Connection of up to 16 CANopen slave stations in the master mode
- 256 bytes of input data and 256 bytes of output data per module
- Connection of up to 3 modules per CPU
- 3 LEDs for module, network and I/O status diagnostics
- Possible integration of the module into the hardware catalog of the TIA Portal configuration suite
- Supports Transparent CAN 2.0A for processing customer-specific protocols
- CANopen implementation according to communication profiles CiA 301 Rev. 4.2 and CiA 302 Rev. 4.1 (master)

More information

The CANopen bus can be configured via any commercially available CANopen configuration tool. The HMS company also supplies suitable "CM CANopen Configuration Studio" software with the product. The configuration is saved directly on the module by means of a USB connection. Routing via PROFIBUS/PROFINET is not possible.

Preprogrammed function blocks are available for easier PLC programming in the TIA Portal.

For further information, please contact HMS directly:

www.ixxat.com/cm-canopen

Ordering and Support

Please note that ordering and support for the module are exclusively carried out via HMS. Please contact HMS directly should you have any questions concerning this module. The relevant contact details can be found on the Internet at

www.ixxat.com/cm-canopen

Exemption from liability/Use of hyperlinks

Siemens has prepared this description with great care. It is not possible, however, for Siemens to verify that the data supplied by external companies is complete, correct or up to date. The possibility that individual items of information might be incorrect, incomplete, or not up-to-date cannot therefore be ruled out. Unless compulsory by law, Siemens accepts no liability for the usability of the data or of the product for the user per se.

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Notes

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Overview



- Modular, scalable, and universally usable system in IP20 level of protection
- The system solution for a variety of automation applications in discrete automation
- Highest performance with excellent usability
- Can only be configured in Totally Integrated Automation Portal with STEP 7 Professional V12 or higher

Performance

- Increase in performance through
  - Faster command execution
  - Language extensions
  - New data types
  - Faster backplane bus
  - Optimized code generation
- Powerful communication:
  - PROFINET IO (2-port switch) as standard interface; from CPU 1515-2 PN, one or more additional integrated PROFINET interfaces, e.g. for network separation, for connecting further PROFINET devices or for high-speed communication as an I-Device
  - OPC UA server (data access) and client as runtime option for the easy connection of SIMATIC S7-1500 to third-party devices/systems
  - Expandable with communication modules for bus systems and point-to-point connection

Integrated technology

- Motion control integrated without additional modules:
  - Standardized blocks (PLCopen) for connection of analog and PROFIdrive-capable drives
  - The motion control functionality supports speed-controlled axes, positioning axes, relative synchronous operation (synchronizing without specification of the synchronized position), as well as external encoders, cams and probes.
  - Extended motion control functions such as absolute synchronous operation (synchronizing with specification of the synchronized position), camming and functions for controlling kinematics are also integrated in the technology CPUs.
- Comprehensive trace functions for all CPU tags for real-time diagnostics and sporadic error detection; for effective commissioning and quick optimization of drives and controls
- Comprehensive control functionalities: e.g. easily configurable blocks for automatic optimization of the control parameters for optimum control quality
- Additional functions through available technology modules: e.g. high-speed counting, position detection, or measurement functions for signals up to 1 MHz

Safety Integrated

- Protection of personnel and machinery – within the framework of an integrated complete system
- Fail-safe SIMATIC S7-1500(T)F Controllers for processing standard and safety programs on the same controller. The fail-safe and standard user programs are created in the TIA Portal with the same editors; fail-safe data, for example, can therefore be evaluated like standard data in the standard user program. Due to this integration the system benefits and the comprehensive functionality of SIMATIC are also available for fail-safe applications.

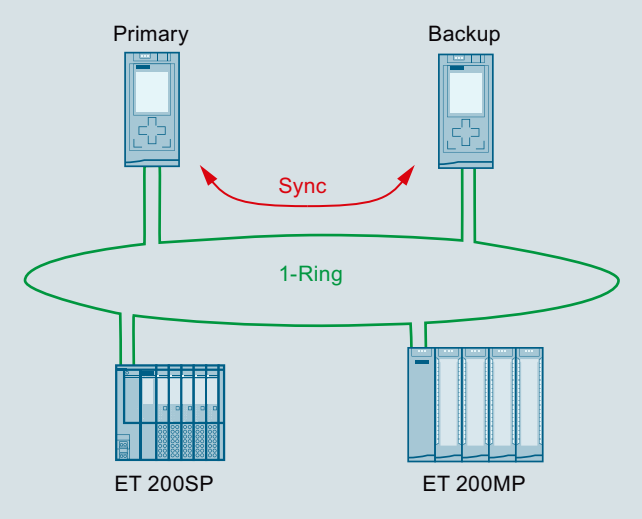
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Overview (continued)

Redundant systems



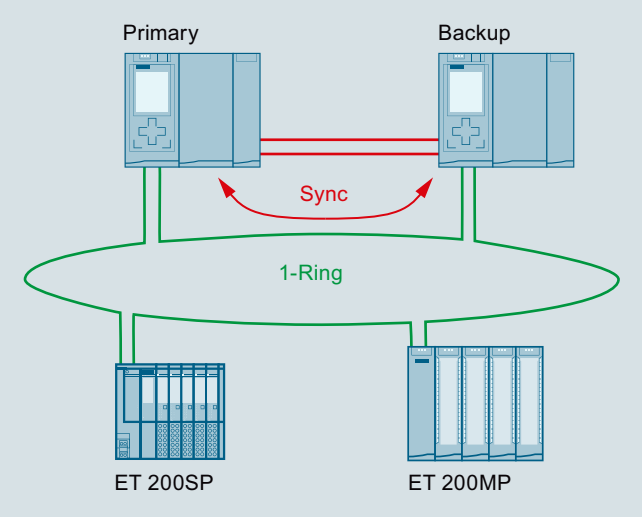
CPU 1513R-1 PN, CPU 1515R-2 PN



SIMATIC S7-1500H mode of operation



CPU 1517H-3 PN/FO



SIMATIC S7-1500H mode of operation

- Redundant S7-1500R/H CPUs for applications where availability of the controller is crucial.
- Both CPUs are connected with the I/O stations via a PROFINET-IO ring. Synchronization for the S7-1500R is via this ring, or via separate FOC synchronization cables for the S7-1500H. In the event of a CPU failure, the back-up CPU automatically assumes control of the process. No data is lost and the process can be continued extremely quickly. The PROFINET IO ring ensures that all nodes remain accessible in the event of a fieldbus interruption.
- The engineering corresponds to that of a standard CPU. The TIA Portal and redundant CPUs handle the synchronization of the programs and data. All without any additional overhead for the user.

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Overview (continued)

Security Integrated

- Password-based know-how protection against unauthorized read-out and modification of program blocks
- Copy protection for greater protection against unauthorized copying of program blocks:
  With copy protection, individual blocks on the SIMATIC memory card can be tied to its serial number so that the block can only be run if the configured memory card is inserted into the CPU.
- Rights concept with four different authorization levels:
  Different access rights can be assigned to various user groups. The new protection level 4 makes it possible to also restrict communication to HMI devices.
- Improved manipulation protection:
  Changed or unauthorized transfers of engineering data are detected by the controller.
- For use of an Ethernet CP (CP 1543-1):
  - Additional access protection by means of a firewall
  - Establishment of secure VPN connections

Design and handling

- CPUs with display for plain text information (display simulator tool on the Internet):
  - Information about article numbers, firmware version, and the serial number of all connected modules can be displayed
  - Setting the IP address of the CPU and additional network settings possible directly on site, without programming device on the display
  - Display of occurring error messages directly as plain text message, meaning reduction in downtime
- Uniform front connectors for all modules and integrated potential bridges for flexible potential group formation simplify stock keeping and reduce wiring effort
- Integrated DIN rail in the S7-1500 rail:
  quick and easy installation of additional components such as miniature circuit breakers, relays, etc.
- Central expansion with signal modules:
  for flexible adaptation to any application
- System cabling for digital signal modules:
  for fast and clearly arranged connecting to sensors and actuators in the field and simple wiring inside the control cabinet
- Power supply:
  - Load power supply modules (PMs) for supplying the module with 24 V
  - Power supply modules to supply power to the internal module electronics via the backplane bus
  - System power supply modules for retentively storing the entire work memory on the controller
- Distributed expansion:
  - Use of up to 30 signal modules, communication modules, and technology modules via the PROFINET interface module IM 155-5 for the ET 200MP I/O system
  - No difference in terms of handling and system functions in central and distributed operation

Integrated system diagnostics

- Integrated system diagnostics for CPUs, activated by default:
  - Consistent plain text display of system diagnostic information in the display, TIA Portal, HMI, and web server, even for drive messages. Messages are updated even if the CPU is in STOP state.
  - System diagnostics integrated in the CPU firmware. Configuration by user not required. The diagnostics is automatically updated on configuration changes.

Support of SIMATIC ProDiag S7-1500

- ProDiag is a concept for the easy creation of machine and plant diagnostics. It increases availability and supports with fault analysis and elimination on-site.

Datalog (archives) and recipes

- SIMATIC memory card:
  - Plug-in load memory
  - Permits firmware updates
  - Storage option for STEP 7 projects (including comments and symbols), additional documentation, or csv/ASCII files (for recipes and archives)
  - Easy access to plant-relevant operating data and configuration data with Office tools via the SD card reader (two-way data exchange from and to the controller)
- Integrated web server:
- Easy access to plant-relevant operating data and configuration data, motion control diagnostics and display of trace recordings via a web browser

Approvals

The SIMATIC S7-1500 complies with the following national and international standards:

- cULus approval
- cULus HazLoc approval
- FM approval
- ATEX approval (only for 24 V; not for 230 V)
- CE
- RCM (formerly C-Tick)
- KCC
- IECEx (24 V only; not for 230 V)
- EN 61000-6-4
- EN 60068-2-1/ -2/ -6/ -14/ -27/ -30/ -32
- EN 61131-2

You can find the marine approvals available for the S7-1500 on the Internet (SIMATIC Customer Support):
http://www.siemens.com/automation/support

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Technical specifications

General technical specifications SIMATIC S7-1500	
Degree of protection	IP20 acc. to IEC 60 529
Ambient temperature	
• Horizontal installation	0...60 °C (display: at an operating temperature of typ. 50 °C, the display is switched off.)
• Vertical installation	0... 40 °C (display: at an operating temperature of typ. 40 °C, the display is switched off.)
Relative humidity	10 %...95 %, no condensation
Atmospheric pressure	From 1080 to 795 hPa (corresponds to an altitude of -1000 to +2000 m)
Insulation	
• < 50 V	707 V DC test voltage (type test)
• < 150 V	2200 V DC test voltage
• < 250 V	2500 V DC test voltage
Electromagnetic compatibility	Requirements of the EMC directive; interference immunity according to IEC 61000-6-2
• Pulse-shaped disturbance variables	Test according to: Electrostatic discharge according to IEC 61000-4-2, burst pulses according to IEC 61000-4-4, energy single pulse (surge) according to IEC 61000-4-5,
• Sinusoidal disturbance variables	Test according to: HF irradiation according to IEC 61000-4-3, HF decoupling according to IEC 61000-4-6
	Requirements of the EMC directive; interference emission according to EN 61000-6-4
• Emission of radio frequency interference	Interference emission according to 61000-6-4
	Interference emission of electromagnetic fields according to EN 61000-6-4
Mechanical stress	
• Vibrations	Testing according to EN 60068-2-6 Tested with: 5 Hz ≤ f ≤ 8.4 Hz, constant amplitude 7 mm; 9 Hz ≤ f ≤ 150 Hz, constant acceleration 2 g; duration of vibration: 10 frequency passes per axis in each direction of the 3 mutually perpendicular axes
• Shock	Testing according to EN 60068-2-27 Tested with: Half-wave: strength of shock 15 g peak value, 11 ms duration; shock direction: 3 shocks each in ± direction in each of the 3 mutually vertical axes

General technical data of SIPLUS S7-1500	
Ambient temperature range	-40/-25/-20 ... +55/60/70 °C
Conformal coating	Coating of the printed circuit boards and the electronic components
Technical specifications	The technical data of the standard product applies except for the ambient conditions.
Ambient conditions	
Extended range of environmental conditions	
• with reference to ambient temperature, air pressure and altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
• At cold restart, min.	0° C
Relative humidity	
• with condensation, max.	100 %; RH incl. bedewing/frost (no commissioning in bedewed state)
Resistance	
• to biologically active substances/ compliance with EN 60721-3-3	Yes; Class 3B2 mold and fungal spores (except fauna); the supplied plug covers must remain in place on the unused interfaces during operation.
• to chemically active substances/ compliance with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray in accordance with EN 60068-2-52 (severity 3); the supplied plug covers must remain in place on the unused interfaces during operation.
• to mechanically active substances, compliance with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust; the supplied plug covers must remain in place on unused interfaces during operation.

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Overview CPU 1511-1 PN



- Entry-level CPU in the S7-1500 controller product range
- Suitable for applications with medium requirements for program scope and processing speed
- Used as central controller in production lines with central and distributed I/O
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET IO controller
- OPC UA server and client as runtime option for the easy connection of SIMATIC S7-1500 to third-party devices/ systems with the functions:
  - OPC UA Data Access
  - OPC UA Security
  - OPC UA Methods Call, Support
  - OPC UA Companion Specifications
- Central and distributed isochronous mode
- Integrated motion control functionalities for controlling speed-controlled and positioning axes, support for external encoders, output cams/cam tracks and probes
- Integrated web server for diagnostics with the option of creating user-defined web pages

Note:

SIMATIC Memory Card required for operation of the CPU.

Overview CPU 1513-1 PN



- The CPU for applications with medium requirements for program/data storage in the S7-1500 controller product range
- Medium to high processing speed for binary and floating-point arithmetic
- Used as central controller in production lines with central and distributed I/O
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET IO controller
- OPC UA server and client as runtime option for the easy connection of SIMATIC S7-1500 to third-party devices/ systems with the functions:
  - OPC UA Data Access
  - OPC UA Security
  - OPC UA Methods Call
  - Support of OPC UA Companion specifications.
- Central and distributed isochronous mode
- Integrated motion control functionalities for controlling speed-controlled and positioning axes, support for external encoders, output cams/cam tracks and probes
- Integrated web server for diagnostics with the option of creating user-defined web pages

Note:

SIMATIC Memory Card required for operation of the CPU.

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Overview CPU 1515-2 PN



- The CPU for applications with medium to high requirements for program/data storage in the S7-1500 controller product range
- Medium to high processing speed for binary and floating-point arithmetic
- Used as central controller in production lines with central and distributed I/O
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET IO controller
- Additional PROFINET interface with separate IP address for network separation, for connecting further PROFINET IO RT devices, or for high-speed communication as an I-Device
- OPC UA server and client as runtime option for the easy connection of SIMATIC S7-1500 to third-party devices/ systems with the functions:
  - OPC UA Data Access
  - OPC UA Security
  - OPC UA Methods Call
  - Support of OPC UA Companion specifications.
- Central and distributed isochronous mode
- Integrated motion control functionalities for controlling speed-controlled and positioning axes, precise position gearing between axes, support for external encoders, output cams/cam tracks and probes
- Integrated web server for diagnostics with the option of creating user-defined web pages

Note:

SIMATIC Memory Card required for operation of the CPU.

Overview CPU 1516-3 PN/DP



- The CPU with a large program and data memory in the S7-1500 controller product range for applications with high requirements regarding program scope and networking.
- High processing speed for binary and floating-point arithmetic
- Used as central controller in production lines with central and distributed I/O
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET.
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET IO controller.
- Additional PROFINET interface with separate IP address for network separation, for connecting further PROFINET IO RT devices, or for high-speed communication as an I-Device
- PROFIBUS DP master interface
- UA server and client as runtime option for easy connection of the SIMATIC S7-1500 to third-party devices/systems with the functions:
  - OPC UA Data Access
  - OPC UA Security
  - OPC UA Methods Call
  - Support of OPC UA Companion specifications.
- Central and distributed isochronous mode on PROFIBUS and PROFINET
- Integrated motion control functionalities for controlling speed-controlled and positioning axes, support for external encoders, output cams/cam tracks and probes
- Integrated web server for diagnostics with the option of creating user-defined web pages

Note:

SIMATIC Memory Card required for operation of the CPU.

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Overview CPU 1517-3 PN/DP



- The CPU with a very large program and data memory in the S7-1500 controller product range for applications with high requirements regarding program scope and networking.
- High processing speed for binary and floating-point arithmetic
- For cross-industry automation tasks in series machines, special machines and plant construction
- Used as central controller in production lines with central and distributed I/O
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET.
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET IO controller.
- Additional PROFINET interface with separate IP address for network separation, for connecting further PROFINET IO RT devices, or for high-speed communication as an I-Device
- PROFIBUS DP master interface
- OPC UA server and client as runtime option for the easy connection of SIMATIC S7-1500 to third-party devices/ systems with the functions:
  - OPC UA Data Access
  - OPC UA Security
  - OPC UA Methods Call
  - Support of OPC UA Companion specifications.
- Central and distributed isochronous mode on PROFIBUS and PROFINET
- Integrated motion control functionalities for controlling speed-controlled and positioning axes, support for external encoders, precise position gearing between axes, output cams/cam tracks and probes
- Integrated web server for diagnostics with the option of creating user-defined web pages

Note:

SIMATIC memory card required for operation of the CPU.

Overview CPU 1518-4 PN/DP



- The CPU with a very large program and data memory in the S7-1500 controller product range for demanding applications with extremely high requirements regarding program scope, performance and networking
- Extremely high processing speed for binary and floating-point arithmetic
- For cross-industry automation tasks in series machines, special machines and plant construction
- Used as central controller in production lines with central and distributed I/O
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET.
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET IO controller.
- Two additional PROFINET interfaces with separate IP address; for network separation. The PROFINET interface X2 can be used for connecting additional PROFINET IO RT devices or for fast communication as an I-Device. The PROFINET interface X3 facilitates data transfer at a speed of 1 Gbps.
- PROFIBUS DP master interface
- OPC UA server and client as runtime option for the easy connection of SIMATIC S7-1500 to third-party devices/ systems with the functions:
  - OPC UA Data Access
  - OPC UA Security
  - OPC UA Methods Call
  - Support of OPC UA Companion specifications.
- Central and distributed isochronous mode on PROFIBUS and PROFINET
- Integrated motion control functionalities for controlling speed-controlled and positioning axes, support for external encoders, precise position gearing between axes, output cams/cam tracks and probes
- Integrated web server for diagnostics with the option of creating user-defined web pages

Note:

SIMATIC Memory Card required for operation of the CPU.

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Overview CPU 1518-4 PN/DP MFP



- The CPU with a very large program and data memory in the S7-1500 controller product range for demanding applications with extremely high requirements regarding program scope, performance and networking
- Extremely high processing speed for binary and floating-point arithmetic
- For cross-industry automation tasks in series machines, special machines and plant construction
- C/C++ functions can be called and executed in the CPU runtime.
- In parallel to the CPU runtime, there is an additional C/C++ Runtime, in which call-independent, i.e. stand-alone, C/C++ applications can be executed.
- Used as central controller in production lines with central and distributed I/O
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET IO controller
- Two additional PROFINET interfaces with separate IP addresses for network separation:
  The PROFINET interface X2 can be used for connecting additional PROFINET IO RT devices or for fast communication as an I-Device. The PROFINET interface X3 facilitates data transfer at a speed of 1 Gbps.
- PROFIBUS DP master interface
- OPC UA server and client as runtime option for the easy connection of SIMATIC S7-1500 to third-party devices/ systems with the functions:
  - OPC UA Data Access
  - OPC UA Security
  - OPC UA Methods Call
  - Support of OPC UA Companion specifications.
- Central and distributed isochronous mode on PROFIBUS and PROFINET
- Integrated motion control functionalities for controlling speed-controlled and positioning axes, support for external encoders, gearing between axes, output cams/cam tracks and probes
- Integrated web server for diagnostics with the option of creating user-defined web pages

Multi-functional platform

With the multi-functional platform (MFP), more functionality can be accommodated in a module. The computing power of the CPU 1518-4 PN/DP MFP allows the merging of previously separate applications on a common platform while continuing to meet the high S7-1500 demands with regard to maintenance and ruggedness.
This means that, in addition to the control function, it is also possible to process typical PC applications on the multi-functional platform, e.g. tasks that:

- require high-level language programming,
- are developed based on models, or
- have to be solved via databases.

Thus, in addition to the option of running C/C++ code in the standard STEP 7 program, the CPU 1518-4 PN/DP MFP multi-functional platform provides an additional second independent runtime environment in order to execute C/C++ applications in parallel to the STEP 7 program if required.
Control-independent applications, e.g. protocol converters, database applications and others, can be created in C/C++. This simplifies the creation or reuse of customer-specific, high-level language applications.
The CPU 1518-4 PN/DP MFP has the quantity structure and functionality of a CPU 1518-4 PN/DP with regard to the control unit. In addition to the user program created with STEP 7 in the TIA Portal, C/C++ functions formulated via the SIMATIC ODK 1500S can be integrated into the standard user program. By using SIMATIC ODK 1500S (ODK - Open Development Kit), higher-level programming language mechanisms, such as object orientation, can also be utilized. Furthermore, with the SIMATIC Target 1500S™ engineering package for Simulink®, it is also possible to integrate complex Simulink models to take advantage of the model-based development using MATLAB and Simulink®.

Note:

SIMATIC memory card required for operation of the CPU.

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Technical specifications

Article number	**6ES7511-1AK02-0AB0** CPU 1511-1 PN, 150KB prog., 1MB data	**6ES7513-1AL02-0AB0** CPU 1513-1 PN, 300KB prog., 1.5MB data	**6ES7515-2AM01-0AB0** CPU 1515-2 PN, 500KB prog., 3MB data	**6ES7516-3AN01-0AB0** CPU 1516-3 PN/DP, 1MB prog., 5MB data
General information				
Product type designation	CPU 1511-1 PN	CPU 1513-1 PN	CPU 1515-2 PN	CPU 1516-3 PN/DP
Engineering with				
• STEP 7 TIA Portal configurable/ integrated as of version	V15.1 (FW V2.6) / V15 (FW V2.5) or higher; with older TIA Portal versions configurable as 6ES7511-1AK01-0AB0	V15.1 (FW V2.6) / V15 (FW V2.5) or higher; with older TIA Portal versions configurable as 6ES7513-1AL01-0AB0	V15.1 (FW V2.6)/V13 SP1 Update 4 (FW V1.8) or higher	V15.1 (FW V2.6)/V13 SP1 Update 4 (FW V1.8) or higher
Display				
Screen diagonal [cm]	3.45 cm	3.45 cm	6.1 cm	6.1 cm
Supply voltage				
Type of supply voltage	24 V DC	24 V DC	24 V DC	24 V DC
Memory				
Work memory				
• integrated (for program)	150 kbyte	300 kbyte	500 kbyte	1 Mbyte
• integrated (for data)	1 Mbyte	1.5 Mbyte	3 Mbyte	5 Mbyte
Load memory				
• Plug-in (SIMATIC memory card), max.	32 Gbyte	32 Gbyte	32 Gbyte	32 Gbyte
CPU processing times				
for bit operations, typ.	60 ns	40 ns	30 ns	10 ns
for word operations, typ.	72 ns	48 ns	36 ns	12 ns
for fixed point arithmetic, typ.	96 ns	64 ns	48 ns	16 ns
for floating point arithmetic, typ.	384 ns	256 ns	192 ns	64 ns
Counters, timers and their retentivity				
S7 counter				
• Number	2 048	2 048	2 048	2 048
IEC counter				
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)	Any (only limited by the main memory)	Any (only limited by the main memory)
S7 times				
• Number	2 048	2 048	2 048	2 048
IEC timer				
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)	Any (only limited by the main memory)	Any (only limited by the main memory)
Data areas and their retentivity				
Flag				
• Number, max.	16 kbyte	16 kbyte	16 kbyte	16 kbyte
Address area				
I/O address area				
• Inputs	32 kbyte; All inputs are in the process image	32 kbyte; All inputs are in the process image	32 kbyte; All inputs are in the process image	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image	32 kbyte; All outputs are in the process image	32 kbyte; All outputs are in the process image	32 kbyte; All outputs are in the process image
Time of day				
Clock				
• Type	Hardware clock	Hardware clock	Hardware clock	Hardware clock
1. Interface				
Interface types				
• Number of ports	2	2	2	2
• integrated switch	Yes	Yes	Yes	Yes
• RJ 45 (Ethernet)	Yes; X1	Yes; X1	Yes; X1	Yes; X1

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Technical specifications (continued)

Article number	**6ES7511-1AK02-0AB0** CPU 1511-1 PN, 150KB prog., 1MB data	**6ES7513-1AL02-0AB0** CPU 1513-1 PN, 300KB prog., 1.5MB data	**6ES7515-2AM01-0AB0** CPU 1515-2 PN, 500KB prog., 3MB data	**6ES7516-3AN01-0AB0** CPU 1516-3 PN/DP, 1MB prog., 5MB data
Protocols				
• IP protocol	Yes; IPv4	Yes; IPv4	Yes; IPv4	Yes; IPv4
• PROFINET IO Controller	Yes	Yes	Yes	Yes
• PROFINET IO Device	Yes	Yes	Yes	Yes
• SIMATIC communication	Yes	Yes	Yes	Yes
• Open IE communication	Yes	Yes	Yes	Yes
• Web server	Yes	Yes	Yes	Yes
• Media redundancy	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0
PROFINET IO Controller				
Services				
- PG/OP communication	Yes	Yes	Yes	Yes
- S7 routing	Yes	Yes	Yes	Yes
- Isochronous mode	Yes	Yes	Yes	Yes
- Open IE communication	Yes	Yes	Yes	Yes
- IRT	Yes	Yes	Yes	Yes
- MRP	Yes; As MRP redundancy manager and/or MRP client; max. number of devices in the ring: 50	Yes; As MRP redundancy manager and/or MRP client; max. number of devices in the ring: 50	Yes; As MRP redundancy manager and/or MRP client; max. number of devices in the ring: 50	Yes; As MRP redundancy manager and/or MRP client; max. number of devices in the ring: 50
- MRPD	Yes; Requirement: IRT	Yes; Requirement: IRT	Yes; Requirement: IRT	Yes; Requirement: IRT
- PROFIenergy	Yes	Yes	Yes	Yes
- Prioritized startup	Yes; Max. 32 PROFINET devices	Yes; Max. 32 PROFINET devices	Yes; Max. 32 PROFINET devices	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	128; In total, up to 256 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	128; In total, up to 512 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	256; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	256; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64	64	64	64
- Number of connectable IO Devices for RT, max.	128	128	256	256
- of which in line, max.	128	128	256	256
- Number of IO Devices that can be simultaneously activated/ deactivated, max.	8; in total across all interfaces	8; in total across all interfaces	8; in total across all interfaces	8; in total across all interfaces
- Number of IO Devices per tool, max.	8	8	8	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data

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Technical specifications (continued)

Article number	6ES7511-1AK02-0AB0 CPU 1511-1 PN, 150KB prog., 1MB data	6ES7513-1AL02-0AB0 CPU 1513-1 PN, 300KB prog., 1.5MB data	6ES7515-2AM01-0AB0 CPU 1515-2 PN, 500KB prog., 3MB data	6ES7516-3AN01-0AB0 CPU 1516-3 PN/DP, 1MB prog., 5MB data
Update time for IRT				
- for send cycle of 250 µs	250 µs to 4 ms; Note: In the case of IRT with isochronous mode, the minimum update time of 625 µs of the isochronous OB is decisive	250 µs to 4 ms; Note: In the case of IRT with isochronous mode, the minimum update time of 500 µs of the isochronous OB is decisive	250 µs to 4 ms; Note: In the case of IRT with isochronous mode, the minimum update time of 500 µs of the isochronous OB is decisive	250 µs to 4 ms; Note: In the case of IRT with isochronous mode, the minimum update time of 375 µs of the isochronous OB is decisive
- for send cycle of 500 µs	500 µs to 8 ms; Note: In the case of IRT with isochronous mode, the minimum update time of 625 µs of the isochronous OB is decisive	500 µs to 8 ms	500 µs to 8 ms	500 µs to 8 ms
- for send cycle of 1 ms	1 ms to 16 ms	1 ms to 16 ms	1 ms to 16 ms	1 ms to 16 ms
- for send cycle of 2 ms	2 ms to 32 ms	2 ms to 32 ms	2 ms to 32 ms	2 ms to 32 ms
- for send cycle of 4 ms	4 ms to 64 ms	4 ms to 64 ms	4 ms to 64 ms	4 ms to 64 ms
- With IRT and parameterization of "odd" send cycles	Update time = set "odd" send clock (any multiple of 125 µs: 375 µs, 625 µs ... 3 875 µs)	Update time = set "odd" send clock (any multiple of 125 µs: 375 µs, 625 µs ... 3 875 µs)	Update time = set "odd" send clock (any multiple of 125 µs: 375 µs, 625 µs ... 3 875 µs)	Update time = set "odd" send clock (any multiple of 125 µs: 375 µs, 625 µs ... 3 875 µs)
Update time for RT				
- for send cycle of 250 µs	250 µs to 128 ms	250 µs to 128 ms	250 µs to 128 ms	250 µs to 128 ms
- for send cycle of 500 µs	500 µs to 256 ms	500 µs to 256 ms	500 µs to 256 ms	500 µs to 256 ms
- for send cycle of 1 ms	1 ms to 512 ms	1 ms to 512 ms	1 ms to 512 ms	1 ms to 512 ms
- for send cycle of 2 ms	2 ms to 512 ms	2 ms to 512 ms	2 ms to 512 ms	2 ms to 512 ms
- for send cycle of 4 ms	4 ms to 512 ms	4 ms to 512 ms	4 ms to 512 ms	4 ms to 512 ms
PROFINET IO Device				
Services				
- PG/OP communication	Yes	Yes	Yes	Yes
- S7 routing	Yes	Yes	Yes	Yes
- Isochronous mode	No	No	No	No
- Open IE communication	Yes	Yes	Yes	Yes
- IRT	Yes	Yes	Yes	Yes
- MRP	Yes; As MRP redundancy manager and/or MRP client; max. number of devices in the ring: 50	Yes; As MRP redundancy manager and/or MRP client; max. number of devices in the ring: 50	Yes; As MRP redundancy manager and/or MRP client; max. number of devices in the ring: 50	Yes; As MRP redundancy manager and/or MRP client; max. number of devices in the ring: 50
- MRPD	Yes; Requirement: IRT	Yes; Requirement: IRT	Yes; Requirement: IRT	Yes; Requirement: IRT
- PROFIenergy	Yes	Yes	Yes	Yes
- Shared device	Yes	Yes	Yes	Yes
- Number of IO Controllers with shared device, max.	4	4	4	4
- Asset management record	Yes; Per user program	Yes; Per user program	Yes; Per user program	Yes; Per user program
2. Interface				
Interface types				
• Number of ports			1	1
• integrated switch			No	No
• RJ 45 (Ethernet)			Yes; X2	Yes; X2
Protocols				
• IP protocol			Yes; IPv4	Yes; IPv4
• PROFINET IO Controller			Yes	Yes
• PROFINET IO Device			Yes	Yes
• SIMATIC communication			Yes	Yes
• Open IE communication			Yes	Yes
• Web server			Yes	Yes
• Media redundancy			No	No

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Technical specifications (continued)

Article number	**6ES7511-1AK02-0AB0** CPU 1511-1 PN, 150KB prog., 1MB data	**6ES7513-1AL02-0AB0** CPU 1513-1 PN, 300KB prog., 1.5MB data	**6ES7515-2AM01-0AB0** CPU 1515-2 PN, 500KB prog., 3MB data	**6ES7516-3AN01-0AB0** CPU 1516-3 PN/DP, 1MB prog., 5MB data
PROFINET IO Controller				
Services				
- PG/OP communication			Yes	Yes
- S7 routing			Yes	Yes
- Isochronous mode			No	No
- Open IE communication			Yes	Yes
- IRT			No	No
- MRP			No	No
- MRPD			No	No
- PROFIenergy			Yes	Yes
- Prioritized startup			No	No
- Number of connectable IO Devices, max.			32; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	32; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Number of connectable IO Devices for RT, max.			32	32
- of which in line, max.			32	32
- Number of IO Devices that can be simultaneously activated/ deactivated, max.			8; in total across all inter-faces	8; in total across all inter-faces
- Number of IO Devices per tool, max.			8	8
- Updating times			The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
Update time for RT				
- for send cycle of 1 ms			1 ms to 512 ms	1 ms to 512 ms
PROFINET IO Device				
Services				
- PG/OP communication			Yes	Yes
- S7 routing			Yes	Yes
- Isochronous mode			No	No
- Open IE communication			Yes	Yes
- IRT			No	No
- MRP			No	No
- MRPD			No	No
- PROFIenergy			Yes	Yes
- Prioritized startup			No	No
- Shared device			Yes	Yes
- Number of IO Controllers with shared device, max.			4	4
- Asset management record			Yes; Per user program	Yes; Per user program
3. Interface				
Interface types				
• Number of ports				1
• RS 485				Yes; X3
Protocols				
• PROFIBUS DP master				Yes
• PROFIBUS DP slave				No
• SIMATIC communication				Yes

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Technical specifications (continued)

Article number	6ES7511-1AK02-0AB0 CPU 1511-1 PN, 150KB prog., 1MB data	6ES7513-1AL02-0AB0 CPU 1513-1 PN, 300KB prog., 1.5MB data	6ES7515-2AM01-0AB0 CPU 1515-2 PN, 500KB prog., 3MB data	6ES7516-3AN01-0AB0 CPU 1516-3 PN/DP, 1MB prog., 5MB data
Protocols				
Number of connections				
• Number of connections, max.	96; via integrated interfaces of the CPU and connected CPs / CMs	128; via integrated interfaces of the CPU and connected CPs / CMs	192; via integrated interfaces of the CPU and connected CPs / CMs	256; via integrated interfaces of the CPU and connected CPs / CMs
PROFIBUS DP master				
Services				
- Number of DP slaves				125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
OPC UA				
• OPC UA client	Yes	Yes	Yes	Yes
• OPC UA server	Yes; Data access (read, write, subscribe), method call, custom address space	Yes; Data access (read, write, subscribe), method call, custom address space	Yes; Data access (read, write, subscribe), method call, custom address space	Yes; Data access (read, write, subscribe), method call, custom address space
Isochronous mode				
Isochronous operation (application synchronized up to terminal)	Yes; Distributed and central; with minimum OB 6x cycle of 625 µs (distributed) and 1 ms (central)	Yes; Distributed and central; with minimum OB 6x cycle of 500 µs (distributed) and 1 ms (central)	Yes; Distributed and central; with minimum OB 6x cycle of 500 µs (distributed) and 1 ms (central)	Yes; Distributed and central; with minimum OB 6x cycle of 375 µs (distributed) and 1 ms (central)
Supported technology objects				
Motion control	Yes; Note: The number of axes affects the cycle time of the PLC program; selection guide via the TIA Selection Tool or SIZER	Yes; Note: The number of axes affects the cycle time of the PLC program; selection guide via the TIA Selection Tool or SIZER	Yes; Note: The number of axes affects the cycle time of the PLC program; selection guide via the TIA Selection Tool or SIZER	Yes; Note: The number of axes affects the cycle time of the PLC program; selection guide via the TIA Selection Tool or SIZER
• Number of available motion control resources for technology objects (except cam disks)	800	800	2 400	2 400
• Required motion control resources				
- per speed-controlled axis	40	40	40	40
- per positioning axis	80	80	80	80
- per synchronous axis	160	160	160	160
- per external encoder	80	80	80	80
- per output cam	20	20	20	20
- per cam track	160	160	160	160
- per probe	40	40	40	40
Controller				
• PID_Compact	Yes; Universal PID controller with integrated optimization	Yes; Universal PID controller with integrated optimization	Yes; Universal PID controller with integrated optimization	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves	Yes; PID controller with integrated optimization for valves	Yes; PID controller with integrated optimization for valves	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature	Yes; PID controller with integrated optimization for temperature	Yes; PID controller with integrated optimization for temperature	Yes; PID controller with integrated optimization for temperature
Counting and measuring				
• High-speed counter	Yes	Yes	Yes	Yes
Ambient conditions				
Ambient temperature during operation				
• horizontal installation, min.	0 °C	0 °C	0 °C	0 °C
• horizontal installation, max.	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off
• vertical installation, min.	0 °C	0 °C	0 °C	0 °C
• vertical installation, max.	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off

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Technical specifications (continued)

Article number	**6ES7511-1AK02-0AB0** CPU 1511-1 PN, 150KB prog., 1MB data	**6ES7513-1AL02-0AB0** CPU 1513-1 PN, 300KB prog., 1.5MB data	**6ES7515-2AM01-0AB0** CPU 1515-2 PN, 500KB prog., 3MB data	**6ES7516-3AN01-0AB0** CPU 1516-3 PN/DP, 1MB prog., 5MB data
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
Configuration				
Programming				
Programming language				
- LAD	Yes	Yes	Yes	Yes
- FBD	Yes	Yes	Yes	Yes
- STL	Yes	Yes	Yes	Yes
- SCL	Yes	Yes	Yes	Yes
- GRAPH	Yes	Yes	Yes	Yes
Know-how protection				
• User program protection/ password protection	Yes	Yes	Yes	Yes
• Copy protection	Yes	Yes	Yes	Yes
• Block protection	Yes	Yes	Yes	Yes
Access protection				
• Password for display	Yes	Yes	Yes	Yes
• Protection level: Write protection	Yes	Yes	Yes	Yes
• Protection level: Read/write protection	Yes	Yes	Yes	Yes
• Protection level: Complete protection	Yes	Yes	Yes	Yes
Dimensions				
Width	35 mm	35 mm	70 mm	70 mm
Height	147 mm	147 mm	147 mm	147 mm
Depth	129 mm	129 mm	129 mm	129 mm
Weights				
Weight, approx.	405 g	405 g	830 g	845 g

Article number	**6ES7517-3AP00-0AB0** CPU 1517-3 PN/DP, 2MB Prog./8MB data	**6ES7518-4AP00-0AB0** CPU 1518-4 PN/DP, 4MB Prog., 20MB data	**6ES7518-4AX00-1AC0** CPU 1518-4 PN/DP MFP + C/C++ RT + OPC UA
General information			
Product type designation	CPU 1517-3 PN/DP	CPU 1518-4 PN/DP	CPU 1518-4 PN/DP MFP
Engineering with			
• STEP 7 TIA Portal configurable/ integrated as of version	V15.1 (FW V2.6) / V13 Update 3 (FW V1.6) or higher	V15.1 (FW V2.6) / V13 (FW V1.5) or higher	V15.1 (FW V2.6) / V15 (FW V2.5) or higher
Display			
Screen diagonal [cm]	6.1 cm	6.1 cm	6.1 cm
Supply voltage			
Type of supply voltage	24 V DC	24 V DC	24 V DC
Memory			
Work memory			
• integrated (for program)	2 Mbyte	4 Mbyte	4 Mbyte
• integrated (for data)	8 Mbyte	20 Mbyte	20 Mbyte
• integrated (for CPU function library of CPU runtime)			50 Mbyte; Note: The "CPU function library of the CPU" are C/C++ blocks for the user program that were created using the SIMATIC ODK 1500S or Target 1500S.

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Technical specifications (continued)

Article number	**6ES7517-3AP00-0AB0** CPU 1517-3 PN/DP, 2MB Prog./8MB data	**6ES7518-4AP00-0AB0** CPU 1518-4 PN/DP, 4MB Prog., 20MB data	**6ES7518-4AX00-1AC0** CPU 1518-4 PN/DP MFP + C/C++ RT + OPC UA
Working memory for additional functions			
• Integrated (for C/C++ Runtime application)			512 Mbyte
Load memory			
• Plug-in (SIMATIC memory card), max.	32 Gbyte	32 Gbyte	32 Gbyte; The memory card must have at least 2 GB of space on it
CPU processing times			
for bit operations, typ.	2 ns	1 ns	1 ns
for word operations, typ.	3 ns	2 ns	2 ns
for fixed point arithmetic, typ.	3 ns	2 ns	2 ns
for floating point arithmetic, typ.	12 ns	6 ns	6 ns
Counters, timers and their retentivity			
S7 counter			
• Number	2 048	2 048	2 048
IEC counter			
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)	Any (only limited by the main memory)
S7 times			
• Number	2 048	2 048	2 048
IEC timer			
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)	Any (only limited by the main memory)
Data areas and their retentivity			
Flag			
• Number, max.	16 kbyte	16 kbyte	16 kbyte
Address area			
I/O address area			
• Inputs	32 kbyte; All inputs are in the process image	32 kbyte; All inputs are in the process image	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image	32 kbyte; All outputs are in the process image	32 kbyte; All outputs are in the process image
Time of day			
Clock			
• Type	Hardware clock	Hardware clock	Hardware clock
1. Interface			
Interface types			
• Number of ports	2	2	2
• integrated switch	Yes	Yes	Yes
• RJ 45 (Ethernet)	Yes; X1	Yes; X1	Yes; X1
Protocols			
• IP protocol	Yes; IPv4	Yes; IPv4	Yes; IPv4
• PROFINET IO Controller	Yes	Yes	Yes
• PROFINET IO Device	Yes	Yes	Yes
• SIMATIC communication	Yes	Yes	Yes
• Open IE communication	Yes	Yes	Yes
• Web server	Yes	Yes	Yes
• Media redundancy	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0

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Technical specifications (continued)

Article number	**6ES7517-3AP00-0AB0** CPU 1517-3 PN/DP, 2MB Prog./8MB data	**6ES7518-4AP00-0AB0** CPU 1518-4 PN/DP, 4MB Prog., 20MB data	**6ES7518-4AX00-1AC0** CPU 1518-4 PN/DP MFP + C/C++ RT + OPC UA
PROFINET IO Controller			
Services			
- PG/OP communication	Yes	Yes	Yes
- S7 routing	Yes	Yes	Yes
- Isochronous mode	Yes	Yes	Yes
- Open IE communication	Yes	Yes	Yes
- IRT	Yes	Yes	Yes
- MRP	Yes; As MRP redundancy manager and/or MRP client; max. number of devices in the ring: 50	Yes; As MRP redundancy manager and/or MRP client; max. number of devices in the ring: 50	Yes; As MRP redundancy manager and/or MRP client; max. number of devices in the ring: 50
- MRPD	Yes; Requirement: IRT	Yes; Requirement: IRT	Yes; Requirement: IRT
- PROFIenergy	Yes	Yes	Yes
- Prioritized startup	Yes; Max. 32 PROFINET devices	Yes; Max. 32 PROFINET devices	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	512; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	512; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	512; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64	64	64
- Number of connectable IO Devices for RT, max.	512	512	512
- of which in line, max.	512	512	512
- Number of IO Devices that can be simultaneously activated/ deactivated, max.	8; in total across all interfaces	8; in total across all interfaces	8; in total across all interfaces
- Number of IO Devices per tool, max.	8	8	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
Update time for IRT			
- for send cycle of 125 µs		125 µs	125 µs
- for send cycle of 187.5 µs		187.5 µs	187.5 µs
- for send cycle of 250 µs	250 µs to 4 ms	250 µs to 4 ms	250 µs to 4 ms
- for send cycle of 500 µs	500 µs to 8 ms	500 µs to 8 ms	500 µs to 8 ms
- for send cycle of 1 ms	1 ms to 16 ms	1 ms to 16 ms	1 ms to 16 ms
- for send cycle of 2 ms	2 ms to 32 ms	2 ms to 32 ms	2 ms to 32 ms
- for send cycle of 4 ms	4 ms to 64 ms	4 ms to 64 ms	4 ms to 64 ms
- With IRT and parameterization of "odd" send cycles	Update time = set "odd" send clock (any multiple of 125 µs: 375 µs, 625 µs ... 3 875 µs)	Update time = set "odd" send clock (any multiple of 125 µs: 375 µs, 625 µs ... 3 875 µs)	Update time = set "odd" send clock (any multiple of 125 µs: 375 µs, 625 µs ... 3 875 µs)
Update time for RT			
- for send cycle of 250 µs	250 µs to 128 ms	250 µs to 128 ms	250 µs to 128 ms
- for send cycle of 500 µs	500 µs to 256 ms	500 µs to 256 ms	500 µs to 256 ms
- for send cycle of 1 ms	1 ms to 512 ms	1 ms to 512 ms	1 ms to 512 ms
- for send cycle of 2 ms	2 ms to 512 ms	2 ms to 512 ms	2 ms to 512 ms
- for send cycle of 4 ms	4 ms to 512 ms	4 ms to 512 ms	4 ms to 512 ms

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Technical specifications (continued)

Article number	**6ES7517-3AP00-0AB0** CPU 1517-3 PN/DP, 2MB Prog./8MB data	**6ES7518-4AP00-0AB0** CPU 1518-4 PN/DP, 4MB Prog., 20MB data	**6ES7518-4AX00-1AC0** CPU 1518-4 PN/DP MFP + C/C++ RT + OPC UA
PROFINET IO Device			
Services			
- PG/OP communication	Yes	Yes	Yes
- S7 routing	Yes	Yes	Yes
- Isochronous mode	No	No	No
- Open IE communication	Yes	Yes	Yes
- IRT	Yes	Yes	Yes
- MRP	Yes; As MRP redundancy manager and/or MRP client; max. number of devices in the ring: 50	Yes; As MRP redundancy manager and/or MRP client; max. number of devices in the ring: 50	Yes; As MRP redundancy manager and/or MRP client; max. number of devices in the ring: 50
- MRPD	Yes; Requirement: IRT	Yes; Requirement: IRT	Yes; Requirement: IRT
- PROFIenergy	Yes	Yes	Yes
- Shared device	Yes	Yes	Yes
- Number of IO Controllers with shared device, max.	4	4	4
- Asset management record	Yes; Per user program	Yes; Per user program	Yes; Per user program
2. Interface			
Interface types			
• Number of ports	1	1	1
• integrated switch	No	No	No
• RJ 45 (Ethernet)	Yes; X2	Yes; X2	Yes; X2
Protocols			
• IP protocol	Yes; IPv4	Yes; IPv4	Yes; IPv4
• PROFINET IO Controller	Yes	Yes	Yes
• PROFINET IO Device	Yes	Yes	Yes
• SIMATIC communication	Yes	Yes	Yes
• Open IE communication	Yes	Yes	Yes
• Web server	Yes	Yes	Yes
• Media redundancy	No	No	No
PROFINET IO Controller			
Services			
- PG/OP communication	Yes	Yes	Yes
- S7 routing	Yes	Yes	Yes
- Isochronous mode	No	No	No
- Open IE communication	Yes	Yes	Yes
- IRT	No	No	No
- MRP	No	No	No
- MRPD	No	No	No
- PROFIenergy	Yes	Yes	Yes
- Prioritized startup	No	No	No
- Number of connectable IO Devices, max.	128; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	128; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	128; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Number of connectable IO Devices for RT, max.	128	128	128
- of which in line, max.	128	128	128
- Number of IO Devices that can be simultaneously activated/ deactivated, max.	8; in total across all interfaces	8; in total across all interfaces	8; in total across all interfaces
- Number of IO Devices per tool, max.	8	8	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data

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Technical specifications (continued)

Article number	**6ES7517-3AP00-0AB0** CPU 1517-3 PN/DP, 2MB Prog./8MB data	**6ES7518-4AP00-0AB0** CPU 1518-4 PN/DP, 4MB Prog., 20MB data	**6ES7518-4AX00-1AC0** CPU 1518-4 PN/DP MFP + C/C++ RT + OPC UA
Update time for RT			
- for send cycle of 1 ms	1 ms to 512 ms	1 ms to 512 ms	1 ms to 512 ms
PROFINET IO Device			
Services			
- PG/OP communication	Yes	Yes	Yes
- S7 routing	Yes	Yes	Yes
- Isochronous mode	No	No	No
- Open IE communication	Yes	Yes	Yes
- IRT	No	No	No
- MRP	No	No	No
- MRPD	No	No	No
- PROFIenergy	Yes	Yes	Yes
- Prioritized startup	No	No	No
- Shared device	Yes	Yes	Yes
- Number of IO Controllers with shared device, max.	4	4	4
- Asset management record	Yes; Per user program	Yes; Per user program	Yes; Per user program
3. Interface			
Interface types			
• Number of ports	1	1	1; C/C++ Runtime can also be reached via this port
• integrated switch		No	No
• RJ 45 (Ethernet)		Yes; X3	Yes; X3
• RS 485	Yes; X3		
Protocols			
• IP protocol		Yes; IPv4	Yes; IPv4
• PROFINET IO Controller		No	No
• PROFINET IO Device		No	No
• PROFIBUS DP master	Yes		
• PROFIBUS DP slave	No		
• SIMATIC communication	Yes	Yes	Yes
• Open IE communication		Yes	Yes
• Web server		Yes	Yes
4. Interface			
Interface types			
• Number of ports		1	1
• RS 485		Yes; X4	Yes; X4
Protocols			
• PROFIBUS DP master		Yes	Yes
• PROFIBUS DP slave		No	No
• SIMATIC communication		Yes	Yes
Protocols			
Number of connections			
• Number of connections, max.	320; via integrated interfaces of the CPU and connected CPs / CMs	384; via integrated interfaces of the CPU and connected CPs / CMs	384; via integrated interfaces of the CPU and connected CPs / CMs
PROFIBUS DP master			
Services			
- Number of DP slaves	125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET

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Technical specifications (continued)

Article number	**6ES7517-3AP00-0AB0** CPU 1517-3 PN/DP, 2MB Prog./8MB data	**6ES7518-4AP00-0AB0** CPU 1518-4 PN/DP, 4MB Prog., 20MB data	**6ES7518-4AX00-1AC0** CPU 1518-4 PN/DP MFP + C/C++ RT + OPC UA
OPC UA			
• OPC UA client	Yes	Yes	Yes
• OPC UA server	Yes; Data access (read, write, subscribe), method call, custom address space	Yes; Data access (read, write, subscribe), method call, custom address space	Yes; Data access (read, write, subscribe), method call, custom address space
Isochronous mode			
Isochronous operation (application synchronized up to terminal)	Yes; Distributed and central; with minimum OB 6x cycle of 250 µs (distributed) and 1 ms (central)	Yes; Distributed and central; with minimum OB 6x cycle of 125 µs (distributed) and 1 ms (central)	Yes; Distributed and central; with minimum OB 6x cycle of 125 µs (distributed) and 1 ms (central)
Supported technology objects			
Motion control	Yes; Note: The number of axes affects the cycle time of the PLC program; selection guide via the TIA Selection Tool or SIZER	Yes; Note: The number of axes affects the cycle time of the PLC program; selection guide via the TIA Selection Tool or SIZER	Yes; Note: The number of axes affects the cycle time of the PLC program; selection guide via the TIA Selection Tool or SIZER
• Number of available motion control resources for technology objects (except cam disks)	10 240	10 240	10 240
• Required motion control resources			
- per speed-controlled axis	40	40	40
- per positioning axis	80	80	80
- per synchronous axis	160	160	160
- per external encoder	80	80	80
- per output cam	20	20	20
- per cam track	160	160	160
- per probe	40	40	40
Controller			
• PID_Compact	Yes; Universal PID controller with integrated optimization	Yes; Universal PID controller with integrated optimization	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves	Yes; PID controller with integrated optimization for valves	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature	Yes; PID controller with integrated optimization for temperature	Yes; PID controller with integrated optimization for temperature
Counting and measuring			
• High-speed counter	Yes	Yes	Yes
Ambient conditions			
Ambient temperature during operation			
• horizontal installation, min.	0 °C	0 °C	0 °C
• horizontal installation, max.	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off
• vertical installation, min.	0 °C	0 °C	0 °C
• vertical installation, max.	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off
Altitude during operation relating to sea level			
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	

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Technical specifications (continued)

Article number	**6ES7517-3AP00-0AB0** CPU 1517-3 PN/DP, 2MB Prog./8MB data	**6ES7518-4AP00-0AB0** CPU 1518-4 PN/DP, 4MB Prog., 20MB data	**6ES7518-4AX00-1AC0** CPU 1518-4 PN/DP MFP + C/C++ RT + OPC UA
Configuration			
Programming			
Programming language			
- LAD	Yes	Yes	Yes
- FBD	Yes	Yes	Yes
- STL	Yes	Yes	Yes
- SCL	Yes	Yes	Yes
- GRAPH	Yes	Yes	Yes
Know-how protection			
• User program protection/password protection	Yes	Yes	Yes
• Copy protection	Yes	Yes	Yes
• Block protection	Yes	Yes	Yes
Access protection			
• Password for display	Yes	Yes	Yes
• Protection level: Write protection	Yes	Yes	Yes
• Protection level: Read/write protection	Yes	Yes	Yes
• Protection level: Complete protection	Yes	Yes	Yes
Open Development interfaces			
• Size of ODK SO file, max.			9.8 Mbyte
Dimensions			
Width	175 mm	175 mm	175 mm
Height	147 mm	147 mm	147 mm
Depth	129 mm	129 mm	129 mm
Weights			
Weight, approx.	1 978 g	1 988 g	2 117 g

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Standard CPUs

Ordering data	Article No.
CPU 1511-1 PN 150 KB work memory for program, 1 MB for data, PROFINET IRT interface with 2-port switch; SIMATIC memory card required	**6ES7511-1AK02-0AB0**
CPU 1513-1 PN 300 KB work memory for program, 1.5 MB for data, PROFINET IRT interface with 2-port switch; SIMATIC memory card required	**6ES7513-1AL02-0AB0**
CPU 1515-2 PN 500 KB work memory for program, 3 MB for data, PROFINET IRT interface with 2-port switch, PROFINET RT interface; SIMATIC memory card required	**6ES7515-2AM01-0AB0**
CPU 1516-3 PN/DP 1 MB work memory for program, 5 MB for data, PROFINET IRT interface with 2-port switch, PROFINET RT interface, PROFIBUS interface; SIMATIC memory card required	**6ES7516-3AN01-0AB0**
CPU 1517-3 PN/DP 2 MB work memory for program, 8 MB for data, PROFINET IRT interface with 2-port switch, PROFINET RT interface, PROFIBUS interface; SIMATIC memory card required	**6ES7517-3AP00-0AB0**
CPU 1518-4 PN/DP 4 MB work memory for program, 20 MB for data, PROFINET IRT interface with 2-port switch, PROFINET RT interface, Ethernet interface, PROFIBUS interface; SIMATIC memory card required	**6ES7518-4AP00-0AB0**
CPU 1518-4 PN/DP MFP CPU 1518-4 PN/DP MFP, including C/C++ Runtime and OPC UA runtime license	**6ES7518-4AX00-1AC0**
Accessories	
SIMATIC memory card	
4 MB	**6ES7954-8LC03-0AA0**
12 MB	**6ES7954-8LE03-0AA0**
24 MB	**6ES7954-8LF03-0AA0**
256 MB	**6ES7954-8LL03-0AA0**
2 GB	**6ES7954-8LP02-0AA0**
32 GB	**6ES7954-8LT03-0AA0**

	Article No.
SIMATIC S7-1500 DIN rail Fixed lengths, with grounding elements	
• 160 mm	**6ES7590-1AB60-0AA0**
• 245 mm	**6ES7590-1AC40-0AA0**
• 482 mm	**6ES7590-1AE80-0AA0**
• 530 mm	**6ES7590-1AF30-0AA0**
• 830 mm	**6ES7590-1AJ30-0AA0**
For cutting to length by customer, without drill holes; grounding elements must be ordered separately	
• 2 000 mm	**6ES7590-1BC00-0AA0**
PE connection element for DIN rail 2 000 mm 20 units	**6ES7590-5AA00-0AA0**
Power supply For supplying the backplane bus of the S7-1500 controller	
24 V DC input voltage, power 25 W	**6ES7505-0KA00-0AB0**
24/48/60 V DC input voltage, power 60 W	**6ES7505-0RA00-0AB0**
24/48/60 V DC input voltage, power 60 W, buffering functionality	**6ES7505-0RB00-0AB0**
120/230 V AC input voltage, power 60 W	**6ES7507-0RA00-0AB0**
Power connector With coding element for power supply module; spare part, 10 units	**6ES7590-8AA00-0AA0**
Load power supply	
24 V DC/3 A	**6EP1332-4BA00**
24 V DC/8 A	**6EP1333-4BA00**
Power supply connector Spare part; for connecting the 24 V DC supply voltage	
• With push-in terminals	**6ES7193-4JB00-0AA0**
PROFIBUS FastConnect RS 485 bus connector with 90° cable outlet With insulation displacement, max. transmission rate 12 Mbps	
Without PG interface, grounding via control cabinet contact surface; 1 unit	**6ES7972-0BA70-0XA0**
With PG interface, grounding via control cabinet contact surface; 1 unit	**6ES7972-0BB70-0XA0**
PROFIBUS FC Standard Cable GP Standard type with special design for fast mounting, 2-wire, shielded; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	**6XV1830-0EH10**
PROFIBUS FC Robust Cable 2-wire, shielded; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	**6XV1830-0JH10**
PROFIBUS FC Flexible Cable 2-wire, shielded; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	**6XV1831-2K**

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Ordering data	Article No.
PROFIBUS FC Trailing Cable 2-wire, shielded; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	
Sheath color: Petrol	**6XV1830-3EH10**
Sheath color: Violet	**6XV1831-2L**
PROFIBUS FC Food Cable 2-wire, shielded; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	**6XV1830-0GH10**
PROFIBUS FC Ground Cable 2-wire, shielded; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	**6XV1830-3FH10**
PROFIBUS FC FRNC Cable GP 2-wire, shielded, flame-retardant, with copolymer outer sheath FRNC; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	**6XV1830-0LH10**
PROFIBUS FastConnect stripping tool Preadjusted stripping tool for fast stripping of PROFIBUS FastConnect bus cables	**6GK1905-6AA00**
IE FC RJ45 plugs RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables	
IE FC RJ45 plug 180 180° cable outlet	
1 unit	**6GK1901-1BB10-2AA0**
10 units	**6GK1901-1BB10-2AB0**
50 units	**6GK1901-1BB10-2AE0**
IE FC TP Standard Cable GP 2x2 4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/IE FC RJ45 plug; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	**6XV1840-2AH10**
IE FC TP Trailing Cable 2 x 2 (Type C) 4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/IE FC RJ45 plug 180/90 for use as trailing cable; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	**6XV1840-3AH10**
IE FC TP Marine Cable 2 x 2 (Type B) 4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/IE FC RJ45 plug 180/90 with marine approval; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	**6XV1840-4AH10**
IE FC stripping tool Preadjusted stripping tool for fast stripping of Industrial Ethernet FC cables	**6GK1901-1GA00**
Display	
For CPU 1511-1 PN and CPU 1513-1 PN; spare part	**6ES7591-1AA01-0AA0**
For CPU 1515-2 PN, CPU 1516-3 PN/DP, CPU 1517-3 PN/DP and CPU 1518-4 PN/DP; spare part	**6ES7591-1BA01-0AA0**
Front cover for PROFIBUS DP interface For CPU 1517-3 PN/DP, CPU 1518-4 PN/DP, CPU 1518-4 PN/DP ODK and CPU 1518-4 PN/DP MFP; spare part	**6ES7591-8AA00-0AA0**
SIMATIC S7-1500 Starter Kit Comprising: CPU 1511C-1 PN, SIMATIC memory card 4 MB, 160 mm DIN rail, front connector, STEP 7 Professional 365-day license, PM 70 W 120/230 V AC power supply, Ethernet cable, documentation	**6ES7511-1CK02-4YB5**

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Standard CPUs

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Ordering data	Article No.
STEP 7 Professional V15.1	
Target system: SIMATIC S7-1200, S7-1500, S7-300, S7-400, WinAC	
Requirement: Windows 7 Home Premium SP1 (64-bit) Windows 7 Professional SP1 (64-bit) Windows 7 Enterprise SP1 (64-bit) Windows 7 Ultimate SP1 (64-bit) Windows 10 Home Version 1709, 1803 Windows 10 Professional Version 1709, 1803 Windows 10 Enterprise Version 1709, 1803 Windows 10 Enterprise 2016 LTSB Windows 10 IoT Enterprise 2015 LTSB Windows 10 IoT Enterprise 2016 LTSB Windows Server 2012 R2 StdE (full installation) Windows Server 2016 Standard (full installation)	
Type of delivery: en, de, fr, it, es, zh	
STEP 7 Professional V15.1, floating license	**6ES7822-1AA05-0YA5**
STEP 7 Professional V15.1, floating license, software download incl. license key [1]	**6ES7822-1AE05-0YA5**
Email address required for delivery	
SIMATIC ODK 1500S	
Open Development Kit for support in developing high-level language applications for SIMATIC S7-1500 Advanced Controllers; supplied on DVD, license key (floating license) on USB flash drive	**6ES7806-2CD03-0YA0**
Open Development Kit for support in developing high-level language applications for SIMATIC S7-1500 Advanced Controllers; software download including license key (floating license) [1]	**6ES7806-2CD03-0YG0**
Email address required for delivery	
Open Development Kit for support in developing high-level language applications for SIMATIC S7-1500 Advanced Controllers; upgrade for existing installations as from V1.0; software download including license key (floating license) [1]	**6ES7806-2CD03-0YK0**
Email address required for delivery	

	Article No.
SIMATIC Target 1500S for Simulink V3.0	**6ES7823-1BE02-0YA5**
Download incl. license key [1]	
Email address required for delivery	
Upgrade of SIMATIC Target 1500S for Simulink V2.0 to V3.0, download incl. license key [1]	**6ES7823-1BE02-0YE5**
Email address required for delivery	
SIMATIC Target + ODK 1500S bundle	**6ES7823-1BE12-0YA0**
Download incl. license key [1]	
Email address required for delivery	
SIMATIC Manual Collection	**6ES7998-8XC01-8YE0**
Electronic manuals on DVD, multi-language: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC Distributed I/O, SIMATIC HMI, SIMATIC sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	
SIMATIC Manual Collection update service for 1 year	**6ES7998-8XC01-8YE2**
Current "Manual Collection" DVD and the three subsequent updates	

[1] For up-to-date information and download availability, see:
http://www.siemens.com/tia-online-software-delivery

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Overview SIPLUS CPU 1511-1 PN



- Entry-level CPU in the S7-1500 controller product range
- Suitable for applications with medium requirements for program scope and processing speed
- Used as central controller in production lines with central and distributed I/O
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET I/O controller
- Isochronous mode
- SIMATIC memory card required for operation of the CPU

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

Overview SIPLUS CPU 1513-1 PN



- The CPU for applications with medium/high requirements for program/data storage in the S7-1500 controller product range
- High processing speed for binary and floating-point arithmetic
- Used as central controller in production lines with central and distributed I/O
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET I/O controller
- Isochronous mode
- SIMATIC memory card required for operation of the CPU

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

Overview CPU 1516-3 PN/DP



- The CPU with large program and data memory in the S7-1500 controller product range for applications with high program scope requirements.
- High processing speed for binary and floating-point arithmetic
- Used as central controller in production lines with central and distributed I/O
- PROFINET IO IRT interface with 2-port switch
- Additional PROFINET interface with separate IP address
- PROFINET IO controller for operating distributed I/O on PROFINET.
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET IO controller.
- PROFIBUS DP master interface
- Isochronous mode on PROFIBUS and PROFINET
- SIMATIC memory card required for operation of the CPU

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

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SIPLUS standard CPUs

Overview SIPLUS CPU 1518-4 PN/DP



- The CPU with a very large program and data memory in the S7-1500 controller product range for demanding applications with extremely high requirements regarding program scope, performance and networking
- Extremely high processing speed for binary and floating-point arithmetic
- For cross-industry automation tasks in series machine, special machine and plant construction
- Used as central controller in production lines with central and distributed I/O
- PROFINET IO IRT interface with 2-port switch
- Two additional PROFINET interfaces with separate IP address
- PROFINET IO controller for operating distributed I/O on PROFINET.
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET IO controller.
- PROFIBUS DP master interface
- Isochronous mode on PROFIBUS and PROFINET
- Integrated motion control functionalities for controlling speed-controlled and positioning axes, support for external encoders
- Integrated web server with the option of creating user-defined web pages

SIMATIC memory card required for operating the CPU

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information has been added.

Overview SIPLUS CPU 1518-4 PN/DP MFP



- CPU with an extremely large program and data memory in the S7-1500 controller product range for demanding applications with demanding requirements regarding program scope, performance and networking
- Extremely high processing speed for binary and floating-point arithmetic
- For cross-industry automation tasks in series machines, special machines and plant construction
- C/C++ functions can be called and executed in the CPU runtime.
- In parallel to the CPU runtime, there is an additional C/C++ Runtime, in which call-independent, i.e. stand-alone, C/C++ applications can be executed.
- Used as central controller in production lines with central and distributed I/O
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET IO controller
- Two additional PROFINET interfaces with separate IP addresses for network separation:
  The PROFINET interface X2 can be used for connecting additional PROFINET IO RT devices or for fast communication as an I-Device. The PROFINET interface X3 facilitates data transfer at a speed of 1 Gbps.
- PROFIBUS DP master interface
- OPC UA server (Data Access) as runtime option for the easy connection of SIMATIC S7-1500 to third-party devices/ systems
- Isochronous mode on PROFIBUS and PROFINET
- Integrated motion control functionalities for controlling speed-controlled and positioning axes, support for external encoders, gearing between axes, output cams/cam tracks and probes
- Integrated web server for diagnostics with the option of creating user-defined web pages

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Overview SIPLUS CPU 1518-4 PN/DP MFP (continued)

Multi-functional platform

With the multi-functional platform (MFP), more functionality can be accommodated in a module. The computing power of the CPU 1518-4 PN/DP MFP allows the merging of previously separate applications on a common platform, and continues to meet the high demands of the S7-1500 in respect of ease of maintenance and ruggedness.
This means that, in addition to the control function, it is also possible to process typical PC applications on the multi-functional platform, e.g. tasks that:

- require high-level language programming,
- are developed based on models, or
- have to be solved via databases.

Thus, in addition to the option of running C/C++ code in the standard STEP 7 program, the CPU 1518-4 PN/DP MFP multi-functional platform provides an additional second independent runtime environment in order to execute C/C++ applications in parallel to the STEP 7 program if required.
Control-independent applications, e.g. protocol converters, database applications and others, can be created in C/C++. This simplifies the creation or reuse of customer-specific, high-level language applications.
The CPU 1518-4 PN/DP MFP has the quantity structure and functionality of a CPU 1518-4 PN/DP with regard to the control unit. In addition to the user program created with STEP 7 in the TIA Portal, C/C++ functions formulated via the SIMATIC ODK 1500S can be integrated into the standard user program.
By using SIMATIC ODK 1500S (ODK - Open Development Kit), higher-level programming language mechanisms, such as object orientation, can also be utilized.
Furthermore, with the SIMATIC Target 1500S™ engineering package for Simulink®, it is also possible to integrate complex Simulink models to take advantage of the model-based development using MATLAB and Simulink®.

Note:

SIMATIC memory card required for operation of the CPU.

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the corresponding standard products. SIPLUS extreme specific information has been added.

Technical specifications

Article number	**6AG1511-1AK02-2AB0**	**6AG1511-1AK01-7AB0**	**6AG1513-1AL02-2AB0**	**6AG1513-1AL01-7AB0**
Based on	**6ES7511-1AK02-0AB0**	**6ES7511-1AK01-0AB0**	**6ES7513-1AL02-0AB0**	**6ES7513-1AL01-0AB0**
	SIPLUS S7-1500 CPU 1511-1 PN	SIPLUS S7-1500 CPU 1511-1 PN	SIPLUS S7-1500 CPU 1513-1 PN	SIPLUS S7-1500 CPU 1513-1 PN
Ambient conditions				
Ambient temperature during operation				
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost); start-up @ -20 °C	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost); start-up @ -20 °C
• horizontal installation, max.	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off	70 °C; Display: 50 °C , at an operating temperature of typically 50 °C, the display is switched off	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off	70 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off
• vertical installation, min.	-40 °C; = Tmin	-40 °C; = Tmin; Startup @ -20 °C	-40 °C; = Tmin	-40 °C; = Tmin; Startup @ -20 °C
• vertical installation, max.	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 080 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 080 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity				
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation

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Technical specifications (continued)

Article number	6AG1511-1AK02-2AB0	6AG1511-1AK01-7AB0	6AG1513-1AL02-2AB0	6AG1513-1AL01-7AB0
Based on	6ES7511-1AK02-0AB0	6ES7511-1AK01-0AB0	6ES7513-1AL02-0AB0	6ES7513-1AL01-0AB0
	SIPLUS S7-1500 CPU 1511-1 PN	SIPLUS S7-1500 CPU 1511-1 PN	SIPLUS S7-1500 CPU 1513-1 PN	SIPLUS S7-1500 CPU 1513-1 PN
Resistance				
Coolants and lubricants				
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!	Yes; Class 3S4 incl. sand, dust, *
Use on ships/at sea				
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Remark				
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating				
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability	Yes; Class 2 for high availability	Yes; Class 2 for high availability	Yes; Class 2 for high availability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

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Technical specifications (continued)

Article number	**6AG1516-3AN01-2AB0**	**6AG1516-3AN01-7AB0**	**6AG1518-4AP00-4AB0**
Based on	**6ES7516-3AN01-0AB0**	**6ES7516-3AN01-0AB0**	**6ES7518-4AP00-1AB0**
	SIPLUS S7-1500 CPU 1516-3 PN/DP	SIPLUS S7-1500 CPU 1516-3 PN/DP	SIPLUS S7-1500 CPU 1518-4 PN/DP
Ambient conditions			
Ambient temperature during operation			
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/ frost); start-up @ -20 °C	-40 °C; = Tmin (incl. condensation/ frost); start-up @ -20 °C	0 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off	70 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off
• vertical installation, min.	-40 °C; = Tmin; Startup @ -20 °C	-40 °C; = Tmin; Startup @ -20 °C	0 °C; = Tmin
• vertical installation, max.	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off
Altitude during operation relating to sea level			
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) / / Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity			
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance			
Coolants and lubricants			
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems			
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
Use on ships/at sea			
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Remark			
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating			
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability	Yes; Class 2 for high availability	Yes; Class 2 for high availability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

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SIPLUS standard CPUs

Ordering data	Article No.
SIPLUS CPU 1511-1 PN	
(Extended temperature range and exposure to media)	
150 KB work memory for program, 1 MB for data, PROFINET IRT interface with 2-port switch; SIMATIC memory card required	
Temperature range -40 ... +60 °C	**6AG1511-1AK02-2AB0**
Temperature range -40 ... +70 °C (startup -20 °C)	**6AG1511-1AK01-7AB0**
SIPLUS CPU 1513-1 PN	
(Extended temperature range and exposure to media)	
300 KB work memory for program, 1.5 MB for data, PROFINET IRT interface with 2-port switch; SIMATIC memory card required	
Temperature range -40 ... +60 °C	**6AG1513-1AL02-2AB0**
Temperature range -40 ... +70 °C (startup -20 °C)	**6AG1513-1AL01-7AB0**
SIPLUS CPU 1516-3 PN/DP	
(Extended temperature range and exposure to media)	
1 MB work memory for program, 5 MB for data, PROFINET IRT interface with 2-port switch, PROFINET RT interface, PROFIBUS interface; SIMATIC memory card required	
Temperature range -40 ... +60 °C (startup -20 °C)	**6AG1516-3AN01-2AB0**
Temperature range -40 ... +70 °C (startup -20 °C)	**6AG1516-3AN01-7AB0**
SIPLUS CPU 1518-4 PN/DP	**6AG1518-4AP00-4AB0**
(Exposure to media)	
3 MB work memory for program, 10 MB for data, PROFINET IRT interface with 2-port switch, PROFINET RT interface, Ethernet interface, PROFIBUS interface; SIMATIC memory card required	
SIPLUS CPU 1518-4 PN/DP MFP	**6AG1518-4AX00-4AC0**
(Exposure to media)	
4 MB work memory for program, 20 MB for data, 50 MB for CPU function library in the CPU runtime, 500 MB for C/C++ Runtime application, PROFINET IRT interface with 2-port switch, PROFINET RT interface, Ethernet interface, PROFIBUS interface; C/C++ Runtime and OPC UA runtime license included; SIMATIC memory card required	
Accessories	
System power supply	
(Extended temperature range and exposure to media)	
24 V DC input voltage, power 25 W	**6AG1505-0KA00-7AB0**
24/48/60 V DC input voltage, power 60 W	**6AG1505-0RA00-7AB0**
120/230 V AC input voltage, power 60 W	**6AG1507-0RA00-7AB0**
Load power supply	
(Extended temperature range and exposure to media)	
24 V DC/3 A	**6AG1332-4BA00-7AA0**
24 V DC/8 A	**6AG1333-4BA00-7AA0**
Display	
(Extended temperature range and exposure to media)	
For SIPLUS CPU 1511-1 PN and CPU 1513-1 PN; spare part	**6AG1591-1AA01-2AA0**
For SIPLUS CPU 1516-3 PN/DP, SIPLUS CPU 1518-4 PN/DP and SIPLUS CPU 1518-4 PN/DP MFP; spare part	**6AG1591-1BA01-2AA0**
Other accessories	See SIMATIC S7-1500, standard CPUs, page 4/22

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Overview CPU 1511C-1 PN



- The compact CPU with integral digital and analog inputs and outputs in the product spectrum of the S7-1500 controllers
- With integrated technological functions, e.g. high-speed counter (HSC), frequency measurement, period duration measurement or stepper motor control, pulse duration modulation, frequency output
- Suitable for applications with medium requirements for program scope and processing speed
- Used as central controller in production lines with central and distributed I/O
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET IO controller
- OPC UA server and client as runtime option for the easy connection of SIMATIC S7-1500 to third-party devices/ systems with the functions:
  - OPC UA Data Access
  - OPC UA Security
  - OPC UA Methods Call
  - Support of OPC UA Companion specifications.
- Isochronous mode (distributed)
- Integrated motion control functionalities for controlling speed-controlled and positioning axes, support for external encoders, output cams/cam tracks and probes
- Integrated web server for diagnostics with the option of creating user-defined web pages

Note:

SIMATIC memory card required for operation of the CPU.

Overview CPU 1512C-1 PN



- The compact CPU with integral digital and analog inputs and outputs in the product spectrum of the S7-1500 controllers
- With integrated technological functions, e.g. high-speed counter (HSC), frequency measurement, period duration measurement or stepper motor control, pulse duration modulation, frequency output
- Suitable for applications with medium requirements for program scope and processing speed
- Used as central controller in production lines with central and distributed I/O
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET IO controller
- OPC UA server and client as runtime option for the easy connection of SIMATIC S7-1500 to third-party devices/ systems with the functions:
  - OPC UA Data Access
  - OPC UA Security
  - OPC UA Methods Call
  - Support of OPC UA Companion specifications.
- Isochronous mode (distributed)
- Integrated motion control functionalities for controlling speed-controlled and positioning axes, support for external encoders, output cams/cam tracks and probes
- Integrated web server for diagnostics with the option of creating user-defined web pages

Note:

SIMATIC memory card required for operation of the CPU.

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Technical specifications

Article number	**6ES7511-1CK01-0AB0**	**6ES7512-1CK01-0AB0**
	CPU 1511C-1 PN, 175 KB Prog, 1 MB data	CPU 1512C-1 PN, 250 KB Prog, 1 MB data
General information		
Product type designation	CPU 1511C-1 PN	CPU 1512C-1 PN
Engineering with		
• STEP 7 TIA Portal configurable/ integrated as of version	V15.1 (FW V2.6) / V15 (FW V2.5) or higher; with older TIA Portal versions configurable as 6ES7511-1CK00-0AB0	V15.1 (FW V2.6) / V15 (FW V2.5) or higher; with older TIA Portal versions configurable as 6ES7512-1CK00-0AB0
Display		
Screen diagonal [cm]	3.45 cm	3.45 cm
Supply voltage		
Type of supply voltage	24 V DC	24 V DC
Memory		
Work memory		
• integrated (for program)	175 kbyte	250 kbyte
• integrated (for data)	1 Mbyte	1 Mbyte
Load memory		
• Plug-in (SIMATIC memory card), max.	32 Gbyte	32 Gbyte
CPU processing times		
for bit operations, typ.	60 ns	48 ns
for word operations, typ.	72 ns	58 ns
for fixed point arithmetic, typ.	96 ns	77 ns
for floating point arithmetic, typ.	384 ns	307 ns
Counters, timers and their retentivity		
S7 counter		
• Number	2 048	2 048
IEC counter		
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)
S7 times		
• Number	2 048	2 048
IEC timer		
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)
Data areas and their retentivity		
Flag		
• Number, max.	16 kbyte	16 kbyte
Address area		
I/O address area		
• Inputs	32 kbyte; All inputs are in the process image	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image	32 kbyte; All outputs are in the process image
Time of day		
Clock		
• Type	Hardware clock	Hardware clock
Digital inputs		
integrated channels (DI)	16	32
Digital outputs		
integrated channels (DO)	16	32
Short-circuit protection	Yes; electronic/thermal	Yes; electronic/thermal
Analog outputs		
integrated channels (AO)	2	2
1. Interface		
Interface types		
• Number of ports	2	2
• integrated switch	Yes	Yes
• RJ 45 (Ethernet)	Yes; X1	Yes; X1

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Technical specifications (continued)

Article number	**6ES7511-1CK01-0AB0**	**6ES7512-1CK01-0AB0**
	CPU 1511C-1 PN, 175 KB Prog, 1 MB data	CPU 1512C-1 PN, 250 KB Prog, 1 MB data
Protocols		
• IP protocol	Yes; IPv4	Yes; IPv4
• PROFINET IO Controller	Yes	Yes
• PROFINET IO Device	Yes	Yes
• SIMATIC communication	Yes	Yes
• Open IE communication	Yes	Yes
• Web server	Yes	Yes
• Media redundancy	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0
PROFINET IO Controller		
Services		
- PG/OP communication	Yes	Yes
- S7 routing	Yes	Yes
- Isochronous mode	Yes	Yes
- Open IE communication	Yes	Yes
- IRT	Yes	Yes
- MRP	Yes; As MRP redundancy manager and/or MRP client; max. number of devices in the ring: 50	Yes; As MRP redundancy manager and/or MRP client; max. number of devices in the ring: 50
- MRPD	Yes; Requirement: IRT	Yes; Requirement: IRT
- PROFIenergy	Yes	Yes
- Prioritized startup	Yes; Max. 32 PROFINET devices	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	128; In total, up to 256 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	128; In total, up to 512 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64	64
- Number of connectable IO Devices for RT, max.	128	128
- of which in line, max.	128	128
- Number of IO Devices that can be simultaneously activated/ deactivated, max.	8; in total across all interfaces	8; in total across all interfaces
- Number of IO Devices per tool, max.	8	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
Update time for IRT		
- for send cycle of 250 µs	250 µs to 4 ms; Note: In the case of IRT with isochronous mode, the minimum update time of 625 µs of the isochronous OB is decisive	250 µs to 4 ms; Note: In the case of IRT with isochronous mode, the minimum update time of 625 µs of the isochronous OB is decisive
- for send cycle of 500 µs	500 µs to 8 ms; Note: In the case of IRT with isochronous mode, the minimum update time of 625 µs of the isochronous OB is decisive	500 µs to 8 ms; Note: In the case of IRT with isochronous mode, the minimum update time of 625 µs of the isochronous OB is decisive
- for send cycle of 1 ms	1 ms to 16 ms	1 ms to 16 ms
- for send cycle of 2 ms	2 ms to 32 ms	2 ms to 32 ms
- for send cycle of 4 ms	4 ms to 64 ms	4 ms to 64 ms
- With IRT and parameterization of "odd" send cycles	Update time = set "odd" send clock (any multiple of 125 µs: 375 µs, 625 µs ... 3 875 µs)	Update time = set "odd" send clock (any multiple of 125 µs: 375 µs, 625 µs ... 3 875 µs)
Update time for RT		
- for send cycle of 250 µs	250 µs to 128 ms	250 µs to 128 ms
- for send cycle of 500 µs	500 µs to 256 ms	500 µs to 256 ms
- for send cycle of 1 ms	1 ms to 512 ms	1 ms to 512 ms
- for send cycle of 2 ms	2 ms to 512 ms	2 ms to 512 ms
- for send cycle of 4 ms	4 ms to 512 ms	4 ms to 512 ms

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Technical specifications (continued)

Article number	**6ES7511-1CK01-0AB0** CPU 1511C-1 PN, 175 KB Prog, 1 MB data	**6ES7512-1CK01-0AB0** CPU 1512C-1 PN, 250 KB Prog, 1 MB data
PROFINET IO Device		
Services		
- PG/OP communication	Yes	Yes
- S7 routing	Yes	Yes
- Isochronous mode	No	No
- Open IE communication	Yes	Yes
- IRT	Yes	Yes
- MRP	Yes; As MRP redundancy manager and/or MRP client; max. number of devices in the ring: 50	Yes; As MRP redundancy manager and/or MRP client; max. number of devices in the ring: 50
- MRPD	Yes; Requirement: IRT	Yes; Requirement: IRT
- PROFIenergy	Yes	Yes
- Shared device	Yes	Yes
- Number of IO Controllers with shared device, max.	4	4
- Asset management record	Yes; Per user program	Yes; Per user program
Protocols		
Number of connections		
• Number of connections, max.	96; via integrated interfaces of the CPU and connected CPs / CMs	128; via integrated interfaces of the CPU and connected CPs / CMs
OPC UA		
• OPC UA client	Yes	Yes
• OPC UA server	Yes; Data access (read, write, subscribe), method call, custom address space	Yes; Data access (read, write, subscribe), method call, custom address space
Isochronous mode		
Isochronous operation (application synchronized up to terminal)	Yes; With minimum OB 6x cycle of 625 µs (distributed)	Yes; With minimum OB 6x cycle of 625 µs (distributed)
Supported technology objects		
Motion control	Yes; Note: The number of axes affects the cycle time of the PLC program; selection guide via the TIA Selection Tool or SIZER	Yes; Note: The number of axes affects the cycle time of the PLC program; selection guide via the TIA Selection Tool or SIZER
• Number of available motion control resources for technology objects (except cam disks)	800	800
• Required motion control resources		
- per speed-controlled axis	40	40
- per positioning axis	80	80
- per synchronous axis	160	160
- per external encoder	80	80
- per output cam	20	20
- per cam track	160	160
- per probe	40	40
Controller		
• PID_Compact	Yes; Universal PID controller with integrated optimization	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature	Yes; PID controller with integrated optimization for temperature
Counting and measuring		
• High-speed counter	Yes	Yes
Ambient conditions		
Ambient temperature during operation		
• horizontal installation, min.	0 °C	0 °C
• horizontal installation, max.	60 °C; Note derating data for onboard I/O in the manual. Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off	60 °C; Note derating data for onboard I/O in the manual. Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off
• vertical installation, min.	0 °C	0 °C
• vertical installation, max.	40 °C; Note derating data for onboard I/O in the manual. Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off	40 °C; Note derating data for onboard I/O in the manual. Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off
Altitude during operation relating to sea level		
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual

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Technical specifications (continued)

Article number	**6ES7511-1CK01-0AB0**	**6ES7512-1CK01-0AB0**
	CPU 1511C-1 PN, 175 KB Prog, 1 MB data	CPU 1512C-1 PN, 250 KB Prog, 1 MB data
Configuration		
Programming		
Programming language		
- LAD	Yes	Yes
- FBD	Yes	Yes
- STL	Yes	Yes
- SCL	Yes	Yes
- GRAPH	Yes	Yes
Know-how protection		
• User program protection/password protection	Yes	Yes
• Copy protection	Yes	Yes
• Block protection	Yes	Yes
Access protection		
• Password for display	Yes	Yes
• Protection level: Write protection	Yes	Yes
• Protection level: Read/write protection	Yes	Yes
• Protection level: Complete protection	Yes	Yes
Dimensions		
Width	85 mm	110 mm
Height	147 mm	147 mm
Depth	129 mm	129 mm
Weights		
Weight, approx.	1 050 g	1 360 g

Ordering data

	Article No.
CPU 1511C-1 PN 175 KB work memory for program, 1 MB for data, 16 digital inputs, 16 digital outputs, 5 analog inputs, 2 analog outputs, 6 high-speed counters, PROFINET IRT interface with 2-port switch, SIMATIC memory card required	**6ES7511-1CK01-0AB0**
CPU 1512C-1 PN 250 KB work memory for program, 1 MB for data, 32 digital inputs, 32 digital outputs, 5 analog inputs, 2 analog outputs, 6 high-speed counters, PROFINET IRT interface with 2-port switch, SIMATIC memory card required	**6ES7512-1CK01-0AB0**
Accessories	
SIMATIC memory card	
4 MB	**6ES7954-8LC03-0AA0**
12 MB	**6ES7954-8LE03-0AA0**
24 MB	**6ES7954-8LF03-0AA0**
256 MB	**6ES7954-8LL03-0AA0**
2 GB	**6ES7954-8LP02-0AA0**
32 GB	**6ES7954-8LT03-0AA0**
Front connectors For 25 mm modules; including cable ties and individual labeling strips; push-in terminal 40-pin; spare part	**6ES7592-1BM00-0XA0**
Shielding set I/O For 25 mm modules; infeed element, shield bracket, and shield terminal; 4 units, spare part (one shield set supplied with the module).	**6ES7590-5CA10-0XA0**
Shield terminal element 10 units; spare part	**6ES7590-5BA00-0AA0**
SIMATIC S7-1500 DIN rail Fixed lengths, with grounding elements	
• 160 mm	**6ES7590-1AB60-0AA0**
• 245 mm	**6ES7590-1AC40-0AA0**
• 482 mm	**6ES7590-1AE80-0AA0**
• 530 mm	**6ES7590-1AF30-0AA0**
• 830 mm	**6ES7590-1AJ30-0AA0**
For cutting to length by customer, without drill holes; grounding elements must be ordered separately	
• 2 000 mm	**6ES7590-1BC00-0AA0**
PE connection element for DIN rail 2 000 mm 20 units	**6ES7590-5AA00-0AA0**
Power supply For supplying the backplane bus of the S7-1500 controller	
24 V DC input voltage, power 25 W	**6ES7505-0KA00-0AB0**
24/48/60 V DC input voltage, power 60 W	**6ES7505-0RA00-0AB0**
24/48/60 V DC input voltage, power 60 W, buffering functionality	**6ES7505-0RB00-0AB0**
120/230 V AC input voltage, power 60 W	**6ES7507-0RA00-0AB0**

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Ordering data	Article No.
Power connector	**6ES7590-8AA00-0AA0**
With coding element for power supply module; spare part, 10 units	
Load power supply	
24 V DC/3 A	**6EP1332-4BA00**
24 V DC/8 A	**6EP1333-4BA00**
Power supply connector	
Spare part; for connecting the 24 V DC supply voltage	
• With push-in terminals	**6ES7193-4JB00-0AA0**
IE FC RJ45 plugs	
RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables	
IE FC RJ45 plug 180	
180° cable outlet	
1 unit	**6GK1901-1BB10-2AA0**
10 units	**6GK1901-1BB10-2AB0**
50 units	**6GK1901-1BB10-2AE0**
IE FC TP Standard Cable GP 2x2	**6XV1840-2AH10**
4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/IE FC RJ45 plug; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	
IE FC TP Trailing Cable 2 x 2 (Type C)	**6XV1840-3AH10**
4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/IE FC RJ45 plug 180/90 for use as trailing cable; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	
IE FC TP Marine Cable 2 x 2 (Type B)	**6XV1840-4AH10**
4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/IE FC RJ45 plug 180/90 with marine approval; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	
IE FC stripping tool	**6GK1901-1GA00**
Preadjusted stripping tool for fast stripping of Industrial Ethernet FC cables	
Display	**6ES7591-1AA01-0AA0**
For CPU 1511(F), CPU 1511C, CPU 1512C, CPU 1513(F); spare part	

	Article No.
SIMATIC S7-1500 Starter Kit	**6ES7511-1CK02-4YB5**
Comprising: CPU 1511C-1 PN, SIMATIC memory card 4 MB, 160 mm DIN rail, front connector, STEP 7 Professional 365-day license, SIMATIC ProDiag 1500, SIMATIC OPC UA S7-1500 Small, PM 1507 24 V/3 A power supply, Ethernet cable, documentation	
STEP 7 Professional V15.1	
Target system: SIMATIC S7-1200, S7-1500, S7-300, S7-400, WinAC	
Requirement: Windows 7 Home Premium SP1 (64-bit) Windows 7 Professional SP1 (64-bit) Windows 7 Enterprise SP1 (64-bit) Windows 7 Ultimate SP1 (64-bit) Windows 10 Home Version 1709, 1803 Windows 10 Professional Version 1709, 1803 Windows 10 Enterprise Version 1709, 1803 Windows 10 Enterprise 2016 LTSB Windows 10 IoT Enterprise 2015 LTSB Windows 10 IoT Enterprise 2016 LTSB Windows Server 2012 R2 StdE (full installation) Windows Server 2016 Standard (full installation)	
Type of delivery: en, de, fr, it, es, zh	
STEP 7 Professional V15.1, floating license	**6ES7822-1AA05-0YA5**
STEP 7 Professional V15.1, floating license, software download incl. license key [1]	**6ES7822-1AE05-0YA5**
Email address required for delivery	
SIMATIC Manual Collection	**6ES7998-8XC01-8YE0**
Electronic manuals on DVD, multi-language: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC Distributed I/O, SIMATIC HMI, SIMATIC sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	
SIMATIC Manual Collection update service for 1 year	**6ES7998-8XC01-8YE2**

[1] For up-to-date information and download availability, see: http://www.siemens.com/tia-online-software-delivery

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Overview CPU 1511F-1 PN



- Entry-level CPU in the S7-1500F Controller product range
- Can be used for safety functions up to SIL 3 according to IEC 61508 and up to PLe according to ISO 13849
- Suitable for standard and fail-safe applications with medium requirements for program scope and processing speed
- Used as central controller in production lines with central and distributed I/O
- Supports PROFIsafe in centralized and distributed configuration
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET I/O controller
- Isochronous mode

Note:

SIMATIC Memory Card required for operation of the CPU.

Overview CPU 1513F-1 PN



- The CPU for standard and fail-safe applications with medium/high requirements for program/data storage in the S7-1500 controller product range
- Can be used for safety functions up to SIL 3 according to IEC 61508 and up to PLe according to ISO 13849
- High processing speed for binary and floating-point arithmetic
- Used as central controller in production lines with central and distributed I/O
- Supports PROFIsafe in centralized and distributed configuration
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET I/O controller
- Isochronous mode

Note:

SIMATIC Memory Card required for operation of the CPU.

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Overview CPU 1515F-2 PN



- The CPU for applications with medium to high requirements for program/data storage in the S7-1500 controller product range
- Can be used for failsafe functions up to SIL 3 according to IEC 61508 and up to PLe according to ISO 13849.
- Medium to high processing speed for binary and floating-point arithmetic
- Used as central controller in production lines with central and distributed I/O
- Supports PROFIsafe in centralized and distributed configurations
- PROFINET IO IRT interface with 2-port switch
- Additional PROFINET interface with separate IP address
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET I/O controller
- Isochronous mode
- Integrated motion control functionalities for controlling speed-controlled and positioning axes, support for external encoders
- Integrated web server with the option of creating user-defined web pages

Note:

SIMATIC Memory Card required for operation of the CPU.

Overview CPU 1516F-3 PN/DP



- The CPU with a large program and data memory in the S7-1500 controller product range for failsafe applications with high requirements regarding program scope and networking.
- Can be used for failsafe functions up to SIL 3 according to IEC 61508 and up to PLe according to ISO 13849.
- High processing speed for binary and floating-point arithmetic
- Used as central controller in production lines with central and distributed I/O.
- Supports PROFIsafe in centralized and distributed configuration.
- PROFINET IO IRT interface with 2-port switch.
- Additional PROFINET interface with separate IP address.
- PROFINET IO controller for operating distributed I/O on PROFINET.
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET IO controller.
- PROFIBUS DP master interface.
- Isochronous mode on PROFIBUS and PROFINET.
- Integrated motion control functionalities for controlling speed-controlled and positioning axes, support for external encoders.
- Integrated Web server with the option of creating user-defined Web pages.

Note:

SIMATIC Memory Card required for operation of the CPU.

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Overview CPU 1517F-3 PN/DP



- The CPU with a very large program and data memory in the S7-1500 controller product range for failsafe applications with high requirements regarding program scope and networking.
- Can be used for failsafe functions up to SIL 3 according to IEC 61508 and up to PLe according to ISO 13849.
- High processing speed for binary and floating-point arithmetic
- For cross-industry automation tasks in series machine, special machine and plant construction
- Used as central controller in production lines with central and distributed I/O
- Supports PROFIsafe in centralized and distributed configurations
- PROFINET IO IRT interface with 2-port switch
- Additional PROFINET interface with separate IP address
- PROFINET IO controller for operating distributed I/O on PROFINET.
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET IO controller.
- PROFIBUS DP master interface
- Isochronous mode on PROFIBUS and PROFINET
- Integrated motion control functionalities for controlling speed-controlled and positioning axes, support for external encoders, positionally precise gearing between axes
- Integrated web server with the option of creating user-defined web pages

Note:

SIMATIC Memory Card required for operation of the CPU.

Overview CPU 1518F-4 PN/DP



- The CPU with a very large program and data memory in the S7-1500 controller product range for failsafe applications with highest requirements regarding program scope and networking.
- Can be used for failsafe functions up to SIL 3 according to IEC 61508 and up to PLe according to ISO 13849.
- Extremely high processing speed for binary and floating-point arithmetic.
- For cross-industry automation tasks in series machine, special machine and plant construction
- Used as central controller in production lines with central and distributed I/O.
- Supports PROFIsafe in centralized and distributed configuration.
- PROFINET IO IRT interface with 2-port switch.
- Two additional PROFINET interfaces with separate IP addresses.
- PROFINET IO controller for operating distributed I/O on PROFINET.
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET IO controller.
- PROFIBUS DP master interface.
- Isochronous mode on PROFIBUS and PROFINET.
- Integrated motion control functionalities for controlling speed-controlled and positioning axes, support for external encoders
- Integrated Web server with the option of creating user-defined Web pages.

Note:

SIMATIC memory card required for operation of the CPU.

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Overview CPU 1518F-4 PN/DP MFP



- CPU with an extremely large program and data memory in the S7-1500 controller product range for demanding standard and fail-safe applications with demanding requirements regarding program scope, performance and networking
- Can be used for safety functions up to SIL 3 according to IEC 61508 and up to PLe according to ISO 13849
- Extremely high processing speed for binary and floating-point arithmetic
- For cross-industry automation tasks in series machines, special machines and plant construction
- C/C++ functions can be called and executed in the CPU runtime.
- In parallel to the CPU runtime, there is an additional C/C++ Runtime, in which call-independent, i.e. stand-alone, C/C++ applications can be executed.
- Used as central controller in production lines with central and distributed I/O
- Supports PROFIsafe in centralized and distributed configurations
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET IO controller
- Two additional PROFINET interfaces with separate IP addresses for network separation:
  The PROFINET interface X2 can be used for connecting additional PROFINET IO RT devices or for fast communication as an I-Device. The PROFINET interface X3 facilitates data transfer at a speed of 1 Gbps.
- PROFIBUS DP master interface
- OPC UA server (data access) as runtime option for easy connection of the SIMATIC S7-1500 to third-party devices/ systems
- Isochronous mode on PROFIBUS and PROFINET
- Integrated motion control functionalities for controlling speed-controlled and positioning axes, support for external encoders, gearing between axes, output cams/cam tracks and probes
- Integrated web server for diagnostics with the option of creating user-defined web pages

Multi-functional platform

With the multi-functional platform (MFP), more functionality can be accommodated in a module. The computing power of the CPU 1518F-4 PN/DP MFP allows the merging of previously separate applications on a common platform while continuing to meet the high S7-1500 demands with regard to maintenance and ruggedness.
This means that, in addition to the control function, it is also possible to process typical PC applications on the multi-functional platform, e.g. tasks that:

- require high-level language programming,
- are developed based on models, or
- have to be solved via databases.

Besides the option of running C/C++ code in the standard STEP 7 program, the multi-functional platform CPU 1518F-4 PN/DP MFP thus provides an additional second independent runtime environment which facilitates execution of C/C++ applications in parallel to the STEP 7 program if required.
Control-independent applications, e.g. protocol converters, database applications and others, can be created in C/C++. This simplifies the creation or reuse of customer-specific, high-level language applications.
The CPU 1518F-4 PN/DP MFP has the quantity structure and functionality of a CPU 1518F-4 PN/DP with regard to the control part. In addition to the user program created with STEP 7 in the TIA Portal, C/C++ functions formulated via the SIMATIC ODK 1500S can be integrated into the standard user program. By using SIMATIC ODK 1500S (ODK - Open Development Kit), higher-level programming language mechanisms, such as object orientation, can also be utilized. Furthermore, with the SIMATIC Target 1500S™ engineering package for Simulink®, it is also possible to integrate complex Simulink models to take advantage of the model-based development using MATLAB and Simulink®.

Note:

SIMATIC memory card required for operation of the CPU.

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Technical specifications

Article number	**6ES7511-1FK02-0AB0**	**6ES7513-1FL02-0AB0**	**6ES7515-2FM01-0AB0**	**6ES7516-3FN01-0AB0**
	CPU 1511F-1PN, 225KB prog, 1MB data	CPU 1513F-1 PN, 450KB prog., 1.5MB data	CPU 1515F-2 PN, 750KB prog., 3MB data	CPU 1516F-3 PN/DP, 1,5MB prog, 5MB data
General information				
Product type designation	CPU 1511F-1 PN	CPU 1513F-1 PN	CPU 1515F-2 PN	CPU 1516F-3 PN/DP
Engineering with				
• STEP 7 TIA Portal configurable/ integrated as of version	V15.1 (FW V2.6) / V15 (FW V2.5) or higher; with older TIA Portal versions configurable as 6ES7511-1FK01-0AB0	V15.1 (FW V2.6) / V15 (FW V2.5) or higher; with older TIA Portal versions configurable as 6ES7513-1FL01-0AB0	V15 (FW V2.5) / V13 SP1 Update 4 (FW V1.8) or higher	V15.1 (FW V2.6)/V13 SP1 Update 4 (FW V1.8) or higher
Display				
Screen diagonal [cm]	3.45 cm	3.45 cm	6.1 cm	6.1 cm
Supply voltage				
Type of supply voltage	24 V DC	24 V DC	24 V DC	24 V DC
Memory				
Work memory				
• integrated (for program)	225 kbyte	450 kbyte	750 kbyte	1.5 Mbyte
• integrated (for data)	1 Mbyte	1.5 Mbyte	3 Mbyte	5 Mbyte
Load memory				
• Plug-in (SIMATIC memory card), max.	32 Gbyte	32 Gbyte	32 Gbyte	32 Gbyte
CPU processing times				
for bit operations, typ.	60 ns	40 ns	30 ns	10 ns
for word operations, typ.	72 ns	48 ns	36 ns	12 ns
for fixed point arithmetic, typ.	96 ns	64 ns	48 ns	16 ns
for floating point arithmetic, typ.	384 ns	256 ns	192 ns	64 ns
Counters, timers and their retentivity				
S7 counter				
• Number	2 048	2 048	2 048	2 048
IEC counter				
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)	Any (only limited by the main memory)	Any (only limited by the main memory)
S7 times				
• Number	2 048	2 048	2 048	2 048
IEC timer				
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)	Any (only limited by the main memory)	Any (only limited by the main memory)
Data areas and their retentivity				
Flag				
• Number, max.	16 kbyte	16 kbyte	16 kbyte	16 kbyte
Address area				
I/O address area				
• Inputs	32 kbyte; All inputs are in the process image	32 kbyte; All inputs are in the process image	32 kbyte; All inputs are in the process image	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image	32 kbyte; All outputs are in the process image	32 kbyte; All outputs are in the process image	32 kbyte; All outputs are in the process image
Time of day				
Clock				
• Type	Hardware clock	Hardware clock	Hardware clock	Hardware clock

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Technical specifications (continued)

Article number	**6ES7511-1FK02-0AB0** CPU 1511F-1PN, 225KB prog, 1MB data	**6ES7513-1FL02-0AB0** CPU 1513F-1 PN, 450KB prog., 1.5MB data	**6ES7515-2FM01-0AB0** CPU 1515F-2 PN, 750KB prog., 3MB data	**6ES7516-3FN01-0AB0** CPU 1516F-3 PN/DP, 1,5MB prog, 5MB data
1. Interface				
Interface types				
• Number of ports	2	2	2	2
• integrated switch	Yes	Yes	Yes	Yes
• RJ 45 (Ethernet)	Yes; X1	Yes; X1	Yes; X1	Yes; X1
Protocols				
• IP protocol	Yes; IPv4	Yes; IPv4	Yes; IPv4	Yes; IPv4
• PROFINET IO controller	Yes	Yes	Yes	Yes
• PROFINET IO Device	Yes	Yes	Yes	Yes
• SIMATIC communication	Yes	Yes	Yes	Yes
• Open IE communication	Yes	Yes	Yes	Yes
• Web server	Yes	Yes	Yes	Yes
• Media redundancy	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0
PROFINET IO controller				
Services				
- PG/OP communication	Yes	Yes	Yes	Yes
- S7 routing	Yes	Yes	Yes	Yes
- Isochronous mode	Yes	Yes	Yes	Yes
- Open IE communication	Yes	Yes	Yes	Yes
- IRT	Yes	Yes	Yes	Yes
- MRP	Yes; As MRP redundancy manager and/or MRP client; max. number of devices in the ring: 50	Yes; As MRP redundancy manager and/or MRP client; max. number of devices in the ring: 50	Yes; As MRP redundancy manager and/or MRP client; max. number of devices in the ring: 50	Yes; As MRP redundancy manager and/or MRP client; max. number of devices in the ring: 50
- MRPD	Yes; Requirement: IRT	Yes; Requirement: IRT	Yes; Requirement: IRT	Yes; Requirement: IRT
- PROFIenergy	Yes	Yes	Yes	Yes
- Prioritized startup	Yes; Max. 32 PROFINET devices	Yes; Max. 32 PROFINET devices	Yes; Max. 32 PROFINET devices	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	128; In total, up to 256 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	128; In total, up to 512 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	256; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	256; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64	64	64	64
- Number of connectable IO Devices for RT, max.	128	128	256	256
- of which in line, max.	128	128	256	256
- Number of IO Devices that can be simultaneously activated/ deactivated, max.	8; in total across all interfaces	8; in total across all interfaces	8; in total across all interfaces	8; in total across all interfaces
- Number of IO Devices per tool, max.	8	8	8	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data

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Technical specifications (continued)

Article number	**6ES7511-1FK02-0AB0** CPU 1511F-1PN, 225KB prog, 1MB data	**6ES7513-1FL02-0AB0** CPU 1513F-1 PN, 450KB prog., 1.5MB data	**6ES7515-2FM01-0AB0** CPU 1515F-2 PN, 750KB prog., 3MB data	**6ES7516-3FN01-0AB0** CPU 1516F-3 PN/DP, 1,5MB prog, 5MB data
Update time for IRT				
- for send cycle of 250 µs	250 µs to 4 ms; Note: In the case of IRT with isochronous mode, the minimum update time of 625 µs of the isochronous OB is decisive	250 µs to 4 ms; Note: In the case of IRT with isochronous mode, the minimum update time of 500 µs of the isochronous OB is decisive	250 µs to 4 ms; Note: In the case of IRT with isochronous mode, the minimum update time of 500 µs of the isochronous OB is decisive	250 µs to 4 ms; Note: In the case of IRT with isochronous mode, the minimum update time of 375 µs of the isochronous OB is decisive
- for send cycle of 500 µs	500 µs to 8 ms; Note: In the case of IRT with isochronous mode, the minimum update time of 625 µs of the isochronous OB is decisive	500 µs to 8 ms	500 µs to 8 ms	500 µs to 8 ms
- for send cycle of 1 ms	1 ms to 16 ms	1 ms to 16 ms	1 ms to 16 ms	1 ms to 16 ms
- for send cycle of 2 ms	2 ms to 32 ms	2 ms to 32 ms	2 ms to 32 ms	2 ms to 32 ms
- for send cycle of 4 ms	4 ms to 64 ms	4 ms to 64 ms	4 ms to 64 ms	4 ms to 64 ms
- With IRT and parameterization of "odd" send cycles	Update time = set "odd" send clock (any multiple of 125 µs: 375 µs, 625 µs ... 3 875 µs)	Update time = set "odd" send clock (any multiple of 125 µs: 375 µs, 625 µs ... 3 875 µs)	Update time = set "odd" send clock (any multiple of 125 µs: 375 µs, 625 µs ... 3 875 µs)	Update time = set "odd" send clock (any multiple of 125 µs: 375 µs, 625 µs ... 3 875 µs)
Update time for RT				
- for send cycle of 250 µs	250 µs to 128 ms	250 µs to 128 ms	250 µs to 128 ms	250 µs to 128 ms
- for send cycle of 500 µs	500 µs to 256 ms	500 µs to 256 ms	500 µs to 256 ms	500 µs to 256 ms
- for send cycle of 1 ms	1 ms to 512 ms	1 ms to 512 ms	1 ms to 512 ms	1 ms to 512 ms
- for send cycle of 2 ms	2 ms to 512 ms	2 ms to 512 ms	2 ms to 512 ms	2 ms to 512 ms
- for send cycle of 4 ms	4 ms to 512 ms	4 ms to 512 ms	4 ms to 512 ms	4 ms to 512 ms
PROFINET IO Device				
Services				
- PG/OP communication	Yes	Yes	Yes	Yes
- S7 routing	Yes	Yes	Yes	Yes
- Isochronous mode	No	No	No	No
- Open IE communication	Yes	Yes	Yes	Yes
- IRT	Yes	Yes	Yes	Yes
- MRP	Yes; As MRP redundancy manager and/or MRP client; max. number of devices in the ring: 50	Yes; As MRP redundancy manager and/or MRP client; max. number of devices in the ring: 50	Yes	Yes; As MRP redundancy manager and/or MRP client; max. number of devices in the ring: 50
- MRPD	Yes; Requirement: IRT	Yes; Requirement: IRT	Yes; Requirement: IRT	Yes; Requirement: IRT
- PROFIenergy	Yes	Yes	Yes	Yes
- Shared device	Yes	Yes	Yes	Yes
- Number of IO controllers with shared device, max.	4	4	4	4
- Asset management record	Yes; Per user program	Yes; Per user program	Yes; Per user program	Yes; Per user program
2. Interface				
Interface types				
• Number of ports			1	1
• integrated switch			No	No
• RJ 45 (Ethernet)			Yes; X2	Yes; X2
Protocols				
• IP protocol			Yes; IPv4	Yes; IPv4
• PROFINET IO controller			Yes	Yes
• PROFINET IO Device			Yes	Yes
• SIMATIC communication			Yes	Yes
• Open IE communication			Yes	Yes
• Web server			Yes	Yes
• Media redundancy			No	No

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Technical specifications (continued)

Article number	**6ES7511-1FK02-0AB0** CPU 1511F-1PN, 225KB prog, 1MB data	**6ES7513-1FL02-0AB0** CPU 1513F-1 PN, 450KB prog., 1.5MB data	**6ES7515-2FM01-0AB0** CPU 1515F-2 PN, 750KB prog., 3MB data	**6ES7516-3FN01-0AB0** CPU 1516F-3 PN/DP, 1,5MB prog, 5MB data
PROFINET IO controller				
Services				
- PG/OP communication			Yes	Yes
- S7 routing			Yes	Yes
- Isochronous mode			No	No
- Open IE communication			Yes	Yes
- IRT			No	No
- MRP			No	No
- MRPD			No	No
- PROFIenergy			Yes	Yes
- Prioritized startup			No	No
- Number of connectable IO Devices, max.			32; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	32; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Number of connectable IO Devices for RT, max.			32	32
- of which in line, max.			32	32
- Number of IO Devices that can be simultaneously activated/deactivated, max.			8; in total across all interfaces	8; in total across all interfaces
- Number of IO Devices per tool, max.			8	8
- Updating times			The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
Update time for RT				
- for send cycle of 1 ms			1 ms to 512 ms	1 ms to 512 ms
PROFINET IO Device				
Services				
- PG/OP communication			Yes	Yes
- S7 routing			Yes	Yes
- Isochronous mode			No	No
- Open IE communication			Yes	Yes
- IRT			No	No
- MRP			No	No
- MRPD			No	No
- PROFIenergy			Yes	Yes
- Prioritized startup			No	No
- Shared device			Yes	Yes
- Number of IO controllers with shared device, max.			4	4
- Asset management record			Yes; Per user program	Yes; Per user program
3. Interface				
Interface types				
• Number of ports				1
• RS 485				Yes; X3
Protocols				
• PROFIBUS DP master				Yes
• PROFIBUS DP slave				No
• SIMATIC communication				Yes

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Technical specifications (continued)

Article number	**6ES7511-1FK02-0AB0** CPU 1511F-1PN, 225KB prog, 1MB data	**6ES7513-1FL02-0AB0** CPU 1513F-1 PN, 450KB prog., 1.5MB data	**6ES7515-2FM01-0AB0** CPU 1515F-2 PN, 750KB prog., 3MB data	**6ES7516-3FN01-0AB0** CPU 1516F-3 PN/DP, 1,5MB prog, 5MB data
Protocols				
Number of connections				
• Number of connections, max.	96; via integrated interfaces of the CPU and connected CPs / CMs	128; via integrated interfaces of the CPU and connected CPs / CMs	192; via integrated interfaces of the CPU and connected CPs / CMs	256; via integrated interfaces of the CPU and connected CPs / CMs
PROFINET IO controller				
Services				
- Number of connectable IO Devices, max.	128; In total, up to 512 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET			
- Of which IO devices with IRT, max.	64			
- Number of connectable IO Devices for RT, max.	128			
PROFIBUS DP master				
Services				
- Number of DP slaves				125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
OPC UA				
• OPC UA client	Yes	Yes		Yes
• OPC UA server	Yes; Data access (read, write, subscribe), method call, custom address space	Yes; Data access (read, write, subscribe), method call, custom address space	Yes; Data access (read, write, subscribe), method call, custom address space	Yes; Data access (read, write, subscribe), method call, custom address space
Isochronous mode				
Isochronous operation (application synchronized up to terminal)	Yes; Distributed and central; with minimum OB 6x cycle of 625 µs (distributed) and 1 ms (central)	Yes; With minimum OB 6x cycle of 500 µs	Yes; With minimum OB 6x cycle of 500 µs	Yes; Distributed and central; with minimum OB 6x cycle of 375 µs (distributed) and 1 ms (central)
Supported technology objects				
Motion control	Yes; Note: The number of axes affects the cycle time of the PLC program; selection guide via the TIA Selection Tool or SIZER	Yes; Note: The number of axes affects the cycle time of the PLC program; selection guide via the TIA Selection Tool or SIZER	Yes; Note: The number of axes affects the cycle time of the PLC program; selection guide via the TIA Selection Tool or SIZER	Yes; Note: The number of axes affects the cycle time of the PLC program; selection guide via the TIA Selection Tool or SIZER
• Number of available motion control resources for technology objects (except cam disks)	800	800	2 400	2 400
• Required motion control resources				
- per speed-controlled axis	40	40	40	40
- per positioning axis	80	80	80	80
- per synchronous axis	160	160	160	160
- per external encoder	80	80	80	80
- per output cam	20	20	20	20
- per cam track	160	160	160	160
- per probe	40	40	40	40
Controller				
• PID_Compact	Yes; Universal PID controller with integrated optimization	Yes; Universal PID controller with integrated optimization	Yes; Universal PID controller with integrated optimization	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves	Yes; PID controller with integrated optimization for valves	Yes; PID controller with integrated optimization for valves	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature	Yes; PID controller with integrated optimization for temperature	Yes; PID controller with integrated optimization for temperature	Yes; PID controller with integrated optimization for temperature
Counting and measuring				
• High-speed counter	Yes	Yes	Yes	Yes

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Technical specifications (continued)

Article number	**6ES7511-1FK02-0AB0** CPU 1511F-1PN, 225KB prog, 1MB data	**6ES7513-1FL02-0AB0** CPU 1513F-1 PN, 450KB prog., 1.5MB data	**6ES7515-2FM01-0AB0** CPU 1515F-2 PN, 750KB prog., 3MB data	**6ES7516-3FN01-0AB0** CPU 1516F-3 PN/DP, 1,5MB prog, 5MB data
Standards, approvals, certificates				
Highest safety class achievable in safety mode				
• Performance level according to ISO 13849-1	PLe	PLe	PLe	PLe
• SIL acc. to IEC 61508	SIL 3	SIL 3	SIL 3	SIL 3
Probability of failure (for service life of 20 years and repair time of 100 hours)				
- Low demand mode: PFDavg in accordance with SIL3	< 2.00E-05	< 2.00E-05	< 2.00E-05	< 2.00E-05
- High demand/continuous mode: PFH in accordance with SIL3	< 1.00E-09	< 1.00E-09	< 1.00E-09	< 1.00E-09
Ambient conditions				
Ambient temperature during operation				
• horizontal installation, min.	0 °C	0 °C	0 °C	0 °C
• horizontal installation, max.	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off
• vertical installation, min.	0 °C	0 °C	0 °C	0 °C
• vertical installation, max.	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
Configuration				
Programming				
Programming language				
- LAD	Yes; incl. failsafe	Yes; incl. failsafe	Yes; incl. failsafe	Yes; incl. failsafe
- FBD	Yes; incl. failsafe	Yes; incl. failsafe	Yes; incl. failsafe	Yes; incl. failsafe
- STL	Yes	Yes	Yes	Yes
- SCL	Yes	Yes	Yes	Yes
- GRAPH	Yes	Yes	Yes	Yes
Know-how protection				
• User program protection/ password protection	Yes	Yes	Yes	Yes
• Copy protection	Yes	Yes	Yes	Yes
• Block protection	Yes	Yes	Yes	Yes
Access protection				
• Password for display	Yes	Yes	Yes	Yes
• Protection level: Write protection	Yes; Specific write protection both for Standard and for Failsafe	Yes; Specific write protection both for Standard and for Failsafe	Yes	Yes
• Protection level: Read/write protection	Yes	Yes	Yes	Yes
• Protection level: Complete protection	Yes	Yes	Yes	Yes
Dimensions				
Width	35 mm	35 mm	70 mm	70 mm
Height	147 mm	147 mm	147 mm	147 mm
Depth	129 mm	129 mm	129 mm	129 mm
Weights				
Weight, approx.	430 g	405 g	830 g	845 g

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Technical specifications (continued)

Article number	**6ES7517-3FP00-0AB0** CPU 1517F-3 PN/DP, 3MB Prog., 8MB data	**6ES7518-4FP00-0AB0** CPU 1518F-4 PN/DP, 6 MB Prog, 20MB data	**6ES7518-4FX00-1AC0** CPU 1518F-4 PN/DP MFP + C/C++ RT +OPC UA
General information			
Product type designation	CPU 1517F-3PN/DP	CPU 1518F-4PN/DP	CPU 1518F-4 PN/DP MFP
Engineering with			
• STEP 7 TIA Portal configurable/ integrated as of version	V15.1 (FW V2.6) / V13 Update 3 (FW V1.6) or higher	V15.1 (FW V2.6) / V13 (FW V1.5) or higher	V15.1 (FW V2.6) / V15 (FW V2.5) or higher
Display			
Screen diagonal [cm]	6.1 cm	6.1 cm	6.1 cm
Supply voltage			
Type of supply voltage	24 V DC	24 V DC	24 V DC
Memory			
Work memory			
• integrated (for program)	3 Mbyte	6 Mbyte	6 Mbyte
• integrated (for data)	8 Mbyte	20 Mbyte	20 Mbyte
• integrated (for CPU function library of CPU runtime)			50 Mbyte; Note: The "CPU function library of the CPU" are C/C++ blocks for the user program that were created using the SIMATIC ODK 1500S or Target 1500S.
Working memory for additional functions			
• Integrated (for C/C++ Runtime application)			512 Mbyte
Load memory			
• Plug-in (SIMATIC memory card), max.	32 Gbyte	32 Gbyte	32 Gbyte; The memory card must have at least 2 GB of space on it
CPU processing times			
for bit operations, typ.	2 ns	1 ns	1 ns
for word operations, typ.	3 ns	2 ns	2 ns
for fixed point arithmetic, typ.	3 ns	2 ns	2 ns
for floating point arithmetic, typ.	12 ns	6 ns	6 ns
Counters, timers and their retentivity			
S7 counter			
• Number	2 048	2 048	2 048
IEC counter			
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)	Any (only limited by the main memory)
S7 times			
• Number	2 048	2 048	2 048
IEC timer			
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)	Any (only limited by the main memory)
Data areas and their retentivity			
Flag			
• Number, max.	16 kbyte	16 kbyte	16 kbyte
Address area			
I/O address area			
• Inputs	32 kbyte; All inputs are in the process image	32 kbyte; All inputs are in the process image	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image	32 kbyte; All outputs are in the process image	32 kbyte; All outputs are in the process image
Time of day			
Clock			
• Type	Hardware clock	Hardware clock	Hardware clock

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Technical specifications (continued)

Article number	**6ES7517-3FP00-0AB0** CPU 1517F-3 PN/DP, 3MB Prog., 8MB data	**6ES7518-4FP00-0AB0** CPU 1518F-4 PN/DP, 6 MB Prog, 20MB data	**6ES7518-4FX00-1AC0** CPU 1518F-4 PN/DP MFP + C/C++ RT +OPC UA
1. Interface			
Interface types			
• Number of ports	2	2	2
• integrated switch	Yes	Yes	Yes
• RJ 45 (Ethernet)	Yes; X1	Yes; X1	Yes; X1
Protocols			
• IP protocol	Yes; IPv4	Yes; IPv4	Yes; IPv4
• PROFINET IO controller	Yes	Yes	Yes
• PROFINET IO Device	Yes	Yes	Yes
• SIMATIC communication	Yes	Yes	Yes
• Open IE communication	Yes	Yes	Yes
• Web server	Yes	Yes	Yes
• Media redundancy	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0
PROFINET IO controller			
Services			
- PG/OP communication	Yes	Yes	Yes
- S7 routing	Yes	Yes	Yes
- Isochronous mode	Yes	Yes	Yes
- Open IE communication	Yes	Yes	Yes
- IRT	Yes	Yes	Yes
- MRP	Yes; As MRP redundancy manager and/or MRP client; max. number of devices in the ring: 50	Yes; As MRP redundancy manager and/or MRP client; max. number of devices in the ring: 50	Yes; As MRP redundancy manager and/or MRP client; max. number of devices in the ring: 50
- MRPD	Yes; Requirement: IRT	Yes; Requirement: IRT	Yes; Requirement: IRT
- PROFIenergy	Yes	Yes	Yes
- Prioritized startup	Yes; Max. 32 PROFINET devices	Yes; Max. 32 PROFINET devices	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	512; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	512; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	512; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64	64	64
- Number of connectable IO Devices for RT, max.	512	512	512
- of which in line, max.	512	512	512
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces	8; in total across all interfaces	8; in total across all interfaces
- Number of IO Devices per tool, max.	8	8	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data

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Technical specifications (continued)

Article number	**6ES7517-3FP00-0AB0** CPU 1517F-3 PN/DP, 3MB Prog., 8MB data	**6ES7518-4FP00-0AB0** CPU 1518F-4 PN/DP, 6 MB Prog, 20MB data	**6ES7518-4FX00-1AC0** CPU 1518F-4 PN/DP MFP + C/C++ RT +OPC UA
Update time for IRT			
- for send cycle of 125 µs		125 µs	125 µs
- for send cycle of 187.5 µs		187.5 µs	187.5 µs
- for send cycle of 250 µs	250 µs to 4 ms	250 µs to 4 ms	250 µs to 4 ms
- for send cycle of 500 µs	500 µs to 8 ms	500 µs to 8 ms	500 µs to 8 ms
- for send cycle of 1 ms	1 ms to 16 ms	1 ms to 16 ms	1 ms to 16 ms
- for send cycle of 2 ms	2 ms to 32 ms	2 ms to 32 ms	2 ms to 32 ms
- for send cycle of 4 ms	4 ms to 64 ms	4 ms to 64 ms	4 ms to 64 ms
- With IRT and parameterization of "odd" send cycles	Update time = set "odd" send clock (any multiple of 125 µs: 375 µs, 625 µs ... 3 875 µs)	Update time = set "odd" send clock (any multiple of 125 µs: 375 µs, 625 µs ... 3 875 µs)	Update time = set "odd" send clock (any multiple of 125 µs: 375 µs, 625 µs ... 3 875 µs)
Update time for RT			
- for send cycle of 250 µs	250 µs to 128 ms	250 µs to 128 ms	250 µs to 128 ms
- for send cycle of 500 µs	500 µs to 256 ms	500 µs to 256 ms	500 µs to 256 ms
- for send cycle of 1 ms	1 ms to 512 ms	1 ms to 512 ms	1 ms to 512 ms
- for send cycle of 2 ms	2 ms to 512 ms	2 ms to 512 ms	2 ms to 512 ms
- for send cycle of 4 ms	4 ms to 512 ms	4 ms to 512 ms	4 ms to 512 ms
PROFINET IO Device			
Services			
- PG/OP communication	Yes	Yes	Yes
- S7 routing	Yes	Yes	Yes
- Isochronous mode	No	No	No
- Open IE communication	Yes	Yes	Yes
- IRT	Yes	Yes	Yes
- MRP	Yes; As MRP redundancy manager and/or MRP client; max. number of devices in the ring: 50	Yes; As MRP redundancy manager and/or MRP client; max. number of devices in the ring: 50	Yes; As MRP redundancy manager and/or MRP client; max. number of devices in the ring: 50
- MRPD	Yes; Requirement: IRT	Yes; Requirement: IRT	Yes; Requirement: IRT
- PROFIenergy	Yes	Yes	Yes
- Shared device	Yes	Yes	Yes
- Number of IO controllers with shared device, max.	4	4	4
- Asset management record	Yes; Per user program	Yes; Per user program	Yes; Per user program
2. Interface			
Interface types			
• Number of ports	1	1	1
• integrated switch	No	No	No
• RJ 45 (Ethernet)	Yes; X2	Yes; X2	Yes; X2
Protocols			
• IP protocol	Yes; IPv4	Yes; IPv4	Yes; IPv4
• PROFINET IO controller	Yes	Yes	Yes
• PROFINET IO Device	Yes	Yes	Yes
• SIMATIC communication	Yes	Yes	Yes
• Open IE communication	Yes	Yes	Yes
• Web server	Yes	Yes	Yes
• Media redundancy	No	No	No

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Technical specifications (continued)

Article number	**6ES7517-3FP00-0AB0** CPU 1517F-3 PN/DP, 3MB Prog., 8MB data	**6ES7518-4FP00-0AB0** CPU 1518F-4 PN/DP, 6 MB Prog, 20MB data	**6ES7518-4FX00-1AC0** CPU 1518F-4 PN/DP MFP + C/C++ RT +OPC UA
PROFINET IO controller			
Services			
- PG/OP communication	Yes	Yes	Yes
- S7 routing	Yes	Yes	Yes
- Isochronous mode	No	No	No
- Open IE communication	Yes	Yes	Yes
- IRT	No	No	No
- MRP	No	No	No
- MRPD	No	No	No
- PROFIenergy	Yes	Yes	Yes
- Prioritized startup	No	No	No
- Number of connectable IO Devices, max.	128; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	128; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	128; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Number of connectable IO Devices for RT, max.	128	128	128
- of which in line, max.	128	128	128
- Number of IO Devices that can be simultaneously activated/ deactivated, max.	8; in total across all interfaces	8; in total across all interfaces	8; in total across all interfaces
- Number of IO Devices per tool, max.	8	8	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
Update time for RT			
- for send cycle of 1 ms	1 ms to 512 ms	1 ms to 512 ms	1 ms to 512 ms
PROFINET IO Device			
Services			
- PG/OP communication	Yes	Yes	Yes
- S7 routing	Yes	Yes	Yes
- Isochronous mode	No	No	No
- Open IE communication	Yes	Yes	Yes
- IRT	No	No	No
- MRP	No	No	No
- MRPD	No	No	No
- PROFIenergy	Yes	Yes	Yes
- Prioritized startup	No	No	No
- Shared device	Yes	Yes	Yes
- Number of IO controllers with shared device, max.	4	4	4
- Asset management record	Yes; Per user program	Yes; Per user program	Yes; Per user program
3. Interface			
Interface types			
• Number of ports	1	1	1; C/C++ Runtime can also be reached via this port
• integrated switch		No	No
• RJ 45 (Ethernet)		Yes; X3	Yes; X3
• RS 485	Yes; X3		

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Technical specifications (continued)

Article number	**6ES7517-3FP00-0AB0** CPU 1517F-3 PN/DP, 3MB Prog., 8MB data	**6ES7518-4FP00-0AB0** CPU 1518F-4 PN/DP, 6 MB Prog, 20MB data	**6ES7518-4FX00-1AC0** CPU 1518F-4 PN/DP MFP + C/C++ RT +OPC UA
Protocols			
• IP protocol		Yes; IPv4	Yes; IPv4
• PROFINET IO controller		No	No
• PROFINET IO Device		No	No
• PROFIBUS DP master	Yes		
• PROFIBUS DP slave	No		
• SIMATIC communication	Yes	Yes	Yes
• Open IE communication		Yes	Yes
• Web server		Yes	Yes
4. Interface			
Interface types			
• Number of ports		1	1
• RS 485		Yes; X4	Yes; X4
Protocols			
• PROFIBUS DP master		Yes	Yes
• PROFIBUS DP slave		No	No
• SIMATIC communication		Yes	Yes
Protocols			
Number of connections			
• Number of connections, max.	320; via integrated interfaces of the CPU and connected CPs / CMs	384; via integrated interfaces of the CPU and connected CPs / CMs	384; via integrated interfaces of the CPU and connected CPs / CMs
PROFIBUS DP master			
Services			
- Number of DP slaves	125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
OPC UA			
• OPC UA client	Yes	Yes	Yes
• OPC UA server	Yes; Data access (read, write, subscribe), method call, custom address space	Yes; Data access (read, write, subscribe), method call, custom address space	Yes; Data access (read, write, subscribe), method call, custom address space
Isochronous mode			
Isochronous operation (application synchronized up to terminal)	Yes; Distributed and central; with minimum OB 6x cycle of 250 µs (distributed) and 1 ms (central)	Yes; Distributed and central; with minimum OB 6x cycle of 125 µs (distributed) and 1 ms (central)	Yes; Distributed and central; with minimum OB 6x cycle of 125 µs (distributed) and 1 ms (central)
Supported technology objects			
Motion control	Yes; Note: The number of axes affects the cycle time of the PLC program; selection guide via the TIA Selection Tool or SIZER	Yes; Note: The number of axes affects the cycle time of the PLC program; selection guide via the TIA Selection Tool or SIZER	Yes; Note: The number of axes affects the cycle time of the PLC program; selection guide via the TIA Selection Tool or SIZER
• Number of available motion control resources for technology objects (except cam disks)	10 240	10 240	10 240
• Required motion control resources			
- per speed-controlled axis	40	40	40
- per positioning axis	80	80	80
- per synchronous axis	160	160	160
- per external encoder	80	80	80
- per output cam	20	20	20
- per cam track	160	160	160
- per probe	40	40	40
Controller			
• PID_Compact	Yes; Universal PID controller with integrated optimization	Yes; Universal PID controller with integrated optimization	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves	Yes; PID controller with integrated optimization for valves	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature	Yes; PID controller with integrated optimization for temperature	Yes; PID controller with integrated optimization for temperature
Counting and measuring			
• High-speed counter	Yes	Yes	Yes

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Technical specifications (continued)

Article number	6ES7517-3FP00-0AB0 CPU 1517F-3 PN/DP, 3MB Prog., 8MB data	6ES7518-4FP00-0AB0 CPU 1518F-4 PN/DP, 6 MB Prog, 20MB data	6ES7518-4FX00-1AC0 CPU 1518F-4 PN/DP MFP + C/C++ RT +OPC UA
Standards, approvals, certificates			
Highest safety class achievable in safety mode			
• Performance level according to ISO 13849-1	PLe	PLe	PLe
• SIL acc. to IEC 61508	SIL 3	SIL 3	SIL 3
Probability of failure (for service life of 20 years and repair time of 100 hours)			
- Low demand mode: PFDavg in accordance with SIL3	< 2.00E-05	< 2.00E-05	< 2.00E-05
- High demand/continuous mode: PFH in accordance with SIL3	< 1.00E-09	< 1.00E-09	< 1.00E-09
Ambient conditions			
Ambient temperature during operation			
• horizontal installation, min.	0 °C	0 °C	0 °C
• horizontal installation, max.	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off
• vertical installation, min.	0 °C	0 °C	0 °C
• vertical installation, max.	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off
Altitude during operation relating to sea level			
• Installation altitude above sea level, max.	3 000 m; Restrictions for installation altitudes > 2 000 m, see manual	3 000 m; Restrictions for installation altitudes > 2 000 m, see manual	
Configuration			
Programming			
Programming language			
- LAD	Yes; incl. failsafe	Yes; incl. failsafe	Yes
- FBD	Yes; incl. failsafe	Yes; incl. failsafe	Yes
- STL	Yes	Yes	Yes
- SCL	Yes	Yes	Yes
- GRAPH	Yes	Yes	Yes
Know-how protection			
• User program protection/password protection	Yes	Yes	Yes
• Copy protection	Yes	Yes	Yes
• Block protection	Yes	Yes	Yes
Access protection			
• Password for display	Yes	Yes	Yes
• Protection level: Write protection	Yes; Specific write protection both for Standard and for Failsafe	Yes; Specific write protection both for Standard and for Failsafe	Yes
• Protection level: Read/write protection	Yes	Yes	Yes
• Protection level: Complete protection	Yes	Yes	Yes
Open Development interfaces			
• Size of ODK SO file, max.			9.8 Mbyte
Dimensions			
Width	175 mm	175 mm	175 mm
Height	147 mm	147 mm	147 mm
Depth	129 mm	129 mm	129 mm
Weights			
Weight, approx.	1 978 g	1 988 g	2 117 g

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Ordering data	Article No.
CPU 1511F-1 PN Fail-safe CPU, 230 KB work memory for program, 1 MB for data, PROFINET IRT interface with 2-port switch; SIMATIC memory card required	**6ES7511-1FK02-0AB0**
CPU 1513F-1 PN Fail-safe CPU, 450 KB work memory for program, 1.5 MB for data, PROFINET IRT interface with 2-port switch; SIMATIC memory card required	**6ES7513-1FL02-0AB0**
CPU 1515F-2 PN Fail-safe CPU, 750 KB work memory for program, 3 MB for data, PROFINET IRT interface with 2-port switch; PROFINET RT interface; SIMATIC memory card required	**6ES7515-2FM01-0AB0**
CPU 1516F-3 PN/DP Fail-safe CPU, 1.5 MB work memory for program, 5 MB for data, PROFINET IRT interface with 2-port switch, PROFINET RT interface, PROFIBUS interface; SIMATIC memory card required	**6ES7516-3FN01-0AB0**
CPU 1517F-3 PN/DP Fail-safe CPU, 3 MB work memory for program, 8 MB for data, PROFINET IRT interface with 2-port switch, PROFINET RT interface, PROFIBUS interface; SIMATIC memory card required	**6ES7517-3FP00-0AB0**
CPU 1518F-4 PN/DP Fail-safe CPU, 6 MB work memory for program, 20 MB for data, PROFINET IRT interface with 2-port switch, PROFINET RT interface, Ethernet interface, PROFIBUS interface; SIMATIC memory card required	**6ES7518-4FP00-0AB0**
CPU 1518F-4 PN/DP MFP CPU 1518F-4 PN/DP MFP, including C/C++ Runtime and OPC UA runtime license	**6ES7518-4FX00-1AC0**

Accessories	Article No.
SIMATIC memory card	
4 MB	**6ES7954-8LC03-0AA0**
12 MB	**6ES7954-8LE03-0AA0**
24 MB	**6ES7954-8LF03-0AA0**
256 MB	**6ES7954-8LL03-0AA0**
2 GB	**6ES7954-8LP02-0AA0**
32 GB	**6ES7954-8LT03-0AA0**
SIMATIC S7-1500 DIN rail	
Fixed lengths, with grounding elements	
• 160 mm	**6ES7590-1AB60-0AA0**
• 245 mm	**6ES7590-1AC40-0AA0**
• 482 mm	**6ES7590-1AE80-0AA0**
• 530 mm	**6ES7590-1AF30-0AA0**
• 830 mm	**6ES7590-1AJ30-0AA0**
For cutting to length by customer, without drill holes; grounding elements must be ordered separately	
• 2 000 mm	**6ES7590-1BC00-0AA0**
PE connection element for DIN rail 2 000 mm 20 units	**6ES7590-5AA00-0AA0**
Power supply	
For supplying the backplane bus of the S7-1500 controller	
24 V DC input voltage, power 25 W	**6ES7505-0KA00-0AB0**
24/48/60 V DC input voltage, power 60 W	**6ES7505-0RA00-0AB0**
24/48/60 V DC input voltage, power 60 W, buffering functionality	**6ES7505-0RB00-0AB0**
120/230 V AC input voltage, power 60 W	**6ES7507-0RA00-0AB0**
Power connector With coding element for power supply module; spare part, 10 units	**6ES7590-8AA00-0AA0**
Load power supply	
24 V DC/3 A	**6EP1332-4BA00**
24 V DC/8 A	**6EP1333-4BA00**
Power supply connector	
Spare part; for connecting the 24 V DC supply voltage	
• With push-in terminals	**6ES7193-4JB00-0AA0**
PROFIBUS FastConnect RS 485 bus connector with 90° cable outlet	
With insulation displacement, max. transmission rate 12 Mbps	
Without PG interface, grounding via control cabinet contact surface; 1 unit	**6ES7972-0BA70-0XA0**
With PG interface, grounding via control cabinet contact surface; 1 unit	**6ES7972-0BB70-0XA0**

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Fail-safe CPUs

Ordering data	Article No.
PROFIBUS FC Standard Cable GP Standard type with special design for fast mounting, 2-wire, shielded; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	**6XV1830-0EH10**
PROFIBUS FC Robust Cable 2-wire, shielded; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	**6XV1830-0JH10**
PROFIBUS FC Flexible Cable 2-wire, shielded; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	**6XV1831-2K**
PROFIBUS FC Trailing Cable 2-wire, shielded; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	
Sheath color: Petrol	**6XV1830-3EH10**
Sheath color: Violet	**6XV1831-2L**
PROFIBUS FC Food Cable 2-wire, shielded; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	**6XV1830-0GH10**
PROFIBUS FC Ground Cable 2-wire, shielded; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	**6XV1830-3FH10**
PROFIBUS FC FRNC Cable GP 2-wire, shielded, flame-retardant, with copolymer outer sheath FRNC; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	**6XV1830-0LH10**
PROFIBUS FastConnect stripping tool Preadjusted stripping tool for fast stripping of PROFIBUS FastConnect bus cables	**6GK1905-6AA00**
IE FC RJ45 plugs RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables	
IE FC RJ45 plug 180 180° cable outlet	
1 unit	**6GK1901-1BB10-2AA0**
10 units	**6GK1901-1BB10-2AB0**
50 units	**6GK1901-1BB10-2AE0**
IE FC TP Standard Cable GP 2x2 4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/IE FC RJ45 plug; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	**6XV1840-2AH10**
IE FC TP Trailing Cable 2 x 2 (Type C) 4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/IE FC RJ45 plug 180/90 for use as trailing cable; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	**6XV1840-3AH10**
IE FC TP Marine Cable 2 x 2 (Type B) 4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/IE FC RJ45 plug 180/90 with marine approval; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	**6XV1840-4AH10**
IE FC stripping tool Preadjusted stripping tool for fast stripping of Industrial Ethernet FC cables	**6GK1901-1GA00**
Display	
For CPU 1511-1 PN, CPU 1511F-1 PN, CPU 1513-1 PN and CPU 1513F-1 PN; spare part	**6ES7591-1AA01-0AA0**
For CPU 1515-2 PN, CPU 1516-3 PN/DP, CPU 1517-3 PN/DP, CPU 1518-4 PN/DP, CPU 1518-4 PN/DP ODK and CPU 1518-4 PN/DP MFP; spare part	**6ES7591-1BA01-0AA0**
Front cover for PROFIBUS DP interface For CPU 1517-3 PN/DP, CPU 1518-4 PN/DP, CPU 1518-4 PN/DP ODK and CPU 1518-4 PN/DP MFP; spare part	**6ES7591-8AA00-0AA0**
SIMATIC S7-1500 Starter Kit Comprising: CPU 1511C-1 PN, SIMATIC memory card 4 MB, 160 mm DIN rail, front connector, STEP 7 Professional 365-day license, SIMATIC ProDiag 1500, SIMATIC OPC UA S7-1500 Small, PM 1507 24 V/3 A power supply, Ethernet cable, documentation	**6ES7511-1CK02-4YB5**

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Ordering data	Article No.
STEP 7 Professional V15.1	
Target system: SIMATIC S7-1200, S7-1500, S7-300, S7-400, WinAC Requirement: Windows 7 Home Premium SP1 (64-bit) Windows 7 Professional SP1 (64-bit) Windows 7 Enterprise SP1 (64-bit) Windows 7 Ultimate SP1 (64-bit) Windows 10 Home Version 1709, 1803 Windows 10 Professional Version 1709, 1803 Windows 10 Enterprise Version 1709, 1803 Windows 10 Enterprise 2016 LTSB Windows 10 IoT Enterprise 2015 LTSB Windows 10 IoT Enterprise 2016 LTSB Windows Server 2012 R2 StdE (full installation) Windows Server 2016 Standard (full installation) Type of delivery: en, de, fr, it, es, zh	
STEP 7 Professional V15.1, floating license	**6ES7822-1AA05-0YA5**
STEP 7 Professional V15.1, floating license, software download incl. license key [1] Email address required for delivery	**6ES7822-1AE05-0YA5**
STEP 7 Safety Advanced V15.1	
Task: Engineering tool for configuring and programming fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-1500F Software Controller, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller and the fail-safe ET 200SP, ET 200MP, ET 200S, ET 200M, ET 200iSP, ET 200pro and ET 200eco I/O Requirement: STEP 7 Professional V15.1	
Floating license for 1 user; software and documentation on DVD; license key on USB flash drive	**6ES7833-1FA15-0YA5**
Floating license for 1 user; software, documentation and license key for download[1]; email address required for delivery	**6ES7833-1FA15-0YH5**

	Article No.
SIMATIC ODK 1500S	
Open Development Kit for support in developing high-level language applications for SIMATIC S7-1500 Advanced Controllers; supplied on DVD, license key (floating license) on USB flash drive	**6ES7806-2CD03-0YA0**
Open Development Kit for support in developing high-level language applications for SIMATIC S7-1500 Advanced Controllers Software download including license key (floating license) [1] Email address required for delivery	**6ES7806-2CD03-0YG0**
Open Development Kit for support in developing high-level language applications for SIMATIC S7-1500 Advanced Controllers; upgrade for existing installations as from V1.0; software download including license key (floating license) [1] Email address required for delivery	**6ES7806-2CD03-0YK0**
SIMATIC Target 1500S for Simulink V3.0	**6ES7823-1BE02-0YA5**
Download incl. license key [1] Email address required for delivery	
SIMATIC Target + ODK 1500S bundle	**6ES7823-1BE12-0YA0**
Download incl. license key [1] Email address required for delivery	
Upgrade of SIMATIC Target 1500S for Simulink V2.0 to V3.0, download incl. license key [1] Email address required for delivery	**6ES7823-1BE02-0YE5**
SIMATIC Manual Collection	**6ES7998-8XC01-8YE0**
Electronic manuals on DVD, multi-language: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC Distributed I/O, SIMATIC HMI, SIMATIC sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	
SIMATIC Manual Collection update service for 1 year	**6ES7998-8XC01-8YE2**
Current "Manual Collection" DVD and the three subsequent updates	

[1] For up-to-date information and download availability, see: http://www.siemens.com/tia-online-software-delivery

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Overview SIPLUS CPU 1511F-1 PN



- Entry-level CPU in the SIPLUS S7-1500F Controller product range
- Suitable for standard and fail-safe applications with medium requirements for program scope and processing speed
- Used as central controller in production lines with central and distributed I/O
- Supports PROFIsafe in centralized and distributed configurations
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET I/O controller
- Isochronous mode

Note:

SIMATIC memory card required for operation of the CPU.

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the corresponding standard products. SIPLUS extreme specific information was added.

Overview SIPLUS CPU 1513F-1 PN



- The CPU for standard and fail-safe applications with medium/high requirements for program/data storage in the SIPLUS S7-1500 controller product range
- High processing speed for binary and floating-point arithmetic
- Used as central controller in production lines with central and distributed I/O
- Supports PROFIsafe in centralized and distributed configurations
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET I/O controller
- Isochronous mode

Note:

SIMATIC memory card required for operation of the CPU.

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the corresponding standard products. SIPLUS extreme specific information was added.

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Overview SIPLUS CPU 1515F-2 PN

- The CPU for applications with medium to high requirements for program/data storage in the S7-1500 controller product range
- Can be used for failsafe functions up to SIL 3 according to IEC 61508 and up to PLe according to ISO 13849.
- Medium to high processing speed for binary and floating-point arithmetic
- Used as central controller in production lines with central and distributed I/O
- Supports PROFIsafe in centralized and distributed configurations
- PROFINET IO IRT interface with 2-port switch
- Additional PROFINET interface with separate IP address
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET IO controller
- Isochronous mode
- Integrated motion control functionalities for controlling speed-controlled and positioning axes, support for external encoders
- Integrated web server with the option of creating user-defined web pages

Note:

SIMATIC memory card required for operation of the CPU.

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

Overview SIPLUS CPU 1516F-3 PN/DP



- The CPU with a large program and data memory in the SIPLUS S7-1500 controller product range for failsafe applications with high requirements regarding program scope and networking.
- Can be used for failsafe functions up to SIL 3 according to IEC 61508 and up to PLe according to ISO 13849.
- High processing speed for binary and floating-point arithmetic
- Used as central controller in production lines with central and distributed I/O.
- Supports PROFIsafe in centralized and distributed configuration.
- PROFINET IO IRT interface with 2-port switch.
- Additional PROFINET interface with separate IP address.
- PROFINET IO controller for operating distributed I/O on PROFINET.
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET IO controller.
- PROFIBUS DP master interface.
- Isochronous mode on PROFIBUS and PROFINET.
- Integrated motion control functionalities for controlling speed-controlled and positioning axes, support for external encoders.
- Integrated Web server with the option of creating user-defined Web pages.

Note:

SIMATIC Memory Card required for operation of the CPU.

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the corresponding standard products. SIPLUS extreme specific information was added.

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Overview SIPLUS CPU 1518F-4 PN/DP



- The CPU with a very large program and data memory in the SIPLUS S7-1500 controller product range for failsafe applications with highest requirements regarding program scope, performance and networking.
- Can be used for failsafe functions up to SIL 3 according to IEC 61508 and up to PLe according to ISO 13849.
- Extremely high processing speed for binary and floating-point arithmetic.
- For cross-industry automation tasks in series machine, special machine and plant construction
- Used as central controller in production lines with central and distributed I/O.
- Supports PROFIsafe in centralized and distributed configuration.
- PROFINET IO IRT interface with 2-port switch.
- Two additional PROFINET interfaces with separate IP addresses.
- PROFINET IO controller for operating distributed I/O on PROFINET.
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET IO controller.
- PROFIBUS DP master interface.
- Isochronous mode on PROFIBUS and PROFINET.
- Integrated motion control functionalities for controlling speed-controlled and positioning axes, support for external encoders
- Integrated Web server with the option of creating user-defined Web pages.

Note:

SIMATIC memory card required for operation of the CPU.

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the corresponding standard products. SIPLUS extreme specific information was added.

Technical specifications

Article number	**6AG1511-1FK01-2AB0**	**6AG1513-1FL01-2AB0**	**6AG1515-2FM01-2AB0**	**6AG1516-3FN01-2AB0**	**6AG1518-4FP00-4AB0**
Based on	**6ES7511-1FK01-0AB0**	**6ES7513-1FL01-0AB0**	**6ES7515-2FM01-0AB0**	**6ES7516-3FN01-0AB0**	**6ES7518-4FP00-0AB0**
	SIPLUS S7-1500 CPU 1511F-1 PN	SIPLUS S7-1500 CPU 1513F-1 PN	SIPLUS S7-1500 CPU 1515F-2 PN	SIPLUS S7-1500 CPU-1516F-3 PN/DP	SIPLUS S7-1500 CPU 1518F-4 PN/DP
Ambient conditions					
Ambient temperature during operation					
• horizontal installation, min.	-25 °C; = Tmin; startup @ -25 °C; startup display @ -20 °C	-25 °C; = Tmin; startup @ -25 °C; startup display @ -20 °C	-25 °C; = Tmin	-25 °C; = Tmin; startup @ -25 °C; startup display @ -20 °C	0 °C
• horizontal installation, max.	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off	60 °C; = Tmax; display: 50 °C, the display is switched off at an operating temperature of typically 50 °C	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off
• vertical installation, min.	-25 °C; = Tmin; startup @ -25 °C; startup display @ -20 °C	-25 °C; = Tmin; startup @ -25 °C; startup display @ -20 °C	-25 °C	-25 °C; = Tmin; startup @ -25 °C; startup display @ -20 °C	0 °C
• vertical installation, max.	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off

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Technical specifications (continued)

Article number	6AG1511-1FK01-2AB0	6AG1513-1FL01-2AB0	6AG1515-2FM01-2AB0	6AG1516-3FN01-2AB0	6AG1518-4FP00-4AB0
Based on	6ES7511-1FK01-0AB0	6ES7513-1FL01-0AB0	6ES7515-2FM01-0AB0	6ES7516-3FN01-0AB0	6ES7518-4FP00-0AB0
	SIPLUS S7-1500 CPU 1511F-1 PN	SIPLUS S7-1500 CPU 1513F-1 PN	SIPLUS S7-1500 CPU 1515F-2 PN	SIPLUS S7-1500 CPU-1516F-3 PN/DP	SIPLUS S7-1500 CPU 1518F-4 PN/DP
Altitude during operation relating to sea level					
• Installation altitude above sea level, max.	2 000 m	2 000 m	2 000 m	2 000 m	2 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)
Relative humidity					
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; incl. condensation / frost permitted (no commissioning under condensation conditions)	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance					
Coolants and lubricants					
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems					
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
Use on ships/at sea					
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Remark					
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating					
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability	Yes; Class 2 for high availability	Yes; Class 2 for high availability	Yes; Class 2 for high availability	Yes; Class 2 for high availability
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

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SIPLUS fail-safe CPUs

Ordering data	Article No.
CPU 1511F-1 PN (Extended temperature range and exposure to environmental substances) Fail-safe CPU, 225 KB work memory for program, 1 MB for data, PROFINET IRT interface with 2-port switch; SIMATIC memory card required	**6AG1511-1FK01-2AB0**
SIPLUS CPU 1513F-1 PN (Extended temperature range and exposure to environmental substances) Fail-safe CPU, 450 KB work memory for program, 1.5 MB for data, PROFINET IRT interface with 2-port switch; SIMATIC memory card required	**6AG1513-1FL01-2AB0**
SIPLUS CPU 1515F-2 PN (Extended temperature range and exposure to environmental substances) Fail-safe CPU, 750 KB work memory for program, 3 MB for data, PROFINET IRT interface with 2-port switch; PROFINET RT interface; SIMATIC memory card required	**6AG1515-2FM01-2AB0**
SIPLUS CPU 1516F-3 PN/DP (Extended temperature range and exposure to environmental substances) Fail-safe CPU, 1.5 MB work memory for program, 5 MB for data, PROFINET IRT interface with 2-port switch, PROFINET RT interface, PROFIBUS interface; SIMATIC memory card required	**6AG1516-3FN01-2AB0**
CPU 1518F-4 PN/DP (exposure to environmental substances) Fail-safe CPU, 6 MB work memory for program, 20 MB for data, PROFINET IRT interface with 2-port switch, PROFINET RT interface, Ethernet interface, PROFIBUS interface; SIMATIC memory card required	**6AG1518-4FP00-4AB0**

Accessories	Article No.
System power supply (Extended temperature range and exposure to environmental substances) For supplying the backplane bus of the S7-1500 controller	
24 V DC input voltage, power 25 W	**6AG1505-0KA00-7AB0**
24/48/60 V DC input voltage, power 60 W	**6AG1505-0RA00-7AB0**
120/230 V AC input voltage, power 60 W	**6AG1507-0RA00-7AB0**
Load power supply (Extended temperature range and exposure to environmental substances)	
24 V DC/3 A	**6AG1332-4BA00-7AA0**
24 V DC/8 A	**6AG1333-4BA00-7AA0**
Display (Extended temperature range and exposure to environmental substances)	
For SIPLUS CPU 1511F-1 PN and CPU 1513F-1 PN; spare part	**6AG1591-1AA01-2AA0**
For SIPLUS CPU 1515F-2 PN, CPU 1516F-3 PN/DP and CPU 1518-4F PN/DP; spare part	**6AG1591-1BA01-2AA0**
Other accessories	See SIMATIC S7-1500, fail-safe CPUs, page 4/53

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Overview CPU 1513R-1 PN



- The CPU for applications with medium requirements for program scope and processing speed, and increased requirements for availability.
- High processing speed for binary and floating-point arithmetic
- Used as the central controller in production lines with distributed I/O
- PROFINET IO RT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET

Note:

SIMATIC Memory Card required for operation of the CPU.

Overview CPU 1515R-2 PN



- The CPU for applications with medium/high requirements for program scope, networking and processing speed, and with increased requirements for availability.
- High processing speed for binary and floating-point arithmetic
- Used as central controller with distributed I/O
- PROFINET IO RT interface with 2-port switch
- Additional PROFINET interface with separate IP address
- PROFINET IO controller for operating distributed I/O on PROFINET

Note:

SIMATIC Memory Card required for operation of the CPU.

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Redundant CPUs

Overview CPU 1517H-3 PN



- The CPU for applications with high requirements for availability, very high requirements for program scope and networking, and very high requirements for processing speed.
- High processing speed for binary and floating-point arithmetic
- Used as central controller with distributed I/O
- PROFINET IO RT interface with 2-port switch
- Additional PROFINET interface with separate IP address
- PROFINET IO controller for operating distributed I/O on PROFINET

Note:

SIMATIC Memory Card required for operation of the CPU.

Technical specifications

Article number	**6ES7513-1RL00-0AB0** CPU 1513R-1 PN, 300KB program, 1.5MB data	**6ES7515-2RM00-0AB0** CPU 1515R-2 PN, 500KB program, 3MB data	**6ES7517-3HP00-0AB0** CPU 1517H-3 PN, 2MB program, 8MB data
General information			
Product type designation	CPU 1513R-1 PN	CPU 1515R-2 PN	CPU 1517H-3 PN
Engineering with			
• STEP 7 TIA Portal configurable/ integrated as of version	STEP 7 V15.1 or higher	STEP 7 V15.1 or higher	STEP 7 V15.1 or higher
Display			
Screen diagonal [cm]	3.45 cm	6.1 cm	6.1 cm
Supply voltage			
Type of supply voltage	24 V DC	24 V DC	24 V DC
Memory			
Work memory			
• integrated (for program)	300 kbyte	500 kbyte	2 Mbyte
• integrated (for data)	1.5 Mbyte	3 Mbyte	8 Mbyte
Load memory			
• Plug-in (SIMATIC memory card), max.	32 Gbyte	32 Gbyte	32 Gbyte
CPU processing times			
for bit operations, typ.	80 ns	60 ns	4 ns
for word operations, typ.	96 ns	72 ns	6 ns
for fixed point arithmetic, typ.	128 ns	96 ns	6 ns
for floating point arithmetic, typ.	512 ns	384 ns	24 ns
Counters, timers and their retentivity			
S7 counter			
• Number	2 048	2 048	2 048
IEC counter			
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)	Any (only limited by the main memory)
S7 times			
• Number	2 048	2 048	2 048
IEC timer			
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)	Any (only limited by the main memory)
Data areas and their retentivity			
Flag			
• Number, max.	16 kbyte	16 kbyte	16 kbyte

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Technical specifications (continued)

Article number	**6ES7513-1RL00-0AB0** CPU 1513R-1 PN, 300KB program, 1.5MB data	**6ES7515-2RM00-0AB0** CPU 1515R-2 PN, 500KB program, 3MB data	**6ES7517-3HP00-0AB0** CPU 1517H-3 PN, 2MB program, 8MB data
Address area			
I/O address area			
• Inputs	32 kbyte	32 kbyte; All inputs are in the process image	32 kbyte
• Outputs	32 kbyte	32 kbyte; All outputs are in the process image	32 kbyte
Time of day			
Clock			
• Type			Hardware clock
1. Interface			
Interface types			
• Number of ports	2	2	2
• integrated switch	Yes	Yes	Yes
• RJ 45 (Ethernet)	Yes; X1	Yes; X1	Yes; X1
Protocols			
• IP protocol	Yes; IPv4	Yes; IPv4	Yes; IPv4
• PROFINET IO controller	Yes	Yes	Yes
• PROFINET IO Device	No	No	No
• SIMATIC communication	Yes; Only Server	Yes; Only Server	Yes; Only Server
• Open IE communication	Yes	Yes	Yes
• Web server	No	No	No
• Media redundancy	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0	Yes	Yes
PROFINET IO controller			
Services			
- PG/OP communication	Yes	Yes	Yes
- S7 routing	No	No	No
- Isochronous mode	No	No	No
- Open IE communication	Yes	Yes	Yes
- IRT	No	No	No
- MRP	Yes; Only Manager Auto, max. 50 nodes; only 16 are recommended, however	Yes; Only Manager Auto, max. 50 nodes; only 16 are recommended, however	Yes; Only Manager Auto, max. 50 nodes
- MRPD	No	No	No
- PROFIenergy	Yes	Yes	Yes
- Number of connectable IO Devices, max.	64	64	256
- Updating times		The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	
Update time for RT			
- for send cycle of 1 ms	1 ms to 512 ms	1 ms to 512 ms	1 ms to 512 ms
2. Interface			
Interface types			
• Number of ports		1	1
• integrated switch		No	No
• RJ 45 (Ethernet)		Yes; X2	Yes; X2
Protocols			
• IP protocol		Yes; IPv4	Yes; IPv4
• PROFINET IO controller		No	No
• PROFINET IO Device		No	No
• SIMATIC communication		Yes; Only Server	Yes; Only Server
• Open IE communication		Yes	Yes
• Web server		No	No
• Media redundancy		No	No

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Technical specifications (continued)

Article number	**6ES7513-1RL00-0AB0** CPU 1513R-1 PN, 300KB program, 1.5MB data	**6ES7515-2RM00-0AB0** CPU 1515R-2 PN, 500KB program, 3MB data	**6ES7517-3HP00-0AB0** CPU 1517H-3 PN, 2MB program, 8MB data
3. Interface			
Interface type			Pluggable interface module (IF)
Plug-in interface modules			Synchronization module 6ES7960-1CB00-0AA5 or 6ES7960-1FB00-0AA5
4. Interface			
Interface type			Pluggable synchronization submodule (FO)
Plug-in interface modules			Synchronization module 6ES7960-1CB00-0AA5 or 6ES7960-1FB00-0AA5
Protocols			
Number of connections			
• Number of connections, max.	88	108	160
OPC UA			
• OPC UA client	No	No	No
• OPC UA server	No	No	No
Supported technology objects			
Motion control	No	No	No
Controller			
• PID_Compact	No	No	No
• PID_3Step	No	No	No
• PID-Temp	No	No	No
Counting and measuring			
• High-speed counter	No	No	No
Ambient conditions			
Ambient temperature during operation			
• horizontal installation, min.	0 °C	0 °C	0 °C
• horizontal installation, max.	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off
• vertical installation, min.	0 °C	0 °C	0 °C
• vertical installation, max.	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off
Configuration			
Programming			
Programming language			
- LAD	Yes	Yes	Yes
- FBD	Yes	Yes	Yes
- STL	Yes	Yes	Yes
- SCL	Yes	Yes	Yes
- CFC		No	No
- GRAPH	No	No	No
Know-how protection			
• User program protection/ password protection	Yes	Yes	Yes
• Copy protection	No	No	No
• Block protection	Yes	Yes	Yes
Access protection			
• Password for display	Yes	Yes	Yes
• Protection level: Write protection	Yes	Yes	Yes
• Protection level: Read/write protection	Yes	Yes	Yes
• Protection level: Complete protection	Yes	Yes	Yes
Dimensions			
Width	35 mm	70 mm	210 mm
Height	147 mm	147 mm	147 mm
Depth	129 mm	129 mm	129 mm
Weights			
Weight, approx.	430 g	830 g	2 119 g; Interface modules: 2x 18 g

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Ordering data	Article No.
CPU 1513R-1 PN	**6ES7513-1RL00-0AB0**
SIMATIC S7-1500R CPU, 300 KB work memory for program, 1.5 MB for data, PROFINET RT interface with 2-port switch; SIMATIC memory card required	
CPU 1515R-2 PN	**6ES7515-2RM00-0AB0**
SIMATIC S7-1500R CPU, 450 KB work memory for program, 3 MB for data, PROFINET RT interface with 2-port switch, PROFINET interface; SIMATIC memory card required	
CPU 1517H-3 PN	**6ES7517-3HP00-0AB0**
SIMATIC S7-1500H CPU, 2 MB work memory for program, 8 MB for data, 1st interface PROFINET RT with 2-port switch, 2nd interface PROFINET, 3rd interface synchronization, command times for bit operations 4 ns; SIMATIC memory card required	
SIMATIC S7-1500H system bundle	**6ES7500-0HP00-0AB0**
Comprising 2 CPUs 517H-3 PN, 4 synchronization modules up to 10 m, 2 FOC synchronization cables (1 m)	
Accessories	
Synchronization module	
For patch cable FOC up to 10 m	**6ES7960-1CB00-0AA5**
For routing cable FOC up to 10 km	**6ES7960-1FB00-0AA5**
Synchronization connecting cables FOC for S7-1500H	
Length 1 m	**6ES7960-1BB00-5AA5**
Length 2 m	**6ES7960-1BC00-5AA5**
Length 10 m	**6ES7960-1CB00-5AA5**
SIMATIC memory card	
4 MB	**6ES7954-8LC03-0AA0**
12 MB	**6ES7954-8LE03-0AA0**
24 MB	**6ES7954-8LF03-0AA0**
256 MB	**6ES7954-8LL03-0AA0**
2 GB	**6ES7954-8LP02-0AA0**
32 GB	**6ES7954-8LT03-0AA0**
SIMATIC S7-1500 DIN rail	
Fixed lengths, with grounding elements	
• 160 mm	**6ES7590-1AB60-0AA0**
• 245 mm	**6ES7590-1AC40-0AA0**
• 482 mm	**6ES7590-1AE80-0AA0**
• 530 mm	**6ES7590-1AF30-0AA0**
• 830 mm	**6ES7590-1AJ30-0AA0**
For cutting to length by customer, without drill holes; grounding elements must be ordered separately	
• 2000 mm	**6ES7590-1BC00-0AA0**
PE connection element for DIN rail 2000 mm	**6ES7590-5AA00-0AA0**
20 units	
Power supply	
For supplying the backplane bus of the S7-1500 controller	
24 V DC input voltage, power 25 W	**6ES7505-0KA00-0AB0**
24/48/60 V DC input voltage, power 60 W	**6ES7505-0RA00-0AB0**
24/48/60 V DC input voltage, power 60 W, buffering functionality	**6ES7505-0RB00-0AB0**
120/230 V AC input voltage, power 60 W	**6ES7507-0RA00-0AB0**
Power connector	**6ES7590-8AA00-0AA0**
With coding element for power supply module; spare part, 10 units	
Load power supply	
24 V DC/3A	**6EP1332-4BA00**
24 V DC/8A	**6EP1333-4BA00**
Power supply connector	
Spare part; for connecting the 24 V DC supply voltage	
• With push-in terminals	**6ES7193-4JB00-0AA0**
IE FC RJ45 plugs	
RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables	
IE FC RJ45 plug 180	
180° cable outlet	
1 unit	**6GK1901-1BB10-2AA0**
10 units	**6GK1901-1BB10-2AB0**
50 units	**6GK1901-1BB10-2AE0**
IE FC TP Standard Cable GP 2x2	**6XV1840-2AH10**
4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/ IE FC RJ45 plug; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	
IE FC TP Trailing Cable 2 x 2 (Type C)	**6XV1840-3AH10**
4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/IE FC RJ45 plug 180/90 for use as trailing cable; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	

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Redundant CPUs

Ordering data	Article No.
IE FC TP Marine Cable 2 x 2 (Type B) 4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/ IE FC RJ45 plug 180/90 with marine approval, sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	**6XV1840-4AH10**
IE FC stripping tool Preadjusted stripping tool for fast stripping of Industrial Ethernet FC cables	**6GK1901-1GA00**
Display	
For CPU 1511-1 PN, CPU 1511F-1 PN, CPU 1513-1 PN, CPU 1513F-1 PN, CPU 1513R-1 PN; spare part	**6ES7591-1AA01-0AA0**
For CPU 1515-2 PN, CPU 1515F-2 PN, CPU 1515R-2 PN, CPU 1516-3 PN/DP, CPU 1516F-3 PN/DP, CPU 1517-3 PN/DP, CPU 1517H-3 PN, CPU 1517F-3 PN/DP, CPU 1518-4 PN/DP, CPU 1518F-4 PN/DP, CPU 1518-4 PN/DP ODK and CPU 1518F-4 PN/DP ODK; spare part	**6ES7591-1BA01-0AA0**

	Article No.
STEP 7 Professional V15.1 (required for S7-1500R/H) Target system: SIMATIC S7-1200, S7-1500, S7-300, S7-400, WinAC Requirement: Windows 7 Home Premium SP1 (64-bit) Windows 7 Professional SP1 (64-bit) Windows 7 Enterprise SP1 (64-bit) Windows 7 Ultimate SP1 (64-bit) Windows 10 Home Version 1703 Windows 10 Professional Version 1703 Windows 10 Enterprise Version 1703 Windows 10 Enterprise 2016 LTSB Windows 10 IoT Enterprise 2015 LTSB Windows 10 IoT Enterprise 2016 LTSB Windows Server 2012 R2 StdE (full installation) Windows Server 2016 Standard (full installation) Type of delivery: en, de, fr, it, es, zh	
STEP 7 Professional V15.1, floating license	**6ES7822-1AA05-0YA5**
STEP 7 Professional V15.1, floating license, software download incl. license key [1] Email address required for delivery	**6ES7822-1AE05-0YA5**
SIMATIC Manual Collection Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC Distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	**6ES7998-8XC01-8YE0**
SIMATIC Manual Collection update service for 1 year Current "Manual Collection" DVD and the three subsequent updates	**6ES7998-8XC01-8YE2**

[1] For up-to-date information and download availability, see: http://www.siemens.com/tia-online-software-delivery

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Overview CPU 1511T-1 PN



- Entry-level CPU in the S7-1500T Controller product range
- Suitable for applications with medium requirements for program scope and processing speed
- Used as central controller in production lines with central and distributed I/O
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET IO controller
- OPC UA server and client as runtime option for the easy connection of SIMATIC S7-1500 to third-party devices/ systems with the functions:
  - OPC UA Data Access
  - OPC UA Security
  - OPC UA Methods Call
  - Support of OPC UA Companion specifications.
- Central and distributed isochronous mode
- Integrated motion control functionalities for controlling speed-controlled, positioning and synchronized axes (gearing and camming), support for external encoders, output cams/cam tracks and probes.
  Technology object for controlling kinematics with up to 4 interpolating axes, e.g. Cartesian portal, delta picker, roll picker, articulated arm, cylindrical robot, tripod picker and SCARA.
  User-defined kinematics are also supported.
- Integrated web server for diagnostics with the option of creating user-defined web pages

Note:

SIMATIC Memory Card required for operation of the CPU.

Overview CPU 1511TF-1 PN



- Entry-level CPU in the S7-1500T Controller product range
- Suitable for standard and fail-safe applications with medium requirements for program scope and processing speed
- Used as central controller in production lines with central and distributed I/O
- Can be used for safety functions up to SIL 3 according to IEC 61508 and up to PLe according to ISO 13849
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET IO controller
- OPC UA server and client as runtime option for the easy connection of SIMATIC S7-1500 to third-party devices/ systems with the functions:
- OPC UA Data Access,
- OPC UA Security,
- OPC UA Methods Call,
- Support of OPC UA Companion specifications.
- Isochronous mode centrally and distributed
- Integrated motion control functionalities for controlling speed-controlled, positioning and synchronized axes (gearing and camming), support for external encoders, output cams/cam tracks and probes.
  Technology object for controlling kinematics with up to 4 interpolating axes, e.g. Cartesian portal, delta picker, roll picker, articulated arm, cylindrical robot, tripod picker and SCARA.
  User-defined kinematics are also supported.
- Integrated web server for diagnostics with the option of creating user-defined web pages

Note:

SIMATIC memory card required for operation of the CPU.

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Overview CPU 1515T-2 PN



- The CPU for applications with medium to high requirements regarding program/data storage in the S7-1500T Controller product range
- Medium to high processing speed for binary and floating-point arithmetic
- Used as central controller in production lines with central and distributed I/O
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET IO controller
- Additional PROFINET interface with separate IP address for network separation, for connecting further PROFINET IO RT devices, or for high-speed communication as an I-Device
- OPC UA server and client as runtime option for the easy connection of SIMATIC S7-1500 to third-party devices/ systems with the functions:
  - OPC UA Data Access,
  - OPC UA Security,
  - OPC UA Methods Call,
  - Support of OPC UA Companion specifications.
- Isochronous mode centrally and distributed
- Integrated motion control functionalities for controlling speed-controlled, positioning and synchronized axes (gearing and camming), support for external encoders, output cams/cam tracks and probes.
  Technology object for controlling kinematics with up to 4 interpolating axes, e.g. Cartesian portal, delta picker, roll picker, articulated arm, cylindrical robot, tripod picker and SCARA.
  User-defined kinematics are also supported.
- Integrated web server for diagnostics with the option of creating user-defined web pages

Note:

SIMATIC memory card required for operation of the CPU.

Overview CPU 1515TF-2 PN



- The CPU for standard and fail-safe applications with medium to high requirements regarding program/data storage in the S7-1500T Controller product range
- Medium to high processing speed for binary and floating-point arithmetic
- Used as central controller in production lines with central and distributed I/O
- Can be used for safety functions up to SIL 3 according to IEC 61508 and up to PLe according to ISO 13849
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET IO controller
- Additional PROFINET interface with separate IP address for network separation, for connecting further PROFINET IO RT devices, or for high-speed communication as an I-Device
- OPC UA server and client as runtime option for the easy connection of SIMATIC S7-1500 to third-party devices/ systems with the functions:
  - OPC UA Data Access,
  - OPC UA Security,
  - OPC UA Methods Call,
  - Support of OPC UA Companion specifications.
- Isochronous mode centrally and distributed
- Integrated motion control functionalities for controlling speed-controlled, positioning and synchronized axes (gearing and camming), support for external encoders, output cams/cam tracks and probes.
  Technology object for controlling kinematics with up to 4 interpolating axes, e.g. Cartesian portal, delta picker, roll picker, articulated arm, cylindrical robot, tripod picker and SCARA.
  User-defined kinematics are also supported.
- Integrated web server for diagnostics with the option of creating user-defined web pages

Note:

SIMATIC memory card required for operation of the CPU.

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Overview CPU 1516T-3 PN/DP



- The CPU with a very large program and data memory in the S7-1500 controller product range for applications with high requirements regarding program scope and networking.
- High processing speed for binary and floating-point arithmetic
- For cross-industry automation tasks in series machines, special machines and plant construction
- Used as central controller in production lines with central and distributed I/O
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET.
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET IO controller.
- Additional PROFINET interface with separate IP address for network separation, for connecting further PROFINET IO RT devices, or for high-speed communication as an I-Device
- PROFIBUS DP master interface
- OPC UA server and client as runtime option for the easy connection of SIMATIC S7-1500 to third-party devices/ systems with the functions:
  - OPC UA Data Access,
  - OPC UA Security,
  - OPC UA Methods Call,
  - Support of OPC UA Companion specifications.
- Isochronous mode centrally and distributed on PROFIBUS and PROFINET
- Integrated motion control functionalities for controlling speed-controlled, positioning and synchronized axes (gearing and camming), support for external encoders, output cams/cam tracks and probes.
  Technology object for controlling kinematics with up to 4 interpolating axes, e.g. Cartesian portal, delta picker, roll picker, articulated arm, cylindrical robot, tripod picker and SCARA.
  User-defined kinematics are also supported.
- Integrated web server for diagnostics with the option of creating user-defined web pages

Note:

SIMATIC memory card required for operation of the CPU.

Overview CPU 1516TF-3 PN/DP



- The CPU with a large program and data memory in the S7-1500 controller product range for standard and fail-safe applications with high requirements regarding program scope and networking.
- Can be used for safety functions up to SIL 3 according to IEC 61508 and up to PLe according to ISO 13849
- High processing speed for binary and floating-point arithmetic
- For cross-industry automation tasks in series machines, special machines and plant construction
- Used as central controller in production lines with central and distributed I/O
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET IO controller
- Additional PROFINET interface with separate IP address for network separation, for connecting further PROFINET IO RT devices, or for high-speed communication as an I-Device
- PROFIBUS DP master interface
- OPC UA server and client as runtime option for the easy connection of SIMATIC S7-1500 to third-party devices/ systems with the functions:
  - OPC UA Data Access
  - OPC UA Security
  - OPC UA Methods Call
  - Support of OPC UA Companion specifications.
- Central and distributed isochronous mode on PROFIBUS and PROFINET
- Integrated motion control functionalities for controlling speed-controlled, positioning and synchronized axes (gearing and camming), support for external encoders, output cams/cam tracks and probes.
  Technology object for controlling kinematics with up to 4 interpolating axes, e.g. Cartesian portal, delta picker, roll picker, articulated arm, cylindrical robot, tripod picker and SCARA.
  User-defined kinematics are also supported.
- Integrated web server for diagnostics with the option of creating user-defined web pages

Note:

SIMATIC memory card required for operation of the CPU.

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Overview CPU 1517T-3 PN/DP



- The CPU with a very large program and data memory in the S7-1500 controller product range for applications with high requirements regarding program scope and networking.
- High processing speed for binary and floating-point arithmetic
- For cross-industry automation tasks in series machines, special machines and plant construction
- Used as central controller in production lines with central and distributed I/O
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET.
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET IO controller.
- Additional PROFINET interface with separate IP address for network separation, for connecting further PROFINET IO RT devices, or for high-speed communication as an I-Device
- PROFIBUS DP master interface
- OPC UA server and client as runtime option for the easy connection of SIMATIC S7-1500 to third-party devices/ systems with the functions:
  - OPC UA Data Access,
  - OPC UA Security,
  - OPC UA Methods Call,
  - Support of OPC UA Companion specifications.
- Isochronous mode centrally and distributed on PROFIBUS and PROFINET
- Integrated motion control functionalities for controlling speed-controlled, positioning and synchronized axes (gearing and camming), support for external encoders, output cams/cam tracks and probes.
  Technology object for controlling kinematics with up to 4 interpolating axes, e.g. Cartesian portal, delta picker, roll picker, articulated arm, cylindrical robot, tripod picker and SCARA.
  User-defined kinematics are also supported.
- Integrated web server for diagnostics with the option of creating user-defined web pages

Note:

SIMATIC memory card required for operation of the CPU.

Overview CPU 1517TF-3 PN/DP



- The CPU with a very large program and data memory in the S7-1500 controller product range for failsafe applications with high requirements regarding program scope and networking.
- Can be used for safety functions up to SIL 3 according to IEC 61508 and up to PLe according to ISO 13849
- High processing speed for binary and floating-point arithmetic
- For cross-industry automation tasks in series machines, special machines and plant construction
- Used as central controller in production lines with central and distributed I/O
- PROFINET IO IRT interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET.
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET IO controller.
- Additional PROFINET interface with separate IP address for network separation, for connecting further PROFINET IO RT devices, or for high-speed communication as an I-Device
- PROFIBUS DP master interface
- OPC UA server and client as runtime option for the easy connection of SIMATIC S7-1500 to third-party devices/ systems with the functions:
  - OPC UA Data Access,
  - OPC UA Security,
  - OPC UA Methods Call,
  - Support of OPC UA Companion specifications.
- Isochronous mode centrally and distributed on PROFIBUS and PROFINET
- Integrated motion control functionalities for controlling speed-controlled, positioning and synchronized axes (gearing and camming), support for external encoders, output cams/cam tracks and probes.
  Technology object for controlling kinematics with up to 4 interpolating axes, e.g. Cartesian portal, delta picker, roll picker, articulated arm, cylindrical robot, tripod picker and SCARA.
  User-defined kinematics are also supported.
- Integrated web server for diagnostics with the option of creating user-defined web pages

Note:

SIMATIC memory card required for operation of the CPU.

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Technical specifications

Article number	**6ES7511-1TK01-0AB0**	**6ES7515-2TM01-0AB0**	**6ES7516-3TN00-0AB0**	**6ES7517-3TP00-0AB0**
	CPU 1511T-1PN, 225KB progr., 1MB data	CPU 1515T-2 PN, 750KB progr, 3MB data	CPU 1516T-3 PN/DP, 1.5MB prog./5MB data	CPU 1517T-3 PN/DP, 3MB prog./8MB data
General information				
Product type designation	CPU 1511T-1 PN	CPU 1515T-2 PN	CPU 1516T-3 PN/DP	CPU 1517T-3 PN/DP
Engineering with				
• STEP 7 TIA Portal configurable/ integrated as of version	V15.1 (FW V2.6)/V14 (FW V2.0) or higher	V15.1 (FW V2.6)/V14 (FW V2.0) or higher	V15.1 (FW V2.6) / V15 (FW V2.5) or higher	V15.1 (FW V2.6)/V14 (FW V2.0) or higher
Display				
Screen diagonal [cm]	3.45 cm	6.1 cm	6.1 cm	6.1 cm
Supply voltage				
Type of supply voltage	24 V DC	24 V DC	24 V DC	24 V DC
Memory				
Work memory				
• integrated (for program)	225 kbyte	750 kbyte	1.5 Mbyte	3 Mbyte
• integrated (for data)	1 Mbyte	3 Mbyte	5 Mbyte	8 Mbyte
Load memory				
• Plug-in (SIMATIC memory card), max.	32 Gbyte	32 Gbyte	32 Gbyte	32 Gbyte
CPU processing times				
for bit operations, typ.	60 ns	30 ns	10 ns	2 ns
for word operations, typ.	72 ns	36 ns	12 ns	3 ns
for fixed point arithmetic, typ.	96 ns	48 ns	16 ns	3 ns
for floating point arithmetic, typ.	384 ns	192 ns	64 ns	12 ns
Counters, timers and their retentivity				
S7 counter				
• Number	2 048	2 048	2 048	2 048
IEC counter				
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)	Any (only limited by the main memory)	Any (only limited by the main memory)
S7 times				
• Number	2 048	2 048	2 048	2 048
IEC timer				
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)	Any (only limited by the main memory)	Any (only limited by the main memory)
Data areas and their retentivity				
Flag				
• Number, max.	16 kbyte	16 kbyte	16 kbyte	16 kbyte
Address area				
I/O address area				
• Inputs	32 kbyte; All inputs are in the process image	32 kbyte; All inputs are in the process image	32 kbyte; All inputs are in the process image	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image	32 kbyte; All outputs are in the process image	32 kbyte; All outputs are in the process image	32 kbyte; All outputs are in the process image
Time of day				
Clock				
• Type	Hardware clock	Hardware clock	Hardware clock	Hardware clock
1. Interface				
Interface types				
• Number of ports	2	2	2	2
• integrated switch	Yes	Yes	Yes	Yes
• RJ 45 (Ethernet)	Yes; X1	Yes; X1	Yes; X1	Yes; X1
Protocols				
• IP protocol	Yes; IPv4	Yes; IPv4	Yes; IPv4	Yes; IPv4
• PROFINET IO controller	Yes	Yes	Yes	Yes
• PROFINET IO Device	Yes	Yes	Yes	Yes
• SIMATIC communication	Yes	Yes	Yes	Yes
• Open IE communication	Yes	Yes	Yes	Yes
• Web server	Yes	Yes	Yes	Yes
• Media redundancy	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0

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Technical specifications (continued)

Article number	6ES7511-1TK01-0AB0 CPU 1511T-1PN, 225KB progr., 1MB data	6ES7515-2TM01-0AB0 CPU 1515T-2 PN, 750KB progr, 3MB data	6ES7516-3TN00-0AB0 CPU 1516T-3 PN/DP, 1.5MB prog./5MB data	6ES7517-3TP00-0AB0 CPU 1517T-3 PN/DP, 3MB prog./8MB data
PROFINET IO controller				
Services				
- PG/OP communication	Yes	Yes	Yes	Yes
- S7 routing	Yes	Yes	Yes	Yes
- Isochronous mode	Yes	Yes	Yes	Yes
- Open IE communication	Yes	Yes	Yes	Yes
- IRT	Yes	Yes	Yes	Yes
- MRP	Yes; As MRP redundancy manager and/or MRP client; max. number of devices in the ring: 50	Yes; As MRP redundancy manager and/or MRP client; max. number of devices in the ring: 50	Yes; As MRP redundancy manager and/or MRP client; max. number of devices in the ring: 50	Yes; As MRP redundancy manager and/or MRP client; max. number of devices in the ring: 50
- MRPD	Yes; Requirement: IRT	Yes; Requirement: IRT	Yes; Requirement: IRT	Yes; Requirement: IRT
- PROFIenergy	Yes	Yes	Yes	Yes
- Prioritized startup	Yes; Max. 32 PROFINET devices	Yes; Max. 32 PROFINET devices	Yes; Max. 32 PROFINET devices	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	128; In total, up to 256 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	256; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	256; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	512; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64	64	64	64
- Number of connectable IO Devices for RT, max.	128	256	256	512
- of which in line, max.	128	256	256	512
- Number of IO Devices that can be simultaneously activated/ deactivated, max.	8; in total across all interfaces	8; in total across all interfaces	8; in total across all interfaces	8; in total across all interfaces
- Number of IO Devices per tool, max.	8	8	8	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
Update time for IRT				
- for send cycle of 250 µs	250 µs to 4 ms; Note: In the case of IRT with isochronous mode, the minimum update time of 625 µs of the isochronous OB is decisive	250 µs to 4 ms; Note: In the case of IRT with isochronous mode, the minimum update time of 500 µs of the isochronous OB is decisive	250 µs to 4 ms; Note: In the case of IRT with isochronous mode, the minimum update time of 500 µs of the isochronous OB is decisive	250 µs to 4 ms
- for send cycle of 500 µs	500 µs to 8 ms; Note: In the case of IRT with isochronous mode, the minimum update time of 625 µs of the isochronous OB is decisive	500 µs to 8 ms	500 µs to 8 ms	500 µs to 8 ms
- for send cycle of 1 ms	1 ms to 16 ms	1 ms to 16 ms	1 ms to 16 ms	1 ms to 16 ms
- for send cycle of 2 ms	2 ms to 32 ms	2 ms to 32 ms	2 ms to 32 ms	2 ms to 32 ms
- for send cycle of 4 ms	4 ms to 64 ms	4 ms to 64 ms	4 ms to 64 ms	4 ms to 64 ms
- With IRT and parameterization of "odd" send cycles	Update time = set "odd" send clock (any multiple of 125 µs: 375 µs, 625 µs ... 3 875 µs)	Update time = set "odd" send clock (any multiple of 125 µs: 375 µs, 625 µs ... 3 875 µs)	Update time = set "odd" send clock (any multiple of 125 µs: 375 µs, 625 µs ... 3 875 µs)	Update time = set "odd" send clock (any multiple of 125 µs: 375 µs, 625 µs ... 3 875 µs)
Update time for RT				
- for send cycle of 250 µs	250 µs to 128 ms	250 µs to 128 ms	250 µs to 128 ms	250 µs to 128 ms
- for send cycle of 500 µs	500 µs to 256 ms	500 µs to 256 ms	500 µs to 256 ms	500 µs to 256 ms
- for send cycle of 1 ms	1 ms to 512 ms	1 ms to 512 ms	1 ms to 512 ms	1 ms to 512 ms
- for send cycle of 2 ms	2 ms to 512 ms	2 ms to 512 ms	2 ms to 512 ms	2 ms to 512 ms
- for send cycle of 4 ms	4 ms to 512 ms	4 ms to 512 ms	4 ms to 512 ms	4 ms to 512 ms

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Technical specifications (continued)

Article number	**6ES7511-1TK01-0AB0** CPU 1511T-1PN, 225KB progr., 1MB data	**6ES7515-2TM01-0AB0** CPU 1515T-2 PN, 750KB progr, 3MB data	**6ES7516-3TN00-0AB0** CPU 1516T-3 PN/DP, 1.5MB prog./5MB data	**6ES7517-3TP00-0AB0** CPU 1517T-3 PN/DP, 3MB prog./8MB data
PROFINET IO Device				
Services				
- PG/OP communication	Yes	Yes	Yes	Yes
- S7 routing	Yes	Yes	Yes	Yes
- Isochronous mode	No	No	No	No
- Open IE communication	Yes	Yes	Yes	Yes
- IRT	Yes	Yes	Yes	Yes
- MRP	Yes; As MRP redundancy manager and/or MRP client; max. number of devices in the ring: 50	Yes; As MRP redundancy manager and/or MRP client; max. number of devices in the ring: 50	Yes; As MRP redundancy manager and/or MRP client; max. number of devices in the ring: 50	Yes; As MRP redundancy manager and/or MRP client; max. number of devices in the ring: 50
- MRPD	Yes; Requirement: IRT	Yes; Requirement: IRT	Yes; Requirement: IRT	Yes; Requirement: IRT
- PROFIenergy	Yes	Yes	Yes	Yes
- Shared device	Yes	Yes	Yes	Yes
- Number of IO controllers with shared device, max.	4	4	4	4
- Asset management record	Yes; Per user program	Yes; Per user program	Yes; Per user program	Yes; Per user program
2. Interface				
Interface types				
• Number of ports		1	1	1
• integrated switch		No	No	No
• RJ 45 (Ethernet)		Yes; X2	Yes; X2	Yes; X2
Protocols				
• IP protocol		Yes; IPv4	Yes; IPv4	Yes; IPv4
• PROFINET IO controller		Yes	Yes	Yes
• PROFINET IO Device		Yes	Yes	Yes
• SIMATIC communication		Yes	Yes	Yes
• Open IE communication		Yes	Yes	Yes
• Web server		Yes	Yes	Yes
• Media redundancy		No	No	No
PROFINET IO controller				
Services				
- PG/OP communication		Yes	Yes	Yes
- S7 routing		Yes	Yes	Yes
- Isochronous mode		No	No	No
- Open IE communication		Yes	Yes	Yes
- IRT		No	No	No
- MRP		No	No	No
- MRPD		No	No	No
- PROFIenergy		Yes	Yes	Yes
- Prioritized startup		No	No	No
- Number of connectable IO Devices, max.		32; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	32; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	128; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Number of connectable IO Devices for RT, max.		32	32	128
- of which in line, max.		32	32	128
- Number of IO Devices that can be simultaneously activated/ deactivated, max.		8; in total across all interfaces	8; in total across all interfaces	8; in total across all interfaces
- Number of IO Devices per tool, max.		8	8	8
- Updating times		The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data

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Technical specifications (continued)

Article number	6ES7511-1TK01-0AB0 CPU 1511T-1PN, 225KB progr., 1MB data	6ES7515-2TM01-0AB0 CPU 1515T-2 PN, 750KB progr, 3MB data	6ES7516-3TN00-0AB0 CPU 1516T-3 PN/DP, 1.5MB prog./5MB data	6ES7517-3TP00-0AB0 CPU 1517T-3 PN/DP, 3MB prog./8MB data
Update time for RT				
- for send cycle of 1 ms		1 ms to 512 ms	1 ms to 512 ms	1 ms to 512 ms
PROFINET IO Device				
Services				
- PG/OP communication		Yes	Yes	Yes
- S7 routing		Yes	Yes	Yes
- Isochronous mode		No	No	No
- Open IE communication		Yes	Yes	Yes
- IRT		No	No	No
- MRP		No	No	No
- MRPD		No	No	No
- PROFIenergy		Yes	Yes	Yes
- Prioritized startup		No	No	No
- Shared device		Yes	Yes	Yes
- Number of IO controllers with shared device, max.		4	4	4
- Asset management record		Yes; Per user program	Yes; Per user program	Yes; Per user program
3. Interface				
Interface types				
• Number of ports			1	1
• RS 485			Yes; X3	Yes; X3
Protocols				
• PROFIBUS DP master			Yes	Yes
• PROFIBUS DP slave			No	No
• SIMATIC communication			Yes	Yes
Protocols				
Number of connections				
• Number of connections, max.	96; via integrated interfaces of the CPU and connected CPs / CMs	192; via integrated interfaces of the CPU and connected CPs / CMs	256; via integrated interfaces of the CPU and connected CPs / CMs	320; via integrated interfaces of the CPU and connected CPs / CMs
PROFINET IO controller				
Services				
- Number of connectable IO Devices, max.	128; In total, up to 256 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET			
- Of which IO devices with IRT, max.	64			
- Number of connectable IO Devices for RT, max.	128			
PROFIBUS DP master				
Services				
- Number of DP slaves			125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
OPC UA				
• OPC UA client	Yes	Yes	Yes	Yes
• OPC UA server	Yes; Data access (read, write, subscribe), method call, custom address space	Yes; Data access (read, write, subscribe), method call, custom address space	Yes; Data access (read, write, subscribe), method call, custom address space	Yes; Data access (read, write, subscribe), method call, custom address space
Isochronous mode				
Isochronous operation (application synchronized up to terminal)	Yes; Distributed and central; with minimum OB 6x cycle of 625 µs (distributed) and 1 ms (central)	Yes; Distributed and central; with minimum OB 6x cycle of 500 µs (distributed) and 1 ms (central)	Yes; Distributed and central; with minimum OB 6x cycle of 375 µs (distributed) and 1 ms (central)	Yes; Distributed and central; with minimum OB 6x cycle of 250 µs (distributed) and 1 ms (central)

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Technical specifications (continued)

Article number	**6ES7511-1TK01-0AB0** CPU 1511T-1PN, 225KB progr., 1MB data	**6ES7515-2TM01-0AB0** CPU 1515T-2 PN, 750KB progr, 3MB data	**6ES7516-3TN00-0AB0** CPU 1516T-3 PN/DP, 1.5MB prog./5MB data	**6ES7517-3TP00-0AB0** CPU 1517T-3 PN/DP, 3MB prog./8MB data
Supported technology objects				
Motion control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool or SIZER	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool or SIZER	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool or SIZER	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool or SIZER
• Number of available motion control resources for technology objects (except cam disks)	800	2 400	6 400	10 240
• Required motion control resources				
- per speed-controlled axis	40	40	40	40
- per positioning axis	80	80	80	80
- per synchronous axis	160	160	160	160
- per external encoder	80	80	80	80
- per output cam	20	20	20	20
- per cam track	160	160	160	160
- per probe	40	40	40	40
• Number of available Extended motion control resources for technology objects	40	120	192	256
• Required Extended motion control resources				
- for each cam	2	2	2	2
- for each set of kinematics	30	30	30	30
Controller				
• PID_Compact	Yes; Universal PID controller with integrated optimization	Yes; Universal PID controller with integrated optimization	Yes; Universal PID controller with integrated optimization	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves	Yes; PID controller with integrated optimization for valves	Yes; PID controller with integrated optimization for valves	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature	Yes; PID controller with integrated optimization for temperature	Yes; PID controller with integrated optimization for temperature	Yes; PID controller with integrated optimization for temperature
Counting and measuring				
• High-speed counter	Yes	Yes	Yes	Yes
Ambient conditions				
Ambient temperature during operation				
• horizontal installation, min.	0 °C	0 °C	0 °C	0 °C
• horizontal installation, max.	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off
• vertical installation, min.	0 °C	0 °C	0 °C	0 °C
• vertical installation, max.	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off
Configuration				
Programming				
Programming language				
- LAD	Yes	Yes	Yes	Yes
- FBD	Yes	Yes	Yes	Yes
- STL	Yes	Yes	Yes	Yes
- SCL	Yes	Yes	Yes	Yes
- GRAPH	Yes	Yes	Yes	Yes
Know-how protection				
• User program protection/password protection	Yes	Yes	Yes	Yes
• Copy protection	Yes	Yes	Yes	Yes
• Block protection	Yes	Yes	Yes	Yes

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Technical specifications (continued)

Article number	**6ES7511-1TK01-0AB0** CPU 1511T-1PN, 225KB progr., 1MB data	**6ES7515-2TM01-0AB0** CPU 1515T-2 PN, 750KB progr, 3MB data	**6ES7516-3TN00-0AB0** CPU 1516T-3 PN/DP, 1.5MB prog./5MB data	**6ES7517-3TP00-0AB0** CPU 1517T-3 PN/DP, 3MB prog./8MB data
Access protection				
• Password for display	Yes	Yes	Yes	Yes
• Protection level: Write protection	Yes	Yes	Yes	Yes
• Protection level: Read/write protection	Yes	Yes	Yes	Yes
• Protection level: Complete protection	Yes	Yes	Yes	Yes
Dimensions				
Width	35 mm	70 mm	175 mm	175 mm
Height	147 mm	147 mm	147 mm	147 mm
Depth	129 mm	129 mm	129 mm	129 mm
Weights				
Weight, approx.	430 g	830 g	1 978 g	1 978 g

Article number	**6ES7511-1UK01-0AB0** CPU 1511TF-1PN, 225KB progr., 1MB data	**6ES7515-2UM01-0AB0** CPU 1515TF-2 PN, 750KB progr, 3MB data	**6ES7516-3UN00-0AB0** CPU 1516TF-3 PN/DP, 1.5MB prog./5MB data	**6ES7517-3UP00-0AB0** CPU 1517TF-3 PN/DP, 3MB prog., 8MB data
General information				
Product type designation	CPU 1511TF-1 PN	CPU 1515TF-2 PN	CPU 1516TF-3 PN/DP	CPU 1517TF-3 PN/DP
Engineering with				
• STEP 7 TIA Portal configurable/ integrated as of version	V15.1 (FW V2.6) / V14 SP1 (FW V2.1) or higher	V15.1 (FW V2.6) / V14 SP1 (FW V2.1) or higher	V15.1 (FW V2.6) / V15 (FW V2.5) or higher	V15.1 (FW V2.6)/V14 (FW V2.0) or higher
Display				
Screen diagonal [cm]	3.45 cm	6.1 cm	6.1 cm	6.1 cm
Supply voltage				
Type of supply voltage	24 V DC	24 V DC	24 V DC	24 V DC
Memory				
Work memory				
• integrated (for program)	225 kbyte	750 kbyte	1.5 Mbyte	3 Mbyte
• integrated (for data)	1 Mbyte	3 Mbyte	5 Mbyte	8 Mbyte
Load memory				
• Plug-in (SIMATIC memory card), max.	32 Gbyte	32 Gbyte	32 Gbyte	32 Gbyte
CPU processing times				
for bit operations, typ.	60 ns	30 ns	10 ns	2 ns
for word operations, typ.	72 ns	36 ns	12 ns	3 ns
for fixed point arithmetic, typ.	96 ns	48 ns	16 ns	3 ns
for floating point arithmetic, typ.	384 ns	192 ns	64 ns	12 ns
Counters, timers and their retentivity				
S7 counter				
• Number	2 048	2 048	2 048	2 048
IEC counter				
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)	Any (only limited by the main memory)	Any (only limited by the main memory)
S7 times				
• Number	2 048	2 048	2 048	2 048
IEC timer				
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)	Any (only limited by the main memory)	Any (only limited by the main memory)
Data areas and their retentivity				
Flag				
• Number, max.	16 kbyte	16 kbyte	16 kbyte	16 kbyte
Address area				
I/O address area				
• Inputs	32 kbyte; All inputs are in the process image	32 kbyte; All inputs are in the process image	32 kbyte; All inputs are in the process image	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image	32 kbyte; All outputs are in the process image	32 kbyte; All outputs are in the process image	32 kbyte; All outputs are in the process image

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Technical specifications (continued)

Article number	**6ES7511-1UK01-0AB0** CPU 1511TF-1PN, 225KB progr., 1MB data	**6ES7515-2UM01-0AB0** CPU 1515TF-2 PN, 750KB progr, 3MB data	**6ES7516-3UN00-0AB0** CPU 1516TF-3 PN/DP, 1.5MB prog./5MB data	**6ES7517-3UP00-0AB0** CPU 1517TF-3 PN/DP, 3MB prog., 8MB data
Time of day				
Clock				
• Type	Hardware clock	Hardware clock	Hardware clock	Hardware clock
1. Interface				
Interface types				
• Number of ports	2	2	2	2
• integrated switch	Yes	Yes	Yes	Yes
• RJ 45 (Ethernet)	Yes; X1	Yes; X1	Yes; X1	Yes; X1
Protocols				
• IP protocol	Yes; IPv4	Yes; IPv4	Yes; IPv4	Yes; IPv4
• PROFINET IO controller	Yes	Yes	Yes	Yes
• PROFINET IO Device	Yes	Yes	Yes	Yes
• SIMATIC communication	Yes	Yes	Yes	Yes
• Open IE communication	Yes	Yes	Yes	Yes
• Web server	Yes	Yes	Yes	Yes
• Media redundancy	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0
PROFINET IO controller				
Services				
- PG/OP communication	Yes	Yes	Yes	Yes
- S7 routing	Yes	Yes	Yes	Yes
- Isochronous mode	Yes	Yes	Yes	Yes
- Open IE communication	Yes	Yes	Yes	Yes
- IRT	Yes	Yes	Yes	Yes
- MRP	Yes; As MRP redundancy manager and/or MRP client; max. number of devices in the ring: 50	Yes; As MRP redundancy manager and/or MRP client; max. number of devices in the ring: 50	Yes; As MRP redundancy manager and/or MRP client; max. number of devices in the ring: 50	Yes; As MRP redundancy manager and/or MRP client; max. number of devices in the ring: 50
- MRPD	Yes; Requirement: IRT	Yes; Requirement: IRT	Yes; Requirement: IRT	Yes; Requirement: IRT
- PROFIenergy	Yes	Yes	Yes	Yes
- Prioritized startup	Yes; Max. 32 PROFINET devices	Yes; Max. 32 PROFINET devices	Yes; Max. 32 PROFINET devices	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	128; In total, up to 256 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	256; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	256; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	512; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64	64	64	64
- Number of connectable IO Devices for RT, max.	128	256	256	512
- of which in line, max.	128	256	256	512
- Number of IO Devices that can be simultaneously activated/ deactivated, max.	8; in total across all interfaces	8; in total across all interfaces	8; in total across all interfaces	8; in total across all interfaces
- Number of IO Devices per tool, max.	8	8	8	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data

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Technical specifications (continued)

Article number	6ES7511-1UK01-0AB0 CPU 1511TF-1PN, 225KB progr., 1MB data	6ES7515-2UM01-0AB0 CPU 1515TF-2 PN, 750KB progr, 3MB data	6ES7516-3UN00-0AB0 CPU 1516TF-3 PN/DP, 1.5MB prog./5MB data	6ES7517-3UP00-0AB0 CPU 1517TF-3 PN/DP, 3MB prog., 8MB data
Update time for IRT				
- for send cycle of 250 µs	250 µs to 4 ms; Note: In the case of IRT with isochronous mode, the minimum update time of 625 µs of the isochronous OB is decisive	250 µs to 4 ms; Note: In the case of IRT with isochronous mode, the minimum update time of 500 µs of the isochronous OB is decisive	250 µs to 4 ms; Note: In the case of IRT with isochronous mode, the minimum update time of 500 µs of the isochronous OB is decisive	250 µs to 4 ms
- for send cycle of 500 µs	500 µs to 8 ms; Note: In the case of IRT with isochronous mode, the minimum update time of 625 µs of the isochronous OB is decisive	500 µs to 8 ms	500 µs to 8 ms	500 µs to 8 ms
- for send cycle of 1 ms	1 ms to 16 ms	1 ms to 16 ms	1 ms to 16 ms	1 ms to 16 ms
- for send cycle of 2 ms	2 ms to 32 ms	2 ms to 32 ms	2 ms to 32 ms	2 ms to 32 ms
- for send cycle of 4 ms	4 ms to 64 ms	4 ms to 64 ms	4 ms to 64 ms	4 ms to 64 ms
- With IRT and parameterization of "odd" send cycles	Update time = set "odd" send clock (any multiple of 125 µs: 375 µs, 625 µs ... 3 875 µs)	Update time = set "odd" send clock (any multiple of 125 µs: 375 µs, 625 µs ... 3 875 µs)	Update time = set "odd" send clock (any multiple of 125 µs: 375 µs, 625 µs ... 3 875 µs)	Update time = set "odd" send clock (any multiple of 125 µs: 375 µs, 625 µs ... 3 875 µs)
Update time for RT				
- for send cycle of 250 µs	250 µs to 128 ms	250 µs to 128 ms	250 µs to 128 ms	250 µs to 128 ms
- for send cycle of 500 µs	500 µs to 256 ms	500 µs to 256 ms	500 µs to 256 ms	500 µs to 256 ms
- for send cycle of 1 ms	1 ms to 512 ms	1 ms to 512 ms	1 ms to 512 ms	1 ms to 512 ms
- for send cycle of 2 ms	2 ms to 512 ms	2 ms to 512 ms	2 ms to 512 ms	2 ms to 512 ms
- for send cycle of 4 ms	4 ms to 512 ms	4 ms to 512 ms	4 ms to 512 ms	4 ms to 512 ms
PROFINET IO Device				
Services				
- PG/OP communication	Yes	Yes	Yes	Yes
- S7 routing	Yes	Yes	Yes	Yes
- Isochronous mode	No	No	No	No
- Open IE communication	Yes	Yes	Yes	Yes
- IRT	Yes	Yes	Yes	Yes
- MRP	Yes; As MRP redundancy manager and/or MRP client; max. number of devices in the ring: 50	Yes; As MRP redundancy manager and/or MRP client; max. number of devices in the ring: 50	Yes; As MRP redundancy manager and/or MRP client; max. number of devices in the ring: 50	Yes; As MRP redundancy manager and/or MRP client; max. number of devices in the ring: 50
- MRPD	Yes; Requirement: IRT	Yes; Requirement: IRT	Yes; Requirement: IRT	Yes; Requirement: IRT
- PROFIenergy	Yes	Yes	Yes	Yes
- Shared device	Yes	Yes	Yes	Yes
- Number of IO controllers with shared device, max.	4	4	4	4
- Asset management record	Yes; Per user program	Yes; Per user program	Yes; Per user program	Yes; Per user program
2. Interface				
Interface types				
• Number of ports		1	1	1
• integrated switch		No	No	No
• RJ 45 (Ethernet)		Yes; X2	Yes; X2	Yes; X2
Protocols				
• IP protocol		Yes; IPv4	Yes; IPv4	Yes; IPv4
• PROFINET IO controller		Yes	Yes	Yes
• PROFINET IO Device		Yes	Yes	Yes
• SIMATIC communication		Yes	Yes	Yes
• Open IE communication		Yes	Yes	Yes
• Web server		Yes	Yes	Yes
• Media redundancy		No	No	No

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Technical specifications (continued)

Article number	**6ES7511-1UK01-0AB0** CPU 1511TF-1PN, 225KB progr., 1MB data	**6ES7515-2UM01-0AB0** CPU 1515TF-2 PN, 750KB progr, 3MB data	**6ES7516-3UN00-0AB0** CPU 1516TF-3 PN/DP, 1.5MB prog./5MB data	**6ES7517-3UP00-0AB0** CPU 1517TF-3 PN/DP, 3MB prog., 8MB data
PROFINET IO controller				
Services				
- PG/OP communication		Yes	Yes	Yes
- S7 routing		Yes	Yes	Yes
- Isochronous mode		No	No	No
- Open IE communication		Yes	Yes	Yes
- IRT		No	No	No
- MRP		No	No	No
- MRPD		No	No	No
- PROFIenergy		Yes	Yes	Yes
- Prioritized startup		No	No	No
- Number of connectable IO Devices, max.		32; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	32; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	128; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Number of connectable IO Devices for RT, max.		32	32	128
- of which in line, max.		32	32	128
- Number of IO Devices that can be simultaneously activated/deactivated, max.		8; in total across all interfaces	8; in total across all interfaces	8; in total across all interfaces
- Number of IO Devices per tool, max.		8	8	8
- Updating times		The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
Update time for RT				
- for send cycle of 1 ms		1 ms to 512 ms	1 ms to 512 ms	1 ms to 512 ms
PROFINET IO Device				
Services				
- PG/OP communication		Yes	Yes	Yes
- S7 routing		Yes	Yes	Yes
- Isochronous mode		No	No	No
- Open IE communication		Yes	Yes	Yes
- IRT		No	No	No
- MRP		No	No	No
- MRPD		No	No	No
- PROFIenergy		Yes	Yes	Yes
- Prioritized startup		No	No	No
- Shared device		Yes	Yes	Yes
- Number of IO controllers with shared device, max.		4	4	4
- Asset management record		Yes; Per user program	Yes; Per user program	Yes; Per user program
3. Interface				
Interface types				
• Number of ports			1	1
• RS 485			Yes; X3	Yes; X3
Protocols				
• PROFIBUS DP master			Yes	Yes
• PROFIBUS DP slave			No	No
• SIMATIC communication			Yes	Yes
Protocols				
Number of connections				
• Number of connections, max.	96; via integrated interfaces of the CPU and connected CPs / CMs	192; via integrated interfaces of the CPU and connected CPs / CMs	256; via integrated interfaces of the CPU and connected CPs / CMs	320; via integrated interfaces of the CPU and connected CPs / CMs

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Technical specifications (continued)

Article number	6ES7511-1UK01-0AB0 CPU 1511TF-1PN, 225KB progr., 1MB data	6ES7515-2UM01-0AB0 CPU 1515TF-2 PN, 750KB progr, 3MB data	6ES7516-3UN00-0AB0 CPU 1516TF-3 PN/DP, 1.5MB prog./5MB data	6ES7517-3UP00-0AB0 CPU 1517TF-3 PN/DP, 3MB prog., 8MB data
PROFINET IO controller				
Services				
- Number of connectable IO Devices, max.	128; In total, up to 256 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET			
- Of which IO devices with IRT, max.	64			
- Number of connectable IO Devices for RT, max.	128			
PROFIBUS DP master				
Services				
- Number of DP slaves			125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET	125; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
OPC UA				
• OPC UA client	Yes	Yes	Yes	Yes
• OPC UA server	Yes; Data access (read, write, subscribe), method call, custom address space	Yes; Data access (read, write, subscribe), method call, custom address space	Yes; Data access (read, write, subscribe), method call, custom address space	Yes; Data access (read, write, subscribe), method call, custom address space
Isochronous mode				
Isochronous operation (application synchronized up to terminal)	Yes; Distributed and central; with minimum OB 6x cycle of 625 µs (distributed) and 1 ms (central)	Yes; Distributed and central; with minimum OB 6x cycle of 500 µs (distributed) and 1 ms (central)	Yes; Distributed and central; with minimum OB 6x cycle of 375 µs (distributed) and 1 ms (central)	Yes; Distributed and central; with minimum OB 6x cycle of 250 µs (distributed) and 1 ms (central)
Supported technology objects				
Motion control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool or SIZER	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool or SIZER	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool or SIZER	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool or SIZER
• Number of available motion control resources for technology objects (except cam disks)	800	2 400	6 400	10 240
• Required motion control resources				
- per speed-controlled axis	40	40	40	40
- per positioning axis	80	80	80	80
- per synchronous axis	160	160	160	160
- per external encoder	80	80	80	80
- per output cam	20	20	20	20
- per cam track	160	160	160	160
- per probe	40	40	40	40
• Number of available Extended motion control resources for technology objects	40	120	192	256
• Required Extended motion control resources				
- for each cam	2	2	2	2
- for each set of kinematics	30	30	30	30
Controller				
• PID_Compact	Yes; Universal PID controller with integrated optimization	Yes; Universal PID controller with integrated optimization	Yes; Universal PID controller with integrated optimization	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves	Yes; PID controller with integrated optimization for valves	Yes; PID controller with integrated optimization for valves	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature	Yes; PID controller with integrated optimization for temperature	Yes; PID controller with integrated optimization for temperature	Yes; PID controller with integrated optimization for temperature
Counting and measuring				
• High-speed counter	Yes	Yes	Yes	Yes

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Technical specifications (continued)

Article number	6ES7511-1UK01-0AB0 CPU 1511TF-1PN, 225KB progr., 1MB data	6ES7515-2UM01-0AB0 CPU 1515TF-2 PN, 750KB progr, 3MB data	6ES7516-3UN00-0AB0 CPU 1516TF-3 PN/DP, 1.5MB prog./5MB data	6ES7517-3UP00-0AB0 CPU 1517TF-3 PN/DP, 3MB prog., 8MB data
Standards, approvals, certificates				
Highest safety class achievable in safety mode				
• Performance level according to ISO 13849-1	PLe	PLe	PLe	PLe
• SIL acc. to IEC 61508	SIL 3	SIL 3	SIL 3	SIL 3
Probability of failure (for service life of 20 years and repair time of 100 hours)				
- Low demand mode: PFDavg in accordance with SIL3	< 2.00E-05	< 2.00E-05	< 2.00E-05	< 2.00E-05
- High demand/continuous mode: PFH in accordance with SIL3	< 1.00E-09	< 1.00E-09	< 1.00E-09 1/h	< 1.00E-09 1/h
Ambient conditions				
Ambient temperature during operation				
• horizontal installation, min.	0 °C	0 °C	0 °C	0 °C
• horizontal installation, max.	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off	60 °C; Display: 50 °C, at an operating temperature of typically 50 °C, the display is switched off
• vertical installation, min.	0 °C	0 °C	0 °C	0 °C
• vertical installation, max.	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off	40 °C; Display: 40 °C, at an operating temperature of typically 40 °C, the display is switched off
Configuration				
Programming				
Programming language				
- LAD	Yes; incl. failsafe	Yes; incl. failsafe	Yes; incl. failsafe	Yes; incl. failsafe
- FBD	Yes; incl. failsafe	Yes; incl. failsafe	Yes; incl. failsafe	Yes; incl. failsafe
- STL	Yes	Yes	Yes	Yes
- SCL	Yes	Yes	Yes	Yes
- GRAPH	Yes	Yes	Yes	Yes
Know-how protection				
• User program protection/ password protection	Yes	Yes	Yes	Yes
• Copy protection	Yes	Yes	Yes	Yes
• Block protection	Yes	Yes	Yes	Yes
Access protection				
• Password for display	Yes	Yes	Yes	Yes
• Protection level: Write protection	Yes	Yes	Yes	Yes
• Protection level: Read/write protection	Yes	Yes	Yes	Yes
• Protection level: Write protection for Failsafe	Yes	Yes	Yes	Yes
• Protection level: Complete protection	Yes	Yes	Yes	Yes
Dimensions				
Width	35 mm	70 mm	175 mm	175 mm
Height	147 mm	147 mm	147 mm	147 mm
Depth	129 mm	129 mm	129 mm	129 mm
Weights				
Weight, approx.	430 g	830 g	1 978 g	1 978 g

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Ordering data	Article No.
CPU 1511T-1 PN 225 KB work memory for program, 1 MB for data, PROFINET IRT interface with 2-port switch; SIMATIC memory card required	**6ES7511-1TK01-0AB0**
CPU 1511TF-1 PN 225 KB work memory for program, 1 MB for data, PROFINET IRT interface with 2-port switch; SIMATIC memory card required	**6ES7511-1UK01-0AB0**
CPU 1515T-2 PN 750 KB work memory for program, 3 MB for data, PROFINET IRT interface with 2-port switch, Ethernet interface; SIMATIC memory card required	**6ES7515-2TM01-0AB0**
CPU 1515TF-2 PN 750 KB work memory for program, 3 MB for data, PROFINET IRT interface with 2-port switch, Ethernet interface; SIMATIC memory card required	**6ES7515-2UM01-0AB0**
CPU 1516T-3 PN/DP 1.5 MB work memory for program, 5 MB for data, PROFINET IRT interface with 2-port switch, Ethernet interface, PROFIBUS interface; SIMATIC memory card required	**6ES7516-3TN00-0AB0**
CPU 1516TF-3 PN/DP 1.5 MB work memory for program, 5 MB for data, PROFINET IRT interface with 2-port switch, Ethernet interface, PROFIBUS interface; SIMATIC memory card required	**6ES7516-3UN00-0AB0**
CPU 1517T-3 PN/DP 3 MB work memory for program, 8 MB for data, PROFINET IRT interface with 2-port switch, Ethernet interface, PROFIBUS interface; SIMATIC memory card required	**6ES7517-3TP00-0AB0**
CPU 1517TF-3 PN/DP 3 MB work memory for program, 8 MB for data, PROFINET IRT interface with 2-port switch, Ethernet interface, PROFIBUS interface; SIMATIC memory card required	**6ES7517-3UP00-0AB0**

	Article No.
Accessories	
SIMATIC memory card	
4 MB	**6ES7954-8LC03-0AA0**
12 MB	**6ES7954-8LE03-0AA0**
24 MB	**6ES7954-8LF03-0AA0**
256 MB	**6ES7954-8LL03-0AA0**
2 GB	**6ES7954-8LP02-0AA0**
32 GB	**6ES7954-8LT03-0AA0**
SIMATIC S7-1500 DIN rail	
Fixed lengths, with grounding elements	
• 160 mm	**6ES7590-1AB60-0AA0**
• 245 mm	**6ES7590-1AC40-0AA0**
• 482 mm	**6ES7590-1AE80-0AA0**
• 530 mm	**6ES7590-1AF30-0AA0**
• 830 mm	**6ES7590-1AJ30-0AA0**
For cutting to length by customer, without drill holes; grounding elements must be ordered separately	
• 2000 mm	**6ES7590-1BC00-0AA0**
PE connection element for DIN rail 2000 mm 20 units	**6ES7590-5AA00-0AA0**
Power supply	
For supplying the backplane bus of the S7-1500 controller	
24 V DC input voltage, power 25 W	**6ES7505-0KA00-0AB0**
24/48/60 V DC input voltage, power 60 W	**6ES7505-0RA00-0AB0**
24/48/60 V DC input voltage, power 60 W, buffering functionality	**6ES7505-0RB00-0AB0**
120/230 V AC input voltage, power 60 W	**6ES7507-0RA00-0AB0**
Power connector With coding element for power supply module; spare part, 10 units	**6ES7590-8AA00-0AA0**
Load power supply	
24 V DC/3 A	**6EP1332-4BA00**
24 V DC/8 A	**6EP1333-4BA00**
Power supply connector	
Spare part; for connecting the 24 V DC supply voltage	
• With push-in terminals	**6ES7193-4JB00-0AA0**
PROFIBUS FastConnect RS 485 bus connector with 90° cable outlet	
With insulation displacement, max. transmission rate 12 Mbps	
Without PG interface, grounding via control cabinet contact surface; 1 unit	**6ES7972-0BA70-0XA0**
With PG interface, grounding via control cabinet contact surface; 1 unit	**6ES7972-0BB70-0XA0**

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Ordering data	Article No.
PROFIBUS FC Standard Cable GP Standard type with special design for fast mounting, 2-wire, shielded; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	**6XV1830-0EH10**
PROFIBUS FC Robust Cable 2-wire, shielded; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	**6XV1830-0JH10**
PROFIBUS FC Flexible Cable 2-wire, shielded; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	**6XV1831-2K**
PROFIBUS FC Trailing Cable 2-wire, shielded; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	
Sheath color: Petrol	**6XV1830-3EH10**
Sheath color: Violet	**6XV1831-2L**
PROFIBUS FC Food Cable 2-wire, shielded; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	**6XV1830-0GH10**
PROFIBUS FC Ground Cable 2-wire, shielded; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	**6XV1830-3FH10**
PROFIBUS FC FRNC Cable GP 2-wire, shielded, flame-retardant, with copolymer outer sheath FRNC; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	**6XV1830-0LH10**
PROFIBUS FastConnect stripping tool Preadjusted stripping tool for fast stripping of PROFIBUS FastConnect bus cables	**6GK1905-6AA00**
IE FC RJ45 plugs RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables	
IE FC RJ45 plug 180 180° cable outlet	
1 unit	**6GK1901-1BB10-2AA0**
10 units	**6GK1901-1BB10-2AB0**
50 units	**6GK1901-1BB10-2AE0**
IE FC TP Standard Cable GP 2x2 4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/ IE FC RJ45 plug; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	**6XV1840-2AH10**
IE FC TP Trailing Cable 2 x 2 (Type C) 4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/ IE FC RJ45 plug 180/90 for use as trailing cable; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	**6XV1840-3AH10**
IE FC TP Marine Cable 2 x 2 (Type B) 4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/ IE FC RJ45 plug 180/90 with marine approval; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	**6XV1840-4AH10**
IE FC stripping tool Preadjusted stripping tool for fast stripping of Industrial Ethernet FC cables	**6GK1901-1GA00**
Display	
For CPU 1511T-1 PN and CPU 1511TF-1 PN; spare part	**6ES7591-1AA01-0AA0**
For CPU 1515-2 PN, CPU 1515F-2 PN, CPU 1515R-2 PN, CPU 1516-3 PN/DP, CPU 1516F-3 PN/DP, CPU 1517-3 PN/DP, CPU 1517H-3 PN, CPU 1517F-3 PN/DP, CPU 1518-4 PN/DP, CPU 1518F-4 PN/DP, CPU 1518-4 PN/DP ODK and CPU 1518F-4 PN/DP ODK; spare part	**6ES7591-1BA01-0AA0**
Front cover for PROFIBUS DP interface For CPU 1517-3 PN/DP, CPU 1518-4 PN/DP, CPU 1518-4 PN/DP ODK and CPU 1518-4 PN/DP MFP; spare part	**6ES7591-8AA00-0AA0**
SIMATIC S7-1500T Starter Kit Comprising: CPU 1511T-1 PN, SIMATIC memory card 4 MB, 160 mm DIN rail, front connector, STEP 7 Professional 365-day license, PM 70 W 120/230 V AC power supply, Ethernet cable, documentation	**6ES7511-1TK01-4YB5**

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Ordering data	Article No.
STEP 7 Professional V15.1	
Target system: SIMATIC S7-1200, S7-1500, S7-300, S7-400, WinAC Requirement: Windows 7 Home Premium SP1 (64-bit) Windows 7 Professional SP1 (64-bit) Windows 7 Enterprise SP1 (64-bit) Windows 7 Ultimate SP1 (64-bit) Windows 10 Home Version 1709, 1803 Windows 10 Professional Version 1709, 1803 Windows 10 Enterprise Version 1709, 1803 Windows 10 Enterprise 2016 LTSB Windows 10 IoT Enterprise 2015 LTSB Windows 10 IoT Enterprise 2016 LTSB Windows Server 2012 R2 StdE (full installation) Windows Server 2016 Standard (full installation) Type of delivery: en, de, fr, it, es, zh	
STEP 7 Professional V15.1, floating license	**6ES7822-1AA05-0YA5**
STEP 7 Professional V15.1, floating license, software download incl. license key [1] Email address required for delivery	**6ES7822-1AE05-0YA5**

Ordering data	Article No.
STEP 7 Safety Advanced V15.1	
Task: Engineering tool for configuring and programming fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-1500F Software Controller, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller and the fail-safe ET 200SP, ET 200MP, ET 200S, ET 200M, ET 200iSP, ET 200pro and ET 200eco I/O Requirement: STEP 7 Professional V15.1	
Floating license for 1 user; software and documentation on DVD, license key on USB flash drive	**6ES7833-1FA15-0YA5**
Floating license for 1 user; software, documentation and license key for download [1]; email address required for delivery	**6ES7833-1FA15-0YH5**
SIMATIC Manual Collection	**6ES7998-8XC01-8YE0**
Electronic manuals on DVD, multi-language: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC Distributed I/O, SIMATIC HMI, SIMATIC sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	
SIMATIC Manual Collection update service for 1 year	**6ES7998-8XC01-8YE2**
Current "Manual Collection" DVD and the three subsequent updates	

[1] For up-to-date information and download availability, see: http://www.siemens.com/tia-online-software-delivery

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Overview



- 16 and 32-channel digital input modules
- For flexible adaptation of the controller to the corresponding task
- For subsequent expansion of the system with additional inputs
- 35 mm wide modules with parameters and diagnostic functions
- 25 mm wide modules for use in tight spaces: particularly economical, without parameters or diagnostic functions

Technical specifications

Article number	**6ES7521-1BH00-0AB0**	**6ES7521-1BL00-0AB0**	**6ES7521-1BH50-0AA0**	**6ES7521-1FH00-0AA0**	**6ES7521-7EH00-0AB0**
	S7-1500, DI 16X24VDC HF	S7-1500, DI 32x24VDC HF	S7-1500, DI 16X24VDC SRC BA	S7-1500, DI 16x230VAC BA	S7-1500, DI 16 X 24...125V UC HF
Engineering with					
• STEP 7 TIA Portal configurable/ integrated as of version	V13 SP1 / -	V13 SP1 / -	V12 / V12	V12 / V12	V13 SP1 / -
• STEP 7 configurable/integrated as of version	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -
• PROFIBUS as of GSD version/ GSD revision	V1.0 / V5.1	V1.0 / V5.1	V1.0 / V5.1	V1.0 / V5.1	V1.0 / V5.1
• PROFINET as of GSD version/ GSD revision	V2.3 / -	V2.3 / -	V2.3 / -	V2.3 / -	V2.3 / -
Operating mode					
• DI	Yes	Yes	Yes	Yes	Yes
• Counter	Yes	Yes	No	No	No
• Oversampling	No	No			No
• MSI	Yes	Yes	Yes	Yes	Yes
Supply voltage					
Rated value (DC)	24 V	24 V			
Reverse polarity protection	Yes	Yes			
Digital inputs					
Number of digital inputs	16	32	16	16	16
Digital inputs, parameterizable	Yes	Yes	No	No	Yes
Source/sink input	P-reading	P-reading	m-reading	P-reading	Yes
Input characteristic curve in accordance with IEC 61131, type 1				Yes	
Input characteristic curve in accordance with IEC 61131, type 3	Yes	Yes	Yes		Yes; at 24 V DC
Digital input functions, parameterizable					
• Gate start/stop	Yes	Yes			
• Freely usable digital input	Yes	Yes			
Input voltage					
• Rated value (DC)	24 V	24 V	24 V		24 V; 48 V, 125 V
• Rated value (AC)				230 V; 120/230 V AC, 50/60 Hz	24 V; 48 V, 125 V (50 - 60 Hz)
• for signal "0"	-30 to +5V	-30 to +5V	-5 to +30V	0V AC to 40V AC	-5 ... +5 V
• for signal "1"	+11 to +30V	+11 to +30V	-11 to -30V	79V AC to 264V AC	+11 ... +146 V

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Technical specifications (continued)

Article number	6ES7521-1BH00-0AB0 S7-1500, DI 16X24VDC HF	6ES7521-1BL00-0AB0 S7-1500, DI 32x24VDC HF	6ES7521-1BH50-0AA0 S7-1500, DI 16X24VDC SRC BA	6ES7521-1FH00-0AA0 S7-1500, DI 16x230VAC BA	6ES7521-7EH00-0AB0 S7-1500, DI 16 X 24...125V UC HF
Input current					
• for signal "1", typ.	2.5 mA	2.5 mA	4.5 mA	11 mA; At 230 V AC and 5.5 mA at 120 V AC	3 mA; at 24 V DC
Input delay (for rated value of input voltage)					
for standard inputs					
- parameterizable	Yes; 0.05 / 0.1 / 0.4 / 1.6 / 3.2 / 12.8 / 20 ms	Yes; 0.05 / 0.1 / 0.4 / 1.6 / 3.2 / 12.8 / 20 ms	No	No	Yes; 0.05 / 0.1 / 0.4 / 1.6 / 3.2 / 12.8 / 20 ms parameterizable with DC, 20 ms fixed with AC
for interrupt inputs					
- parameterizable	Yes	Yes	No	No	Yes
for technological functions					
- parameterizable	Yes	Yes	No	No	No
Encoder					
Connectable encoders					
• 2-wire sensor	Yes	Yes	Yes	Yes	Yes
- permissible quiescent current (2-wire sensor), max.	1.5 mA	1.5 mA	1.5 mA	2 mA	1.5 mA
Isochronous mode					
Isochronous operation (application synchronized up to terminal)	Yes	Yes	No	No	No
Filtering and processing time (TCI), min.	80 µs; At 50 µs filter time	80 µs; At 50 µs filter time			
Bus cycle time (TDP), min.	250 µs	250 µs			
Interrupts/diagnostics/ status information					
Diagnostics function	Yes	Yes	No	No	Yes
Alarms					
• Diagnostic alarm	Yes	Yes	No	No	Yes
• Hardware interrupt	Yes	Yes	No	No	Yes
Diagnostic messages					
• Monitoring the supply voltage	Yes	Yes	No	No	No
• Wire-break	Yes; to I < 350 µA	Yes; to I < 350 µA	No	No	Yes; To I < 550 µA
• Short-circuit	No	No	No	No	No
Diagnostics indication LED					
• RUN LED	Yes; Green LED	Yes; Green LED	Yes; Green LED	Yes; Green LED	Yes; Green LED
• ERROR LED	Yes; Red LED	Yes; Red LED	Yes; Red LED	Yes; Red LED	Yes; Red LED
• Monitoring of the supply voltage (PWR-LED)	Yes; Green LED	Yes; Green LED	No	No	No
• Channel status display	Yes; Green LED	Yes; Green LED	Yes; Green LED	Yes; Green LED	Yes; Green LED
• for channel diagnostics	Yes; Red LED	Yes; Red LED	No	No	Yes; Red LED
• for module diagnostics	Yes; Red LED	Yes; Red LED	No	Yes; Red LED	Yes; Red LED
Potential separation					
Potential separation channels					
• between the channels and backplane bus	Yes	Yes	Yes	Yes	Yes
Standards, approvals, certificates					
Suitable for safety functions	No	No	No	No	No

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Technical specifications (continued)

Article number	**6ES7521-1BH00-0AB0** S7-1500, DI 16X24VDC HF	**6ES7521-1BL00-0AB0** S7-1500, DI 32x24VDC HF	**6ES7521-1BH50-0AA0** S7-1500, DI 16X24VDC SRC BA	**6ES7521-1FH00-0AA0** S7-1500, DI 16x230VAC BA	**6ES7521-7EH00-0AB0** S7-1500, DI 16 X 24...125V UC HF
Ambient conditions					
Ambient temperature during operation					
• horizontal installation, min.	0 °C	0 °C	0 °C	0 °C	0 °C
• horizontal installation, max.	60 °C	60 °C	60 °C	60 °C	60 °C
• vertical installation, min.	0 °C	0 °C	0 °C	0 °C	0 °C
• vertical installation, max.	40 °C	40 °C	40 °C	40 °C	40 °C
Decentralized operation					
Prioritized startup	Yes	Yes	Yes	Yes	Yes
Dimensions					
Width	35 mm	35 mm	35 mm	35 mm	35 mm
Height	147 mm	147 mm	147 mm	147 mm	147 mm
Depth	129 mm	129 mm	129 mm	129 mm	129 mm
Weights					
Weight, approx.	240 g	260 g	230 g	300 g	240 g

Article number	**6ES7521-1BH10-0AA0** S7-1500, DI 16X24VDC BA	**6ES7521-1BL10-0AA0** S7-1500, DI 32x24VDC BA
Engineering with		
• STEP 7 TIA Portal configurable/ integrated as of version	V13 / V13	V13 / V13
• STEP 7 configurable/integrated as of version	V5.5 SP3 / -	V5.5 SP3 / -
• PROFIBUS as of GSD version/ GSD revision	V1.0 / V5.1	V1.0 / V5.1
• PROFINET as of GSD version/ GSD revision	V2.3 / -	V2.3 / -
Operating mode		
• DI	Yes	Yes
• Counter	No	No
• MSI	Yes	Yes
Supply voltage		
Rated value (DC)	24 V	24 V
Digital inputs		
Number of digital inputs	16	32
Digital inputs, parameterizable	No	No
Source/sink input	P-reading	P-reading
Input characteristic curve in accordance with IEC 61131, type 3	Yes	Yes
Input voltage		
• Rated value (DC)	24 V	24 V
• for signal "0"	-30 to +5V	-30 to +5V
• for signal "1"	+11 to +30V	+11 to +30V
Input current		
• for signal "1", typ.	2.7 mA	2.7 mA
Input delay (for rated value of input voltage)		
for standard inputs		
- parameterizable	No	No
for interrupt inputs		
- parameterizable	No	No
for technological functions		
- parameterizable	No	No
Encoder		
Connectable encoders		
• 2-wire sensor	Yes	Yes
- permissible quiescent current (2-wire sensor), max.	1.5 mA	1.5 mA

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Technical specifications (continued)

Article number	**6ES7521-1BH10-0AA0** S7-1500, DI 16X24VDC BA	**6ES7521-1BL10-0AA0** S7-1500, DI 32x24VDC BA
Isochronous mode		
Isochronous operation (application synchronized up to terminal)	No	No
Interrupts/diagnostics/ status information		
Diagnostics function	No	No
Alarms		
• Diagnostic alarm	No	No
• Hardware interrupt	No	No
Diagnostic messages		
• Monitoring the supply voltage	No	No
• Wire-break	No	No
• Short-circuit	No	No
Diagnostics indication LED		
• RUN LED	Yes; Green LED	Yes; Green LED
• ERROR LED	Yes; Red LED	Yes; Red LED
• Monitoring of the supply voltage (PWR-LED)	No	No
• Channel status display	Yes; Green LED	Yes; Green LED
• for channel diagnostics	No	No
• for module diagnostics	No	No
Potential separation		
Potential separation channels		
• between the channels and backplane bus	Yes	Yes
Standards, approvals, certificates		
Suitable for safety functions	No	No
Ambient conditions		
Ambient temperature during operation		
• horizontal installation, min.	0 °C	0 °C
• horizontal installation, max.	60 °C	60 °C
• vertical installation, min.	0 °C	0 °C
• vertical installation, max.	40 °C	40 °C
Decentralized operation		
Prioritized startup	Yes	Yes
Dimensions		
Width	25 mm	25 mm
Height	147 mm	147 mm
Depth	129 mm	129 mm
Weights		
Weight, approx.	230 g	260 g
Other		
Note:	Supplied incl. 40-pole push-in front connectors	Supplied incl. 40-pole push-in front connectors

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Ordering data

	Article No.
SM 521 digital input modules	
Module width 35 mm	
16 inputs, 24 V DC, isolated, parameterizable diagnostics and hardware interrupts	**6ES7521-1BH00-0AB0**
32 inputs, 24 V DC, isolated, parameterizable diagnostics and hardware interrupts	**6ES7521-1BL00-0AB0**
16 inputs, 24 V DC, isolated, input delay 3.2 ms	**6ES7521-1BH50-0AA0**
16 inputs, 230 V AC, isolated, input delay 20 ms	**6ES7521-1FH00-0AA0**
16 inputs, 24 ... 125 V UC, input delay 0.05 ... 20 ms, parameterizable diagnostics and hardware interrupts	**6ES7521-7EH00-0AB0**
Module width 25 mm; front connector (push-in) included in delivery package	
16 inputs, 24 V DC, isolated	**6ES7521-1BH10-0AA0**
32 inputs, 24 V DC, isolated	**6ES7521-1BL10-0AA0**
Accessories	
Front connectors	
For 35 mm modules; including four potential bridges, cable ties and individual labeling strips, 40-pin	
• Screw terminals	**6ES7592-1AM00-0XB0**
• Push-in	**6ES7592-1BM00-0XB0**
For 25 mm modules; including cable ties and individual labeling strips; push-in terminal 40-pin; spare part	**6ES7592-1BM00-0XA0**
Potential bridges for front connectors	**6ES7592-3AA00-0AA0**
For 35 mm modules; 20 pieces; spare part	
DIN A4 labeling sheets	
For 35 mm modules; 10 sheets with 10 labeling strips each for I/O modules; perforated, Al gray	**6ES7592-2AX00-0AA0**
For 25 mm modules; 10 sheets with 20 labeling strips each for I/O modules; perforated, Al gray	**6ES7592-1AX00-0AA0**
U connector	**6ES7590-0AA00-0AA0**
5 units; spare part	
Universal front door for I/O modules	
For 35 mm modules; 5 front doors; with 5 labeling strips (front) and 5 cabling diagrams per front door; spare part	**6ES7528-0AA00-7AA0**
For 25 mm modules; 5 front doors; with 5 labeling strips (front) and 5 cabling diagrams per front door; spare part	**6ES7528-0AA00-0AA0**
SIMATIC Manual Collection	**6ES7998-8XC01-8YE0**
Electronic manuals on DVD, multi-language: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC Distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	
SIMATIC Manual Collection update service for 1 year	**6ES7998-8XC01-8YE2**
Current "Manual Collection" DVD and the three subsequent updates	

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SM 522 digital output modules

Overview



- 8, 16 and 32-channel digital output modules
- For flexible adaptation of the controller to the corresponding task
- For subsequent expansion of the system with additional outputs
- 35 mm wide modules with parameters and diagnostic functions
- 25 mm wide modules for use in tight spaces: particularly economical, without parameters or diagnostic functions

Technical specifications

Article number	**6ES7522-1BH01-0AB0** S7-1500, DQ 16x24V DC/0.5A HF	**6ES7522-1BL01-0AB0** S7-1500, DQ 32x24VDC/0.5A HF	**6ES7522-1BF00-0AB0** S7-1500, DQ 8x24VDC/2A HF	**6ES7522-5EH00-0AB0** S7-1500, DQ 16x24...48VUC/ 125VDC/0.5A ST
Engineering with				
• STEP 7 TIA Portal configurable/ integrated as of version	V13 SP1 / -	V13 SP1 / -	V13 SP1 / -	V13 SP1 / -
• STEP 7 configurable/integrated as of version			V5.5 SP3 / -	V5.5 SP3 / -
• PROFIBUS as of GSD version/ GSD revision	V1.0 / V5.1	V1.0 / V5.1	V1.0 / V5.1	V1.0 / V5.1
• PROFINET as of GSD version/ GSD revision	V2.3 / -	V2.3 / -	V2.3 / -	V2.3 / -
Operating mode				
• DQ	Yes	Yes	Yes	Yes
• DQ with energy-saving function	No	No	Yes; with an application	No
• PWM	No	No	Yes	No
• Cam control (switching at comparison values)	No	No	No	No
• Oversampling	No	No	No	No
• MSO	Yes	Yes	Yes	Yes
• Integrated operating cycle counter	Yes	Yes	Yes	No
Supply voltage				
Rated value (DC)	24 V	24 V	24 V	
Reverse polarity protection	Yes; through internal protection with 7 A per group	Yes; through internal protection with 7 A per group	Yes; through internal protection with 10 A per group	
Digital outputs				
Type of digital output	Transistor	Transistor	Transistor	Transistor
Number of digital outputs	16	32	8	16
Current-sinking				Yes
Current-sourcing	Yes	Yes	Yes	Yes
Digital outputs, parameterizable	Yes	Yes	Yes	Yes
Short-circuit protection	Yes; Clocked electronically	Yes; Clocked electronically	Yes	
Limitation of inductive shutdown voltage to	L+ (-53 V)	L+ (-53 V)	-17 V	200 V (suppressor diode)
Controlling a digital input	Yes	Yes	Yes	Yes
Digital output functions, parameterizable				
• Freely usable digital output			Yes	
• PWM output			Yes	
- Number, max.			2	

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Technical specifications (continued)

Article number	**6ES7522-1BH01-0AB0** S7-1500, DQ 16x24V DC/0.5A HF	**6ES7522-1BL01-0AB0** S7-1500, DQ 32x24VDC/0.5A HF	**6ES7522-1BF00-0AB0** S7-1500, DQ 8x24VDC/2A HF	**6ES7522-5EH00-0AB0** S7-1500, DQ 16x24...48VUC/ 125VDC/0.5A ST
Switching capacity of the outputs				
• with resistive load, max.	0.5 A	0.5 A		0.5 A
• on lamp load, max.	5 W	5 W	10 W	40 W; At 125 V DC, 10 W at 48 V UC, 5 W at 24 V UC
Load resistance range				
• lower limit	48 Ω	48 Ω	12 Ω	
• upper limit	12 kΩ	12 kΩ	4 kΩ	
Output voltage				
• Type of output voltage	DC	DC	DC	UC
• for signal "1", min.	L+ (-0.8 V)	L+ (-0.8 V)	L+ (-0.8 V)	L+ (-1.0 V)
Output current				
• for signal "1" rated value	0.5 A	0.5 A	2 A	0.5 A
• for signal "0" residual current, max.	0.5 mA	0.5 mA	0.5 mA	
Output delay with resistive load				
• "0" to "1", typ.			80 µs	
• "0" to "1", max.	100 µs	100 µs	100 µs	5 ms
• "1" to "0", typ.			300 µs	
• "1" to "0", max.	500 µs	500 µs	500 µs	5 ms
Parallel switching of two outputs				
• for logic links	Yes	Yes	Yes	Yes
• for uprating	No	No	No	No
• for redundant control of a load	Yes	Yes	Yes	Yes
Switching frequency				
• with resistive load, max.	100 Hz	100 Hz	100 Hz; With PWM operation: 500 Hz	25 Hz
• with inductive load, max.	0.5 Hz; According to IEC 60947-5-1, DC-13	0.5 Hz; According to IEC 60947-5-1, DC-13	0.5 Hz; According to IEC 60947-5-1, DC-13; max. 500 Hz with PWM operation only with external circuit; see additional description in the manual	0.5 Hz
• on lamp load, max.	10 Hz	10 Hz	10 Hz	10 Hz
Total current of the outputs				
• Current per channel, max.	0.5 A; see additional description in the manual	0.5 A; see additional description in the manual	2 A; see additional description in the manual	0.5 A
• Current per group, max.	4 A; see additional description in the manual	4 A; see additional description in the manual	8 A; see additional description in the manual	0.5 A
• Current per module, max.	8 A; see additional description in the manual	16 A; see additional description in the manual	16 A; see additional description in the manual	8 A
Cable length				
• shielded, max.	1 000 m	1 000 m	1 000 m	1 000 m
• unshielded, max.	600 m	600 m	600 m	600 m
Isochronous mode				
Isochronous operation (application synchronized up to terminal)	Yes	Yes	No	No
Execution and activation time (TCO), min.	70 µs	70 µs		
Bus cycle time (TDP), min.	250 µs	250 µs		
Interrupts/diagnostics/ status information				
Diagnostics function	Yes	Yes	Yes	No
Substitute values connectable	Yes	Yes	Yes	Yes
Alarms				
• Diagnostic alarm	Yes	Yes	Yes	No
• Maintenance interrupt	Yes	Yes	Yes	No

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Technical specifications (continued)

Article number	6ES7522-1BH01-0AB0 S7-1500, DQ 16x24V DC/0.5A HF	6ES7522-1BL01-0AB0 S7-1500, DQ 32x24VDC/0.5A HF	6ES7522-1BF00-0AB0 S7-1500, DQ 8x24VDC/2A HF	6ES7522-5EH00-0AB0 S7-1500, DQ 16x24...48VUC/ 125VDC/0.5A ST
Diagnostic messages				
• Monitoring the supply voltage	Yes	Yes	Yes	No
• Wire-break	Yes	Yes	No	No
• Short-circuit	Yes	Yes	Yes	No
• Group error	Yes	Yes	Yes	
Diagnostics indication LED				
• RUN LED	Yes; Green LED	Yes; Green LED	Yes; Green LED	Yes; Green LED
• ERROR LED	Yes; Red LED	Yes; Red LED	Yes; Red LED	Yes; Red LED
• MAINT LED	Yes; yellow LED	Yes; yellow LED	Yes; yellow LED	
• Monitoring of the supply voltage (PWR-LED)	Yes; Green LED	Yes; Green LED	Yes; Green LED	No
• Channel status display	Yes; Green LED	Yes; Green LED	Yes; Green LED	Yes; Green LED
• for channel diagnostics	Yes; Red LED	Yes; Red LED	Yes; Red LED	No
• for module diagnostics	Yes; Red LED	Yes; Red LED	Yes; Red LED	Yes; Red LED
Potential separation				
Potential separation channels				
• between the channels and backplane bus	Yes	Yes	Yes	Yes
Standards, approvals, certificates				
Suitable for safety functions	No	No	No	No
Suitable for safety-related tripping of standard modules	Yes; From FS02	Yes; From FS02	Yes; From FS03	Yes; From FS02
Highest safety class achievable for safety-related tripping of standard modules				
• Performance level according to ISO 13849-1	PL d	PL d	PL d	PL d
• Category according to ISO 13849-1	Cat. 3	Cat. 3	Cat. 3	Cat. 3
• SILCL according to IEC 62061	SILCL 2	SILCL 2	SILCL 2	SILCL 2
Ambient conditions				
Ambient temperature during operation				
• horizontal installation, min.	0 °C			0 °C
• horizontal installation, max.	60 °C			60 °C
• vertical installation, min.	0 °C			0 °C
• vertical installation, max.	60 °C			40 °C
Decentralized operation				
Prioritized startup	Yes	Yes	Yes	Yes
Dimensions				
Width	35 mm	35 mm	35 mm	35 mm
Height	147 mm	147 mm	147 mm	147 mm
Depth	129 mm	129 mm	129 mm	129 mm
Weights				
Weight, approx.	230 g	280 g	240 g	230 g

Article number	6ES7522-5HF00-0AB0 S7-1500, DQ 8x230VAC/5A ST (Relay)	6ES7522-5HH00-0AB0 S7-1500, DQ 16x230VAC/2A ST (Relay)	6ES7522-5FF00-0AB0 S7-1500, DQ 8x230VAC/2A ST (Triac)	6ES7522-5FH00-0AB0 S7-1500, DQ 16x230VAC/1A ST (Triac)
Engineering with				
• STEP 7 TIA Portal configurable/ integrated as of version	V12 / V12	V13 SP1 / -	V12 / V12	V13 SP1 / -
• STEP 7 configurable/integrated as of version	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -
• PROFIBUS as of GSD version/ GSD revision	V1.0 / V5.1	V1.0 / V5.1	V1.0 / V5.1	V1.0 / V5.1
• PROFINET as of GSD version/ GSD revision	V2.3 / -	V2.3 / -	V2.3 / -	V2.3 / -

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Technical specifications (continued)

Article number	**6ES7522-5HF00-0AB0**	**6ES7522-5HH00-0AB0**	**6ES7522-5FF00-0AB0**	**6ES7522-5FH00-0AB0**
	S7-1500, DQ 8x230VAC/5A ST (Relay)	S7-1500, DQ 16x230VAC/2A ST (Relay)	S7-1500, DQ 8x230VAC/2A ST (Triac)	S7-1500, DQ 16x230VAC/1A ST (Triac)
Operating mode				
• DQ	Yes	Yes	Yes	Yes
• DQ with energy-saving function	No	No	No	No
• PWM	No	No	No	No
• Oversampling	No	No	No	No
• MSO	Yes	Yes	Yes	Yes
Supply voltage				
Rated value (DC)	24 V	24 V		
Reverse polarity protection	Yes	Yes		
Digital outputs				
Type of digital output	Relays	Relays	Triac	Triac
Number of digital outputs	8	16	8	16
Current-sinking	Yes	Yes		Yes
Current-sourcing	Yes	Yes	Yes	Yes
Digital outputs, parameterizable	Yes	Yes	Yes	Yes
Short-circuit protection	No	No	No	No
Controlling a digital input	possible	Yes		
Size of motor starters according to NEMA, max.	5	5	5	4
Switching capacity of the outputs				
• with resistive load, max.			2 A	1 A
• on lamp load, max.	1 500 W; 10 000 operating cycles	50 W (230 V AC), 5 W (24 V DC)	50 W	50 W
• Low energy/fluorescent lamps with electronic control gear	10x 58 W (25 000 operating cycles)			
• Fluorescent tubes, conventionally compensated	1x 58 W (25 000 operating cycles)			
• Fluorescent tubes, uncompensated	10x 58 W (25 000 operating cycles)			
Output voltage				
• Type of output voltage			AC	AC
• for signal "1", min.			L1 (-1.5 V) at maximum output current; L1 (-8.5 V) at minimum output current	L1 (-1.5 V) at maximum output current; L1 (-8.5 V) at minimum output current
Output current				
• for signal "1" rated value	5 A	2 A	2 A	1 A
• for signal "0" residual current, max.	0 A	0 A	2 mA	2 mA
Output delay with resistive load				
• "0" to "1", max.			1 AC cycle	1 AC cycle
• "1" to "0", max.			1 AC cycle	1 AC cycle
Parallel switching of two outputs				
• for logic links	Yes	Yes	No	No
• for uprating	No	No	No	No
• for redundant control of a load	Yes	Yes	Yes	Yes
Switching frequency				
• with resistive load, max.	2 Hz	1 Hz	10 Hz	10 Hz
• with inductive load, max.	0.5 Hz	0.5 Hz	0.5 Hz	0.5 Hz
• on lamp load, max.	2 Hz	1 Hz	1 Hz	1 Hz
Total current of the outputs				
• Current per channel, max.	8 A; see additional description in the manual	2 A; see additional description in the manual	2 A; see additional description in the manual	1 A; see additional description in the manual
• Current per group, max.	8 A; see additional description in the manual	4 A; see additional description in the manual	2 A; see additional description in the manual	2 A; see additional description in the manual
• Current per module, max.	64 A; see additional description in the manual	32 A; see additional description in the manual	10 A; see additional description in the manual	10 A; see additional description in the manual

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Technical specifications (continued)

Article number	6ES7522-5HF00-0AB0	6ES7522-5HH00-0AB0	6ES7522-5FF00-0AB0	6ES7522-5FH00-0AB0
	S7-1500, DQ 8x230VAC/5A ST (Relay)	S7-1500, DQ 16x230VAC/2A ST (Relay)	S7-1500, DQ 8x230VAC/2A ST (Triac)	S7-1500, DQ 16x230VAC/1A ST (Triac)
Relay outputs				
• Number of relay outputs	8	16		
• Rated supply voltage of relay coil L+ (DC)	24 V	24 V		
• Current consumption of relays (coil current of all relays), typ.	80 mA	150 mA		
• external protection for relay outputs	With miniature circuit breaker with characteristic B for: cos φ 1.0: 600 A cos φ 0.5 ... 0.7: 900 A with 8 A Diazed fuse: 1 000 A	Miniature circuit breaker B10 / B16		
• Contact connection (internal)	No	No		
• Number of operating cycles, max.	4 000 000; see additional description in the manual	see additional description in the manual		
• Relay approved acc. to UL 508	Yes; 250 V AC/5 A g.p.; 120 V AC TV-4 tungsten; A300, R300	No		
Switching capacity of contacts				
- with inductive load, max.	see additional description in the manual	2 A; see additional description in the manual		
- with resistive load, max.	see additional description in the manual	2 A; see additional description in the manual		
Cable length				
• shielded, max.	1 000 m	1 000 m	1 000 m	1 000 m
• unshielded, max.	600 m	600 m	600 m	600 m
Isochronous mode				
Isochronous operation (application synchronized up to terminal)	No	No	No	No
Interrupts/diagnostics/ status information				
Diagnostics function	Yes	Yes	No	No
Substitute values connectable	Yes	Yes	Yes	Yes
Alarms				
• Diagnostic alarm	Yes	Yes	No	No
• Maintenance interrupt		No	No	No
Diagnostic messages				
• Monitoring the supply voltage	Yes	Yes	No	No
• Wire-break	No	No	No	No
• Short-circuit	No	No	No	No
Diagnostics indication LED				
• RUN LED	Yes; Green LED	Yes; Green LED	Yes; Green LED	Yes; Green LED
• ERROR LED	Yes; Red LED	Yes; Red LED	Yes; Red LED	Yes; Red LED
• Monitoring of the supply voltage (PWR-LED)	Yes; Green LED	Yes; Green LED	No	No
• Channel status display	Yes; Green LED	Yes; Green LED	Yes; Green LED	Yes; Green LED
• for channel diagnostics	No	No	No	No
• for module diagnostics	Yes; Red LED	Yes; Red LED	Yes; Red LED	Yes; Red LED
Potential separation				
Potential separation channels				
• between the channels and backplane bus	Yes	Yes	Yes	Yes
Standards, approvals, certificates				
Suitable for safety functions	No	No	No	No

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Technical specifications (continued)

Article number	**6ES7522-5HF00-0AB0**	**6ES7522-5HH00-0AB0**	**6ES7522-5FF00-0AB0**	**6ES7522-5FH00-0AB0**
	S7-1500, DQ 8x230VAC/5A ST (Relay)	S7-1500, DQ 16x230VAC/2A ST (Relay)	S7-1500, DQ 8x230VAC/2A ST (Triac)	S7-1500, DQ 16x230VAC/1A ST (Triac)
Ambient conditions				
Ambient temperature during operation				
• horizontal installation, min.	0 °C	0 °C	0 °C	0 °C
• horizontal installation, max.	60 °C	60 °C	60 °C	60 °C
• vertical installation, min.	0 °C	0 °C	0 °C	0 °C
• vertical installation, max.	40 °C	40 °C	40 °C	60 °C
Decentralized operation				
Prioritized startup	Yes	Yes	Yes	Yes
Dimensions				
Width	35 mm	35 mm	35 mm	35 mm
Height	147 mm	147 mm	147 mm	147 mm
Depth	129 mm	129 mm	129 mm	129 mm
Weights				
Weight, approx.	350 g	350 g	290 g	310 g

Article number	**6ES7522-1BH10-0AA0**	**6ES7522-1BL10-0AA0**
	S7-1500, DQ 16X24VDC/0.5A BA	S7-1500, DQ 32x24VDC/0.5A BA
Engineering with		
• STEP 7 TIA Portal configurable/ integrated as of version	V13 / V13	V13 / V13
• STEP 7 configurable/integrated as of version	V5.5 SP3 / -	V5.5 SP3 / -
• PROFIBUS as of GSD version/ GSD revision	V1.0 / V5.1	V1.0 / V5.1
• PROFINET as of GSD version/ GSD revision	V2.3 / -	V2.3 / -
Operating mode		
• DQ	Yes	Yes
• DQ with energy-saving function	No	No
• PWM	No	No
• Oversampling	No	No
• MSO	Yes	Yes
Supply voltage		
Rated value (DC)	24 V	24 V
Reverse polarity protection	Yes; through internal protection with 7 A per group	Yes; through internal protection with 7 A per group
Digital outputs		
Type of digital output	Transistor	Transistor
Number of digital outputs	16	32
Current-sourcing	Yes	Yes
Digital outputs, parameterizable	No	No
Short-circuit protection	Yes	Yes
Limitation of inductive shutdown voltage to	L+ (-53 V)	L+ (-53 V)
Controlling a digital input	Yes	Yes
Switching capacity of the outputs		
• with resistive load, max.	0.5 A	0.5 A
• on lamp load, max.	5 W	5 W
Load resistance range		
• lower limit	48 Ω	48 Ω
• upper limit	12 kΩ	12 kΩ
Output voltage		
• Type of output voltage	DC	DC
• for signal "1", min.	L+ (-0.8 V)	L+ (-0.8 V)
Output current		
• for signal "1" rated value	0.5 A	0.5 A
• for signal "0" residual current, max.	0.5 mA	0.5 mA

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Technical specifications (continued)

Article number	**6ES7522-1BH10-0AA0** S7-1500, DQ 16X24VDC/0.5A BA	**6ES7522-1BL10-0AA0** S7-1500, DQ 32x24VDC/0.5A BA
Output delay with resistive load		
• "0" to "1", max.	100 µs	100 µs
• "1" to "0", max.	500 µs	500 µs
Parallel switching of two outputs		
• for logic links	Yes	Yes
• for uprating	No	No
• for redundant control of a load	Yes	Yes
Switching frequency		
• with resistive load, max.	100 Hz	100 Hz
• with inductive load, max.	0.5 Hz; According to IEC 60947-5-1, DC-13	0.5 Hz; According to IEC 60947-5-1, DC-13
• on lamp load, max.	10 Hz	10 Hz
Total current of the outputs		
• Current per channel, max.	0.5 A; see additional description in the manual	0.5 A; see additional description in the manual
• Current per group, max.	4 A; see additional description in the manual	4 A; see additional description in the manual
• Current per module, max.	8 A; see additional description in the manual	16 A; see additional description in the manual
Cable length		
• shielded, max.	1 000 m	1 000 m
• unshielded, max.	600 m	600 m
Isochronous mode		
Isochronous operation (application synchronized up to terminal)	No	No
Interrupts/diagnostics/ status information		
Diagnostics function	No	No
Substitute values connectable	No	No
Alarms		
• Diagnostic alarm	No	No
• Maintenance interrupt	No	No
Diagnostic messages		
• Monitoring the supply voltage	No	No
• Wire-break	No	No
• Short-circuit	No	No
• Group error	No	No
Diagnostics indication LED		
• RUN LED	Yes; Green LED	Yes; Green LED
• ERROR LED	Yes; Red LED	Yes; Red LED
• Monitoring of the supply voltage (PWR-LED)	Yes; Green LED	Yes; Green LED
• Channel status display	Yes; Green LED	Yes; Green LED
• for channel diagnostics	No	No
• for module diagnostics	No	No
Potential separation		
Potential separation channels		
• between the channels and backplane bus	Yes	Yes
Standards, approvals, certificates		
Suitable for safety functions	No	No
Decentralized operation		
Prioritized startup	Yes	Yes
Dimensions		
Width	25 mm	25 mm
Height	147 mm	147 mm
Depth	129 mm	129 mm
Weights		
Weight, approx.	230 g	280 g
Other		
Note:	Supplied incl. 40-pole push-in front connectors	Supplied incl. 40-pole push-in front connectors

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Ordering data

	Article No.
SM 522 digital output modules	
Module width 35 mm	
8 outputs, 24 V DC; 2 A, isolated	**6ES7522-1BF00-0AB0**
16 outputs, 24 V DC; 0.5 A, isolated	**6ES7522-1BH01-0AB0**
32 outputs, 24 V DC; 0.5 A, isolated	**6ES7522-1BL01-0AB0**
8 relay outputs, 230 V AC, 5 A	**6ES7522-5HF00-0AB0**
16 relay outputs, 230 V AC, 2 A	**6ES7522-5HH00-0AB0**
8 outputs (triac), 230 V AC, 2 A	**6ES7522-5FF00-0AB0**
16 outputs (triac), 230 V AC, 1 A	**6ES7522-5FH00-0AB0**
16 outputs, 24 ... 48 V UC, 125 V DC, 0.5 A, isolated	**6ES7522-5EH00-0AB0**
Module width 25 mm; front connector (push-in) included in delivery package	
16 outputs, 24 V DC; 0.5 A, isolated	**6ES7 522-1BH10-0AA0**
32 outputs, 24 V DC; 0.5 A, isolated	**6ES7 522-1BL10-0AA0**
Accessories	
Front connectors	
For 35 mm modules; including four potential bridges, cable ties and individual labeling strips, 40-pin	
• Screw terminals	**6ES7592-1AM00-0XB0**
• Push-in	**6ES7592-1BM00-0XB0**
For 25 mm modules; including cable ties and individual labeling strips; push-in terminal 40-pin; spare part	**6ES7592-1BM00-0XA0**
Potential bridges for front connectors	**6ES7592-3AA00-0AA0**
For 35 mm modules; 20 pieces; spare part	

	Article No.
DIN A4 labeling sheets	
For 35 mm modules; 10 sheets with 10 labeling strips each for I/O modules; perforated, Al gray	**6ES7592-2AX00-0AA0**
For 25 mm modules; 10 sheets with 20 labeling strips each for I/O modules; perforated, Al gray	**6ES7592-1AX00-0AA0**
U connector	**6ES7590-0AA00-0AA0**
5 units; spare part	
Universal front door for I/O modules	
For 35 mm modules; 5 front doors; with 5 labeling strips (front) and 5 cabling diagrams per front door; spare part	**6ES7528-0AA00-7AA0**
For 25 mm modules; 5 front doors; with 5 labeling strips (front) and 5 cabling diagrams per front door; spare part	**6ES7528-0AA00-0AA0**
SIMATIC Manual Collection	**6ES7998-8XC01-8YE0**
Electronic manuals on DVD, multi-language: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC Distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	
SIMATIC Manual Collection update service for 1 year	**6ES7998-8XC01-8YE2**
Current "Manual Collection" DVD and the three subsequent updates	

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SM 523 digital input/output modules

Overview



- 16 digital inputs and 16 digital outputs
- For flexible adaptation of the controller to the corresponding task
- For subsequent expansion of the system with additional inputs and outputs
- For use in the tightest spaces: particularly economical, without parameters or diagnostic functions

Technical specifications

Article number	**6ES7523-1BL00-0AA0** S7-1500, DI 16x24VDC/ DQ 16x24VDC/0.5A BA
General information	
Product type designation	DI 16x24VDC / DQ16x24VDC/0.5A BA
Product function	
• I&M data	Yes; I&M0 to I&M3
Engineering with	
• STEP 7 TIA Portal configurable/ integrated as of version	V13 / V13
• STEP 7 configurable/integrated as of version	V5.5 SP3 / -
• PROFIBUS as of GSD version/ GSD revision	V1.0 / V5.1
• PROFINET as of GSD version/ GSD revision	V2.3 / -
Operating mode	
• DI	Yes
• Counter	No
• DQ	Yes
• DQ with energy-saving function	No
• PWM	No
• Oversampling	No
• MSI	Yes
• MSO	Yes
Supply voltage	
Rated value (DC)	24 V
Reverse polarity protection	Yes; through internal protection with 7 A per group
Digital inputs	
Number of digital inputs	16
Digital inputs, parameterizable	No
Source/sink input	P-reading
Input characteristic curve in accordance with IEC 61131, type 3	Yes
Input voltage	
• Type of input voltage	DC
• Rated value (DC)	24 V
• for signal "0"	-30 to +5V
• for signal "1"	+11 to +30V
Input current	
• for signal "1", typ.	2.7 mA

Article number	**6ES7523-1BL00-0AA0** S7-1500, DI 16x24VDC/ DQ 16x24VDC/0.5A BA
Input delay (for rated value of input voltage)	
for standard inputs	
- parameterizable	No
for interrupt inputs	
- parameterizable	No
Cable length	
• shielded, max.	1 000 m
• unshielded, max.	600 m
Digital outputs	
Type of digital output	Transistor
Number of digital outputs	16
Current-sourcing	Yes
Digital outputs, parameterizable	No
Short-circuit protection	Yes
Limitation of inductive shutdown voltage to	L+ (-53 V)
Controlling a digital input	Yes
Switching capacity of the outputs	
• with resistive load, max.	0.5 A
• on lamp load, max.	5 W
Load resistance range	
• lower limit	48 Ω
• upper limit	12 kΩ
Output voltage	
• Type of output voltage	DC
• for signal "1", min.	L+ (-0.8 V)
Output current	
• for signal "1" rated value	0.5 A
• for signal "0" residual current, max.	0.5 mA
Output delay with resistive load	
• "0" to "1", max.	100 µs
• "1" to "0", max.	500 µs
Parallel switching of two outputs	
• for logic links	Yes
• for uprating	No
• for redundant control of a load	Yes

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Technical specifications (continued)

Article number	**6ES7523-1BL00-0AA0** S7-1500, DI 16x24VDC/ DQ 16x24VDC/0.5A BA
Switching frequency	
• with resistive load, max.	100 Hz
• with inductive load, max.	0.5 Hz
• on lamp load, max.	10 Hz
Total current of the outputs	
• Current per channel, max.	0.5 A; see additional description in the manual
• Current per group, max.	4 A; see additional description in the manual
• Current per module, max.	8 A; see additional description in the manual
Cable length	
• shielded, max.	1 000 m
• unshielded, max.	600 m
Encoder	
Connectable encoders	
• 2-wire sensor	Yes
- permissible quiescent current (2-wire sensor), max.	1.5 mA
Isochronous mode	
Isochronous operation (application synchronized up to terminal)	No
Interrupts/diagnostics/ status information	
Diagnostics function	No
Substitute values connectable	No
Alarms	
• Diagnostic alarm	No
• Maintenance interrupt	No
• Hardware interrupt	No
Diagnostic messages	
• Monitoring the supply voltage	No
• Wire-break	No
• Short-circuit	No
• Group error	No

Article number	**6ES7523-1BL00-0AA0** S7-1500, DI 16x24VDC/ DQ 16x24VDC/0.5A BA
Diagnostics indication LED	
• RUN LED	Yes; Green LED
• ERROR LED	Yes; Red LED
• Monitoring of the supply voltage (PWR-LED)	Yes; Green LED
• Channel status display	Yes; Green LED
• for channel diagnostics	No
• for module diagnostics	No
Potential separation	
Potential separation channels	
• between the channels and backplane bus	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	0 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	0 °C
• vertical installation, max.	40 °C
Decentralized operation	
Prioritized startup	Yes
Dimensions	
Width	25 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	280 g
Other	
Note:	Supplied incl. 40-pole push-in front connectors

Ordering data

	Article No.
SM 523 digital input/output module Module width 25 mm; front connector (push-in) included in delivery package 16 inputs, 24 V DC, isolated; 16 outputs, 24 V DC; 0.5 A, isolated	**6ES7523-1BL00-0AA0**
Accessories	
Front connectors For 25 mm modules; including cable ties and individual labeling strips; push-in terminal 40-pin; spare part	**6ES7592-1BM00-0XA0**
DIN A4 labeling sheets For 25 mm modules; 10 sheets with 20 labeling strips each for I/O modules; perforated, Al gray	**6ES7592-1AX00-0AA0**
U connector 5 units; spare part	**6ES7590-0AA00-0AA0**

	Article No.
Universal front door for I/O modules For 25 mm modules; 5 front doors; with 5 labeling strips (front) and 5 cabling diagrams per front door; spare part	**6ES7528-0AA00-0AA0**
SIMATIC Manual Collection Electronic manuals on DVD, multi-language: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC Distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	**6ES7998-8XC01-8YE0**
SIMATIC Manual Collection update service for 1 year Current "Manual Collection" DVD and the three subsequent updates	**6ES7998-8XC01-8YE2**

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SIPLUS SM 521 digital input modules

Overview



- 16 and 32-channel digital input modules
- For flexible adaptation of the controller to the corresponding task
- For subsequent expansion of the system with additional inputs

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

Technical specifications

Article number	**6AG1521-1BH00-7AB0**	**6AG1521-1BL00-7AB0**	**6AG1521-1BH50-7AA0**	**6AG1521-1FH00-7AA0**
Based on	**6ES7521-1BH00-0AB0**	**6ES7521-1BL00-0AB0**	**6ES7521-1BH50-0AA0**	**6ES7521-1FH00-0AA0**
	SIPLUS S7-1500 DI 16X24VDC HF	SIPLUS S7-1500 DI 32X24VDC HF	SIPLUS S7-1500 DI 16X24VDC SRC BA	SIPLUS S7-1500 DI 16X230VAC BA
Ambient conditions				
Ambient temperature during operation				
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	70 °C; = Tmax	70 °C; = Tmax; > +60 °C number of simultaneously controllable inputs max. 16	70 °C; = Tmax; > +60 °C number of simultaneously controllable inputs max. 8	70 °C; = Tmax; > +60 °C number of simultaneously controllable inputs max. 8
• vertical installation, min.	-40 °C; = Tmin	-40 °C; = Tmin	-40 °C; = Tmin	-40 °C; = Tmin
• vertical installation, max.	40 °C; = Tmax	40 °C; = Tmax	40 °C; = Tmax	40 °C; = Tmax
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m	2 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)
Relative humidity				
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance				
Coolants and lubricants				
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *

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Technical specifications (continued)

Article number	**6AG1521-1BH00-7AB0**	**6AG1521-1BL00-7AB0**	**6AG1521-1BH50-7AA0**	**6AG1521-1FH00-7AA0**
Based on	**6ES7521-1BH00-0AB0**	**6ES7521-1BL00-0AB0**	**6ES7521-1BH50-0AA0**	**6ES7521-1FH00-0AA0**
	SIPLUS S7-1500 DI 16X24VDC HF	SIPLUS S7-1500 DI 32X24VDC HF	SIPLUS S7-1500 DI 16X24VDC SRC BA	SIPLUS S7-1500 DI 16X230VAC BA
Use on ships/at sea				
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Remark				
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating				
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability	Yes; Class 2 for high availability	Yes; Class 2 for high availability	Yes; Class 2 for high availability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

Ordering data

	Article No.
SIPLUS SM 521 digital input modules	
(Extended temperature range and exposure to media)	
16 inputs, 24 V DC, isolated, parameterizable diagnostics and hardware interrupts	**6AG1521-1BH00-7AB0**
32 inputs, 24 V DC, isolated, parameterizable diagnostics and hardware interrupts	**6AG1521-1BL00-7AB0**
16 inputs, 24 V DC, isolated, input delay 3.2 ms	**6AG1521-1BH50-7AA0**
16 inputs, 230 V AC, isolated, input delay 20 ms	**6AG1521-1FH00-7AA0**

	Article No.
Accessories	See SIMATIC S7-1500 SM 521 digital input modules, page 4/89

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SIPLUS SM 522 digital output modules

Overview



- 8, 16 and 32-channel digital output modules
- For flexible adaptation of the controller to the corresponding task
- For subsequent expansion of the system with additional outputs

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information has been added.

Technical specifications

Article number	**6AG1522-1BF00-7AB0**	**6AG1522-1BH01-7AB0**	**6AG1522-1BL01-7AB0**	**6AG1522-5HF00-2AB0**	**6AG1522-5FF00-7AB0**
Based on	**6ES7522-1BF00-0AB0**	**6ES7522-1BH01-0AB0**	**6ES7522-1BL01-0AB0**	**6ES7522-5HF00-0AB0**	**6ES7522-5FF00-0AB0**
	SIPLUS S7-1500 DQ 8X24VDC/2A HF	SIPLUS S7-1500 DQ 16X24VDC/0.5A HF	SIPLUS S7-1500 DQ 32X24VDC/0.5A HF	SIPLUS S7-1500 DQ 8X230VAC/5A ST (RELAY)	SIPLUS S7-1500 DQ 8X230VAC/2A ST (TRIAC)
Ambient conditions					
Ambient temperature during operation					
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-25 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	70 °C; = Tmax; > +60 °C Number of simultaneously controllable outputs max. 8x 0.5 A, max. total current per group 2 A	70 °C; = Tmax; see Derating BasedOn (e.g. manual), additionally Tmax > 60 °C max. aggregate current 2 A per group	70 °C; = Tmax; see Derating BasedOn (e.g. manual), additionally Tmax > 60 °C max. aggregate current 2 A per group	60 °C; = Tmax	70 °C; = Tmax; > +60 °C number of simultaneously controllable outputs max. 8x 0.25 A, max. total current 2 A
• vertical installation, min.	-40 °C; = Tmin			-25 °C; = Tmin	-40 °C; = Tmin
• vertical installation, max.	40 °C; = Tmax			40 °C; = Tmax	40 °C; = Tmax
Altitude during operation relating to sea level					
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m	2 000 m	2 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)
Relative humidity					
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance					
Coolants and lubricants					
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air

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Technical specifications (continued)

Article number	**6AG1522-1BF00-7AB0**	**6AG1522-1BH01-7AB0**	**6AG1522-1BL01-7AB0**	**6AG1522-5HF00-2AB0**	**6AG1522-5FF00-7AB0**
Based on	**6ES7522-1BF00-0AB0**	**6ES7522-1BH01-0AB0**	**6ES7522-1BL01-0AB0**	**6ES7522-5HF00-0AB0**	**6ES7522-5FF00-0AB0**
	SIPLUS S7-1500 DQ 8X24VDC/2A HF	SIPLUS S7-1500 DQ 16X24VDC/0.5A HF	SIPLUS S7-1500 DQ 32X24VDC/0.5A HF	SIPLUS S7-1500 DQ 8X230VAC/5A ST (RELAY)	SIPLUS S7-1500 DQ 8X230VAC/2A ST (TRIAC)
Use in stationary industrial systems					
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
Use on ships/at sea					
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Remark					
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating					
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability	Yes; Class 2 for high availability	Yes; Class 2 for high availability	Yes; Class 2 for high availability	Yes; Class 2 for high availability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

Ordering data

	Article No.
SIPLUS SM 522 digital output modules	
(Extended temperature range and exposure to media)	
8 outputs, 24 V DC; 2 A, isolated	**6AG1522-1BF00-7AB0**
16 outputs, 24 V DC; 0.5 A, isolated	**6AG1522-1BH01-7AB0**
32 outputs, 24 V DC; 0.5 A, isolated	**6AG1522-1BL01-7AB0**
8 relay outputs, 230 V AC, 5 A	**6AG1522-5HF00-2AB0**
8 outputs (triac), 230 V AC, 2 A	**6AG1522-5FF00-7AB0**

	Article No.
Accessories	See SIMATIC S7-1500 SM 522 digital output modules, page 4/97

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SM 531 analog input modules

Overview



- 4 or 8-channel analog input modules
- Optionally with extremely short conversion times
- For the connection of analog sensors without additional amplifiers
- Even solves more complex automation tasks

Technical specifications

Article number	**6ES7531-7QD00-0AB0**	**6ES7531-7QF00-0AB0**	**6ES7531-7KF00-0AB0**	**6ES7531-7NF10-0AB0**	**6ES7531-7NF00-0AB0**
	S7-1500, AI 4xU/I/RTD/TC ST	S7-1500, AI 8xU/I/R/RTD BA	S7-1500, AI 8xU/I/RTD/TC ST	S7-1500, AI 8xU/I HS	S7-1500, AI 8xU/I HF
General information					
Product type designation	AI 4xU/I/RTD/TC ST	AI 8xU/I/R/RTD BA	AI 8xU/I/RTD/TC ST	AI 8xU/I HS	AI 8xU/I HF
Product function					
• I&M data	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3
• Measuring range scalable	No		No	No	No
• Scalable measured values	No		No	No	Yes
• Adjustment of measuring range	No		No	No	Yes
Engineering with					
• STEP 7 TIA Portal configurable/ integrated as of version	V13 / V13.0.2	V15.1 / V16	V12 / V12	V14 / -	V14 / -
• STEP 7 configurable/integrated as of version	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -
• PROFIBUS as of GSD version/ GSD revision	V1.0 / V5.1	V1.0 / V5.1	V1.0 / V5.1	V1.0 / V5.1	V1.0 / V5.1
• PROFINET as of GSD version/ GSD revision	V2.3 / -	V2.3 / -	V2.3 / -	V2.3 / -	V2.3 / -
Operating mode					
• Oversampling	No	No	No	Yes	No
• MSI	Yes	Yes	Yes	Yes	Yes
Supply voltage					
Rated value (DC)	24 V		24 V	24 V	24 V
Reverse polarity protection	Yes		Yes	Yes	Yes

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Technical specifications (continued)

Article number	**6ES7531-7QD00-0AB0** S7-1500, AI 4xU/I/RTD/TC ST	**6ES7531-7QF00-0AB0** S7-1500, AI 8xU/I/R/RTD BA	**6ES7531-7KF00-0AB0** S7-1500, AI 8xU/I/RTD/TC ST	**6ES7531-7NF10-0AB0** S7-1500, AI 8xU/I HS	**6ES7531-7NF00-0AB0** S7-1500, AI 8xU/I HF
Analog inputs					
Number of analog inputs	4	8	8	8	8
• For current measurement	4	8	8	8	8
• For voltage measurement	4	8	8	8	8
• For resistance/resistance thermometer measurement	2	8	4		
• For thermocouple measurement	4		8		
permissible input voltage for voltage input (destruction limit), max.	28.8 V	12 V; 12 V continuous, 30 V for max. 1 s	28.8 V	28.8 V	28.8 V
permissible input current for current input (destruction limit), max.	40 mA	40 mA	40 mA	40 mA	40 mA
Constant measurement current for resistance-type transmitter, typ.		230 ... 370 µA	150 Ohm, 300 Ohm, 600 Ohm, Pt100, Pt200, Ni100: 1.25 mA; 6 000 Ohm, Pt500, Pt1000, Ni1000, LG-Ni1000: 0.625 mA; PTC: 0.472 mA		
Technical unit for temperature measurement adjustable	Yes; °C/°F/K	Yes; °C/°F/K	Yes; °C/°F/K		
Analog input with oversampling	No				
Standardization of measured values	No				
Input ranges (rated values), voltages					
• 0 to +5 V	No	No	No	No	No
• 0 to +10 V	No	No	No	No	No
• 1 V to 5 V	Yes	Yes	Yes	Yes	Yes
• -1 V to +1 V	Yes	Yes	Yes		
• -10 V to +10 V	Yes	Yes	Yes	Yes	Yes
• -2.5 V to +2.5 V	Yes	No	Yes	No	Yes
• -25 mV to +25 mV	No	No	No	No	No
• -250 mV to +250 mV	Yes	No	Yes	No	No
• -5 V to +5 V	Yes	Yes	Yes	Yes	Yes
• -50 mV to +50 mV	Yes	Yes	Yes	No	No
• -500 mV to +500 mV	Yes	Yes	Yes	No	No
• -80 mV to +80 mV	Yes	No	Yes	No	No
Input ranges (rated values), currents					
• 0 to 10 mA		No			
• 0 to 20 mA	Yes	Yes	Yes	Yes	Yes
• -20 mA to +20 mA	Yes	Yes	Yes	Yes	Yes
• 4 mA to 20 mA	Yes	Yes	Yes	Yes	Yes
Input ranges (rated values), thermocouples					
• Type B	Yes	No	Yes	No	No
• Type C	No	No	No	No	No
• Type E	Yes	No	Yes	No	No
• Type J	Yes	No	Yes	No	No
• Type K	Yes	No	Yes	No	No
• Type L	No	No	No	No	No
• Type N	Yes	No	Yes	No	No
• Type R	Yes	No	Yes	No	No
• Type S	Yes	No	Yes	No	No
• Type T	Yes	No	Yes	No	No
• Type U	No	No			
• Type TXK/TXK(L) to GOST	No	No	No	No	No

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Technical specifications (continued)

Article number	**6ES7531-7QD00-0AB0** S7-1500, AI 4xU/I/RTD/TC ST	**6ES7531-7QF00-0AB0** S7-1500, AI 8xU/I/R/RTD BA	**6ES7531-7KF00-0AB0** S7-1500, AI 8xU/I/RTD/TC ST	**6ES7531-7NF10-0AB0** S7-1500, AI 8xU/I HS	**6ES7531-7NF00-0AB0** S7-1500, AI 8xU/I HF
Input ranges (rated values), resistance thermometer					
• Cu 10	No	No	No	No	No
• Cu 10 according to GOST	No	No	No	No	No
• Cu 50	No	No	No	No	No
• Cu 50 according to GOST	No	No	No	No	No
• Cu 100	No	No	No	No	No
• Cu 100 according to GOST	No	No	No	No	No
• Ni 10	No	No	No	No	No
• Ni 10 according to GOST	No	No	No	No	No
• Ni 100	Yes; Standard/climate	Yes; Standard/climate	Yes; Standard/climate	No	No
• Ni 100 according to GOST	No	No	No	No	No
• Ni 1000	Yes; Standard/climate	Yes; Standard/climate	Yes; Standard/climate	No	No
• Ni 1000 according to GOST	No	No	No	No	No
• LG-Ni 1000	Yes; Standard/climate	Yes; Standard/climate	Yes; Standard/climate	No	No
• Ni 120	No	No	No	No	No
• Ni 120 according to GOST	No	No	No	No	No
• Ni 200	No	No		No	No
• Ni 200 according to GOST	No	No	No	No	No
• Ni 500	No	No	No	No	No
• Ni 500 according to GOST	No	No	No	No	No
• Pt 10	No	No	No	No	No
• Pt 10 according to GOST	No	No	No	No	No
• Pt 50	No	No	No	No	No
• Pt 50 according to GOST	No	No	No	No	No
• Pt 100	Yes; Standard/climate	Yes; Standard/climate	Yes; Standard/climate	No	No
• Pt 100 according to GOST	No	No	No	No	No
• Pt 1000	Yes; Standard/climate	Yes; Standard/climate	Yes; Standard/climate	No	No
• Pt 1000 according to GOST	No	No	No	No	No
• Pt 200	Yes; Standard/climate	No	Yes; Standard/climate	No	No
• Pt 200 according to GOST	No	No	No	No	No
• Pt 500	Yes; Standard/climate	No	Yes; Standard/climate	No	No
• Pt 500 according to GOST	No	No	No	No	No
Input ranges (rated values), resistors					
• 0 to 150 ohms	Yes	No	Yes	No	No
• 0 to 300 ohms	Yes	No	Yes	No	No
• 0 to 600 ohms	Yes	Yes	Yes	No	No
• 0 to 3000 ohms	No	No	No	No	No
• 0 to 6000 ohms	Yes	Yes	Yes	No	No
• PTC	Yes	Yes	Yes	No	No
Thermocouple (TC)					
Temperature compensation					
- parameterizable	Yes		Yes		
Cable length					
• shielded, max.	800 m; for U/I, 200 m for R/RTD, 50 m for TC	200 m; 50 m at 50 mV	800 m; for U/I, 200 m for R/RTD, 50 m for TC	800 m	800 m

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Technical specifications (continued)

Article number	**6ES7531-7QD00-0AB0** S7-1500, AI 4xU/I/RTD/TC ST	**6ES7531-7QF00-0AB0** S7-1500, AI 8xU/I/R/RTD BA	**6ES7531-7KF00-0AB0** S7-1500, AI 8xU/I/RTD/TC ST	**6ES7531-7NF10-0AB0** S7-1500, AI 8xU/I HS	**6ES7531-7NF00-0AB0** S7-1500, AI 8xU/I HF
Analog value generation for the inputs					
Integration and conversion time/ resolution per channel					
• Resolution with overrange (bit including sign), max.	16 bit	16 bit	16 bit	16 bit	24 bit; When using the function "Scaling of the measured values" or "Measuring range adaptation" (32 bit REAL format); 16 bit when using the S7 format (16 bit INTEGER)
• Integration time, parameterizable	Yes	Yes	Yes		Yes
• Integration time (ms)	2,5 / 16,67 / 20 / 100 ms	2,5 / 16,67 / 20 / 100 ms	2,5 / 16,67 / 20 / 100 ms		Fast mode: 2.5 / 16.67 / 20 / 100 ms, standard mode: 7.5 / 50 / 60 / 300 ms
• Basic conversion time, including integration time (ms)	9 / 23 / 27 / 107 ms	10 / 24 / 27 / 107 ms	9 / 23 / 27 / 107 ms		Fast mode: 4 / 18 / 22 / 102 ms; Standard mode: 9 / 52 / 62 / 302 ms
- additional conversion time for wire-break monitoring	9 ms (to be considered in R/RTD/TC measurement)	4 ms (to be considered in R/RTD/U 1 to 5 V measurement)	9 ms (to be considered in R/RTD/TC measurement)		
- additional conversion time for resistance measurement	150 ohm, 300 ohm, 600 ohm, Pt100, Pt200, Ni100: 2 ms, 6000 ohm, Pt500, Pt1000, Ni1000, LG-Ni1000, PTC: 4 ms	8 ms	150 ohm, 300 ohm, 600 ohm, Pt100, Pt200, Ni100: 2 ms, 6000 ohm, Pt500, Pt1000, Ni1000, LG-Ni1000, PTC: 4 ms		
• Interference voltage suppression for interference frequency f1 in Hz	400 / 60 / 50 / 10	400 / 60 / 50 / 10 Hz	400 / 60 / 50 / 10 Hz		400 / 60 / 50 / 10 Hz
• Basic execution time of the module (all channels released)					Corresponds to the channel with the highest basic conversion time
• Basic execution time of the module (all channels released)				62.5 µs; independent of number of activated channels	
Smoothing of measured values					
• parameterizable	Yes	Yes	Yes	Yes	Yes
Encoder					
Connection of signal encoders					
• for voltage measurement	Yes	Yes	Yes	Yes	Yes
• for current measurement as 2-wire transducer	Yes	Yes; with external supply	Yes	Yes	Yes; with external transmitter supply
- Burden of 2-wire transmitter, max.	820 Ω		820 Ω	820 Ω	
• for current measurement as 4-wire transducer	Yes	Yes	Yes	Yes	Yes
• for resistance measurement with two-wire connection	Yes; Only for PTC	Yes; Only for PTC	Yes; Only for PTC	No	No
• for resistance measurement with three-wire connection	Yes; All measuring ranges except PTC; internal compensation of the cable resistances	Yes; All measuring ranges except PTC; internal compensation of the cable resistances	Yes; All measuring ranges except PTC; internal compensation of the cable resistances	No	No
• for resistance measurement with four-wire connection	Yes; All measuring ranges except PTC		Yes; All measuring ranges except PTC	No	No

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Technical specifications (continued)

Article number	6ES7531-7QD00-0AB0	6ES7531-7QF00-0AB0	6ES7531-7KF00-0AB0	6ES7531-7NF10-0AB0	6ES7531-7NF00-0AB0
	S7-1500, AI 4xU/I/RTD/TC ST	S7-1500, AI 8xU/I/R/RTD BA	S7-1500, AI 8xU/I/RTD/TC ST	S7-1500, AI 8xU/I HS	S7-1500, AI 8xU/I HF
Errors/accuracies					
Basic error limit (operational limit at 25 °C)					
• Voltage, relative to input range, (+/-)	0.1 %	0.3 %	0.1 %	0.2 %	0.05 %
• Current, relative to input range, (+/-)	0.1 %	0.3 %	0.1 %	0.2 %	0.05 %
• Resistance, relative to input range, (+/-)	0.1 %	0.3 %	0.1 %		
• Resistance thermometer, relative to input range, (+/-)	0.1 %; Ptxxx standard: ±0.7 K, Ptxxx climate: ±0.2 K, Nixxx standard: ±0.3 K, Nixxx climate: ±0.15 K	Ptxxx Standard: ±1.0 K, Ptxxx Climate: ±0.5 K, Nixxx Standard: ±0.5 K, Nixxx Climate: ±0.5 K	Ptxxx standard: ±0.7 K, Ptxxx climate: ±0.2 K, Nixxx standard: ±0.3 K, Nixxx climate: ±0.15 K		
• Thermocouple, relative to input range, (+/-)	0.1 %; Type B: > 600 °C ±1.7 K, type E: > -200 °C ±0.7 K, type J: > -210 °C ±0.8 K, type K: > -200 °C ±1.2 K, type N: > -200 °C ±1.2 K, type R: > 0 °C ±1.9 K, type S: > 0 °C ±1.9 K, type T: > -200 °C ±0.8 K		Type B: > 600 °C ±1.7 K, type E: > -200 °C ±0.7 K, type J: > -210 °C ±0.8 K, type K: > -200 °C ±1.2 K, type N: > -200 °C ±1.2 K, type R: > 0 °C ±1.9 K, type S: > 0 °C ±1.9 K, type T: > -200 °C ±0.8 K		
Interference voltage suppression for f = n x (f1 +/- 1 %), f1 = interference frequency					
• Series mode interference (peak value of interference < rated value of input range), min.	40 dB	40 dB	40 dB		80 dB; in the Standard operating mode, 40 dB in the Fast operating mode
• Common mode voltage, max.	10 V	4 V	10 V	10 V	60 V DC/30 V AC
• Common mode interference, min.	60 dB	60 dB	60 dB	50 dB at 400 Hz; 60 dB at 60 / 50 / 10 Hz	80 dB
Isochronous mode					
Isochronous operation (application synchronized up to terminal)	No		No	Yes	No
Filtering and processing time (TCI), min.				80 µs	
Bus cycle time (TDP), min.				250 µs	
Interrupts/diagnostics/ status information					
Diagnostics function	Yes	Yes	Yes	Yes	Yes
Alarms					
• Diagnostic alarm	Yes	Yes	Yes	Yes	Yes
• Limit value alarm	Yes; two upper and two lower limit values in each case	Yes; two upper and two lower limit values in each case	Yes; two upper and two lower limit values in each case	Yes; two upper and two lower limit values in each case	Yes; two upper and two lower limit values in each case
Diagnostic messages					
• Monitoring the supply voltage	Yes	No	Yes	Yes	Yes
• Wire-break	Yes; Only for 1 to 5 V, 4 to 20 mA, TC, R, and RTD	Yes; Only for 1 ... 5 V, 4 ... 20 mA, R, and RTD	Yes; Only for 1 to 5 V, 4 to 20 mA, TC, R, and RTD	Yes; only for 1 ... 5 V and 4 ... 20 mA	Yes; only for 1 ... 5 V and 4 ... 20 mA
• Short-circuit		No			
• Group error		No			
• Overflow/underflow	Yes	Yes	Yes	Yes	Yes
Diagnostics indication LED					
• RUN LED	Yes; Green LED	Yes; Green LED	Yes; Green LED	Yes; Green LED	Yes; Green LED
• ERROR LED	Yes; Red LED	Yes; Red LED	Yes; Red LED	Yes; Red LED	Yes; Red LED
• MAINT LED		No			
• Monitoring of the supply voltage (PWR-LED)	Yes; Green LED	No	Yes; Green LED	Yes; Green LED	Yes; Green LED
• Channel status display	Yes; Green LED	Yes; Green LED	Yes; Green LED	Yes; Green LED	Yes; Green LED
• for channel diagnostics	Yes; Red LED	Yes; Red LED	Yes; Red LED	Yes; Red LED	Yes; Red LED
• for module diagnostics	Yes; Red LED	Yes; Red LED	Yes; Red LED	Yes; Red LED	Yes; Red LED

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Technical specifications (continued)

Article number	**6ES7531-7QD00-0AB0** S7-1500, AI 4xU/I/RTD/TC ST	**6ES7531-7QF00-0AB0** S7-1500, AI 8xU/I/R/RTD BA	**6ES7531-7KF00-0AB0** S7-1500, AI 8xU/I/RTD/TC ST	**6ES7531-7NF10-0AB0** S7-1500, AI 8xU/I HS	**6ES7531-7NF00-0AB0** S7-1500, AI 8xU/I HF
Potential separation					
Potential separation channels					
• between the channels and backplane bus	Yes	Yes	Yes	Yes	Yes
Standards, approvals, certificates					
Suitable for applications according to AMS 2750			Yes; Declaration of Conformity, see online support entry 109757262		
Suitable for applications according to CQI-9			Yes; Based on AMS 2750 E		
Ambient conditions					
Ambient temperature during operation					
• horizontal installation, min.	0 °C	0 °C	0 °C	0 °C	0 °C
• horizontal installation, max.	60 °C	60 °C	60 °C	60 °C	60 °C
• vertical installation, min.	0 °C	0 °C	0 °C	0 °C	0 °C
• vertical installation, max.	40 °C	40 °C	40 °C	40 °C	40 °C
Decentralized operation					
Prioritized startup	No	No	No	Yes	Yes
Dimensions					
Width	25 mm	35 mm	35 mm	35 mm	35 mm
Height	147 mm	147 mm	147 mm	147 mm	147 mm
Depth	129 mm	129 mm	129 mm	129 mm	129 mm
Weights					
Weight, approx.	210 g	250 g	310 g	300 g	280 g
Other					
Note:	Supplied incl. 40-pole push-in front connectors. Additional basic error and noise for integration time = 2.5 ms: Voltage: ±250 mV (±0.02%), ±80 mV (±0.05%), ±50 mV (±0.05%); resistance: 150 Ohms (±0.02%); resistance thermometer: Pt100 climate: ±0.08 K, Ni100 climate: ±0.08 K; thermoelement: Type B, R, S: ±3 K, type E, J, K, N, T: ±1 K		Additional basic error and noise for integration time = 2.5 ms: Voltage: ±250 mV (±0.02%), ±80 mV (±0.05%), ±50 mV (±0.05%); resistance: 150 ohms ±0.02%; resistance thermometer: Pt100 climate: ±0.08 K, Ni100 climate: ±0.08 K; thermocouple: Type B, R, S: ±3 K, type E, J, K, N, T: ±1 K		

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Technical specifications (continued)

Article number	6ES7531-7PF00-0AB0 S7-1500, AI 8 X U/R/RTD/TC HF
General information	
Product type designation	AI 8xU/R/RTD/TC HF
Product function	
• I&M data	Yes; I&M0 to I&M3
• Measuring range scalable	Yes
• Scalable measured values	No
• Adjustment of measuring range	No
Engineering with	
• STEP 7 TIA Portal configurable/ integrated as of version	V14 / -
• STEP 7 configurable/integrated as of version	V5.5 SP3 / -
• PROFIBUS as of GSD version/ GSD revision	V1.0 / V5.1
• PROFINET as of GSD version/ GSD revision	V2.3 / -
Operating mode	
• Oversampling	No
• MSI	Yes
Supply voltage	
Rated value (DC)	24 V
Reverse polarity protection	Yes
Analog inputs	
Number of analog inputs	8; Plus one additional RTD (reference) channel
• For voltage measurement	8; Plus one additional RTD (reference) channel
• For resistance/resistance thermometer measurement	8; Plus one additional RTD (reference) channel
• For thermocouple measurement	8; Plus one additional RTD (reference) channel
permissible input voltage for voltage input (destruction limit), max.	20 V
Constant measurement current for resistance-type transmitter, typ.	150 Ohm, 300 Ohm, 600 Ohm, Cu10, Cu50, Cu100, Ni10, Ni100, Ni120, Ni200, Pt10, Pt50, Pt100, Pt200 climate: 1 mA; 6 kOhm, Ni500, Ni1000, LG-Ni1000, Pt200 standard, Pt500, Pt1000, PTC: 0.25 mA
Technical unit for temperature measurement adjustable	Yes; °C/°F/K
Input ranges (rated values), voltages	
• 0 to +5 V	No
• 0 to +10 V	No
• 1 V to 5 V	No
• -1 V to +1 V	Yes
• -10 V to +10 V	No
• -2.5 V to +2.5 V	No
• -25 mV to +25 mV	Yes
• -250 mV to +250 mV	Yes
• -5 V to +5 V	No
• -50 mV to +50 mV	Yes
• -500 mV to +500 mV	Yes
• -80 mV to +80 mV	Yes
Input ranges (rated values), currents	
• 0 to 20 mA	No
• -20 mA to +20 mA	No
• 4 mA to 20 mA	No

Article number	6ES7531-7PF00-0AB0 S7-1500, AI 8 X U/R/RTD/TC HF
Input ranges (rated values), thermocouples	
• Type B	Yes
• Type C	Yes
• Type E	Yes
• Type J	Yes
• Type K	Yes
• Type L	No
• Type N	Yes
• Type R	Yes
• Type S	Yes
• Type T	Yes
• Type TXK/TXK(L) to GOST	Yes
Input ranges (rated values), resistance thermometer	
• Cu 10	Yes; Standard/climate
• Cu 10 according to GOST	Yes; Standard/climate
• Cu 50	Yes; Standard/climate
• Cu 50 according to GOST	Yes; Standard/climate
• Cu 100	Yes; Standard/climate
• Cu 100 according to GOST	Yes; Standard/climate
• Ni 10	Yes; Standard/climate
• Ni 10 according to GOST	Yes; Standard/climate
• Ni 100	Yes; Standard/climate
• Ni 100 according to GOST	Yes; Standard/climate
• Ni 1000	Yes; Standard/climate
• Ni 1000 according to GOST	Yes; Standard/climate
• LG-Ni 1000	Yes; Standard/climate
• Ni 120	Yes; Standard/climate
• Ni 120 according to GOST	Yes; Standard/climate
• Ni 200	Yes; Standard/climate
• Ni 200 according to GOST	Yes; Standard/climate
• Ni 500	Yes; Standard/climate
• Ni 500 according to GOST	Yes; Standard/climate
• Pt 10	Yes; Standard/climate
• Pt 10 according to GOST	Yes; Standard/climate
• Pt 50	Yes; Standard/climate
• Pt 50 according to GOST	Yes; Standard/climate
• Pt 100	Yes; Standard/climate
• Pt 100 according to GOST	Yes; Standard/climate
• Pt 1000	Yes; Standard/climate
• Pt 1000 according to GOST	Yes; Standard/climate
• Pt 200	Yes; Standard/climate
• Pt 200 according to GOST	Yes; Standard/climate
• Pt 500	Yes; Standard/climate
• Pt 500 according to GOST	Yes; Standard/climate
Input ranges (rated values), resistors	
• 0 to 150 ohms	Yes
• 0 to 300 ohms	Yes
• 0 to 600 ohms	Yes
• 0 to 3000 ohms	No
• 0 to 6000 ohms	Yes
• PTC	Yes
Thermocouple (TC)	
Temperature compensation	
- parameterizable	Yes
Cable length	
• shielded, max.	800 m; at U; 200 m at R/RTD/TC

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Technical specifications (continued)

Article number	**6ES7531-7PF00-0AB0**
	S7-1500, AI 8 X U/R/RTD/TC HF
Analog value generation for the inputs	
Integration and conversion time/ resolution per channel	
• Resolution with overrange (bit including sign), max.	21 bit; For measuring mode RTC and TC when using the function "Scalable temperature measuring range" (32 bit REAL format); 16 bit for measuring mode R and U; 16 bit for all measuring modes when using the S7 format (16 bit INTEGER)
• Integration time, parameterizable	Yes
• Integration time (ms)	Fast mode: 2.5 / 16.67 / 20 / 100 ms, standard mode: 7.5 / 50 / 60 / 300 ms
• Basic conversion time, including integration time (ms)	Fast mode: 4 / 18 / 22 / 102 ms; Standard mode: 9 / 52 / 62 / 302 ms
- additional conversion time for wire-break monitoring	Thermocouples, 150 Ohm, 300 Ohm, 600 Ohm, Cu10, Cu50, Cu100, Ni10, Ni100, Ni120, Ni200, Pt10, Pt50, Pt100: 4 ms; 6 kOhm, Ni500, Ni1000, LG-Ni1000, Pt200, Pt500, Pt1000: 13 ms
• Interference voltage suppression for interference frequency f1 in Hz	400 / 60 / 50 / 10 Hz
• Basic execution time of the module (all channels released)	Corresponds to the channel with the highest basic conversion time
Smoothing of measured values	
• parameterizable	Yes
Encoder	
Connection of signal encoders	
• for voltage measurement	Yes
• for current measurement as 2-wire transducer	No
• for current measurement as 4-wire transducer	No
• for resistance measurement with two-wire connection	Yes
• for resistance measurement with three-wire connection	Yes; All measuring ranges except PTC; internal compensation of the cable resistances
• for resistance measurement with four-wire connection	Yes; All measuring ranges except PTC
Errors/accuracies	
Basic error limit (operational limit at 25 °C)	
• Voltage, relative to input range, (+/-)	0.05 %
• Resistance, relative to input range, (+/-)	0.05 %
• Resistance thermometer, relative to input range, (+/-)	Cuxxx Standard: ±0.3 K, Cuxxx Klima: ±0.2 K, Ptxxx Standard: ±0.5 K, Ptxxx Klima: ±0.2 K, Nixxx Standard: ±0.3 K, Nixxx Klima: ±0.15 K
• Thermocouple, relative to input range, (+/-)	Type B: > 600 °C ±1 K, Type E: > -200 °C ±0.5 K, Type J: > -210 °C ±0.5 K, Type K: > -200 °C ±1 K, Type N: > -200 °C ±1 K, Type R: > 0 °C ±1 K, Type S: > 0 °C ±1 K, Type T: > -200 °C ±0.5 K, Type C: ±2 K, Type TXK/TXK(L): ±0.5 K

Article number	**6ES7531-7PF00-0AB0**
	S7-1500, AI 8 X U/R/RTD/TC HF
Interference voltage suppression for f = n x (f1 +/- 1 %), f1 = interference frequency	
• Series mode interference (peak value of interference < rated value of input range), min.	80 dB; in the Standard operating mode, 40 dB in the Fast operating mode
• Common mode voltage, max.	60 V DC/30 V AC
• Common mode interference, min.	80 dB
Isochronous mode	
Isochronous operation (application synchronized up to terminal)	No
Interrupts/diagnostics/ status information	
Diagnostics function	Yes
Alarms	
• Diagnostic alarm	Yes
• Limit value alarm	Yes; two upper and two lower limit values in each case
Diagnostic messages	
• Monitoring the supply voltage	Yes
• Wire-break	Yes; Only with TC, R, RTD
• Overflow/underflow	Yes
Diagnostics indication LED	
• RUN LED	Yes; Green LED
• ERROR LED	Yes; Red LED
• Monitoring of the supply voltage (PWR-LED)	Yes; Green LED
• Channel status display	Yes; Green LED
• for channel diagnostics	Yes; Red LED
• for module diagnostics	Yes; Red LED
Potential separation	
Potential separation channels	
• between the channels and backplane bus	Yes
Standards, approvals, certificates	
Suitable for applications according to AMS 2750	Yes; Declaration of Conformity, see online support entry 109757262
Suitable for applications according to CQI-9	Yes; Based on AMS 2750 E
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	0 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	0 °C
• vertical installation, max.	40 °C
Decentralized operation	
Prioritized startup	Yes
Dimensions	
Width	35 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	290 g
Other	
Note:	For the R/RDT three-wire measurement, the conductor compensation is made alternating with the measurement. This then requires two module cycles for a measured value.

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SM 531 analog input modules

Ordering data	Article No.
SM 531 analog input modules	
4 x U/I/RTD/TC 4 analog inputs, ±10 V, ±5 V, ±2.5 V, ±1 V, ±500 mV, ±250 mV, ±80 mV, ±50 mV, 1 ... 5 V, 0/4 ... 20 mA, ±20 mA, thermocouples type B, E, J, K, N, R, S, T, resistance thermometers Ni 100, Ni 1000, LG-Ni 1000, Pt100, Pt1000, Pt250, Pt500, resistors 0 ... 150/300/600/ 6000 ohms; 16 bits; incl. infeed element, shield bracket, shield terminal, labeling strips, U connector, printed front door	**6ES7531-7QD00-0AB0**
8 x U/I/R/RTD/ 8 analog inputs ±1 V, ±10 V, ±5 V, ±50 mV, ±500 mV, 1 ... 5 V, 0/4 ... 20 mA, ±20 mA, resistance thermometers Ni 100, Ni 1000, LG-Ni 1000, Pt100, Pt1000, resistors 0 ... 600/6000 ohms, PTC; 16 bits; incl. infeed element, shield bracket, shield terminal, labeling strips, U connector, printed front door	**6ES7531-7QF00-0AB0**
8 x U/I HS 8 analog inputs, ±10 V, ±5 V, 1 ... 5 V or 0/4 ... 20 mA, ±20 mA, 16 bits + sign; incl. infeed element, shield bracket, shield terminal, labeling strips, U connector, printed front door	**6ES7531-7NF10-0AB0**
8 x U/I/RTD/TC 8 analog inputs ±10 V, ±5 V, ±2.5 V, ±1 V, ±500 mV, ±250 mV, ±80 mV, ±50 mV, 1 ... 5 V, 0/4 ... 20 mA, ±20 mA, thermocouples type B, E, J, K, N, R, S, T, resistance thermometers Ni 100, Ni 1000, LG-Ni 1000, Pt100, Pt1000, Pt250, Pt500, resistors 0 ... 150/300/600/ 6000 ohms; 16 bits; incl. infeed element, shield bracket, shield terminal, labeling strips, U connector, printed front door	**6ES7531-7KF00-0AB0**
8 x U/I HF 8 analog inputs, ±10 V, ±5 V, 1 ... 5 V or 0/4 ... 20 mA, ±20 mA, 16 bits + sign; incl. infeed element, shield bracket, shield terminal, labeling strips, U connector, printed front door	**6ES7531-7NF00-0AB0**
8 x U/R/RTD/TC 8 analog inputs, ±1 V, ±500 mV, ±250 mV, ±80 mV, ±50 mV, ±25 mV; thermocouples type B, E, J, K, N, R, S, T, TXK/TXK(L) according to GOST; resistance thermometers Cu 10, Cu 50, Cu 100, Ni 10, Ni 100, Ni 120, Ni 200, Ni 500, Ni 1000, LG-Ni 1000, Pt10, Pt50, Pt100, Pt200, Pt500, Pt1000; resistors 0...150/300/600/ 6000 ohms, PTC; 16 bits; incl. infeed element, shield bracket, shield terminal, labeling strips, U connector, printed front door	**6ES7531-7PF00-0AB0**

Accessories	Article No.
Front connectors	
For 35 mm modules; including four potential bridges, cable ties and individual labeling strips, 40-pin	
• Screw terminals	**6ES7592-1AM00-0XB0**
• Push-in	**6ES7592-1BM00-0XB0**
For 25 mm modules; including cable ties and individual labeling strips; push-in terminal 40-pin; spare part	**6ES7592-1BM00-0XA0**
DIN A4 labeling sheets	
For 35 mm modules; 10 sheets with 10 labeling strips each for I/O modules; perforated, Al gray	**6ES7592-2AX00-0AA0**
For 25 mm modules; 10 sheets with 20 labeling strips each for I/O modules; perforated, Al gray	**6ES7592-1AX00-0AA0**
U connector 5 units; spare part	**6ES7590-0AA00-0AA0**
Universal front door for I/O modules	
For 35 mm modules; 5 front doors; with 5 labeling strips (front) and 5 cabling diagrams per front door; spare part	**6ES7528-0AA00-7AA0**
For 25 mm modules; 5 front doors; with 5 labeling strips (front) and 5 cabling diagrams per front door; spare part	**6ES7528-0AA00-0AA0**
Shielding set I/O	
For 35 mm modules; infeed element, shield bracket, and shield terminal; 5 units, spare part (one shield set supplied with the module).	**6ES7590-5CA00-0AA0**
For 25 mm modules; infeed element, shield bracket, and shield terminal; 4 units, spare part (one shield set supplied with the module).	**6ES7590-5CA10-0XA0**
Shield terminal element 10 units; spare part	**6ES7590-5BA00-0AA0**
SIMATIC Manual Collection Electronic manuals on DVD, multi-language: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC Distributed I/O, SIMATIC HMI, SIMATIC sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	**6ES7998-8XC01-8YE0**
SIMATIC Manual Collection update service for 1 year Current "Manual Collection" DVD and the three subsequent updates	**6ES7998-8XC01-8YE2**

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Overview



- 2, 4 and 8-channel analog output modules
- Optionally with extremely short conversion times
- For connecting analog actuators without additional amplifiers
- Even solves more complex automation tasks

Technical specifications

Article number	**6ES7532-5NB00-0AB0** S7-1500, AQ 2xU/I ST	**6ES7532-5HD00-0AB0** S7-1500, AQ 4xU/I ST	**6ES7532-5HF00-0AB0** S7-1500, AQ 8xU/I HS	**6ES7532-5ND00-0AB0** S7-1500, AQ 4xU/I HF
General information				
Product type designation	AQ 2xU/I ST	AQ 4xU/I ST	AQ 8xU/I HS	AQ 4xU/I HF
Product function				
• I&M data	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3
• Output range scalable	No	No	No	
Engineering with				
• STEP 7 TIA Portal configurable/ integrated as of version	V13 / V13.0.2	V12 / V12	V14 / -	V14 / -
• STEP 7 configurable/integrated as of version	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -
• PROFIBUS as of GSD version/ GSD revision	V1.0 / V5.1	V1.0 / V5.1	V1.0 / V5.1	V1.0 / V5.1
• PROFINET as of GSD version/ GSD revision	V2.3 / -	V2.3 / -	V2.3 / -	V2.3 / -
Operating mode				
• Oversampling	No	No	Yes	No
• MSO	Yes	Yes	Yes	Yes
Supply voltage				
Rated value (DC)	24 V	24 V	24 V	24 V
Reverse polarity protection	Yes	Yes	Yes	Yes
Analog outputs				
Number of analog outputs	2	4	8	4
Cycle time (all channels), min.	3.2 ms; independent of number of activated channels	3.2 ms; independent of number of activated channels	125 µs; independent of number of activated channels	125 µs; independent of number of activated channels
Output ranges, voltage				
• 0 to 10 V	Yes	Yes	Yes	Yes
• 1 V to 5 V	Yes	Yes	Yes	Yes
• -5 V to +5 V	No	No	No	No
• -10 V to +10 V	Yes	Yes	Yes	Yes

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Technical specifications (continued)

Article number	6ES7532-5NB00-0AB0 S7-1500, AQ 2xU/I ST	6ES7532-5HD00-0AB0 S7-1500, AQ 4xU/I ST	6ES7532-5HF00-0AB0 S7-1500, AQ 8xU/I HS	6ES7532-5ND00-0AB0 S7-1500, AQ 4xU/I HF
Output ranges, current				
• 0 to 20 mA	Yes	Yes	Yes	Yes
• -20 mA to +20 mA	Yes	Yes	Yes	Yes
• 4 mA to 20 mA	Yes	Yes	Yes	Yes
Connection of actuators				
• for voltage output two-wire connection	Yes	Yes	Yes	Yes
• for voltage output four-wire connection	Yes	Yes	Yes	Yes
• for current output two-wire connection	Yes	Yes	Yes	Yes
Load impedance (in rated range of output)				
• with voltage outputs, min.	1 kΩ; 0.5 kOhm at 1 to 5 V	1 kΩ; 0.5 kOhm at 1 to 5 V	1 kΩ	1 kΩ; 0.5 kOhm at 1 to 5 V
• with voltage outputs, capacitive load, max.	1 µF	1 µF	100 nF	1 µF
• with current outputs, max.	750 Ω	750 Ω	500 Ω	750 Ω
• with current outputs, inductive load, max.	10 mH	10 mH	1 mH	10 mH
Cable length				
• shielded, max.	800 m; for current, 200 m for voltage	800 m; for current, 200 m for voltage	200 m	800 m; for current, 200 m for voltage
Analog value generation for the outputs				
Integration and conversion time/ resolution per channel				
• Resolution with overrange (bit including sign), max.	16 bit	16 bit	16 bit	16 bit
• Conversion time (per channel)	0.5 ms	0.5 ms	50 µs; independent of number of activated channels	125 µs; independent of number of activated channels
Settling time				
• for resistive load	1.5 ms	1.5 ms	30 µs; see additional description in the manual	0.2 ms; see additional description in the manual
• for capacitive load	2.5 ms	2.5 ms	100 µs; see additional description in the manual	1.8 ms; see additional description in the manual
• for inductive load	2.5 ms	2.5 ms	100 µs; see additional description in the manual	2 ms; see additional description in the manual
Errors/accuracies				
Basic error limit (operational limit at 25 °C)				
• Voltage, relative to output range, (+/-)	0.2 %	0.2 %	0.2 %	0.06 %
• Current, relative to output range, (+/-)	0.2 %	0.2 %	0.2 %	0.1 %
Isochronous mode				
Isochronous operation (application synchronized up to terminal)	No	No	Yes	Yes
Execution and activation time (TCO), min.			100 µs	100 µs
Bus cycle time (TDP), min.			250 µs	250 µs
Interrupts/diagnostics/ status information				
Diagnostics function	Yes	Yes	Yes	Yes
Substitute values connectable	Yes	Yes	Yes	Yes
Alarms				
• Diagnostic alarm	Yes	Yes	Yes	Yes

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Technical specifications (continued)

Article number	**6ES7532-5NB00-0AB0**	**6ES7532-5HD00-0AB0**	**6ES7532-5HF00-0AB0**	**6ES7532-5ND00-0AB0**
	S7-1500, AQ 2xU/I ST	S7-1500, AQ 4xU/I ST	S7-1500, AQ 8xU/I HS	S7-1500, AQ 4xU/I HF
Diagnostic messages				
• Monitoring the supply voltage	Yes	Yes	Yes	Yes
• Wire-break	Yes; Only for output type "current"	Yes; Only for output type "current"	Yes; Only for output type "current"	Yes; Only for output type "current"
• Short-circuit	Yes; Only for output type "voltage"	Yes; Only for output type "voltage"	Yes; Only for output type "voltage"	Yes; Only for output type "voltage"
• Overflow/underflow	Yes	Yes	Yes	Yes
Diagnostics indication LED				
• RUN LED	Yes; Green LED	Yes; Green LED	Yes; Green LED	Yes; Green LED
• ERROR LED	Yes; Red LED	Yes; Red LED	Yes; Red LED	Yes; Red LED
• Monitoring of the supply voltage (PWR-LED)	Yes; Green LED	Yes; Green LED	Yes; Green LED	Yes; Green LED
• Channel status display	Yes; Green LED	Yes; Green LED	Yes; Green LED	Yes; Green LED
• for channel diagnostics	Yes; Red LED	Yes; Red LED	Yes; Red LED	Yes; Red LED
• for module diagnostics	Yes; Red LED	Yes; Red LED	Yes; Red LED	Yes; Red LED
Potential separation				
Potential separation channels				
• between the channels and backplane bus	Yes	Yes	Yes	Yes
Ambient conditions				
Ambient temperature during operation				
• horizontal installation, min.	0 °C			
• horizontal installation, max.	60 °C			
• vertical installation, min.	0 °C			
• vertical installation, max.	40 °C			
Decentralized operation				
Prioritized startup	No	No	No	Yes
Dimensions				
Width	25 mm	35 mm	35 mm	35 mm
Height	147 mm	147 mm	147 mm	147 mm
Depth	129 mm	129 mm	129 mm	129 mm
Weights				
Weight, approx.	200 g	310 g	325 g	300 g
Other				
Note:	Supplied incl. 40-pole push-in front connectors			

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SM 532 analog output modules

Ordering data	Article No.
SM 532 analog output modules	
Module width 25 mm	
2 x U/I ST; 2 analog outputs, ±10 V, 1 ... 5 V, 0 ... 10 V or ±20 mA, 0/4 ... 20 mA, 16-bit; incl. infeed element, shield bracket, shield terminal, labeling strips, U connector, printed front door	**6ES7532-5NB00-0AB0**
Module width 35 mm	
4 x U/I ST; 4 analog outputs, ±10 V, 1 ... 5 V, 0 ... 10 V or ±20 mA, 0/4 ... 20 mA, 16-bit; incl. infeed element, shield bracket, shield terminal, labeling strips, U connector, printed front door	**6ES7532-5HD00-0AB0**
8 x U/I HF; 8 analog outputs, ±10 V, 1 ... 5 V, 0 ... 10 V or ±20 mA, 0/4 ... 20 mA, 16-bit; incl. infeed element, shield bracket, shield terminal, labeling strips, U connector, printed front door	**6ES7532-5HF00-0AB0**
4 x U/I HF; 4 analog outputs, ±10 V, 1 ... 5 V, 0 ... 10 V or ±20 mA, 0/4 ... 20 mA, 16-bit; incl. infeed element, shield bracket, shield terminal, labeling strips, U connector, printed front door	**6ES7532-5ND00-0AB0**
Accessories	
Front connectors	
For 35 mm modules; including four potential bridges, cable ties and individual labeling strips, 40-pin	
• Screw terminals	**6ES7592-1AM00-0XB0**
• Push-in	**6ES7592-1BM00-0XB0**
For 25 mm modules; including cable ties and individual labeling strips; push-in terminal 40-pin; spare part	**6ES7592-1BM00-0XA0**

Ordering data	Article No.
DIN A4 labeling sheets	
For 35 mm modules; 10 sheets with 10 labeling strips each for I/O modules; perforated, Al gray	**6ES7592-2AX00-0AA0**
For 25 mm modules; 10 sheets with 20 labeling strips each for I/O modules; perforated, Al gray	**6ES7592-1AX00-0AA0**
U connector	**6ES7590-0AA00-0AA0**
5 units; spare part	
Universal front door for I/O modules	
For 35 mm modules; 5 front doors; with 5 labeling strips (front) and 5 cabling diagrams per front door; spare part	**6ES7528-0AA00-7AA0**
For 25 mm modules; 5 front doors; with 5 labeling strips (front) and 5 cabling diagrams per front door; spare part	**6ES7528-0AA00-0AA0**
Shielding set I/O	
For 35 mm modules; infeed element, shield bracket, and shield terminal; 5 units, spare part (one shield set supplied with the module).	**6ES7590-5CA00-0AA0**
For 25 mm modules; infeed element, shield bracket, and shield terminal; 4 units, spare part (one shield set supplied with the module).	**6ES7590-5CA10-0XA0**
Shield terminal element	**6ES7590-5BA00-0AA0**
10 units; spare part	
SIMATIC Manual Collection	**6ES7998-8XC01-8YE0**
Electronic manuals on DVD, multi-language: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC Distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	
SIMATIC Manual Collection update service for 1 year	**6ES7998-8XC01-8YE2**
Current "Manual Collection" DVD and the three subsequent updates	

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Overview



- 4 analog inuts/ 2 analog outputs
- For flexible adaptation of the controller to the corresponding task
- For subsequent expansion of the system with additional inputs and outputs
- For use in the tightest spaces

Technical specifications

Article number	**6ES7534-7QE00-0AB0** S7-1500, AI 4x U/I/RTD/TC/AQ 2x U/I ST
General information	
Product type designation	AI 4xU/I/RTD/TC /AQ 2xU/I ST
Product function	
• I&M data	Yes; I&M0 to I&M3
• Measuring range scalable	No
• Scalable measured values	No
• Adjustment of measuring range	No
• Output range scalable	No
Engineering with	
• STEP 7 TIA Portal configurable/ integrated as of version	V13 / V13.0.2
• STEP 7 configurable/integrated as of version	V5.5 SP3 / -
• PROFIBUS as of GSD version/ GSD revision	V1.0 / V5.1
• PROFINET as of GSD version/ GSD revision	V2.3 / -
Operating mode	
• Oversampling	No
• MSI	Yes
• MSO	Yes
Supply voltage	
Rated value (DC)	24 V
Reverse polarity protection	Yes
Analog inputs	
Number of analog inputs	4
• For current measurement	4
• For voltage measurement	4
• For resistance/resistance thermometer measurement	2
• For thermocouple measurement	4
permissible input voltage for voltage input (destruction limit), max.	28.8 V
permissible input current for current input (destruction limit), max.	40 mA
Constant measurement current for resistance-type transmitter, typ.	150 Ohm, 300 Ohm, 600 Ohm, Pt100, Pt200, Ni100: 1.25 mA; 6 000 Ohm, Pt500, Pt1000, Ni1000, LG-Ni1000: 0.625 mA; PTC: 0.472 mA

Article number	**6ES7534-7QE00-0AB0** S7-1500, AI 4x U/I/RTD/TC/AQ 2x U/I ST
Technical unit for temperature measurement adjustable	Yes; °C/°F/K
Analog input with oversampling	No
Standardization of measured values	No
Input ranges (rated values), voltages	
• 0 to +5 V	No
• 0 to +10 V	No
• 1 V to 5 V	Yes
• -1 V to +1 V	Yes
• -10 V to +10 V	Yes
• -2.5 V to +2.5 V	Yes
• -25 mV to +25 mV	No
• -250 mV to +250 mV	Yes
• -5 V to +5 V	Yes
• -50 mV to +50 mV	Yes
• -500 mV to +500 mV	Yes
• -80 mV to +80 mV	Yes
Input ranges (rated values), currents	
• 0 to 20 mA	Yes
• -20 mA to +20 mA	Yes
• 4 mA to 20 mA	Yes
Input ranges (rated values), thermocouples	
• Type B	Yes
• Type C	No
• Type E	Yes
• Type J	Yes
• Type K	Yes
• Type L	No
• Type N	Yes
• Type R	Yes
• Type S	Yes
• Type T	Yes
• Type U	No
• Type TXK/TXK(L) to GOST	No

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Technical specifications (continued)

Article number	6ES7534-7QE00-0AB0 S7-1500, AI 4x U/I/RTD/TC/AQ 2x U/I ST
Input ranges (rated values), resistance thermometer	
• Cu 10	No
• Cu 10 according to GOST	No
• Cu 50	No
• Cu 50 according to GOST	No
• Cu 100	No
• Cu 100 according to GOST	No
• Ni 10	No
• Ni 10 according to GOST	No
• Ni 100	Yes; Standard/climate
• Ni 100 according to GOST	No
• Ni 1000	Yes; Standard/climate
• Ni 1000 according to GOST	No
• LG-Ni 1000	Yes; Standard/climate
• Ni 120	No
• Ni 120 according to GOST	No
• Ni 200	No
• Ni 200 according to GOST	No
• Ni 500	No
• Ni 500 according to GOST	No
• Pt 10	No
• Pt 10 according to GOST	No
• Pt 50	No
• Pt 50 according to GOST	No
• Pt 100	Yes; Standard/climate
• Pt 100 according to GOST	No
• Pt 1000	Yes; Standard/climate
• Pt 1000 according to GOST	No
• Pt 200	Yes; Standard/climate
• Pt 200 according to GOST	No
• Pt 500	Yes; Standard/climate
• Pt 500 according to GOST	No
Input ranges (rated values), resistors	
• 0 to 150 ohms	Yes
• 0 to 300 ohms	Yes
• 0 to 600 ohms	Yes
• 0 to 3000 ohms	No
• 0 to 6000 ohms	Yes
• PTC	Yes
Thermocouple (TC)	
Temperature compensation	
- parameterizable	Yes
Cable length	
• shielded, max.	800 m; for U/I, 200 m for R/RTD, 50 m for TC
Analog outputs	
Number of analog outputs	2
Cycle time (all channels), min.	3.2 ms; ±0.5 ms, regardless of the number of activated channels
Output ranges, voltage	
• 0 to 10 V	Yes
• 1 V to 5 V	Yes
• -5 V to +5 V	No
• -10 V to +10 V	Yes

Article number	6ES7534-7QE00-0AB0 S7-1500, AI 4x U/I/RTD/TC/AQ 2x U/I ST
Output ranges, current	
• 0 to 20 mA	Yes
• -20 mA to +20 mA	Yes
• 4 mA to 20 mA	Yes
Connection of actuators	
• for voltage output two-wire connection	Yes
• for voltage output four-wire connection	Yes
• for current output two-wire connection	Yes
Load impedance (in rated range of output)	
• with voltage outputs, min.	1 kΩ; 0.5 kOhm at 1 to 5 V
• with voltage outputs, capacitive load, max.	1 µF
• with current outputs, max.	750 Ω
• with current outputs, inductive load, max.	10 mH
Cable length	
• shielded, max.	800 m; for current, 200 m for voltage
Analog value generation for the inputs	
Integration and conversion time/ resolution per channel	
• Resolution with overrange (bit including sign), max.	16 bit
• Integration time, parameterizable	Yes
• Integration time (ms)	2,5 / 16,67 / 20 / 100 ms
• Basic conversion time, including integration time (ms)	9 / 23 / 27 / 107 ms
- additional conversion time for wire-break monitoring	9 ms
- additional conversion time for resistance measurement	150 ohm, 300 ohm, 600 ohm, Pt100, Pt200, Ni100: 2 ms, 6000 ohm, Pt500, Pt1000, Ni1000, LG-Ni1000, PTC: 4 ms
• Interference voltage suppression for interference frequency f1 in Hz	400 / 60 / 50 / 10
Smoothing of measured values	
• parameterizable	Yes
Analog value generation for the outputs	
Integration and conversion time/ resolution per channel	
• Resolution with overrange (bit including sign), max.	16 bit
• Conversion time (per channel)	0.5 ms
Settling time	
• for resistive load	1.5 ms
• for capacitive load	2.5 ms
• for inductive load	2.5 ms

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Technical specifications (continued)

Article number	**6ES7534-7QE00-0AB0** S7-1500, AI 4x U/I/RTD/TC/AQ 2x U/I ST
Encoder	
Connection of signal encoders	
• for voltage measurement	Yes
• for current measurement as 2-wire transducer	Yes
- Burden of 2-wire transmitter, max.	820 Ω
• for current measurement as 4-wire transducer	Yes
• for resistance measurement with two-wire connection	Yes; Only for PTC
• for resistance measurement with three-wire connection	Yes; All measuring ranges except PTC; internal compensation of the cable resistances
• for resistance measurement with four-wire connection	Yes; All measuring ranges except PTC
Errors/accuracies	
Basic error limit (operational limit at 25 °C)	
• Voltage, relative to input range, (+/-)	0.1 %
• Current, relative to input range, (+/-)	0.1 %
• Resistance, relative to input range, (+/-)	0.1 %
• Resistance thermometer, relative to input range, (+/-)	0.1 %; Ptxxx standard: ±0.7 K, Ptxxx climate: ±0.2 K, Nixxx standard: ±0.3 K, Nixxx climate: ±0.15 K
• Thermocouple, relative to input range, (+/-)	0.1 %; Type B: > 600 °C ±1.7 K, type E: > -200 °C ±0.7 K, type J: > -210 °C ±0.8 K, type K: > -200 °C ±1.2 K, type N: > -200 °C ±1.2 K, type R: > 0 °C ±1.9 K, type S: > 0 °C ±1.9 K, type T: > -200 °C ±0.8 K
• Voltage, relative to output range, (+/-)	0.2 %
• Current, relative to output range, (+/-)	0.2 %
Interference voltage suppression for f = n x (f1 +/- 1 %), f1 = interference frequency	
• Series mode interference (peak value of interference < rated value of input range), min.	40 dB
• Common mode voltage, max.	10 V
• Common mode interference, min.	60 dB
Isochronous mode	
Isochronous operation (application synchronized up to terminal)	No

Article number	**6ES7534-7QE00-0AB0** S7-1500, AI 4x U/I/RTD/TC/AQ 2x U/I ST
Interrupts/diagnostics/ status information	
Diagnostics function	Yes
Substitute values connectable	Yes
Alarms	
• Diagnostic alarm	Yes
• Limit value alarm	Yes; two upper and two lower limit values in each case
Diagnostic messages	
• Monitoring the supply voltage	Yes
• Wire-break	Yes; only for input type 1 ... 5 V, 4 ... 20 mA, TC, R, RTD and output type current
• Short-circuit	Yes; Only for output type "voltage"
• Overflow/underflow	Yes
Diagnostics indication LED	
• RUN LED	Yes; Green LED
• ERROR LED	Yes; Red LED
• Monitoring of the supply voltage (PWR-LED)	Yes; Green LED
• Channel status display	Yes; Green LED
• for channel diagnostics	Yes; Red LED
• for module diagnostics	Yes; Red LED
Potential separation	
Potential separation analog inputs	
• between the channels and backplane bus	Yes
Potential separation analog outputs	
• between the channels and backplane bus	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	0 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	0 °C
• vertical installation, max.	40 °C
Decentralized operation	
Prioritized startup	No
Dimensions	
Width	25 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	250 g
Other	
Note:	Supplied incl. 40-pole push-in front connectors. Additional basic error and noise for integration time = 2.5 ms: Voltage: ±250 mV (±0.02%), ±80 mV (±0.05%), ±50 mV (±0.05%); resistance: 150 Ohms (±0.02%); resistance thermometer: Pt100 climate: ±0.08 K, Ni100 climate: ±0.08 K; thermoelement: Type B, R, S: ±3 K, type E, J, K, N, T: ±1 K

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SM 534 analog input/output modules

Ordering data	Article No.
SM 534 analog input/output module	
Module width 25 mm	
4 analog inputs ±10 V, ±5 V, ±2.5 V, ±1 V, ±500 mV, ±250 mV, ±80 mV, ±50 mV, 1 ... 5 V, 0/4 ... 20 mA, ±20 mA, thermocouples type B, E, J, K, N, R, S, T, resistance thermometers Ni 100, Ni 1000, LG-Ni 1000, Pt 100, Pt 1000, Pt 250, Pt 500, resistors 0...150/300/600/ 6000 Ohm, 16 bits; 2 analog outputs, ±10 V, 1 ... 5 V, 0 ... 10 V or ±20 mA, 0/4 ... 20 mA, 16 bits; incl. infeed element, shield bracket, shield terminal, labeling strips, U connector, printed front door	**6ES7534-7QE00-0AB0**
Accessories	
Front connectors	
For 25 mm modules; including cable ties and individual labeling strips; push-in terminal 40-pin; spare part	**6ES7592-1BM00-0XA0**
DIN A4 labeling sheets	
For 25 mm modules; 10 sheets with 20 labeling strips each for I/O modules; perforated, Al gray	**6ES7592-1AX00-0AA0**
U connector	**6ES7590-0AA00-0AA0**
5 units; spare part	

	Article No.
Universal front door for I/O modules	
For 25 mm modules; 5 front doors; with 5 labeling strips (front) and 5 cabling diagrams per front door; spare part	**6ES7528-0AA00-0AA0**
Shielding set I/O	
For 25 mm modules; infeed element, shield bracket, and shield terminal; 4 units, spare part (one shield set supplied with the module).	**6ES7590-5CA10-0XA0**
Shield terminal element	**6ES7590-5BA00-0AA0**
10 units; spare part	
SIMATIC Manual Collection	**6ES7998-8XC01-8YE0**
Electronic manuals on DVD, multi-language: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC Distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	
SIMATIC Manual Collection update service for 1 year	**6ES7998-8XC01-8YE2**
Current "Manual Collection" DVD and the three subsequent updates	

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Overview



- 8-channel analog input modules
- Optionally with extremely short conversion times
- For the connection of analog sensors without additional amplifiers
- Even solves more complex automation tasks

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

Technical specifications

Article number	**6AG1531-7NF10-7AB0**	**6AG1531-7KF00-7AB0**
Based on	**6ES7531-7NF10-0AB0**	**6ES7531-7KF00-0AB0**
	SIPLUS S7-1500 AI 8XU/I HS	SIPLUS S7-1500 AI 8XU/I/RTD/TC ST
Ambient conditions		
Ambient temperature during operation		
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	70 °C; = Tmax	70 °C; = Tmax
• vertical installation, min.	-40 °C; = Tmin	-40 °C; = Tmin
• vertical installation, max.	40 °C; = Tmax	40 °C; = Tmax
Altitude during operation relating to sea level		
• Installation altitude above sea level, max.	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity		
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance		
Coolants and lubricants		
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems		
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *

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SIPLUS SM 531 analog input modules

Technical specifications (continued)

Article number	**6AG1531-7NF10-7AB0**	**6AG1531-7KF00-7AB0**
Based on	**6ES7531-7NF10-0AB0**	**6ES7531-7KF00-0AB0**
	SIPLUS S7-1500 AI 8XU/I HS	SIPLUS S7-1500 AI 8XU/I/RTD/TC ST
Use on ships/at sea		
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Remark		
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating		
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability	Yes; Class 2 for high availability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

Ordering data

	Article No.
SIPLUS SM 531 analog input modules	
(Extended temperature range and exposure to media)	
8 analog inputs, ±10 V, ±5 V, 1 ... 5 V or 0/4 ... 20 mA, ±20 mA, 16 bits + sign; incl. infeed element, shield clamp, shield terminal, labeling strips, U connector, printed front door	**6AG1531-7NF10-7AB0**
8 analog inputs ±10 V, ±5 V, ±2.5 V, ±1 V, ±500 mV, ±250 mV, ±80 mV, ±50 mV, 1 ... 5 V, 0/4 ... 20 mA, ±20 mA, thermocouples type B, E, J, K, N, R, S, T, resistance thermometers Ni 100, Ni 1000, LG-Ni 1000, Pt 100, Pt 1000, Pt 250, Pt 500, resistors 0...150/300/600/ 6000 Ohm, 16 bits	**6AG1531-7KF00-7AB0**

	Article No.
Accessories	See SIMATIC S7-1500 SM 531 analog input modules, page 4/112

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Overview



- 4 and 8-channel analog output modules
- Optionally with extremely short conversion times
- For connecting analog actuators without additional amplifiers
- Even solves more complex automation tasks

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

Technical specifications

Article number	**6AG1532-5HD00-7AB0**	**6AG1532-5HF00-7AB0**
Based on	**6ES7532-5HD00-0AB0**	**6ES7532-5HF00-0AB0**
	SIPLUS S7-1500 AQ 4XU/I ST	SIPLUS S7-1500 AQ 8XU/I HS
Ambient conditions		
Ambient temperature during operation		
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C
• horizontal installation, max.	70 °C; = Tmax	70 °C; = Tmax; > +60 °C max. 4x ±10 V permissible
• vertical installation, min.	-40 °C; = Tmin	-40 °C; = Tmin; Startup @ -25 °C
• vertical installation, max.	40 °C; = Tmax	40 °C; = Tmax
Altitude during operation relating to sea level		
• Installation altitude above sea level, max.	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity		
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance		
Coolants and lubricants		
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems		
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *

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SIPLUS SM 532 analog output modules

Technical specifications (continued)

Article number	6AG1532-5HD00-7AB0	6AG1532-5HF00-7AB0
Based on	6ES7532-5HD00-0AB0 SIPLUS S7-1500 AQ 4XU/I ST	6ES7532-5HF00-0AB0 SIPLUS S7-1500 AQ 8XU/I HS
Use on ships/at sea		
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Remark		
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating		
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability	Yes; Class 2 for high availability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

Ordering data

	Article No.
SIPLUS SM 532 analog output modules	
(Extended temperature range and exposure to media)	
4 analog outputs, ±10 V, 1 ... 5 V, 0 ... 10 V or ±20 mA, 0/4 ... 20 mA, 16 bits	**6AG1532-5HD00-7AB0**
8 analog outputs, ±10 V, 1 ... 5 V, 0 ... 10 V or ±20 mA, 0/4 ... 20 mA, 16 bits; incl. infeed element, shield clamp, shield terminal, labeling strips, U connector, printed front door	**6AG1532-5HF00-7AB0**

	Article No.
Accessories	See SIMATIC S7-1500 SM 532 analog output modules, page 4/116

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Overview



- 2-channel high-speed counter module
- With comprehensive parameterization options for an optimum adaptation to the task and reduction of control load
- Speed and time period measuring
- Storage and comparison functions
- Connection of 24 V encoders

Technical specifications

Article number	**6ES7550-1AA00-0AB0**
	S7-1500, TM Count 2x24V
General information	
Product type designation	TM Count 2x24V
Product function	
• I&M data	Yes; I&M0 to I&M3
Engineering with	
• STEP 7 TIA Portal configurable/ integrated as of version	V12 (FW V1.0) ... V15 (FW V1.3)/ V12 (FW V1.0), V13 (FW V1.1)
• PROFIBUS as of GSD version/ GSD revision	GSD Revision 5
• PROFINET as of GSD version/ GSD revision	V2.3 / -
Installation type/mounting	
Rail mounting	Yes; S7-1500 mounting rail
Supply voltage	
Load voltage L+	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes
Encoder supply	
Number of outputs	1; A common 24V encoder supply for both channels
24 V encoder supply	
• 24 V	Yes; L+ (-0.8 V)
• Short-circuit protection	Yes
• Output current, max.	1 A; total current of all encoders/ channels

Article number	**6ES7550-1AA00-0AB0**
	S7-1500, TM Count 2x24V
Digital inputs	
Number of digital inputs	6; 3 per channel
Digital inputs, parameterizable	Yes
Input characteristic curve in accordance with IEC 61131, type 3	Yes
Digital input functions, parameterizable	
• Gate start/stop	Yes
• Capture	Yes
• Synchronization	Yes
• Freely usable digital input	Yes
Input voltage	
• Type of input voltage	DC
• Rated value (DC)	24 V
• for signal "0"	-5 ... +5 V
• for signal "1"	+11 to +30V
• permissible voltage at input, min.	-30 V; -5 V continuous, -30 V brief reverse polarity protection
• permissible voltage at input, max.	30 V
Input current	
• for signal "1", typ.	2.5 mA
Input delay (for rated value of input voltage)	
for standard inputs	
- parameterizable	Yes; none / 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms
- at "0" to "1", min.	6 µs; for parameterization "none"
- at "1" to "0", min.	6 µs; for parameterization "none"
for technological functions	
- parameterizable	Yes
Cable length	
• shielded, max.	1 000 m
• unshielded, max.	600 m

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TM Count 2x24V counter module

Technical specifications (continued)

Article number	6ES7550-1AA00-0AB0 S7-1500, TM Count 2x24V
Digital outputs	
Type of digital output	Transistor
Number of digital outputs	4; 2 per channel
Digital outputs, parameterizable	Yes
Short-circuit protection	Yes; electronic/thermal
Limitation of inductive shutdown voltage to	L+ (-33 V)
Controlling a digital input	Yes
Digital output functions, parameterizable	
• Switching tripped by comparison values	Yes
• Freely usable digital output	Yes
Switching capacity of the outputs	
• with resistive load, max.	0.5 A; Per digital output
• on lamp load, max.	5 W
Load resistance range	
• lower limit	48 Ω
• upper limit	12 kΩ
Output voltage	
• Type of output voltage	DC
• for signal "1", min.	23.2 V; L+ (-0.8 V)
Output current	
• for signal "1" rated value	0.5 A; Per digital output
• for signal "0" residual current, max.	0.5 mA
Output delay with resistive load	
• "0" to "1", max.	50 µs
• "1" to "0", max.	50 µs
Switching frequency	
• with resistive load, max.	10 kHz
• with inductive load, max.	0.5 Hz; Acc. to IEC 60947-5-1, DC-13; observe derating curve
• on lamp load, max.	10 Hz
Total current of the outputs	
• Current per module, max.	2 A
Cable length	
• shielded, max.	1 000 m
• unshielded, max.	600 m
Encoder	
Connectable encoders	
• 2-wire sensor	Yes
- permissible quiescent current (2-wire sensor), max.	1.5 mA
Encoder signals, incremental encoder (asymmetrical)	
• Input voltage	24 V
• Input frequency, max.	200 kHz
• Counting frequency, max.	800 kHz; with quadruple evaluation
• Cable length, shielded, max.	600 m; depending on input frequency, encoder and cable quality; max. 50 m at 200 kHz
• Signal filter, parameterizable	Yes
• Incremental encoder with A/B tracks, 90° phase offset	Yes
• Incremental encoder with A/B tracks, 90° phase offset and zero track	Yes
• Pulse encoder	Yes
• Pulse encoder with direction	Yes
• Pulse encoder with one impulse signal per count direction	Yes

Article number	6ES7550-1AA00-0AB0 S7-1500, TM Count 2x24V
Encoder signal 24 V	
- permissible voltage at input, min.	-30 V
- permissible voltage at input, max.	30 V
Interface types	
• Source/sink input	Yes
• Input characteristic curve in accordance with IEC 61131, type 3	Yes
Isochronous mode	
Isochronous operation (application synchronized up to terminal)	Yes
Filtering and processing time (TCI), min.	130 µs
Bus cycle time (TDP), min.	250 µs
Interrupts/diagnostics/ status information	
Alarms	
• Diagnostic alarm	Yes
• Hardware interrupt	Yes
Diagnostic messages	
• Monitoring the supply voltage	Yes
• Wire-break	Yes
• Short-circuit	Yes
• A/B transition error at incremental encoder	Yes
Diagnostics indication LED	
• RUN LED	Yes; Green LED
• ERROR LED	Yes; Red LED
• MAINT LED	Yes; yellow LED
• Monitoring of the supply voltage (PWR-LED)	Yes; Green LED
• Channel status display	Yes; Green LED
• for channel diagnostics	Yes; Red LED
• Status indicator backward counting (green)	Yes
• Status indicator forward counting (green)	Yes
Integrated Functions	
Number of counters	2
Counting frequency (counter) max.	800 kHz; with quadruple evaluation
Counting functions	
• Can be used with TO High_Speed_Counter	Yes
• Continuous counting	Yes
• Counter response parameterizable	Yes
• Hardware gate via digital input	Yes
• Software gate	Yes
• Event-controlled stop	Yes
• Synchronization via digital input	Yes
• Counting range, parameterizable	Yes
Comparator	
- Number of comparators	2; Per channel
- Direction dependency	Yes
- Can be changed from user program	Yes

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Technical specifications (continued)

Article number	**6ES7550-1AA00-0AB0**
	S7-1500, TM Count 2x24V
Position detection	
• Incremental acquisition	Yes
• Suitable for S7-1500 motion control	Yes
Measuring functions	
• Measuring time, parameterizable	Yes
• Dynamic measurement period adjustment	Yes
• Number of thresholds, parameterizable	2
Measuring range	
- Frequency measurement, min.	0.04 Hz
- Frequency measurement, max.	800 kHz
- Cycle duration measurement, min.	1.25 µs
- Cycle duration measurement, max.	25 s
Accuracy	
- Frequency measurement	100 ppm; depending on measuring interval and signal evaluation
- Cycle duration measurement	100 ppm; depending on measuring interval and signal evaluation
- Velocity measurement	100 ppm; depending on measuring interval and signal evaluation
Potential separation	
Potential separation channels	
• between the channels and backplane bus	Yes

Article number	**6ES7550-1AA00-0AB0**
	S7-1500, TM Count 2x24V
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	0 °C
• horizontal installation, max.	60 °C; Please note derating for inductive loads
• vertical installation, min.	0 °C
• vertical installation, max.	40 °C; Please note derating for inductive loads
Decentralized operation	
to SIMATIC S7-300	Yes
to SIMATIC S7-400	Yes
to SIMATIC S7-1200	Yes
to SIMATIC S7-1500	Yes
to standard PROFIBUS master	Yes; FW V1.1 and higher
to standard PROFINET controller	Yes
Dimensions	
Width	35 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	250 g

Ordering data

	Article No.
TM Count 2x24V counter module With 2 channels, max. 200 kHz; for 24 V encoder	**6ES7550-1AA00-0AB0**
Accessories	
Front connectors For 35 mm modules; including four potential bridges, cable ties and individual labeling strips, 40-pin	
• Screw terminals	**6ES7592-1AM00-0XB0**
• Push-in	**6ES7592-1BM00-0XB0**
DIN A4 labeling sheets 10 sheets with 10 labeling strips each for I/O modules; perforated, Al grey	**6ES7592-2AX00-0AA0**
U connector 5 units; spare part	**6ES7590-0AA00-0AA0**
Universal front door for I/O modules 5 front doors; with 5 labeling strips (front) and 5 cabling diagrams per front door; spare part	**6ES7528-0AA00-7AA0**

	Article No.
Shielding set I/O Infeed element, shield clamp, and shield terminal; 5 units, spare part	**6ES7590-5CA00-0AA0**
Shield terminal element 10 units; spare part	**6ES7590-5BA00-0AA0**
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TM PosInput 2 counter and position detection module

Overview



- 2-channel counter and position detection module with RS 422 interface
- Extensive parameterization options for optimum task-specific adaptation
- Reduces load on controller due to preprocessing on the module
- Position detection with incremental and SSI absolute encoders
- Speed and time period measuring
- Storage and comparison functions
- Connection of encoders with RS 422 signals or 5V-TTL signals

Technical specifications

Article number	**6ES7551-1AB00-0AB0** S7-1500, TM Posinput 2
General information	
Product type designation	TM PosInput 2
Product function	
• I&M data	Yes; I&M0 to I&M3
Engineering with	
• STEP 7 TIA Portal configurable/ integrated as of version	V12 (FW V1.0) ... V15 (FW V1.3)/ V12 (FW V1.0), V13 (FW V1.1)
• PROFIBUS as of GSD version/ GSD revision	GSD Revision 5
• PROFINET as of GSD version/ GSD revision	V2.3 / -
Installation type/mounting	
Rail mounting	Yes; S7-1500 mounting rail
Supply voltage	
Load voltage L+	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes
Encoder supply	
Number of outputs	4; One 5V and 24V encoder supply per channel
5 V encoder supply	
• 5 V	Yes; 5.2 V ±2 %
• Short-circuit protection	Yes
• Output current, max.	300 mA; Per channel
24 V encoder supply	
• 24 V	Yes; L+ (-0.8 V)
• Short-circuit protection	Yes
• Output current, max.	300 mA; Per channel
Digital inputs	
Number of digital inputs	4; 2 per channel
Digital inputs, parameterizable	Yes
Input characteristic curve in accordance with IEC 61131, type 3	Yes
Digital input functions, parameterizable	
• Gate start/stop	Yes; only for pulse and incremental encoders
• Capture	Yes
• Synchronization	Yes; only for pulse and incremental encoders
• Freely usable digital input	Yes

Article number	**6ES7551-1AB00-0AB0** S7-1500, TM Posinput 2
Input voltage	
• Type of input voltage	DC
• Rated value (DC)	24 V
• for signal "0"	-5 ... +5 V
• for signal "1"	+11 to +30V
• permissible voltage at input, min.	-30 V; -5 V continuous, -30 V brief reverse polarity protection
• permissible voltage at input, max.	30 V
Input current	
• for signal "1", typ.	2.5 mA
Input delay (for rated value of input voltage)	
for standard inputs	
- parameterizable	Yes; none / 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms
- at "0" to "1", min.	6 µs; for parameterization "none"
- at "1" to "0", min.	6 µs; for parameterization "none"
for technological functions	
- parameterizable	Yes
Cable length	
• shielded, max.	1 000 m
• unshielded, max.	600 m
Digital outputs	
Type of digital output	Transistor
Number of digital outputs	4; 2 per channel
Digital outputs, parameterizable	Yes
Short-circuit protection	Yes; electronic/thermal
Limitation of inductive shutdown voltage to	L+ (-33 V)
Controlling a digital input	Yes
Digital output functions, parameterizable	
• Switching tripped by comparison values	Yes
• Freely usable digital output	Yes
Switching capacity of the outputs	
• with resistive load, max.	0.5 A; Per digital output
• on lamp load, max.	5 W

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Technical specifications (continued)

Article number	**6ES7551-1AB00-0AB0**
	S7-1500, TM Posinput 2
Load resistance range	
• lower limit	48 Ω
• upper limit	12 kΩ
Output voltage	
• Type of output voltage	DC
• for signal "1", min.	23.2 V; L+ (-0.8 V)
Output current	
• for signal "1" rated value	0.5 A; Per digital output
• for signal "0" residual current, max.	0.5 mA
Output delay with resistive load	
• "0" to "1", max.	50 µs
• "1" to "0", max.	50 µs
Switching frequency	
• with resistive load, max.	10 kHz
• with inductive load, max.	0.5 Hz; Acc. to IEC 60947-5-1, DC-13; observe derating curve
• on lamp load, max.	10 Hz
Total current of the outputs	
• Current per module, max.	2 A
Cable length	
• shielded, max.	1 000 m
• unshielded, max.	600 m
Encoder signals, incremental encoder (symmetrical)	
• Input voltage	RS 422
• Input frequency, max.	1 MHz
• Counting frequency, max.	4 MHz; with quadruple evaluation
• Cable length, shielded, max.	32 m; at 1 MHz
• Signal filter, parameterizable	Yes
• Incremental encoder with A/B tracks, 90° phase offset	Yes
• Incremental encoder with A/B tracks, 90° phase offset and zero track	Yes
• Pulse encoder	Yes
• Pulse encoder with direction	Yes
• Pulse encoder with one impulse signal per count direction	Yes
Encoder signals, incremental encoder (asymmetrical)	
• Input voltage	5 V TTL (push-pull encoders only)
• Input frequency, max.	1 MHz
• Counting frequency, max.	4 MHz; with quadruple evaluation
• Signal filter, parameterizable	Yes
• Incremental encoder with A/B tracks, 90° phase offset	Yes
• Incremental encoder with A/B tracks, 90° phase offset and zero track	Yes
• Pulse encoder	Yes
• Pulse encoder with direction	Yes
• Pulse encoder with one impulse signal per count direction	Yes

Article number	**6ES7551-1AB00-0AB0**
	S7-1500, TM Posinput 2
Encoder signals, absolute encoder (SSI)	
• Input signal	to RS-422
• Telegram length, parameterizable	10 ... 40 bit
• Clock frequency, max.	2 MHz; 125 kHz, 250 kHz, 500 kHz, 1 MHz, 1.5 MHz or 2 MHz
• Binary code	Yes
• Gray code	Yes
• Cable length, shielded, max.	320 m; Cable length, RS-422 SSI absolute encoders, Siemens type 6FX2001-5, 24 V supply: 125 kHz, 320 meters shielded, max.; 250 kHz, 160 meters shielded, max.; 500 kHz, 60 meters shielded, max.; 1 MHz, 20 meters shielded, max. 1.5 MHz, 10 meters shielded, max.; 2 MHz, 8 meters shielded, max.
• Parity bit, parameterizable	Yes
• Monoflop time	16, 32, 48, 64 µs & automatic
• Multiturn	Yes
• Singleturn	Yes
Interface types	
• TTL 5 V	Yes; push-pull encoders only
• RS 422	Yes
Isochronous mode	
Isochronous operation (application synchronized up to terminal)	Yes
Filtering and processing time (TCI), min.	130 µs; only for pulse and incremental encoders
Bus cycle time (TDP), min.	250 µs
Interrupts/diagnostics/ status information	
Alarms	
• Diagnostic alarm	Yes
• Hardware interrupt	Yes
Diagnostic messages	
• Monitoring the supply voltage	Yes
• Wire-break	Yes
• Short-circuit	Yes
• A/B transition error at incremental encoder	Yes
• Telegram error at SSI encoder	Yes
Diagnostics indication LED	
• RUN LED	Yes; Green LED
• ERROR LED	Yes; Red LED
• MAINT LED	Yes; yellow LED
• Monitoring of the supply voltage (PWR-LED)	Yes; Green LED
• Channel status display	Yes; Green LED
• for channel diagnostics	Yes; Red LED
Integrated Functions	
Number of counters	2
Counting frequency (counter) max.	4 MHz; with quadruple evaluation
Counting functions	
• Can be used with TO High_Speed_Counter	Yes; only for pulse and incremental encoders
• Continuous counting	Yes
• Counter response parameterizable	Yes
• Hardware gate via digital input	Yes
• Software gate	Yes
• Event-controlled stop	Yes
• Synchronization via digital input	Yes
• Counting range, parameterizable	Yes

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TM PosInput 2 counter and position detection module

Technical specifications (continued)

Article number	6ES7551-1AB00-0AB0 S7-1500, TM Posinput 2
Comparator	
- Number of comparators	2; Per channel
- Direction dependency	Yes
- Can be changed from user program	Yes
Position detection	
• Incremental acquisition	Yes
• Absolute acquisition	Yes
• Suitable for S7-1500 motion control	Yes
Measuring functions	
• Measuring time, parameterizable	Yes
• Dynamic measurement period adjustment	Yes
• Number of thresholds, parameterizable	2
Measuring range	
- Frequency measurement, min.	0.04 Hz
- Frequency measurement, max.	4 MHz
- Cycle duration measurement, min.	0.25 µs
- Cycle duration measurement, max.	25 s
Accuracy	
- Frequency measurement	100 ppm; depending on measuring interval and signal evaluation
- Cycle duration measurement	100 ppm; depending on measuring interval and signal evaluation
- Velocity measurement	100 ppm; depending on measuring interval and signal evaluation

Article number	6ES7551-1AB00-0AB0 S7-1500, TM Posinput 2
Potential separation	
Potential separation channels	
• between the channels and backplane bus	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	0 °C
• horizontal installation, max.	60 °C; Please note derating for inductive loads
• vertical installation, min.	0 °C
• vertical installation, max.	40 °C; Please note derating for inductive loads
Decentralized operation	
to SIMATIC S7-300	Yes
to SIMATIC S7-400	Yes
to SIMATIC S7-1200	Yes
to SIMATIC S7-1500	Yes
to standard PROFIBUS master	Yes; FW V1.1 and higher
to standard PROFINET controller	Yes
Dimensions	
Width	35 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	325 g

Ordering data

	Article No.
TM PosInput 2 counting and position detecting module With 2 channels, max. 1 MHz counting frequency; for SSI encoders and incremental encoders with RS 422 or 5V TTL interface	**6ES7551-1AB00-0AB0**
Accessories	
Front connectors For 35 mm modules; including four potential bridges, cable ties and individual labeling strips, 40-pin	
• Screw terminals	**6ES7592-1AM00-0XB0**
• Push-in	**6ES7592-1BM00-0XB0**
DIN A4 labeling sheets 10 sheets with 10 labeling strips each for I/O modules; perforated, Al grey	**6ES7592-2AX00-0AA0**
U connector 5 units; spare part	**6ES7590-0AA00-0AA0**
Universal front door for I/O modules 5 front doors; with 5 labeling strips (front) and 5 cabling diagrams per front door; spare part	**6ES7528-0AA00-7AA0**

	Article No.
Shielding set I/O Infeed element, shield bracket, and shield terminal; 5 units, spare part	**6ES7590-5CA00-0AA0**
Shield terminal element 10 units; spare part	**6ES7590-5BA00-0AA0**
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Overview



- 8 digital inputs, 16 digital outputs, of which up to 16 can be used in different configurations as technological, time-controlled channels
- Inputs for detecting the input edges with µs accuracy
- Outputs for outputting switching signals with µs accuracy
- 32x oversampling
- PWM output
- Counter function
- Outputs can be switched between 0.5 A standard and especially fast 0.1 A high-speed operation

Technical specifications

Article number	**6ES7552-1AA00-0AB0**
	S7-1500, TM Timer DIDQ 16x24V
General information	
Product type designation	TM Timer DIDQ 16x24V
Product function	
• I&M data	Yes; I&M 0
Engineering with	
• STEP 7 TIA Portal configurable/ integrated as of version	V13 Update 3
Installation type/mounting	
Rail mounting	Yes; S7-1500 mounting rail
Load voltage 1L+	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes; against destruction
Load voltage 2L+	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes; against destruction
Encoder supply	
Number of outputs	8; max. depending on parameterization
24 V encoder supply	
• 24 V	Yes; L+ (-0.8 V)
• Short-circuit protection	Yes
• Output current, max.	1.2 A; Total current of all encoders / channels, max. 0.5 A per output
Digital inputs	
Number of digital inputs	8; max. depending on parameterization
• in groups of	8
Digital inputs, parameterizable	Yes
Input characteristic curve in accordance with IEC 61131, type 3	Yes
Digital input functions, parameterizable	
• Digital input with time stamp	Yes
- Number, max.	8
• Counter	Yes
- Number, max.	4
• Counter for incremental encoder	Yes
- Number, max.	4
• Digital input with oversampling	Yes
- Number, max.	8
• HW enable for digital input	Yes
- Number, max.	4
• HW enable for digital output	Yes
- Number, max.	4

Article number	**6ES7552-1AA00-0AB0**
	S7-1500, TM Timer DIDQ 16x24V
Input voltage	
• Type of input voltage	DC
• Rated value (DC)	24 V
• for signal "0"	-5 ... +5 V
• for signal "1"	+11 to +30V
• permissible voltage at input, min.	-30 V; -5 V continuous, -30 V brief reverse polarity protection
• permissible voltage at input, max.	30 V
Input current	
• for signal "1", typ.	2.5 mA
Input delay (for rated value of input voltage)	
• Minimum pulse width for program reactions	3 µs for parameterization "none"
for standard inputs	
- parameterizable	Yes; none / 0.05 / 0.1 / 0.4 / 0.8 ms
- at "0" to "1", min.	4 µs; for parameterization "none"
- at "1" to "0", min.	4 µs; for parameterization "none"
Cable length	
• shielded, max.	1 000 m; Depending on sensor, cable quality and rate of change
• unshielded, max.	600 m; Depending on sensor, cable quality and rate of change
Digital outputs	
Type of digital output	Transistor
Number of digital outputs	16; max. depending on parameterization
• in groups of	8
Digital outputs, parameterizable	Yes
Short-circuit protection	Yes; electronic/thermal
Limitation of inductive shutdown voltage to	-0.8 V
Controlling a digital input	Yes
Digital output functions, parameterizable	
• Digital output with time stamp	Yes
- Number, max.	16
• PWM output	Yes
- Number, max.	16
• Digital output with oversampling	Yes
- Number, max.	16

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Time-based IO module TM Timer DIDQ 16x24V

Technical specifications (continued)

Article number	**6ES7552-1AA00-0AB0**
	S7-1500, TM Timer DIDQ 16x24V
Switching capacity of the outputs	
• with resistive load, max.	0.5 A; 0.1 A with High Speed output
• on lamp load, max.	5 W; 1 W with High Speed output
Load resistance range	
• lower limit	48 Ω; 240 ohm with High Speed output
• upper limit	12 kΩ
Output voltage	
• Type of output voltage	DC
• for signal "0", max.	1 V; With High Speed output
• for signal "1", min.	23.2 V; L+ (-0.8 V)
Output current	
• for signal "1" rated value	0.5 A; 0.1 A with High Speed output, observe derating
• for signal "0" residual current, max.	0.5 mA
Output delay with resistive load	
• "0" to "1", max.	1 µs; With High Speed output, 5 µs with Standard output
• "1" to "0", max.	1 µs; With High Speed output, 6 µs with Standard output
Switching frequency	
• with resistive load, max.	10 kHz
• on lamp load, max.	10 Hz
Total current of the outputs	
• Current per group, max.	4 A
• Current per module, max.	8 A; Observe derating
Cable length	
• shielded, max.	1 000 m; Depending on load and cable quality
• unshielded, max.	600 m; Depending on load and cable quality
Encoder	
Connectable encoders	
• Incremental encoder (asymmetrical)	Yes
• 24 V initiator	Yes
• 2-wire sensor	Yes
- permissible quiescent current (2-wire sensor), max.	1.5 mA
Encoder signals, incremental encoder (asymmetrical)	
• Input voltage	24 V
• Input frequency, max.	50 kHz
• Counting frequency, max.	200 kHz; with quadruple evaluation
• Cable length, shielded, max.	600 m; Depending on input frequency, encoder and cable quality; max. 200 m at 50 kHz
• Incremental encoder with A/B tracks, 90° phase offset	Yes
• Pulse encoder	Yes
Encoder signal 24 V	
- permissible voltage at input, min.	-30 V
- permissible voltage at input, max.	30 V

Article number	**6ES7552-1AA00-0AB0**
	S7-1500, TM Timer DIDQ 16x24V
Interface types	
• Input characteristic curve in accordance with IEC 61131, type 3	Yes
Isochronous mode	
Isochronous operation (application synchronized up to terminal)	Yes
Bus cycle time (TDP), min.	250 µs
Interrupts/diagnostics/ status information	
Diagnostics function	Yes
Substitute values connectable	Yes
Alarms	
• Diagnostic alarm	Yes
Diagnostic messages	
• Monitoring the supply voltage	Yes
• Short-circuit	Yes
Diagnostics indication LED	
• RUN LED	Yes; Green LED
• ERROR LED	Yes; Red LED
• MAINT LED	Yes; yellow LED
• Monitoring of the supply voltage (PWR-LED)	Yes; Green LED
• Channel status display	Yes; Green LED
• for channel diagnostics	Yes; Red LED
Integrated Functions	
Number of counters	4
Counting frequency (counter) max.	200 kHz; with quadruple evaluation
Counting functions	
• Continuous counting	Yes
Potential separation	
Potential separation channels	
• between the channels and backplane bus	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	0 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	0 °C
• vertical installation, max.	40 °C; Observe derating
Decentralized operation	
to SIMATIC S7-1500	Yes
Dimensions	
Width	35 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	320 g

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Ordering data

	Article No.
Time-based IO module TM Timer DIDQ 16x24V Max. 16 time-controlled inputs or outputs	**6ES7552-1AA00-0AB0**
Accessories	
Front connector For 35 mm modules; including four potential bridges, cable ties and individual labeling strips, 40-pin	
• Screw terminals	**6ES7592-1AM00-0XB0**
• Push-in	**6ES7592-1BM00-0XB0**
DIN A4 labeling sheets 10 sheets with 10 labeling strips each for I/O modules; perforated, AI grey	**6ES7592-2AX00-0AA0**
U connector 5 units; spare part	**6ES7590-0AA00-0AA0**
Universal front door for I/O modules 5 front doors; with 5 labeling strips (front) and 5 cabling diagrams per front door; spare part	**6ES7528-0AA00-7AA0**
Shielding set I/O Infeed element, shield bracket, and shield terminal; 5 units, spare part: Note: Only shield bracket and shield terminal are required for the TM Timer DIDQ 16x24V	**6ES7590-5CA00-0AA0**
Shield terminal element 10 units; spare part	**6ES7590-5BA00-0AA0**
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Interface module for PTO (Pulse Train Output) TM PTO 4

Overview

- 4-channel interface module for PTO (Pulse Train Output)
- 3 signal interfaces can be configured for speed and direction:
  - 24 V asymmetrical up to 200 kHz
  - RS 422, 5 V symmetrical up to 1 MHz
  - TTL 5 V asymmetrical up to 200 kHz
- 3 signal types can be configured:
  - Pulse and direction
  - Pulses for forward movement and pulses for backwards movement
  - 2 phase-shifted signals, with simple or quadruple evaluation
- Supported technology objects:
  - Speed controlled axis (S7-1500, S7-1500T)
  - Positioning axis (S7-1200, S7-1500, S7-1500T)
  - Synchronous axis (S7-1500, S7-1500T)
  - Probe (S7-1500, S7-1500T)

4

Technical specifications

Article number	**6ES7553-1AA00-0AB0**
	S7-1500, TM PT O4
General information	
Product type designation	TM PTO 4
Number of channels	4; Axes
Product function	
• I&M data	Yes; I&M0 to I&M3
• Isochronous mode	Yes
Engineering with	
• STEP 7 TIA Portal configurable/ integrated as of version	STEP 7 V14 or higher
• STEP 7 configurable/integrated as of version	V5.5 SP3 with GSD file / -
• PROFINET as of GSD version/ GSD revision	GSDML V2.32
Installation type/mounting	
Rail mounting	Yes; S7-1500 mounting rail
Supply voltage	
Load voltage L+	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes
Digital inputs	
Number of digital inputs	12; 3 per channel, of which 1 DIQ
Digital inputs, parameterizable	Yes
Input characteristic curve in accordance with IEC 61131, type 3	Yes
Digital input functions, parameterizable	
• Synchronization	Yes
Input voltage	
• Type of input voltage	DC
• Rated value (DC)	24 V
• for signal "0"	-5 ... +5 V
• for signal "1"	+11 to +30V
• permissible voltage at input, min.	-5 V
• permissible voltage at input, max.	30 V
Input current	
• for signal "1", typ.	2.5 mA

Article number	**6ES7553-1AA00-0AB0**
	S7-1500, TM PT O4
Input delay (for rated value of input voltage)	
for standard inputs	
- parameterizable	Yes; none / 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms
- at "0" to "1", min.	4 µs; for parameterization "none"
- at "1" to "0", min.	4 µs; for parameterization "none"
for technological functions	
- parameterizable	Yes
Cable length	
• shielded, max.	1 000 m
• unshielded, max.	600 m
Digital outputs	
Number of digital outputs	12; 3 per channel, of which 1 DIQ
Digital outputs, parameterizable	Yes
Short-circuit protection	Yes; electronic/thermal
Controlling a digital input	Yes
Digital output functions, parameterizable	
• PTO (pulse train output) signal interface	
- 24 V asymmetrical	Yes
- RS 422 symmetrical	Yes
- TTL (5 V) asymmetrical	Yes
• PTO (pulse train output) signal type	
- Pulse and direction	Yes
- Count up, count down	Yes
- Incremental encoder (A, B phase shift)	Yes
- Incremental encoder (A, B phase shift, quadruple)	Yes
Switching capacity of the outputs	
• with resistive load, max.	0.1 A; 0.5 A for DIQn.2
• on lamp load, max.	1 W; 5 W for DIQn.2
Load resistance range	
• lower limit	240 Ω; 48 ohms for DIQn.2
• upper limit	12 kΩ

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Technical specifications (continued)

Article number	**6ES7553-1AA00-0AB0**
	S7-1500, TM PT O4
Output voltage	
• Type of output voltage	DC
• for signal "1", min.	23.2 V; L+ (-0.8 V), L+ (-1.3 V) for DIQn.2
Output current	
• for signal "1" rated value	0.1 A; 0.5 A for DIQn.2
• for signal "0" residual current, max.	0.5 mA
Output delay with resistive load	
• "0" to "1", typ.	1 µs; 28 µs for DIQn.2
• "1" to "0", typ.	1 µs; 25 µs for DIQn.2
Switching frequency	
• with resistive load, max.	1 kHz; For DIQn.2
• with inductive load, max.	0.5 Hz; According to IEC 60947-5-1, DC-13, for DIQn.2
• on lamp load, max.	10 Hz; For DIQn.2
• For signal interface 24 V asymmetrical	200 kHz; With DQn.0 and DQn.1
• For signal interface RS 422 symmetrical	1 MHz
• For signal interface TTL (5 V) asymmetrical	200 kHz
Cable length	
• shielded, max.	600 m; Cable length, RS 422 / TTL Siemens Type 6FX2001-5: 125 kHz, 320 meters shielded, max.; 250 kHz, 160 meters shielded, max.; 500 kHz, 60 meters shielded, max.; 1 MHz, 32 meters shielded, max. 24 V (DQn.x / DIQn.2): 10 kHz, 600 meters, shielded, max. 200 kHz, 50 meters shielded, max.
Isochronous mode	
Isochronous operation (application synchronized up to terminal)	Yes
Bus cycle time (TDP), min.	250 µs; 375 µs if all 4 channels are used
Interrupts/diagnostics/ status information	
Diagnostics function	Yes
Alarms	
• Diagnostic alarm	Yes
Diagnostic messages	
• Monitoring the supply voltage	Yes
• Short-circuit	Yes; Thermal overload protection
• Group error	Yes

Article number	**6ES7553-1AA00-0AB0**
	S7-1500, TM PT O4
Diagnostics indication LED	
• RUN LED	Yes; Green LED
• ERROR LED	Yes; Red LED
• MAINT LED	Yes; yellow LED
• Monitoring of the supply voltage (PWR-LED)	Yes; Green LED
• Channel status display	Yes; Green LED
• for channel diagnostics	Yes; Red LED
Potential separation	
Potential separation channels	
• between the channels and backplane bus	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	0 °C
• horizontal installation, max.	60 °C; Observe derating
• vertical installation, min.	0 °C
• vertical installation, max.	40 °C; Observe derating
Decentralized operation	
to SIMATIC S7-300	Yes; Via control and feedback interface
to SIMATIC S7-400	Yes; Via control and feedback interface
to SIMATIC S7-1200	Yes
to SIMATIC S7-1500	Yes
to standard PROFINET controller	Yes; Via control and feedback interface
Dimensions	
Width	35 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	300 g

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Interface module for PTO (Pulse Train Output) TM PTO 4

Ordering data

	Article No.
Interface module for TM PTO 4 stepper drives 4 Pulse Train Output PTO channels; PTO: 24 V or RS 422; 2 DQ PTO, 2 DI 24 V, 1 DIQ 24 V per channel	**6ES7553-1AA00-0AB0**
Accessories	
Front connectors For 35 mm modules; including four potential bridges, cable ties and individual labeling strips, 40-pin	
• Screw terminals	**6ES7592-1AM00-0XB0**
• Push-in	**6ES7592-1BM00-0XB0**
DIN A4 labeling sheets 10 sheets with 10 labeling strips each for I/O modules; perforated, Al grey	**6ES7592-2AX00-0AA0**
U connector 5 units; spare part	**6ES7590-0AA00-0AA0**
Universal front door for I/O modules 5 front doors; with 5 labeling strips (front) and 5 cabling diagrams per front door; spare part	**6ES7528-0AA00-7AA0**

	Article No.
Shielding set I/O Infeed element, shield clamp, and shield terminal; 5 units, spare part	**6ES7590-5CA00-0AA0**
Shield terminal element 10 units; spare part	**6ES7590-5BA00-0AA0**
SIMATIC Manual Collection SIMATIC Manual Collection on DVD in 5 languages, all manuals for S7-1200/1500/200/300/400, LOGO!, SIMATIC DP, PC, PG, STEP 7, Engineering SW, Runtime SW, PCS7, SIMATIC HMI, SIMATIC NET, SIMATIC IDENT	**6ES7998-8XC01-8YE0**
SIMATIC Manual Collection update service for 1 year Current "Manual Collection" DVD and the three subsequent updates	**6ES7998-8XC01-8YE2**

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Overview



SIWAREX WP521 ST



SIWAREX WP522 ST

SIWAREX WP521 ST / WP522 ST (ST = Standard) are versatile weighing modules for the SIMATIC S7-1500 Advanced Controller family. With these electronic weighing systems, simple weighing applications, such as platform or hopper scales, can be seamlessly integrated into the S7-1500 automation environment.

Technical specifications

SIWAREX WP521 ST, WP522 ST	
Weighing modes	• Non-automatic scales, e.g. platform and hopper scales
Ports	• 1 x SIMATIC S7-1500 system bus • 1 x Ethernet (SIWATOOL, Modbus TCP/IP) • 1 x RS 485 (Modbus RTU or remote display) per channel • 3 x digital outputs (24 V DC) per channel • 4 x digital outputs (24 V DC short-circuit proof) per channel
Functions	• 3 limits • Zeroing • Tare • Tare specification • Zero adjustment • Trace function for signal analysis • Internal restore point • SIMATIC S7-1500 integrated and/or stand-alone operation
Parameter assignment	• By means of function block in SIMATIC S7-1500 and HMI • Using SIWATOOL V7 • Using Modbus TCP/IP • Using Modbus RTU
Remote display (see accessories)	
Connection	via RS 485
Display	Additional display for weight value

SIWAREX WP521 ST, WP522 ST	
Measuring accuracy	
Error limit according to DIN 1319-1 of full-scale value at 20 °C ± 10 K (68 °F ± 10 K)	0.05%
Internal resolution	Up to ± 4 million parts
Number of measurements/second	100 or 120 (selectable)
Filter	• Low-pass filter 0.05 ... 50 Hz • Average value filter
Weighing functions	
Weight values	• Gross • Net • Tare
Limit values	• 2 x min/max • 1 x empty
Zeroing	Per command
Tare	Per command
Tare specification	Per command
Compatible sensors	Analog load cells / full-bridge strain gauges (1-4 mV/V) in 4-wire or 6-wire system

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SIWAREX WP521 / WP522 ST weighing modules

Technical specifications (continued)

SIWAREX WP521 ST, WP522 ST	
Load cell powering	
Supply voltage (regulated via feedback)	4.85 V DC
Permissible load resistance	
• R_{Lmin}	> 40 Ω
• R_{Lmax}	< 4 100 Ω
With SIWAREX IS Ex interface	
• R_{Lmin}	> 50 Ω
• R_{Lmax}	< 4 100 Ω
Load cell characteristic	1 … 4 mV/V
Permissible range of the measurement signal (with 4 mV/V sensors)	-21.3 ... +21.3 mV
Max. distance of load cells	800 m (2 624 ft)
Connection to load cells in Ex zone 1	Optionally via SIWAREX IS Ex interface
Certificates	• ATEX Zone 2 • UL • KCC • EAC • RCM • FM • IECEx

SIWAREX WP521 ST, WP522 ST	
Auxiliary power supply	
Rated voltage	24 V DC
Max. power consumption WP521 ST / WP522 ST	120 mA / 200 mA
Max. power consumption SIMATIC Bus	35 mA @ 15 V
IP degree of protection to EN 60529; IEC 60529	IP20
Climatic requirements	
$T_{min(IND)}$ ··· $T_{max(IND)}$ (operating temperature)	
• Horizontal installation	-10 ... +60 °C (14 ... 140 °F)
• Vertical installation	-10 ... +40 °C (14 ... 104 °F)
EMC requirements	according to IEC 61000-6-2:2004; IEC 61000-6-4:2007+A1:2011
Dimensions (W x H x D)	35 x 147 x 129 mm (1.38 x 5.79 x 5.08 in)

Ordering data

	Article No.
Weighing module TM SIWAREX WP521 ST Single-channel, for platform or hopper scale with analog load cells (1–4 mV/V), 1 x LC, 4 x DQ, 3 x DI, 1 x RS 485, Ethernet port, including shielding set.	**7MH4980-1AA01**
Weighing module TM SIWAREX WP522 ST Two-channel, for two separate platform or hopper scales with analog load cells (1–4 mV/V), per channel 1 x LC, 4 x DQ, 3 x DI, 1 x RS 485, Ethernet port, including shielding set.	**7MH4980-2AA01**
SIMATIC S7-1500, front connector with screw-type terminals 40-pin, for 35 mm wide modules, including 4 jumper links and cable ties	**6ES7592-1AM00-0XB0**
SIMATIC S7-1500, front connector with push-in technology 40-pin, for 35 mm wide modules, including 4 jumper links and cable ties	**6ES7592-1BM00-0XB0**
SIWATOOL V4 & V7 Service and commissioning software for SIWAREX weighing modules	**7MH4900-1AK01**
Ethernet cable patch cord 2 m (7 ft) For connecting SIWAREX WP52x ST to a PC (SIWATOOL V7 or Modbus TCP/IP)	**6XV1850-2GH20**

	Article No.
Remote display (optional) The digital remote displays can be connected directly to the SIWAREX WP231 via the RS 485 interface. Suitable remote display: S102 Siebert Industrieelektronik GmbH Postfach 1180 D-66565 Eppelborn, Germany Tel.: +49 6806/980-0 Fax: +49 6806/980-999 Internet: http://www.siebert.de Detailed information is available from the manufacturer.	
Accessories	
SIWAREX JB junction box, aluminum housing For connecting up to 4 load cells in parallel, and for connecting multiple junction boxes.	**7MH5001-0AA20**
SIWAREX JB junction box, stainless steel housing For connecting up to 4 load cells in parallel.	**7MH5001-0AA00**
SIWAREX JB junction box, stainless steel housing (ATEX) For parallel connection of up to 4 load cells (for zone allocation, see manual or type-examination certificate).	**7MH4710-1EA01**

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Ordering data	Article No.
Ex interface SIWAREX IS	
For intrinsically-safe connection of load cells. With ATEX approval (not UL/FM). Suitable for SIWAREX electronic weighing system. Compatibility of load cells must be checked separately.	
• Short-circuit current < 199 mA DC	**7MH4710-5BA**
• Short-circuit current < 137 mA DC	**7MH4710-5CA**
Load cell cable (optional)	
Cable Li2Y 1 x 2 x 0.75 ST + 2 x (2 x 0.34 ST) – CY	
For connecting SIWAREX electronic weighing systems to junction box (JB), extension box (EB) and Ex interface or between two EBs. For permanent installation. Occasional bending is possible.	
External diameter: approx. 10.8 mm (0.43 in)	
Permissible ambient temperature -40 ... +80 °C (-40 ... +176 °F).	
Sold by the meter.	
• Sheath color: orange	**7MH4702-8AG**
• For hazardous atmospheres. Sheath color: blue.	**7MH4702-8AF**

	Article No.
Commissioning	
Commissioning charge for one static scale with SIWAREX module	**9LA1110-8SN50-0AA0**
(Travel and setup charge must be ordered separately)	
Scope: • Recording of data • Checking of mechanical installation of the scale • Checking of electrical wiring and function • Static adjustment of the scale	
Requirements: • Mechanical design functional • Modules electrically wired and tested • Calibration weights available • Free access to scale	
Flat charge for travel and setup in Germany	**9LA1110-8RA10-0AA0**

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SIPLUS TM Count 2x24V counter module

Overview



- 2-channel high-speed counter module
- With comprehensive parameterization options for an optimum adaptation to the task and reduction of control load
- Speed and time period measuring
- Storage and comparison functions
- Connection of 24 V encoders

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

Technical specifications

Article number	**6AG1550-1AA00-7AB0**
Based on	**6ES7550-1AA00-0AB0**
	SIPLUS S7-1500 TM COUNT 2X24V
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/ frost); start-up @ -25 °C
• horizontal installation, max.	70 °C; = Tmax; note derating for inductive loads; > +60 °C total current of the encoder supply max. 0.5 A, total current of the outputs max. 1 A
• vertical installation, min.	-40 °C; = Tmin; Startup @ -25 °C
• vertical installation, max.	40 °C; Please note derating for inductive loads
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance	
Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
Remark	
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A

Ordering data

	Article No.
SIPLUS TM Count 2x24V counter module	**6AG1550-1AA00-7AB0**
(Extended temperature range and exposure to media)	
With 2 channels, max. 200 kHz; for 24 V encoder	
Accessories	See SIMATIC S7-1500, TM Count 2x24V counter module, page 4/127

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Overview



- 2-channel counter and position detection module with RS 422 interface
- Comprehensive parameterization options for optimum adaptation to the task
- Offloading of controller through preprocessing on the module
- Position detection with incremental and SSI absolute-value encoders
- Speed and time period measuring
- Storage and comparison functions
- Connection of encoders with RS 422 signals or 5 V TTL signals

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

Technical specifications

Article number	**6AG1551-1AB00-7AB0**
Based on	**6ES7551-1AB00-0AB0**
	SIPLUS S7-1500 TM POSINPUT 2
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/ frost); start-up @ -25 °C
• horizontal installation, max.	70 °C; Please note derating for inductive loads
• vertical installation, min.	0 °C
• vertical installation, max.	40 °C; Please note derating for inductive loads
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance	
Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
Remark	
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A

Ordering data

	Article No.
SIPLUS TM PosInput 2 counter and positioning module	**6AG1551-1AB00-7AB0**
(Extended temperature range and medial exposure)	
With 2 channels, max. 1 MHz counter frequency; for SSI and incremental encoders with RS 422 or 5 V TTL interface	
Accessories	See SIMATIC S7-1500, TM PosInput 2 counter and positioning module, page 4/130

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CM PtP

Overview



- Modules for serial communication connections, scaled according to interface types, protocols, and performance
- 4 versions with different physical transmission characteristics:
  - RS 232C, max. 19.2 Kbit/s
  - RS 232C, max.115.2 Kbit/s
  - RS 422/RS 485, max. 19.2 Kbit/s
  - RS 422/RS 485, max. 115.2 Kbit/s
- Protocols supported
  - Freeport: User-parameterizable telegram format for universal communication
  - 3964(R) for improved transmission reliability
  - Modbus RTU Master
  - Modbus RTU Slave
  - USS, implemented through instructions

Technical specifications

Article number	**6ES7540-1AD00-0AA0** S7-1500, CM PtP RS232 BA	**6ES7541-1AD00-0AB0** S7-1500, CM PtP RS232 HF	**6ES7540-1AB00-0AA0** S7-1500, CM PtP RS 422/485 BA	**6ES7541-1AB00-0AB0** S7-1500, CM PtP RS 422/485 HF
General information				
Product type designation	CM PtP RS 232 BA	CM PtP RS 232 HF	CM PtP RS 422 / 485 BA	CM PtP RS 422 / 485 HF
Product function				
• I&M data	Yes; I&M 0	Yes; I&M 0	Yes; I&M 0	Yes; I&M 0
Engineering with				
• STEP 7 TIA Portal configurable/ integrated as of version	V12 / V12	V12 / V12	V12 / V12	V12 / V12
• STEP 7 configurable/integrated as of version	V5.5 SP2 with GSD file	V5.5 SP2 with GSD file	V5.5 SP2 with GSD file	V5.5 SP2 with GSD file
• PROFIBUS as of GSD version/ GSD revision	- / -	- / -	- / -	- / -
• PROFINET as of GSD version/ GSD revision	V2.3	V2.3 / -	V2.3	V2.3 / -
Installation type/mounting				
Rail mounting	Yes; S7-1500 mounting rail	Yes; S7-1500 mounting rail	Yes; S7-1500 mounting rail	Yes; S7-1500 mounting rail
Interface types				
RS 232				
• Transmission rate, max.	19.2 kbit/s	115.2 kbit/s		
• Cable length, max.	15 m	15 m		
• RS 232 auxiliary signals	RTS, CTS, DTR, DSR, RI, DCD	RTS, CTS, DTR, DSR, RI, DCD		
RS 485				
• Transmission rate, max.			19.2 kbit/s	115.2 kbit/s
• Cable length, max.			1 200 m	1 200 m
RS 422				
• Transmission rate, max.			19.2 kbit/s	115.2 kbit/s
• Cable length, max.			1 200 m	1 200 m
• 4-wire full duplex connection			Yes	Yes
• 4-wire multipoint connection			No	No
Protocols				
Integrated protocols				
Freeport				
- Telegram length, max.	1 kbyte	4 kbyte	1 kbyte	4 kbyte
- Bits per character	7 or 8	7 or 8	7 or 8	7 or 8
- Number of stop bits	1 or 2 bit	1 or 2 bit	1 or 2 bit	1 or 2 bit
- Parity	None, even, odd, always 1, always 0, any	None, even, odd, always 1, always 0, any	None, even, odd, always 1, always 0, any	None, even, odd, always 1, always 0, any

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Technical specifications (continued)

Article number	**6ES7540-1AD00-0AA0** S7-1500, CM PtP RS232 BA	**6ES7541-1AD00-0AB0** S7-1500, CM PtP RS232 HF	**6ES7540-1AB00-0AA0** S7-1500, CM PtP RS 422/485 BA	**6ES7541-1AB00-0AB0** S7-1500, CM PtP RS 422/485 HF
3964 (R)				
- Telegram length, max.	1 kbyte	4 kbyte	1 kbyte	4 kbyte
- Bits per character	7 or 8	7 or 8	7 or 8	7 or 8
- Number of stop bits	1 or 2 bit	1 or 2 bit	1 or 2 bit	1 or 2 bit
- Parity	None, even, odd, always 1, always 0, any	None, even, odd, always 1, always 0, any	None, even, odd, always 1, always 0, any	None, even, odd, always 1, always 0, any
Modbus RTU master				
- Address area		1 to 247, extended 1 to 65535		1 to 247, extended 1 to 65535
- Number of slaves, max.		1		32
MODBUS RTU slave				
- Address area		1 to 247, extended 1 to 65535		1 to 247, extended 1 to 65535
Telegram buffer				
• Buffer memory for telegrams	2 kbyte	8 kbyte	2 kbyte	8 kbyte
• Number of telegrams which can be buffered	255	255	255	255
Interrupts/diagnostics/ status information				
Diagnostics function	Yes	Yes	Yes	Yes
Alarms				
• Diagnostic alarm	Yes	Yes	Yes	Yes
• Hardware interrupt	No	No	No	No
Diagnostic messages				
• Wire-break	Yes	Yes	Yes	Yes
Diagnostics indication LED				
• RUN LED	Yes; Green LED	Yes; Green LED	Yes; Green LED	Yes; Green LED
• ERROR LED	Yes; Red LED	Yes; Red LED	Yes; Red LED	Yes; Red LED
• Receive RxD	Yes; yellow LED	Yes; yellow LED	Yes; yellow LED	Yes; yellow LED
• Transmit TxD	Yes; yellow LED	Yes; yellow LED	Yes; yellow LED	Yes; yellow LED
Potential separation				
between backplane bus and interface	Yes	Yes	Yes	Yes
Ambient conditions				
Ambient temperature during operation				
• horizontal installation, min.	0 °C	0 °C	0 °C	0 °C
• horizontal installation, max.	60 °C	60 °C	60 °C	60 °C
• vertical installation, min.	0 °C	0 °C	0 °C	0 °C
• vertical installation, max.	40 °C	40 °C	40 °C	40 °C
Decentralized operation				
to SIMATIC S7-300	Yes	Yes	Yes	Yes
to SIMATIC S7-400	Yes	Yes	Yes	Yes
to SIMATIC S7-1500	Yes	Yes	Yes	Yes
to standard PROFINET controller	Yes	Yes	Yes	Yes
Fast Startup supported	Yes	Yes	Yes	Yes
Dimensions				
Width	35 mm	35 mm	35 mm	35 mm
Height	147 mm	147 mm	147 mm	147 mm
Depth	127 mm	127 mm	127 mm	127 mm
Weights				
Weight, approx.	0.22 kg	0.22 kg	0.22 kg	0.22 kg

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Ordering data	Article No.
CM PtP RS 232 BA communication module Basic communication module with one RS 232 interface, Freeport, 3964(R) and USS protocols, 9-pin sub D connector, max. 19.2 kbit/s	**6ES7540-1AD00-0AA0**
CM PtP RS 232 HF communication module High Feature communication module with one RS 232 interface, Freeport, 3964(R), USS and Modbus RTU protocols, 9-pin sub D connector, max. 115.2 kbit/s	**6ES7541-1AD00-0AB0**
CM PtP RS 422/485 BA communication module Basic communication module with one RS 422/485 interface, Freeport, 3964(R) and USS protocols, 15-pin sub D socket, max. 19.2 kbit/s	**6ES7540-1AB00-0AA0**
CM PtP RS 422/485 HF communication module High Feature communication module with one RS 422/485 interface, Freeport, 3964(R), USS and Modbus RTU protocols, 15-pin sub D socket, max. 115.2 kbit/s	**6ES7541-1AB00-0AB0**

	Article No.
Accessories	
RS 232 connecting cable	
For linking to SIMATIC S7	
5 m	**6ES7902-1AB00-0AA0**
10 m	**6ES7902-1AC00-0AA0**
15 m	**6ES7902-1AD00-0AA0**
RS 422/485 connecting cable	
For linking to SIMATIC S7	
5 m	**6ES7902-3AB00-0AA0**
10 m	**6ES7902-3AC00-0AA0**
50 m	**6ES7902-3AG00-0AA0**
SIMATIC Manual Collection Electronic manuals on DVD, multi-language: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC Distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	**6ES7998-8XC01-8YE0**
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Overview



DP-M	DP-S	FMS	PG/OP	S7	
●	●		●	●	

The CM 1542-5 communications module expands the SIMATIC S7-1500 controller to include a PROFIBUS connection for communication with lower-level PROFIBUS devices in bandwidths from 9.6 kbps to 12 Mbps. The module can also be used to implement separate PROFIBUS lines, in other words, to control a number of different field devices via a number of PROFIBUS segments. The CM 1542-5 assumes all communication tasks, thus reducing the CPU workload.

The CM 1542-5 is suitable for S7 communication as well as for conventional PROFIBUS communication. This makes it possible to establish communication between the S7-1500 controller and other devices, for example those from the SIMATIC S7-300/400 range.

- PROFIBUS DP master or DP slave with electrical interface for connecting the SIMATIC S7-1500 to PROFIBUS at up to 12 Mbps (including 45.45 kbps)
- Communication services:
  - PROFIBUS DP
  - PG/OP communication
  - S7 communication
  - Open user communication (SEND/RECEIVE) via FDL
- Time synchronization
- Simple programming and configuration over PROFIBUS
- Cross-network PG communication using S7 routing
- Module replacement without a PG
- Data record routing (PROFIBUS DP)
- Adding or modifying distributed I/O during operation

Technical specifications

Article number	**6GK7542-5DX00-0XE0**
Product type designation	CM 1542-5
Transmission rate	
Transfer rate	
• at the 1st interface acc. to PROFIBUS	9.6 kbit/s ... 12 Mbps
Interfaces	
Number of interfaces acc. to Industrial Ethernet	0
Number of electrical connections	
• at the 1st interface acc. to PROFIBUS	1
Type of electrical connection	
• at the 1st interface acc. to PROFIBUS	9-pin Sub-D socket (RS485)
Supply voltage, current consumption, power loss	
Type of voltage of the supply voltage	DC
Supply voltage 1 from backplane bus	15 V
Relative symmetrical tolerance at DC	
• at 15 V	3 %
Consumed current	
• from backplane bus at DC at 15 V typical	0.2 A
Power loss [W]	3 W
Permitted ambient conditions	
Ambient temperature	
• for vertical installation during operation	0 ... 40 °C
• for horizontally arranged busbars during operation	0 ... 60 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
Relative humidity at 25 °C without condensation during operation maximum	95 %
Protection class IP	IP20
Design, dimensions and weight	
Module format	Compact module S7-1500 single width
Width	35 mm
Height	142 mm
Depth	129 mm
Net weight	0.4 kg
Mounting type	
• S7-1500 rail mounting	Yes
Product properties, functions, components general	
Number of units	
• per CPU maximum	8
• Note	depending on CPU type
Performance data open communication	
Number of possible connections for open communication by means of SEND/RECEIVE blocks maximum	30
Amount of data	
• as user data per connection for open communication by means of SEND/RECEIVE blocks maximum	240 byte

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Technical specifications (continued)

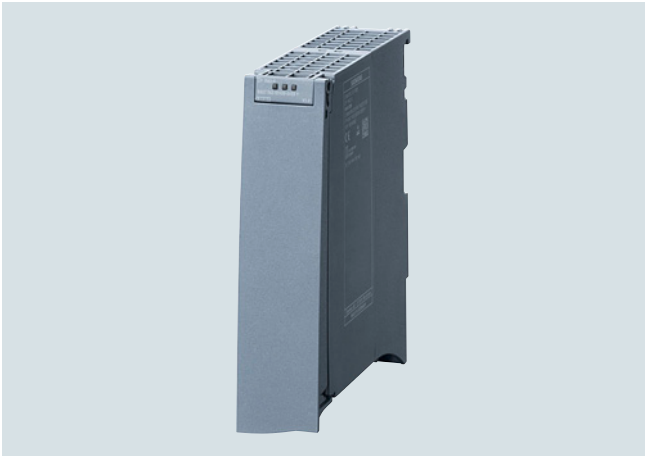
Article number	6GK7542-5DX00-0XE0
Product type designation	CM 1542-5
Performance data PROFIBUS DP	
Service as DP master	
• DPV1	Yes
Number of DP slaves on DP master usable	125
Amount of data	
• of the address area of the inputs as DP master total	8 192 byte
• of the address area of the outputs as DP master total	8 192 byte
• of the address area of the inputs per DP slave	244 byte
• of the address area of the outputs per DP slave	244 byte
Service as DP slave	
• DPV0	Yes
• DPV1	Yes
Amount of data	
• of the address area of the inputs as DP slave total	240 byte
• of the address area of the outputs as DP slave total	240 byte
Performance data S7 communication	
Number of possible connections for S7 communication	
• maximum	48
• Note	depending on the system upper limit
Performance data multi-protocol mode	
Number of active connections with multi-protocol mode	48
Performance data telecontrol	
Protocol is supported	
• TCP/IP	No
Product functions management, configuration	
Configuration software	
• required	STEP 7 Professional V12 (TIA Portal) or higher
Identification & maintenance function	
• I&M0 - device-specific information	Yes
• I&M1 – higher-level designation/ location designation	Yes
Product functions Diagnosis	
Product function Web-based diagnostics	Yes; yes, via S7-1500 CPU
Product functions Time	
Product function pass on time synchronization	Yes

Ordering data

	Article No.
CM 1542-5 communication module	
Communications module for electrical connection of SIMATIC S7-1500 to PROFIBUS as DP master or DP slave; S7 and PG/OP communication, data record routing, time synchronization, diagnostics	**6GK7542-5DX00-0XE0**
Accessories	
PROFIBUS FastConnect RS 485 connection plug	
With 90° cable outlet; insulation displacement technology, max. transmission rate 12 Mbps	
• Without PG interface	**6ES7972-0BA52-0XA0**
• With programming device interface	**6ES7972-0BB52-0XA0**
PROFIBUS FC Standard Cable	
2-wire bus cable, shielded, special design for fast mounting, delivery unit: max. 1000 m, minimum order quantity 20 m, sold by the meter	**6XV1830-0EH10**
PROFIBUS FastConnect stripping tool	
Stripping tool for fast stripping of the PROFIBUS FastConnect bus cable	**6GK1905-6AA00**
PROFIBUS bus terminal 12M	
Bus terminal for connection of PROFIBUS nodes up to 12 Mbps with connecting cable	**6GK1500-0AA10**

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Overview



DP-M	DP-S	FMS	PG/OP	S7/S5	
●	●		●		

The CP 1542-5 communications processor expands the SIMATIC S7-1500 controller to include a PROFIBUS connection for communication with lower-level PROFIBUS devices in bandwidths from 9.6 kbps to 12 Mbps. This processor allows the implementation of separate PROFIBUS lines, in other words the control of multiple field devices over multiple PROFIBUS segments. The CP 1542-5 handles all communication tasks, thus reducing the CPU load.

- PROFIBUS DP master or DP slave with electrical interface for connecting the SIMATIC S7-1500 to PROFIBUS at up to 12 Mbps (including 45.45 kbps)

Communication services:

- PROFIBUS DP
- PG/OP communication
- Time synchronization
- Simple programming and configuration over PROFIBUS
- Cross-network PG communication using S7 routing
- Module replacement without a PG

Technical specifications

Article number	**6GK7542-5FX00-0XE0**
Product type designation	CP 1542-5
Transmission rate	
Transfer rate	
• at the 1st interface acc. to PROFIBUS	9.6 kbit/s ... 12 Mbps
Interfaces	
Number of interfaces acc. to Industrial Ethernet	0
Number of electrical connections	
• at the 1st interface acc. to PROFIBUS	1
Type of electrical connection	
• at the 1st interface acc. to PROFIBUS	9-pin Sub-D socket (RS485)
Supply voltage, current consumption, power loss	
Type of voltage of the supply voltage	DC
Supply voltage 1 from backplane bus	15 V
Relative symmetrical tolerance at DC	
• at 15 V	3 %
Consumed current	
• from backplane bus at DC at 15 V typical	0.1 A
Power loss [W]	1.5 W
Permitted ambient conditions	
Ambient temperature	
• for vertical installation during operation	0 ... 40 °C
• for horizontally arranged busbars during operation	0 ... 60 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
Relative humidity at 25 °C without condensation during operation maximum	95 %
Protection class IP	IP20
Design, dimensions and weight	
Module format	Compact module S7-1500 single width
Width	35 mm
Height	142 mm
Depth	129 mm
Net weight	0.27 kg
Mounting type	
• S7-1500 rail mounting	Yes
Product properties, functions, components general	
Number of units	
• per CPU maximum	8
• Note	depending on CPU type

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Technical specifications (continued)

Article number	**6GK7542-5FX00-0XE0**
Product type designation	CP 1542-5
Performance data PROFIBUS DP	
Service as DP master	
• DPV1	Yes
Number of DP slaves on DP master usable	32
Amount of data	
• of the address area of the inputs as DP master total	2 048 byte
• of the address area of the outputs as DP master total	2 048 byte
• of the address area of the inputs per DP slave	244 byte
• of the address area of the outputs per DP slave	244 byte
Service as DP slave	
• DPV0	Yes
• DPV1	Yes
Amount of data	
• of the address area of the inputs as DP slave total	240 byte
• of the address area of the outputs as DP slave total	240 byte
Performance data S7 communication	
Number of possible connections for S7 communication	
• maximum	16
• Note	depending on the system upper limit
Performance data multi-protocol mode	
Number of active connections with multi-protocol mode	16
Performance data telecontrol	
Protocol is supported	
• TCP/IP	No
Product functions management, configuration	
Configuration software	
• required	STEP 7 Professional V12 SP1 (TIA Portal) or higher
Identification & maintenance function	
• I&M0 - device-specific information	Yes
• I&M1 – higher-level designation/ location designation	Yes
Product functions Diagnosis	
Product function Web-based diagnostics	Yes; yes, via S7-1500 CPU
Product functions Time	
Product function pass on time synchronization	Yes

Ordering data

	Article No.
CP 1542-5 communications processor	
Communications module for electrical connection of SIMATIC S7-1500 to PROFIBUS as DP master or DP slave; PG/OP communication, time synchronization, diagnostics; smaller quantity structure	**6GK7542-5FX00-0XE0**
Accessories	
PROFIBUS FastConnect RS 485 connection plug	
With 90° cable outlet; insulation displacement technology, max. transmission rate 12 Mbps	
• Without programming device interface	**6ES7972-0BA52-0XA0**
• With programming device interface	**6ES7972-0BB52-0XA0**
PROFIBUS FC Standard Cable	
2-wire bus cable, shielded, special design for fast mounting, delivery unit: max. 1000 m, minimum order quantity 20 m, sold by the meter	**6XV1830-0EH10**
PROFIBUS FastConnect stripping tool	
Stripping tool for fast stripping of the PROFIBUS FastConnect bus cable	**6GK1905-6AA00**
PROFIBUS bus terminal 12M	
Bus terminal for connection of PROFIBUS stations for up to 12 Mbps with connecting cable	**6GK1500-0AA10**

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Overview



ISO	TCP/ UDP	PN	MRP	IT	IP-R	PG/OP	S7/S5
	●	●	●	●	●	●	●

G_IK10_XX_10383

Communications module for connecting a SIMATIC S7-1500 to PROFINET networks as PROFINET IO controller or PROFINET IO device.

The CM 1542-1 supports the following communication services:

- PG/OP communication
- S7 communication
- Open communication (SEND/RECEIVE)
- PROFINET communication
- IT communication;
  - web diagnostics by means of access to the Web server of the S7-1500 system
  - Static IP routing with up to 1 Mbps via IPv4 to other CM 1543-1 / CM 1542-1 units in an S7-1500 station, e.g., for web server accesses without real-time capability.

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Technical specifications

Article number	**6GK7542-1AX00-0XE0**
Product type designation	CM 1542-1
Transmission rate	
Transfer rate	
• at the 1st interface	10 ... 100 Mbps
Interfaces	
Number of interfaces acc. to Industrial Ethernet	1
Number of electrical connections	
• at the 1st interface acc. to Industrial Ethernet	2
Type of electrical connection	
• at the 1st interface acc. to Industrial Ethernet	RJ45 port
Supply voltage, current consumption, power loss	
Type of voltage of the supply voltage	DC
Supply voltage 1 from backplane bus	15 V
Relative symmetrical tolerance at DC	
• at 15 V	3 %
Consumed current	
• from backplane bus at DC at 15 V typical	0.22 A
Power loss [W]	3.3 W
Permitted ambient conditions	
Ambient temperature	
• for vertical installation during operation	0 ... 40 °C
• for horizontally arranged busbars during operation	0 ... 60 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
Relative humidity at 25 °C without condensation during operation maximum	95 %
Protection class IP	IP20

Article number	**6GK7542-1AX00-0XE0**
Product type designation	CM 1542-1
Design, dimensions and weight	
Module format	Compact module S7-1500 single width
Width	35 mm
Height	142 mm
Depth	129 mm
Net weight	0.4 kg
Mounting type	
• S7-1500 rail mounting	Yes
Product properties, functions, components general	
Number of units	
• per CPU maximum	8
• Note	depending on CPU type
Performance data open communication	
Number of possible connections for open communication	
• by means of T blocks maximum	64; depending on the system upper limit
Amount of data	
• as user data per ISO on TCP connection for open communication by means of T blocks maximum	65 536 byte
Number of Multicast stations	6
Performance data S7 communication	
Number of possible connections for S7 communication	
• maximum	64
• Note	depending on the system upper limit

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Technical specifications (continued)

Article number	6GK7542-1AX00-0XE0
Product type designation	CM 1542-1
Performance data multi-protocol mode	
Number of active connections with multi-protocol mode	64
Performance data PROFINET communication as PN IO-Controller	
Product function PROFINET IO controller	Yes
Number of PN IO devices on PROFINET IO controller usable total	128
Number of PN IO IRT devices on PROFINET IO controller usable	64
Number of external PN IO lines with PROFINET per rack	10
Amount of data	
• as user data for input variables as PROFINET IO controller maximum	8 Kibyte
• as user data for input variables as PROFINET IO controller maximum	8 Kibyte
• as user data for input variables per PN IO device as PROFINET IO controller maximum	1 433 byte
• as user data for output variables per PN IO device as PROFINET IO controller maximum	1 433 byte
• as user data for input variables per PN IO device for each sub-module as PROFINET IO controller maximum	256 byte
• as user data for output variables per PN IO device for each sub-module as PROFINET IO controller maximum	256 byte
Performance data PROFINET communication as PN IO-Device	
Product function PROFINET IO device	Yes
Amount of data	
• as user data for input variables as PROFINET IO device maximum	8 192 byte
• as user data for input variables as PROFINET IO device maximum	8 192 byte
• as user data for input variables for each sub-module as PROFINET IO device	256 byte
• as user data for input variables for each sub-module as PROFINET IO device	256 byte
• as user data for the consistency area for each sub-module	256 byte
Number of submodules per PROFINET IO-Device	32
Performance data telecontrol	
Protocol is supported	
• TCP/IP	Yes
Product functions management, configuration	
Product function MIB support	Yes
Protocol is supported	
• SNMP v1	Yes
• DCP	Yes
• LLDP	Yes
Configuration software	
• required	STEP 7 Professional V14 (TIA Portal) or higher

Article number	6GK7542-1AX00-0XE0
Product type designation	CM 1542-1
Identification & maintenance function	
• I&M0 - device-specific information	Yes
• I&M1 – higher-level designation/ location designation	Yes
Product functions Diagnosis	
Product function Web-based diagnostics	Yes; yes, via S7-1500 CPU
Product functions switch	
Product feature Switch	Yes
Product function	
• switch-managed	No
• with IRT PROFINET IO switch	Yes
• Configuration with STEP 7	Yes
Product functions Routing	
Service Routing Note	IP routing up to 1 Mbps
Product function	
• Static IP routing	Yes
• Static IP routing IPv6	No
• dynamic IP routing	No
• dynamic IP routing IPv6	No
Protocol is supported	
• RIP v1	No
• RIPv2	No
• RIPnG for IPv6	No
• OSPFv2	No
• OSPFv3 for IPv6	No
• VRRP	No
• VRRP for IPv6	No
• BGP	No
• PPP	No
• PPoE via DSL	No
Product functions Redundancy	
Product function	
• Ring redundancy	Yes
• Redundancy manager	Yes
Protocol is supported Media Redundancy Protocol (MRP)	Yes
Product functions Security	
Product function	
• switch-off of non-required services	Yes
• Blocking of communication via physical ports	No
• log file for unauthorized access	No
Product functions Time	
Product function SICLOCK support	Yes
Product function pass on time synchronization	Yes
Protocol is supported	
• NTP	Yes

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Ordering data

	Article No.
CM 1542-1 communications module For connecting SIMATIC S7-1500 to PROFINET IO, TCP/IP, ISO-on-TCP, UDP, S7 communication, IP broadcast/multicast, SNMPV1, time synchronization via NTP; 2 x RJ45 interface with 10/100 Mbps	**6GK7542-1AX00-0XE0**

Accessories	Article No.
IE FC RJ45 plug 4 x 2 RJ45 plug connector for Industrial Ethernet (10/100/1000 Mbps) with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; 180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface	
• 1 pack = 1 unit	**6GK1901-1BB11-2AA0**
• 1 pack = 10 units	**6GK1901-1BB11-2AB0**
• 1 pack = 50 units	**6GK1901-1BB11-2AE0**
IE FC TP Standard Cable GP 4 x 2 8-wire, shielded TP installation cable for connection to IE FC RJ45 Modular Outlet for universal applications; with UL approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	
• AWG22, for connection to IE FC RJ45 Modular Outlet	**6XV1870-2E**
• AWG24, for connection to IE FC RJ45 plug 4 x 2	**6XV1878-2A**

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CP 1543-1

Overview



ISO	TCP/ UDP	PN	MRP	IT	IP-R	PG/OP	S7/S5
●	●			●	●	●	●

The SIMATIC CP 1543-1 communications processor securely connects the new SIMATIC S7-1500 controller to Industrial Ethernet networks. By combining a variety of security features such as stateful packet inspection firewalls and VPNs, and data encryption protocols such as FTPS and SNMPv3, the communications processor protects individual S7-1500 stations or even entire automation cells against unauthorized access.

The CP can also be used for linking the S7-1500 station into an IPv6-based network. All functions are configured by means of STEP 7 Professional V12 (TIA Portal) or higher.

The CP 1543-1 supports the following communications services:

- PG/OP communication
- S7 communication
- Open user communication (SEND/RECEIVE, FETCH/WRITE)
- IT communication
  - FTP functions (File Transfer Protocol FTP/FTPS) for file management and access to data blocks in the CPU (client and server function)
  - Access (read and write modes) to csv files stored on the memory card of the CPU via FTP(S)
  - Sending emails via SMTP or ESMTP with "SMTP-Auth" for authentication on an email server (also with IPv6)
  - Static IP routing with up to 1 Mbps via IPv4 to other CM 1543-1 / CM 1542-1 units in an S7-1500 system, e.g., for web server accesses without real-time capability. Securing a cell by activating the security function in the CP 1543-1 automatically deactivates IP routing.
- Security Integrated
  - Stateful Packet Inspection Firewall
  - Secure communication via VPN (IPsec)
- Protocols for secure communication
  - Secure access to the web server of the CPU via the HTTPS protocol
  - Secure file transfer using FTPS
  - Secure transfer of the time of day (NTP)
  - SNMPv3 for tap-proof transfer of network analysis information
  - Encrypted email communication via SMTPS (Port 587)
  - Open communication over TCP/IP
- Integration of the S7-1500 into IPv6-based networks
  An IPv6-compliant IP address can be used for the following communication services:
  - FETCH/WRITE access (CP as server)
  - FTP server mode
  - FTP client mode with addressing by program block
  - Email transfer with addressing by program block

Technical specifications

Article number	**6GK7543-1AX00-0XE0**
Product type designation	CP 1543-1
Transmission rate	
Transfer rate	
• at the 1st interface	10 ... 1 000 Mbps
Interfaces	
Number of interfaces acc. to Industrial Ethernet	1
Number of electrical connections	
• at the 1st interface acc. to Industrial Ethernet	1
Type of electrical connection	
• at the 1st interface acc. to Industrial Ethernet	RJ45 port
Supply voltage, current consumption, power loss	
Type of voltage of the supply voltage	DC
Supply voltage 1 from backplane bus	15 V
Relative symmetrical tolerance at DC	
• at 15 V	3 %
Consumed current	
• from backplane bus at DC at 15 V typical	0.35 A
Power loss [W]	5.3 W

Article number	**6GK7543-1AX00-0XE0**
Product type designation	CP 1543-1
Permitted ambient conditions	
Ambient temperature	
• for vertical installation during operation	0 ... 40 °C
• for horizontally arranged busbars during operation	0 ... 60 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
Relative humidity at 25 °C without condensation during operation maximum	95 %
Protection class IP	IP20
Design, dimensions and weight	
Module format	Compact module S7-1500 single width
Width	35 mm
Height	142 mm
Depth	129 mm
Net weight	0.35 kg
Mounting type	
• S7-1500 rail mounting	Yes

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Technical specifications (continued)

Article number	**6GK7543-1AX00-0XE0**
Product type designation	CP 1543-1
Product properties, functions, components general	
Number of units	
• per CPU maximum	8
• Note	depending on CPU type
Performance data open communication	
Number of possible connections for open communication	
• by means of T blocks maximum	118; depending on the system upper limit
Amount of data	
• as user data per ISO on TCP connection for open communication by means of T blocks maximum	65 536 byte
Number of Multicast stations	118
Performance data S7 communication	
Number of possible connections for S7 communication	
• maximum	118
• Note	depending on the system upper limit
Performance data multi-protocol mode	
Number of active connections with multi-protocol mode	118
Performance data IT functions	
Number of possible connections	
• as client by means of FTP maximum	32
• as server by means of FTP maximum	16
Number of possible connections	
• as server by means of HTTP maximum	4
• as e-mail client maximum	1
Amount of data as user data for email maximum	64 Kibyte
Performance data telecontrol	
Protocol is supported	
• TCP/IP	Yes
Product functions management, configuration	
Product function MIB support	Yes
Protocol is supported	
• SNMP v1	Yes
• DCP	Yes
• LLDP	No
Configuration software	
• required	STEP 7 Professional V14 (TIA Portal) or higher
Identification & maintenance function	
• I&M0 - device-specific information	Yes
• I&M1 – higher-level designation/ location designation	Yes

Article number	**6GK7543-1AX00-0XE0**
Product type designation	CP 1543-1
Product functions Diagnosis	
Product function Web-based diagnostics	Yes; yes, via S7-1500 CPU
Product functions Routing	
Service Routing Note	IP routing up to 1 Mbps
Product function	
• Static IP routing	Yes
• Static IP routing IPv6	No
• dynamic IP routing	No
• dynamic IP routing IPv6	No
Protocol is supported	
• RIP v1	No
• RIPv2	No
• RIPnG for IPv6	No
• OSPFv2	No
• OSPFv3 for IPv6	No
• VRRP	No
• VRRP for IPv6	No
• BGP	No
• PPP	No
• PPoE via DSL	No
Product functions Security	
Firewall version	stateful inspection
Product function with VPN connection	IPSec
Type of encryption algorithms with VPN connection	AES-256, AES-192, AES-128, 3DES-168, DES-56
Type of authentication procedure with VPN connection	Preshared key (PSK), X.509v3 certificates
Type of hashing algorithms with VPN connection	MD5, SHA-1
Number of possible connections with VPN connection	16
Product function	
• password protection for Web applications	No
• ACL - IP-based	No
• ACL - IP-based for PLC/routing	No
• switch-off of non-required services	Yes
• Blocking of communication via physical ports	No
• log file for unauthorized access	Yes
Product functions Time	
Product function SICLOCK support	Yes
Product function pass on time synchronization	Yes
Protocol is supported	
• NTP	Yes

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Ordering data	Article No.
CP 1543-1 communications processor For connecting SIMATIC S7-1500 to Industrial Ethernet via TCP/IP, ISO and UDP and security functions (VPN, firewall); 1 x RJ45 interface with 10/100/1000 Mbps; SNMPv1/ V3; time synchronization via NTP, FTP, email, IPv4/IPv6	**6GK7543-1AX00-0XE0**
Accessories	
IE FC RJ45 plug 180 2 x 2 RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface	
• 1 pack = 1 unit	**6GK1901-1BB10-2AA0**
• 1 pack = 10 units	**6GK1901-1BB10-2AB0**
• 1 pack = 50 units	**6GK1901-1BB10-2AE0**
IE FC RJ45 plug 4 x 2 RJ45 plug connector for Industrial Ethernet (10/100/1000 Mbps) with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; 180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface	
• 1 pack = 1 unit	**6GK1901-1BB11-2AA0**
• 1 pack = 10 units	**6GK1901-1BB11-2AB0**
• 1 pack = 50 units	**6GK1901-1BB11-2AE0**

	Article No.
IE FC TP Standard Cable GP 2 x 2 (Type A) 4-wire, shielded TP installation cable for connection to IE FC outlet RJ45/IE FC RJ45 plug; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	**6XV1840-2AH10**
IE FC TP Standard Cable GP 4 x 2 8-wire, shielded TP installation cable for connection to IE FC RJ45 Modular Outlet for universal applications; with UL approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	
• AWG22, for connection to IE FC RJ45 Modular Outlet	**6XV1870-2E**
• AWG24, for connection to IE FC RJ45 plug 4 x 2	**6XV1878-2A**
IE FC stripping tool Pre-adjusted stripping tool for fast stripping of Industrial Ethernet FC cables	**6GK1901-1GA00**

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Overview



- TIM 1531 IRC communication module for telecontrol applications with four interfaces as a stand-alone device for SIMATIC S7-1500 for use in wide area networks (WANs)
- For universal use in a station, node station and control center
- Communication either via the SINAUT ST7, IEC 60870-5-101/104 or DNP3 telecontrol protocols
- Operation via VPN (IPsec/OpenVPN) with additional SIMATIC NET components
- Wireless communication via mobile wireless routers, modems or radio devices
- Wired communication via Ethernet, Internet, 2/4 wire cables (SHDSL), dialup modems or dedicated line modem
- Frame buffer for seamless recording of data
- Support of redundant communication paths
- Simple configuration with STEP 7 Professional V15.1 (TIA Portal)

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Technical specifications

Article number	**6GK7543-1MX00-0XE0**
Product type designation	TIM 1531 IRC
Transmission rate	
Transfer rate	
• at the 1st interface	10 ... 1 000 Mbps
• at the 2nd interface	10 ... 100 Mbps
• at interface 3	10 ... 100 Mbps
• acc. to RS 232	300 ... 115 200 bit/s
Interfaces	
Number of interfaces acc. to Industrial Ethernet	3
Number of electrical connections	
• for external data transmission acc. to RS 232	1
• for power supply	1
Number of slots	
• for memory cards	1
Type of electrical connection	
• of Industrial Ethernet interface	RJ45 port
• at interface 1 for external data transmission	9 pin Sub-D-connector, RS232 switchable to RS485
• for power supply	2-pole plugable terminal block
Slot version	
• of the memory card	SD 1.0, SD 1.1, SDHC, Siemens SMC
Storage capacity of the memory card maximum	32 Gibyte
Supply voltage, current consumption, power loss	
Type of voltage of the supply voltage	DC
Supply voltage	24 V
Supply voltage	20.4 ... 28.8 V
Supply voltage external at DC Rated value	24 V
Supply voltage external at DC rated value	20.4 ... 28.8 V

Article number	**6GK7543-1MX00-0XE0**
Product type designation	TIM 1531 IRC
Consumed current	
• from external supply voltage at DC at 24 V typical	0.15 A
• from external supply voltage at DC at 24 V maximum	0.3 A
Power loss [W] with external supply voltage at 24 V DC	
• in update mode typical	3.9 W
• in communication mode typical	3.9 W
Product extension optional Backup battery	No
Permitted ambient conditions	
Ambient temperature	
• during operation	0 ... 70 °C
• for vertical installation during operation	0 ... 50 °C
• for horizontally arranged busbars during operation	0 ... 70 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
Relative humidity at 25 °C without condensation during operation maximum	95 %
Protection class IP	IP20
Design, dimensions and weight	
Module format	Compact module S7-1500 double-wide
Width	70 mm
Height	147 mm
Depth	129 mm
Net weight	0.525 kg
Mounting type	
• 35 mm DIN rail mounting	No
• S7-300 rail mounting	No
• S7-1500 rail mounting	Yes

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Technical specifications (continued)

Article number	6GK7543-1MX00-0XE0
Product type designation	TIM 1531 IRC
Product properties, functions, components general	
Product function	
• DynDNS client	No
Number of units	
• Note	Number of TIM per S7-1500: 1
Wire length	
• with RS 232 interface maximum	6 m
• with RS 485 interface maximum	30 m
Performance data S7 communication	
Number of possible connections for S7 communication	
• maximum	132
• with PG connections maximum	4
• with PG/OP connections maximum	4
• with OP connections maximum	4
• Note	only via LAN
Service	
• of SIMATIC communication as server	Yes
• SINAUT ST7 via S7 communication	Yes
• PG/OP communication	Yes
Performance data IT functions	
Number of possible connections	
• as server by means of HTTP maximum	2
• as server by means of HTTPS maximum	2
• as e-mail client maximum	1
Performance data telecontrol	
Suitability for use	
• Node station	Yes
• substation	Yes
• TIM control center	Yes
Protocol is supported	
• DNP3	Yes
• IEC 60870-5	Yes
• SINAUT ST1 protocol	No
• SINAUT ST7 protocol	Yes
• Modbus RTU	No
Product function data buffering if connection is aborted	Yes
Number of data points per station maximum	3 000
Number of DNP3 masters	
• for Ethernet maximum	4
• with RS 232 interface maximum	4
Product feature Buffered message frame memory	Yes
Transmission format	
• for SINAUT ST7 protocol with polling or spontaneous 10-bit or 11-bit	Yes
Operating mode for scanning of data transmission	
• with dedicated line/radio link with SINAUT ST7 protocol	Polling, polling with time slot procedure
• with dial-up network with SINAUT ST7 protocol	spontaneous
Hamming distance	
• for SINAUT ST7 protocol	4

Article number	6GK7543-1MX00-0XE0
Product type designation	TIM 1531 IRC
Performance data Teleservice	
Diagnostics function online diagnostics with SIMATIC STEP 7	Yes
Product function	
• program download with SIMATIC STEP 7	Yes
• Remote firmware update	Yes
• remote configuration	Yes
Product functions management, configuration	
Product function MIB support	Yes
Protocol is supported	
• SNMP v1	Yes
• SNMP v3	Yes
• DCP	Yes
• LLDP	Yes
Configuration software	
• required	STEP 7 Professional V14 SP1 (TIA Portal) or higher
• for CPU configuring required SINAUT TD7 block library for CPU	No
• for PG configuring required SINAUT ST7 configuration software for PG	No
Storage location of TIM configuration data	Flash or SD card of the TIM 1531 IRC
Identification & maintenance function	
• I&M0 - device-specific information	Yes
• I&M1 – higher-level designation/ location designation	Yes
• I&M2 - installation date	Yes
• I&M3 - comment	Yes
Product functions Diagnosis	
Product function Web-based diagnostics	Yes
Product functions Routing	
Service Routing Note	IP routing up to 1 Mbps
Product function	
• Static IP routing	Yes
• Static IP routing IPv6	Yes
• dynamic IP routing	No
• dynamic IP routing IPv6	No
Protocol is supported	
• RIP v1	No
• RIPv2	No
• RIPnG for IPv6	No
• OSPFv2	No
• OSPFv3 for IPv6	No
• VRRP	No
• VRRP for IPv6	No
• BGP	No
• PPP	No
• PPoE via DSL	No

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Technical specifications (continued)

Article number	**6GK7543-1MX00-0XE0**
Product type designation	TIM 1531 IRC
Product functions Security	
Product function	
• MSC client via GPRS modem with MSC capability	Yes
Protocol	
• is supported MSC protocol	Yes
• with Virtual Private Network MSC is supported	TCP/IP
Key length for MSC with Virtual Private Network	128 bit
Number of possible connections	
• as MSC client with VPN connection	1
• as MSC server with VPN connection	127
Product functions Time	
Product function SICLOCK support	No
Product function pass on time synchronization	Yes
Protocol is supported	
• NTP	Yes
• NTP (secure)	Yes
Product component Hardware real-time clock	No
Product feature Hardware real-time clock w. battery backup	No
time synchronization	
• from NTP-server	Yes
• from GPS-signal	No
• from control center	Yes
• from mobile network provider	No
• PC	No
• manual setting	No
Product functions Position recognition	
Product function	
• position detection with GPS	No
• pass on position data	No

Ordering data

	Article No.
TIM 1531 IRC communication module TIM 1531 IRC communication module for SIMATIC S7-1500, S7-400, S7-300 with SINAUT ST7, DNP3 and IEC 60870-5-101/104 with three RJ45 interfaces for communication via IP-based networks (WAN/LAN) and an RS 232/RS 485 interface for communication via conventional WANs	**6GK7543-1MX00-0XE0**
Accessories	
Engineering software STEP 7 Professional V15.1	
SIMATIC STEP 7 Professional V15.1 floating license	**6ES7822-1AA05-0YA5**
Upgrade SIMATIC STEP 7 Basic V11 ... V14 -> V15.1 floating license	**6ES7822-0AA05-0YE5**
Upgrade SIMATIC STEP 7 Professional V11 ... V14 -> V15.1 || V11 ... V14/201x combo -> V15.1/ 2017 SR1 combo or 2006 ... 2010 -> V15.1/2017 SR1 combo floating license	**6ES7822-1AA05-0YE5**
DIN rail SIMATIC S7-1500, 160 mm DIN rail; incl. grounding screw, integrated DIN rail for mounting small items, such as terminals, relays	**6ES7590-1AB60-0AA0**
SIMATIC memory card SIMATIC S7, Memory Card for S7-1x 00 CPU/SINAMICS, 3.3 V flash, 24 MB	**6ES7954-8LF03-0AA0**
SCALANCE M874-2 2G mobile wireless routers (GPRS/EDGE); 2 RJ45 ports, firewall, VPN, NAT	**6GK5874-2AA00-2AA2**
SCALANCE M874-3 3G mobile wireless routers (GPRS/EDGE/HSPA+); 2 RJ45 ports, firewall, VPN, NAT	**6GK5874-3AA00-2AA2**
SCALANCE M876-3 3G router; for wireless IP communication of Ethernet-based programmable controllers via 3G mobile radio HSPA+/EV-DO, VPN, firewall, NAT; 4-port switch; antenna diversity; 1 x digital input, 1 x digital output; note country approvals. Note provider approvals!	**6GK5876-3AA02-2BA2**
SCALANCE M876-4 (EU) 4G router; for wireless IP communication of Ethernet-based programmable controllers via LTE (4G) mobile radio optimized for use in Europe, VPN, firewall, NAT; 4-port switch; 2 x SMA antenna, MIMO technology; 1 x digital input, 1 x digital output; note country approvals.	**6GK5876-4AA00-2BA2**

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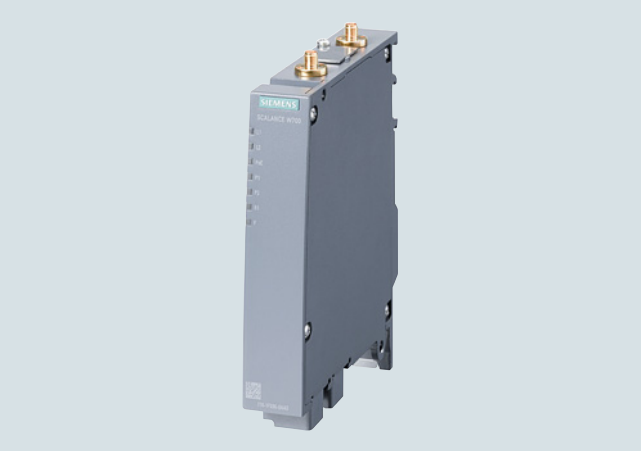
TIM 1531 IRC (for S7-1500)

Ordering data	Article No.
SCALANCE M876-4 (NAM) 4G router (NAM); for wireless IP communication of Ethernet-based programmable controllers via LTE (4G) mobile radio optimized for use in North America, VPN, firewall, NAT; 4-port switch; 2 x SMA antenna, MIMO technology; 1 x digital input, 1 x digital output; note country approvals!	**6GK5876-4AA00-2DA2**
SCALANCE M812-1 ADSL router For wired IP communication of Ethernet-based automation devices via Internet Service Providers; VPN, firewall, NAT; 1x Ethernet RJ45 port, 1x digital input, 1x digital output; ADSL2+, Annex B	**6GK5812-1BA00-2AA2**
SCALANCE M812-1 ADSL router For wired IP communication of Ethernet-based automation devices via Internet Service Providers; VPN, firewall, NAT; 4-port switch; 1x digital input, 1x digital output; ADSL2+, Annex A	**6GK5812-1BA00-2AA2**
SCALANCE M816-1 ADSL router For wired IP communication of Ethernet-based automation devices via Internet Service Providers; VPN, firewall, NAT; 4-port switch; 1x digital input, 1x digital output; ADSL2+, Annex B, J	**6GK5816-1BA00-2AA2**
SCALANCE M826-2 SHDSL router For IP communication via the 2-wire and 4-wire cables of Ethernet-based automation devices; SHDSL topology: point-to-point, bonding, line bridge mode; routing mode with VPN, firewall, NAT; 4-port switch; 1x digital input, 1x digital output	**6GK5826-2AB00-2AB2**

	Article No.
MD720 modem GSM/GPRS, 2G mobile modem with RS 232 interface; for GSM services CSD, GPRS, SMS; Quadband GSM; AT command interface; note country-specific approvals! Autom. GPRS connection; including gender changer for RS 232/PPI adapter	**6NH9720-3AA01-0XX0**
Connecting cable With one end open for connecting a TIM (RS 232) to a third-party modem or radio unit (RS 232); cable length 2.5 m	**6NH7701-4BN**
Connecting cable For connecting two TIMs via their RS 232 interfaces without modems (null modem); cable length 6 m	**6NH7701-0AR**
SITOP compact 24 V/0.6 A 1-phase power supply with wide range input 85 ... 264 V AC/ 110 ... 300 V DC, 24 V stabilized output voltage, 0.6 A nominal value of output current, slim design	**6EP1331-5BA00**
SIMATIC PM 1507 24 V/3 A Stabilized power supply for SIMATIC S7-1500 input: 120/230 V AC output: 24 V DC/3 A	**6EP1332-4BA00**
SIMATIC PM 1507 24 V/8 A Stabilized power supply for SIMATIC S7-1500 input: 120/230 V AC output: 24 V DC/8 A	**6EP1333-4BA00**

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Overview



- Access points in SIMATIC S7-1500 design are suitable for applications where the device is to be mounted in the control cabinet

Technical specifications

Article number	**6GK5774-1FX00-0AA0**
	6GK5774-1FX00-0AB0 [1]
	6GK5774-1FX00-0AC0 [2]
Product type designation	SCALANCE W774-1 RJ45
Transmission rate	
Transfer rate	
• with WLAN maximum	300 Mbps
• for Industrial Ethernet	10, 100 Mbps
Transfer rate for Industrial Ethernet	
• minimum	10 Mbps
• maximum	100 Mbps
Interfaces	
Number of electrical connections	
• for network components or terminal equipment	2
• for power supply	1
• for redundant voltage supply	1
Type of electrical connection	
• for network components or terminal equipment	RJ45 socket
• for power supply	4-pole screw terminal, PoE
design of the removable storage	
• C-PLUG	Yes
• KEY-PLUG	Yes
Interfaces wireless	
Number of radio cards permanently installed	1
Transmission mode for multiple input multiple output (MIMO)	2x2
Number of spatial streams	2
Number of electrical connections for external antenna(s)	2
Type of electrical connectio n for external antenna(s)	R-SMA (socket)
Product feature external antenna can be mounted directly on device	Yes

Article number	**6GK5774-1FX00-0AA0**
	6GK5774-1FX00-0AB0 [1]
	6GK5774-1FX00-0AC0 [2]
Product type designation	SCALANCE W774-1 RJ45
Supply voltage, current consumption, power loss	
Type of voltage of the supply voltage	DC
Supply voltage 1	
• from terminal block	19.2 V
Supply voltage 2	
• from terminal block	28.8 V
Supply voltage	
• from Power-over-Ethernet acc. to IEEE802.3at for type 1 and IEEE802.3af	48 V
Consumed current	
• at DC at 24 V typical	0.25 A
• with Power-over-Ethernet according to IEEE802.3at for type 1 and IEEE802.3af typical	0.125 A
Power loss [W]	
• at DC at 24 V typical	6 W
• with Power-over-Ethernet according to IEEE802.3at for type 1 and IEEE802.3af typical	6 W
Permitted ambient conditions	
Ambient temperature	
• during operation	-20 ... +60 °C
• during storage	-40 ... +85 °C
• during transport	-40 ... +85 °C
Relative humidity at 25 °C without condensation during operation maximum	97 %
Ambient condition for operation	When used under hazardous conditions (Zone 2), the SCALANCE W774-1 RJ45 or W734-1 RJ45 product must be installed in an enclosure. To comply with EN 50021, this enclosure must meet the requirements of at least IP 54 in compliance with EN 60529.
Protection class IP	IP30

[1] Wireless approval in the USA
[2] Wireless approval in Israel

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Technical specifications (continued)

Article number	6GK5774-1FX00-0AA0	6GK5774-1FX00-0AB0 [1]	6GK5774-1FX00-0AC0 [2]
Product type designation	SCALANCE W774-1 RJ45	SCALANCE W774-1 RJ45	SCALANCE W774-1 RJ45
Design, dimensions and weight			
Width	26 mm	26 mm	26 mm
Height	156 mm	156 mm	156 mm
Depth	127 mm	127 mm	127 mm
Width of the enclosure without antenna	26 mm	26 mm	26 mm
Height of the enclosure without antenna	147 mm	147 mm	147 mm
Depth of the enclosure without antenna	127 mm	127 mm	127 mm
Net weight	0.52 kg	0.52 kg	0.52 kg
Mounting type	wall mounting only if flat mounted	wall mounting only if flat mounted	wall mounting only if flat mounted
• S7-300 rail mounting	Yes	Yes	Yes
• S7-1500 rail mounting	Yes	Yes	Yes
• 35 mm DIN rail mounting	Yes	Yes	Yes
• wall mounting	Yes	Yes	Yes
Wireless frequencies			
Operating frequency			
• for WLAN in 2.4 GHz frequency band	2.41 ... 2.48 GHz	2.41 ... 2.48 GHz	2.41 ... 2.48 GHz
• for WLAN in 5 GHz frequency band	4.9 ... 5.8 GHz	4.9 ... 5.8 GHz	4.9 ... 5.8 GHz
Product properties, functions, components general			
Product function Access Point Mode	Yes	Yes	Yes
Product function Client Mode	Yes	Yes	Yes
Number of SSIDs	4	4	4
Product function			
• iPCF Access Point	Yes; Only in combination with the 'KEY-PLUG W780 iFeatures'	Yes; Only in combination with the 'KEY-PLUG W780 iFeatures'	Yes; Only in combination with the 'KEY-PLUG W780 iFeatures'
• iPCF client	Yes; Only in combination with the 'KEY-PLUG W740 iFeatures'	Yes; Only in combination with the 'KEY-PLUG W740 iFeatures'	Yes; Only in combination with the 'KEY-PLUG W740 iFeatures'
• iPCF-MC Access Point	No	No	No
• iPCF-MC client	Yes; Only in combination with the 'KEY-PLUG W740 iFeatures'	Yes; Only in combination with the 'KEY-PLUG W740 iFeatures'	Yes; Only in combination with the 'KEY-PLUG W740 iFeatures'
No. of iPCF-capable radio modules	1	1	1
Product function iREF	Yes; Only in combination with the 'KEY-PLUG W780 iFeatures' or 'KEY-PLUG W740 iFeatures'	Yes; Only in combination with the 'KEY-PLUG W780 iFeatures' or 'KEY-PLUG W740 iFeatures'	Yes; Only in combination with the 'KEY-PLUG W780 iFeatures' or 'KEY-PLUG W740 iFeatures'
No. of iREF-capable radio modules	1	1	1
Product function iPRP	Yes; In combination with the 'KEY-PLUG W780 iFeatures' only	Yes; In combination with the 'KEY-PLUG W780 iFeatures' only	Yes; In combination with the 'KEY-PLUG W780 iFeatures' only
Product functions management, configuration			
Number of manageable IP addresses in client	8	8	8
Product function			
• CLI	Yes	Yes	Yes
• web-based management	Yes	Yes	Yes
• MIB support	Yes	Yes	Yes
• TRAPs via email	Yes	Yes	Yes
• Configuration with STEP 7	Yes	Yes	Yes
• configuration with STEP 7 in the TIA Portal	Yes	Yes	Yes
• operation with IWLAN controller	No	No	No
• operation with Enterasys WLAN controller	No	No	No
• forced roaming on IP down with IWLAN	Yes	Yes	Yes
• forced roaming on link down with IWLAN	Yes	Yes	Yes
• WDS	Yes	Yes	Yes
Protocol is supported			
• Address Resolution Protocol (ARP)	Yes	Yes	Yes
• ICMP	Yes	Yes	Yes
• Telnet	Yes	Yes	Yes
• HTTP	Yes	Yes	Yes
• HTTPS	Yes	Yes	Yes
• TFTP	Yes	Yes	Yes
• DCP	Yes	Yes	Yes
• LLDP	Yes	Yes	Yes
Identification & maintenance function			
• I&M0 - device-specific information	Yes	Yes	Yes
• I&M1 – higher-level designation/ location designation	Yes	Yes	Yes
Product functions Diagnosis			
Product function			
• PROFINET IO diagnosis	Yes	Yes	Yes
• Link Check	No	No	No
• connection monitoring IP-Alive	No	No	No
• localization via Aeroscout	Yes	Yes	Yes
• SysLog	Yes	Yes	Yes
Protocol is supported			
• SNMP v1	Yes	Yes	Yes
• SNMP v2	Yes	Yes	Yes
• SNMP v3	Yes	Yes	Yes
Product functions VLAN			
Product function			
• function VLAN with IWLAN	Yes	Yes	Yes
Product functions DHCP			
Product function			
• DHCP client	Yes	Yes	Yes
• in Client Mode DHCP server via LAN	Yes	Yes	Yes
• DHCP Option 82	Yes	Yes	Yes
Product functions Redundancy			
Protocol is supported			
• STP/RSTP	Yes	Yes	Yes
• MSTP	Yes	Yes	Yes
• RSTP	Yes	Yes	Yes
Product functions Security			
Product function			
• ACL - MAC-based	Yes	Yes	Yes
• Management security, ACL-IP based	Yes	Yes	Yes
• IEEE 802.1x (radius)	Yes	Yes	Yes
• NAT/NAPT	No	No	No
• access protection according to IEEE802.11i	Yes	Yes	Yes
• WPA/WPA2	Yes	Yes	Yes
• TKIP/AES	Yes	Yes	Yes
Protocol is supported			
• SSH	Yes	Yes	Yes
• RADIUS	Yes	Yes	Yes
Product functions Time			
Protocol is supported			
• NTP	Yes	Yes	Yes
• SNTP	Yes	Yes	Yes
• SIMATIC Time	Yes	Yes	Yes

[1] Wireless approval in the USA
[2] Wireless approval in Israel

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Technical specifications (continued)

Article number	**6GK5774-1FX00-0AA0**
	6GK5774-1FX00-0AB0 [1]
	6GK5774-1FX00-0AC0 [2]
Product type designation	SCALANCE W774-1 RJ45
Standards, specifications, approvals	
Standard	
• for FM	FM 3611: Class I, Division 2, Groups A,B,C,D, T4 / Class 1, Zone 2, Group IIC, T4
• for hazardous zone	EN 60079-15:2005, EN 60079-0:2006, II 3 G Ex nA II T4 KEMA 07 ATEX 0145X
• for safety from CSA and UL	UL 60950-1 CSA C22.2 No. 60950-1
Certificate of suitability	
• EC declaration of conformity	Yes
• CE marking	Yes
• C-Tick	Yes
• E1 approval	No
• Railway application in accordance with EN 50155	No
• Railway application in accordance with EN 50121-4	No
• NEMA TS2	No
• IEC 61375	No
• IEC 61850-3	No
• NEMA4X	No
• Power-over-Ethernet according IEEE802.3at for type 1 and IEEE802.3af	Yes
• Power-over-Ethernet according to IEEE802.3at for type 2	Yes
Standard for wireless communication	
• IEEE 802.11a	Yes
• IEEE 802.11b	Yes
• IEEE 802.11e	Yes
• IEEE 802.11g	Yes
• IEEE 802.11h	Yes
• IEEE 802.11i	Yes
• IEEE 802.11n	Yes
Wireless approval	You will find the current list of countries at: www.siemens.com/wireless-approvals
Marine classification association	
• American Bureau of Shipping Europe Ltd. (ABS)	Yes
• Bureau Veritas (BV)	Yes
• DNV GL	Yes
• Lloyds Register of Shipping (LRS)	Yes
• Nippon Kaiji Kyokai (NK)	Yes
• Polski Rejestr Statkow (PRS)	Yes
• Royal Institution of Naval Architects (RINA)	Yes
Accessories	
accessories	24 V DC screw terminal included in scope of delivery

[1] Wireless approval in the USA
[2] Wireless approval in Israel

Ordering data

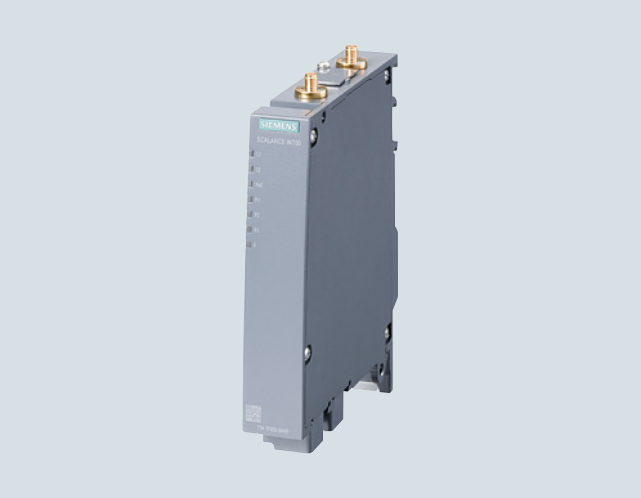
	Article No.
Access Points SCALANCE W774	
IWLAN access points with built-in wireless interface for establishing wireless connections with iFeatures; wireless networks IEEE 802.11a/b/g/h/n at 2.4/5 GHz up to 300 Mbps; WPA2/AES; integrated 2-port switch; Power over Ethernet (PoE), IP30 degree of protection (-20°C to +60°C); scope of supply: Mounting hardware; 4-pin screw terminal for 24 V DC; manual on CD-ROM; English/German	
SCALANCE W774-1 RJ45	
IWLAN Access Point with one built-in wireless interface	
• Country approvals for operation outside the USA	**6GK5774-1FX00-0AA0**
• Country approvals for operation within the USA [1]	**6GK5774-1FX00-0AB0**
• Country approvals for operation in Israel [1]	**6GK5774-1FX00-0AC0**
Accessories	
KEY-PLUG W780 iFeatures	**6GK5907-8PA00**
Removable data storage medium for enabling additional iFeatures, for simple device replacement if a fault occurs and for storage of configuration data; can be used in SCALANCE W access points with PLUG compartment	
C-PLUG	**6GK1900-0AB10**
Removable data storage medium for simple replacement of devices if a fault occurs; for storing configuration data; can be used in SIMATIC NET products with PLUG compartment	
IE FC RJ45 plug 180 2 x 2	
RJ45 connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation-displacement contacts for connecting Industrial Ethernet FC installation cables; with a 180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface	
• 1 pack = 1 unit	**6GK1901-1BB10-2AA0**
• 1 pack = 10 units	**6GK1901-1BB10-2AB0**
• 1 pack = 50 units	**6GK1901-1BB10-2AE0**
IE FC Standard Cable GP 2 x 2	**6XV1840-2AH10**
4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet plug / IE FC RJ45 plug; PROFINET-compliant; with UL approval; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	
IE FC stripping tool	**6GK1901-1GA00**
Pre-adjusted stripping tool for fast stripping of Industrial Ethernet FC cables	

[1] Please note country approvals under: http://www.siemens.com/wireless-approvals

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SCALANCE W734 RJ45 for the control cabinet

Overview





ET 200MP station with SCALANCE W734 RJ45

- Client modules in SIMATIC S7-1500 design are suitable for applications where the device is to be mounted in the control cabinet

Technical specifications

Article number	**6GK5734-1FX00-0AA0**
	6GK5734-1FX00-0AB0 [1]
Product type designation	SCALANCE W734-1 RJ45
Transmission rate	
Transfer rate	
• with WLAN maximum	300 Mbps
• for Industrial Ethernet	10, 100 Mbps
Transfer rate for Industrial Ethernet	
• minimum	10 Mbps
• maximum	100 Mbps
Interfaces	
Number of electrical connections	
• for network components or terminal equipment	2
• for power supply	1
• for redundant voltage supply	1
Type of electrical connection	
• for network components or terminal equipment	RJ45 socket
• for power supply	4-pole screw terminal, PoE
design of the removable storage	
• C-PLUG	Yes
• KEY-PLUG	Yes
Interfaces wireless	
Number of radio cards permanently installed	1
Transmission mode for multiple input multiple output (MIMO)	2x2
Number of spatial streams	2
Number of electrical connections for external antenna(s)	2
Type of electrical connection for external antenna(s)	R-SMA (socket)
Product feature external antenna can be mounted directly on device	Yes

Article number	**6GK5734-1FX00-0AA0**
	6GK5734-1FX00-0AB0 [1]
Product type designation	SCALANCE W734-1 RJ45
Supply voltage, current consumption, power loss	
Type of voltage of the supply voltage	DC
Supply voltage 1	
• from terminal block	19.2 V
Supply voltage 2	
• from terminal block	28.8 V
Supply voltage	
• from Power-over-Ethernet acc. to IEEE802.3at for type 1 and IEEE802.3af	48 V
Consumed current	
• at DC at 24 V typical	0.25 A
• with Power-over-Ethernet according to IEEE802.3at for type 1 and IEEE802.3af typical	0.125 A
Power loss [W]	
• at DC at 24 V typical	6 W
• with Power-over-Ethernet according to IEEE802.3at for type 1 and IEEE802.3af typical	6 W
Permitted ambient conditions	
Ambient temperature	
• during operation	-20 ... +60 °C
• during storage	-40 ... +85 °C
• during transport	-40 ... +85 °C
Relative humidity at 25 °C without condensation during operation maximum	95 %
Ambient condition for operation	When used under hazardous conditions (Zone 2), the SCALANCE W774-1 RJ45 or W734-1 RJ45 product must be installed in an enclosure. To comply with EN 50021, this enclosure must meet the requirements of at least IP 54 in compliance with EN 60529.
Protection class IP	IP30

[1] Wireless approval in the USA

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Technical specifications (continued)

Article number	**6GK5734-1FX00-0AA0**
	6GK5734-1FX00-0AB0 [1]
Product type designation	SCALANCE W734-1 RJ45
Design, dimensions and weight	
Width	26 mm
Height	156 mm
Depth	127 mm
Width of the enclosure without antenna	26 mm
Height of the enclosure without antenna	147 mm
Depth of the enclosure without antenna	127 mm
Net weight	0.52 kg
Mounting type	wall mounting only if flat mounted
• S7-300 rail mounting	Yes
• S7-1500 rail mounting	Yes
• 35 mm DIN rail mounting	Yes
• wall mounting	Yes
Wireless frequencies	
Operating frequency	
• for WLAN in 2.4 GHz frequency band	2.41 ... 2.48 GHz
• for WLAN in 5 GHz frequency band	4.9 ... 5.8 GHz
Product properties, functions, components general	
Product function Access Point Mode	No
Product function Client Mode	Yes
Product function	
• iPCF client	Yes; Only in combination with the 'KEY-PLUG W780 iFeatures' or 'KEY-PLUG W740 iFeatures'
• iPCF-MC client	Yes; Only in combination with 'KEY-PLUG W780 iFeatures' or 'KEY-PLUG W740 iFeatures'
Number of iPCF-capable radio modules	1
Product function iPRP	Yes; In combination with the 'KEY-PLUG W780 iFeatures' or 'KEY-PLUG W740 iFeatures' only
Product functions management, configuration	
Number of manageable IP addresses in client	8
Product function	
• CLI	Yes
• web-based management	Yes
• MIB support	Yes
• TRAPs via email	Yes
• Configuration with STEP 7	Yes
• configuration with STEP 7 in the TIA Portal	Yes
• WDS	No
Protocol is supported	
• Address Resolution Protocol (ARP)	Yes
• ICMP	Yes
• Telnet	Yes
• HTTP	Yes
• HTTPS	Yes
• TFTP	Yes
• DCP	Yes
• LLDP	No
Identification & maintenance function	
• I&M0 - device-specific information	Yes
• I&M1 – higher-level designation/ location designation	Yes

Article number	**6GK5734-1FX00-0AA0**
	6GK5734-1FX00-0AB0 [1]
Product type designation	SCALANCE W734-1 RJ45
Product functions Diagnosis	
Product function	
• PROFINET IO diagnosis	Yes
• Link Check	No
• connection monitoring IP-Alive	No
• SysLog	Yes
Protocol is supported	
• SNMP v1	Yes
• SNMP v2	Yes
• SNMP v3	Yes
Product functions VLAN	
Product function	
• function VLAN with IWLAN	No
Product functions DHCP	
Product function	
• DHCP client	Yes
• in Client Mode DHCP server via LAN	Yes
• DHCP Option 82	Yes
Product functions Redundancy	
Protocol is supported	
• STP/RSTP	Yes
• MSTP	Yes
• RSTP	Yes
Product functions Security	
Product function	
• ACL - MAC-based	Yes
• Management security, ACL-IP based	Yes
• IEEE 802.1x (radius)	Yes
• NAT/NAPT	Yes
• access protection according to IEEE802.11i	Yes
• WPA/WPA2	Yes
• TKIP/AES	Yes
Protocol is supported	
• SSH	Yes
• RADIUS	Yes
Product functions Time	
Protocol is supported	
• NTP	Yes
• SNTP	Yes
• SIMATIC Time	Yes

[1] Wireless approval in the USA

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SCALANCE W734 RJ45 for the control cabinet

Technical specifications (continued)

Article number	**6GK5734-1FX00-0AA0**
	6GK5734-1FX00-0AB0 [1]
Product type designation	SCALANCE W734-1 RJ45
Standards, specifications, approvals	
Standard	
• for FM	FM 3611: Class I, Division 2, Groups A,B,C,D, T4 / Class 1, Zone 2, Group IIC, T4
• for hazardous zone	EN 60079-15:2005, EN 60079-0:2006, II 3 G Ex nA II T4 KEMA 07 ATEX 0145X
• for safety from CSA and UL	UL 60950-1 CSA C22.2 No. 60950-1
Certificate of suitability	
• EC declaration of conformity	Yes
• CE marking	Yes
• C-Tick	Yes
• E1 approval	No
• Railway application in accordance with EN 50155	No
• NEMA TS2	No
• IEC 61375	No
• IEC 61850-3	No
• NEMA4X	No
• Power-over-Ethernet according IEEE802.3at for type 1 and IEEE802.3af	Yes
• Power-over-Ethernet according to IEEE802.3at for type 2	Yes
Standard for wireless communication	
• IEEE 802.11a	Yes
• IEEE 802.11b	Yes
• IEEE 802.11e	Yes
• IEEE 802.11g	Yes
• IEEE 802.11h	Yes
• IEEE 802.11i	Yes
• IEEE 802.11n	Yes
Wireless approval	You will find the current list of countries at: www.siemens.com/wireless-approvals
Marine classification association	
• American Bureau of Shipping Europe Ltd. (ABS)	Yes
• Bureau Veritas (BV)	Yes
• DNV GL	Yes
• Lloyds Register of Shipping (LRS)	Yes
• Nippon Kaiji Kyokai (NK)	Yes
• Polski Rejestr Statkow (PRS)	Yes
• Royal Institution of Naval Architects (RINA)	Yes
Accessories	
accessories	24 V DC screw terminal included in scope of delivery

[1] Wireless approval in the USA

Ordering data

	Article No.
Client Modules SCALANCE W734	
IWLAN Ethernet client modules with built-in wireless interface; wireless networks IEEE 802.11a/b/g/h/n at 2.4/5 GHz up to 300 Mbps; WPA2/AES; integrated 2-port switch; Power over Ethernet (PoE), IP30 degree of protection (-20°C to +60°C); scope of supply: Mounting hardware; 4-pin screw terminal for 24 V DC; manual on CD-ROM; English/German	
SCALANCE W734-1 RJ45	
For managing the wireless connection of up to eight linked devices with Industrial Ethernet connection;	
• Country approvals for operation outside the USA	**6GK5734-1FX00-0AA0**
• Country approvals for operation within the USA [1]	**6GK5734-1FX00-0AB0**
Accessories	
KEY-PLUG W740 iFeatures	**6GK5907-4PA00**
Removable data storage medium for enabling additional iFeatures, for simple device replacement if a fault occurs and for storage of configuration data; can be used in SCALANCE W client modules with plug slot	
C-PLUG	**6GK1900-0AB10**
Removable data storage medium for simple replacement of devices if a fault occurs; for storing configuration data; can be used in SIMATIC NET products with PLUG compartment	
IE FC RJ45 plug 180 2 x 2	
RJ45 connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation-displacement contacts for connecting Industrial Ethernet FC installation cables; with a 180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface	
• 1 pack = 1 unit	**6GK1901-1BB10-2AA0**
• 1 pack = 10 units	**6GK1901-1BB10-2AB0**
• 1 pack = 50 units	**6GK1901-1BB10-2AE0**
IE FC Standard Cable GP 2 x 2	**6XV1840-2AH10**
4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet plug / IE FC RJ45 plug; PROFINET-compliant; with UL approval; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	
IE FC stripping tool	**6GK1901-1GA00**
Pre-adjusted stripping tool for fast stripping of Industrial Ethernet FC cables	

[1] Please note country approvals under: http://www.siemens.com/wireless-approvals

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Overview



- Modules for serial communication connections, scaled according to interface types, protocols, and performance
- 4 versions with different physical transmission characteristics:
  - RS 232C, max. 19.2 kbps
  - RS 232C, max. 115.2 kbps
  - RS 422/RS 485, max. 19.2 kbps
  - RS 422/RS 485, max. 115.2 kbps
- Protocols supported
  - Freeport: User-parameterizable telegram format for universal communication
  - 3964(R) for improved transmission reliability
  - Modbus RTU Master
  - Modbus RTU Slave
  - USS, implemented through instructions

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

Technical specifications

Article number	**6AG1540-1AD00-7AA0**	**6AG1541-1AD00-7AB0**	**6AG1540-1AB00-7AA0**	**6AG1541-1AB00-7AB0**
Based on	**6ES7540-1AD00-0AA0**	**6ES7541-1AD00-0AB0**	**6ES7540-1AB00-0AA0**	**6ES7541-1AB00-0AB0**
	SIPLUS S7-1500 CM PtP RS232 BA	SIPLUS S7-1500 CM PtP RS232 HF	SIPLUS S7-1500 CM PtP RS 422/485 BA	SIPLUS S7-1500 CM PtP RS 422/485 HF
Ambient conditions				
Ambient temperature during operation				
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C
• horizontal installation, max.	70 °C	70 °C	70 °C	70 °C
• vertical installation, min.	-40 °C; = Tmin; Startup @ -25 °C	-40 °C; = Tmin; Startup @ -25 °C	-40 °C; = Tmin; Startup @ -25 °C	-40 °C; = Tmin; Startup @ -25 °C
• vertical installation, max.	40 °C	40 °C	40 °C	40 °C
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity				
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance				
Coolants and lubricants				
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air

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Technical specifications (continued)

Article number	6AG1540-1AD00-7AA0	6AG1541-1AD00-7AB0	6AG1540-1AB00-7AA0	6AG1541-1AB00-7AB0
Based on	6ES7540-1AD00-0AA0	6ES7541-1AD00-0AB0	6ES7540-1AB00-0AA0	6ES7541-1AB00-0AB0
	SIPLUS S7-1500 CM PtP RS232 BA	SIPLUS S7-1500 CM PtP RS232 HF	SIPLUS S7-1500 CM PtP RS 422/485 BA	SIPLUS S7-1500 CM PtP RS 422/485 HF
Use in stationary industrial systems				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
Use on ships/at sea				
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Remark				
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating				
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability	Yes; Class 2 for high availability	Yes; Class 2 for high availability	Yes; Class 2 for high availability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

Ordering data

	Article No.
SIPLUS CM PtP RS 232 BA communication module (Extended temperature range and exposure to media) Basic communication module with 1 interface RS 232, Freeport, 3964(R) and USS protocols, 9-pin sub D connector, max. 19.2 kbps	**6AG1540-1AD00-7AA0**
SIPLUS CM PtP RS 232 HF communication module (Extended temperature range and exposure to media) High Feature communication module with 1 interface RS 232, Freeport, 3964(R), USS and Modbus RTU protocols, 9-pin sub D connector, max. 115.2 kbps	**6AG1541-1AD00-7AB0**
SIPLUS CM PtP RS 422/485 BA communication module (Extended temperature range and exposure to media) Basic communication module with 1 interface RS 422/485, Freeport, 3964(R) and USS protocols, 15-pin sub D socket, max. 19.2 kbps	**6AG1540-1AB00-7AA0**
SIPLUS CM PtP RS 422/485 HF communication module (Extended temperature range and exposure to media) High Feature communication module with 1 interface RS 422/485, Freeport, 3964(R), USS and Modbus RTU protocols, 15-pin sub D socket, max. 115.2 kbps	**6AG1541-1AB00-7AB0**
Accessories	See SIMATIC S7-1500, CM PtP communication module, page 4/144

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Overview



DP-M	DP-S	FMS	PG/OP	S7/S5	
●	●		●	●	

The CM 1542-5 communication module expands the SIMATIC S7-1500 controller to include a PROFIBUS connection for communication with lower-level PROFIBUS devices in bandwidths from 9.6 kbps to 12 Mbps. The module can also be used to implement separate PROFIBUS lines, in other words, to control a number of different field devices via a number of PROFIBUS segments. The CM 1542-5 handles all communication tasks, thus reducing the CPU load.

Apart from classic PROFIBUS communication, the CM 1542-5 is also suitable for S7 communication. This makes it possible to establish communication between the S7-1500 controller and other devices, for example those from the SIMATIC S7-300/400 range.

- PROFIBUS DP master or DP slave with electrical interface for connecting a SIMATIC S7-1500 to PROFIBUS at up to 12 Mbps (including 45.45 kbps)
- Communications services:
  - PROFIBUS DP
  - PG/OP communication
  - S7 communication
- Time synchronization
- Simple programming and configuration over PROFIBUS
- Cross-network PG communication using S7 routing
- Module replacement without a PG
- Data record routing (PROFIBUS DP)
- Adding or modifying distributed I/O during operation

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

Ordering data

	Article No.
SIPLUS CM 1542-5 communication module	
(Extended temperature range and medial exposure)	
Communication module for electrical connection of SIMATIC S7-1500 to PROFIBUS as a DP master or DP slave	**6AG1542-5DX00-7XE0**
Accessories	See SIMATIC S7-1500, CM 1542-5 communication module, page 4/148

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SIPLUS NET CP 1543-1

Overview



ISO	TCP/ UDP	PN	MRP	IT	IP-R	PG/OP	S7/S5
●	●			●	●	●	●

G_IK10_XX_10363

The SIMATIC CP 1543-1 communications processor securely connects the new SIMATIC S7-1500 controller to Industrial Ethernet networks. By combining a variety of security features such as an SPI (Stateful Packet Inspection) firewall, VPN and data encryption protocols such as FTPS and SNMPv3, the communications processor protects individual S7-1500 stations or even entire automation cells against unauthorized access.

The CP can also be used for linking the S7-1500 station into an IPv6-based network. All functions are configured by means of STEP 7 Professional V12 (TIA Portal) or higher.

The CP 1543-1 supports the following communications services:

- PG/OP communication
- S7 communication
- Open communication (SEND/RECEIVE, FETCH/WRITE)
- IT communication
  - FTP functions (File Transfer Protocol FTP/FTPS) for file management and access to data blocks in the CPU (client and server function)
  - Sending e-mails via SMTP or ESMTP with "SMTP-Auth" for authentication on an e-mail server (also with IPv6)
- Security functions
  - Stateful Packet Inspection (layers 3 and 4) firewall
  - Secure communication via VPN (IPsec)
  - Secure access to the Web server of the CPU via the HTTPS protocol
  - Secure file transfer using FTPS
  - Secure transfer of the time of day (NTP)
  - SNMPv3 for tap-proof transfer of network analysis information
- Integration of an S7-1500 into IPv6-based networks; An IPv6-compliant IP address can be used for the following communication services:
  - FETCH/WRITE access (CP as server)
  - FTP server mode
  - FTP client mode with addressing by program block
  - E-mail transfer with addressing by program block

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

Ordering data

	Article No.
SIPLUS NET CP 1543-1 communications processor (Extended temperature range and exposure to media) For connection of SIMATIC S7-1500 to Industrial Ethernet via TCP/IP, ISO and UDP and Security functions; 1 x RJ45 interface with 10/100/1000 Mbps; electronic manual on DVD	**6AG1543-1AX00-2XE0**
Accessories	See SIMATIC S7-1500, SIMATIC CP 1543-1 communications processor, page 4/154

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Overview



- Uniform, 40-pin front connector, suitable for SIMATIC S7-1500 I/O modules
- Versions for 25 mm wide or 35 mm wide modules
- With screw-type or push-in terminals
- Connectable core cross-sections: 0.25 mm^2 to 1.5 mm^2 (AWG 24 to 16)
- Front connector for 35 mm modules to be ordered separately; front connector for 25 mm modules included in scope of supply of modules

Design

- 40 terminals, arranged in two rows, numbered consecutively from 1 to 40
- Direct assignment of terminal to LED and labeling simplifies wiring, commissioning, and troubleshooting
- Holders for four potential bridges for simple and flexible creation of potential groups;
  four units are supplied with the front connector
  (optionally available as spare parts in packs of 20)
- Integrated shielding concept for analog modules and technology modules;
  allows space-saving installation without tools and ensures high ruggedness and EMC stability;
  components supplied with analog modules
- Cable ties for mechanical fixing of the cable bundle and for strain relief;
  1 unit supplied with front connector

Ordering data

	Article No.
Front connectors	
For 35 mm modules; including four potential bridges, cable ties and individual labeling strips, 40-pin	
• Screw terminals	**6ES7592-1AM00-0XB0**
• Push-in	**6ES7592-1BM00-0XB0**
For 25 mm modules; including cable ties and individual labeling strips; push-in, 40-pin; spare part	**6ES7592-1BM00-0XA0**
Potential bridges for front connectors	**6ES7592-3AA00-0AA0**
For 35 mm modules; 20 pieces; spare part	

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System cabling for SIMATIC S7-1500 and ET 200MP

Overview



With two cabling systems, SIMATIC TOP connect ensures efficient wiring of the input and output module of the SIMATIC S7-1500 (35 mm unit): Fully modular connection for fast and clearly arranged connecting to sensors and actuators in the field, and flexible connection for simple wiring inside the control cabinet.

With the TIA Selection Tool, you can select suitable system cabling for the individual I/O modules with a simple mouse click. Suitable components for the respective I/O module are always offered. These can be transferred to the order list and then ordered in the Industry Mall.

Further information can be found on the Internet at

http://www.siemens.com/tia-selection-tool

Design

Two cabling variants are available for a wide range of control cabinet concepts:

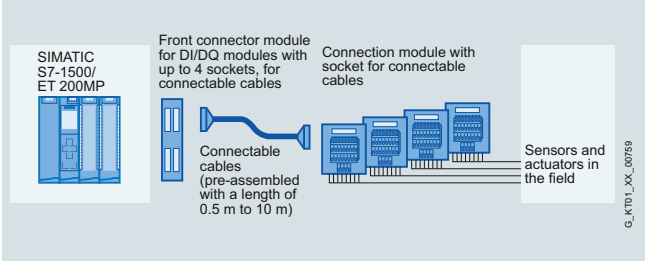
Fully modular connection

The system consists of:

- Front connector module
- Connecting cable
- Terminal modules in the following versions: Basic module, signal module and function module

Connection errors are thus practically excluded and installation overhead is significantly reduced.

Systematic connection of the SIMATIC system. The assembly overhead for the connecting cables is drastically reduced thanks to the use of pre-assembled or easily assembled cables sold by the meter.



SIMATIC TOP connect for S7-1500/ ET200 MP, fully modular connection

Flexible connection

Flexible connection with front connectors is available with 20 (Pin1 – 20) or 40 wired single cores.

These are available in lengths from 2.5 m to 10.0 m.

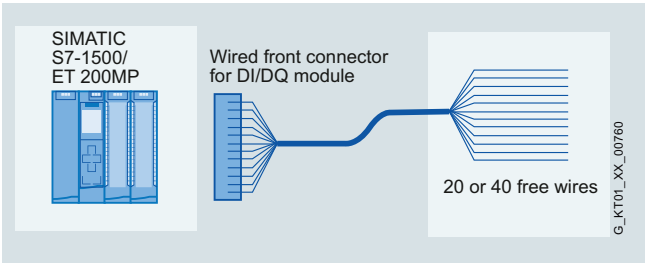
The single cores are available in different versions:

- Wire type H05V-K is used for industrial applications
- The UL/CSA-approved core is available for export to North America
- The halogen-free version is used where low smoke gas density in the event of fire is required, e.g. in building automation

The blue wires are numbered sequentially and can be routed direct to each element in the control cabinet. The numbering of the single cores corresponds to the coding of the front connector contacts.

In comparison to conventional single wiring, there is a cost saving of 50% for assembly, since the single cores that have already been checked on the connector are fixed.

Thus no complex pre-assembly of up to two times 20 single cores per module is necessary.



SIMATIC TOP connect for S7-1500/ ET200 MP, flexible connection

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Overview



The fully modular connection for connecting to the digital I/O modules of the SIMATIC S7-1500 or ET 200MP (35 mm design) consists of modified front connectors, called front connector modules, pre-assembled connecting cables of various lengths, and terminal modules. Suitable components can be selected for the application in question and joined by means of simple plug-in connections. The terminal modules are used instead of conventional terminal blocks and act as the interface to the sensors and actuators.

Benefits

- Easy plugging in of front connector module, connecting cable and terminal module
- Fast and low-cost wiring
- In the case of digital signals, the supply voltage can be connected to the front connector module or the terminal module
- Reduction in wiring errors, clear control cabinet wiring
- Byte-by-byte, or four-bye distribution of the signals in the case of digital signals
- Each component can be replaced individually
- Every cable length can be configured without cutting losses, or pre-assembled cables can be used

Design

Front connector module

Modified front connectors, called front connector modules, are available for connecting to the I/O modules (35 mm design). These are plugged into the I/O module to be wired instead of the front connector. The front connector modules are available in many different versions for digital I/O modules, analog I/O modules and for the 24 V, 2-ampère module. The connecting cables are plugged into these front connector modules.

Connecting cable

The connecting cable is available in two different versions.

As a pre-assembled 16-pin or 50-pin round cable (shielded or unshielded) up to a length of 10 m, or as a 16-pin round-sheath ribbon cable (with or without shield), which can be easily assembled by the user; or as 2 x 16-pin round-sheath ribbon cables (without shield).

When assembled, there are one or two insulation displacement connectors (female ribbon connectors) at both ends of the cable.

The round-sheath ribbon cable is assembled by the user with the aid of pliers (can be ordered separately). The cable transmits 8 or 2 x 8 channels over a distance of up to 30 m.

The connecting cable connects the front connector module with the terminal module.

Connection module

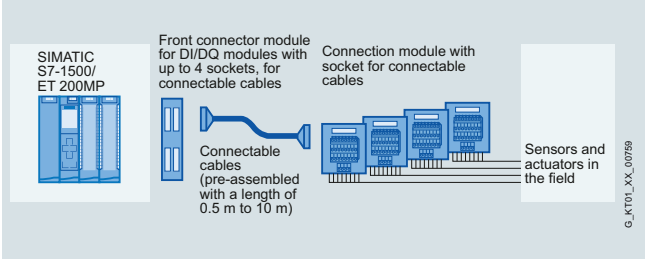
The system has digital and analog terminal modules for connecting the I/O signals. These are snapped onto the DIN rail. The terminal modules with basic or signal functionality are available in 1-byte or 4-byte versions.

Terminal modules are available for two different connection methods: with push-in or screw-type terminals The potential can be fed in at the terminal module or at the front connector module.

If other voltage or power levels are required in the field, the terminal module for TPRo or TPOo output signals is used. For the TPRo terminal module, relays are used for the implementation. For the TPOo terminal module, optocouplers are used for the implementation. This converts the 24 V DC output signal simply and reliably to another voltage or power level. If 230 V AC or 110 V AC input signals have to be transmitted to the controller in the field, a connection module with relay TPRi is available that simply converts the 230/110 V AC signal to 24 V DC. This means that there is always the same voltage level on the module side.

Use with optocouplers for the TPRo relay modules

If higher switching frequencies of the relay terminal module are required for the output signals, the relay can simply be replaced with an optocoupler (note technical specifications) in order to increase the switching frequency here.



SIMATIC TOP connect for S7-1500/ ET200 MP, fully modular connection

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Technical specifications Front connector module

Rated operating voltage	**24 V DC**
Max. permissible operating voltage	60 V DC
Max. permissible continuous current • per connector pin	1 A
Max. permissible total current	2 A/byte
Permissible ambient temperature	0 to +60 °C
Test voltage	0.5 kV, 50 Hz, 60 sec.
Clearance and creepage distances	IEC 664 (1980), IEC 664 A (1981), in accordance with DIN VDE 0110 (01.89), overvoltage class II, pollution degree 2

Wiring rules for the front connector modules

SIMATIC TOP connect front connector module, connection for potential infeed		
	Push-in	Screw terminals
	Modules up to 4 connections	
Connectable cable cross-sections		
• Solid conductors • Flexible cables with/without wire end ferrule	No 0.25 to 1.5 mm^2	
Number of cables per connection	1 or a combination of 2 wires up to 1.5 mm^2 (total) in a common wire end ferrule	
Max. diameter of the cable insulation	3.1 mm	
Stripped length of the cables		
• Without insulating collar • With insulating collar	6 mm -	
Wire end ferrules according to DIN 46228		
• Without insulating collar • with insulating collar 0.25 to 1.0 mm^2 • with insulating collar 1.5 mm^2	Form A; 5 to 7 mm long - -	
Blade width of the screwdriver	3.5 mm (cylindrical design)	
Tightening torque for connecting the cables	-	0.4 Nm to 0.7 Nm

Technical specifications Connecting cable

Technical specifications of connecting cable from SIMATIC S7 to connection module	
Operating voltage	60 V DC
Continuous current per signal conductor	1 A
Max. total current	4 A/byte
Operating temperature	0 to +60 °C
Outer diameter of pre-assembled round cable in mm unshielded/ shielded (16-pin)	Approx. 6.5/7.0

Ordering data

Front connector modules

	Article No.
Front connector module for digital modules for the connection of 16-pin connecting cables	
Power supply via	
• Push-in	**6ES7921-5AH20-0AA0**
• Screw terminals	**6ES7921-5AB20-0AA0**
Front connector module for digital modules for the connection of 50-pin connecting cables	
Power supply via	
• Push-in	**6ES7921-5CH20-0AA0**
• Screw terminals	**6ES7921-5CB20-0AA0**
Front connector module for 2 A digital modules for the connection of 16-pin connecting cables	
Power supply via	
• Push-in	**6ES7921-5AJ00-0AA0**
• Screw terminals	**6ES7921-5AD00-0AA0**
Front connector module for analog modules for the connection of 16-pin connecting cables	**6ES7921-5AK20-0AA0**
Front connector module for analog modules for the connection of 50-pin connecting cables	**6ES7921-5CK20-0AA0**

[1] The terminal assignment of these front connector modules is unique and the dimensional drawings are shown in the equipment manual of SIMATIC TOP connect for S7-1500 and ET200MP. The equipment manual is available as a download from Customer Support with the following ID: 95924607.

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Ordering data

Connecting cables

Connecting cables for SIMATIC S7-1500	Article No.
Pre-assembled round cable	
16-pin, 0.14 mm²	
Unshielded	
• 0.5 m	**6ES7923-0BA50-0CB0**
• 1.0 m	**6ES7923-0BB00-0CB0**
• 1.5 m	**6ES7923-0BB50-0CB0**
• 2.0 m	**6ES7923-0BC00-0CB0**
• 2.5 m	**6ES7923-0BC50-0CB0**
• 3.0 m	**6ES7923-0BD00-0CB0**
• 4.0 m	**6ES7923-0BE00-0CB0**
• 5.0 m	**6ES7923-0BF00-0CB0**
• 6.5 m	**6ES7923-0BG50-0CB0**
• 8.0 m	**6ES7923-0BJ00-0CB0**
• 10.0 m	**6ES7923-0CB00-0CB0**
Shielded	
• 1.0 m	**6ES7923-0BB00-0DB0**
• 2.0 m	**6ES7923-0BC00-0DB0**
• 2.5 m	**6ES7923-0BC50-0DB0**
• 3.0 m	**6ES7923-0BD00-0DB0**
• 4.0 m	**6ES7923-0BE00-0DB0**
• 5.0 m	**6ES7923-0BF00-0DB0**
• 6.5 m	**6ES7923-0BG50-0DB0**
• 8.0 m	**6ES7923-0BJ00-0DB0**
• 10.0 m	**6ES7923-0CB00-0DB0**
Version 4 x 16 to 1 x 50-pin, 0.14 mm²	
Unshielded	
• 0.5 m	**6ES7923-5BA50-0EB0**
• 1.0 m	**6ES7923-5BB00-0EB0**
• 1.5 m	**6ES7923-5BB50-0EB0**
• 2.0 m	**6ES7923-5BC00-0EB0**
• 2.5 m	**6ES7923-5BC50-0EB0**
• 3.0 m	**6ES7923-5BD00-0EB0**
• 4.0 m	**6ES7923-5BE00-0EB0**
• 5.0 m	**6ES7923-5BF00-0EB0**
• 6.5 m	**6ES7923-5BG50-0EB0**
• 8.0 m	**6ES7923-5BJ00-0EB0**
• 10.0 m	**6ES7923-5CB00-0EB0**

Connecting cables for S7-1500	Article No.
Pre-assembled round cable	
50-pin, 0.14 mm²	
Unshielded	
• 0.5 m	**6ES7923-5BA50-0CB0**
• 1.0 m	**6ES7923-5BB00-0CB0**
• 1.5 m	**6ES7923-5BB50-0CB0**
• 2.0 m	**6ES7923-5BC00-0CB0**
• 2.5 m	**6ES7923-5BC50-0CB0**
• 3.0 m	**6ES7923-5BD00-0CB0**
• 4.0 m	**6ES7923-5BE00-0CB0**
• 5.0 m	**6ES7923-5BF00-0CB0**
• 6.5 m	**6ES7923-5BG50-0CB0**
• 8.0 m	**6ES7923-5BJ00-0CB0**
• 10.0 m	**6ES7923-5CB00-0CB0**
Shielded	
• 1.0 m	**6ES7923-5BB00-0DB0**
• 2.0 m	**6ES7923-5BC00-0DB0**
• 2.5 m	**6ES7923-5BC50-0DB0**
• 3.0 m	**6ES7923-5BD00-0DB0**
• 4.0 m	**6ES7923-5BE00-0DB0**
• 5.0 m	**6ES7923-5BF00-0DB0**
• 6.5 m	**6ES7923-5BG50-0DB0**
• 8.0 m	**6ES7923-5BJ00-0DB0**
• 10.0 m	**6ES7923-5CB00-0DB0**

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Ordering data

Terminal modules

	Article No.
Terminal module TP1	
For 1-wire connection, for 16-pin connecting cables	
• Push-in terminals without LEDs	**6ES7924-0AA20-0AC0**
• Screw-type terminals without LEDs	**6ES7924-0AA20-0AA0**
• Push-in terminals with LEDs	**6ES7924-0AA20-0BC0**
• Screw-type terminals with LEDs	**6ES7924-0AA20-0BA0**
For 1-wire connection, for 50-pin connecting cables	
• Push-in terminals without LEDs	**6ES7924-2AA20-0AC0**
• Screw-type terminals without LEDs	**6ES7924-2AA20-0AA0**
• Push-in terminals with LEDs	**6ES7924-2AA20-0BC0**
• Screw-type terminals with LEDs	**6ES7924-2AA20-0BA0**
Terminal module TP3	
For 3-wire connection, for 16-pin connecting cables	
• Push-in terminals without LEDs	**6ES7924-0CA20-0AC0**
• Screw-type terminals without LEDs	**6ES7924-0CA20-0AA0**
• Push-in terminals with LEDs	**6ES7924-0CA20-0BC0**
• Screw-type terminals with LEDs	**6ES7924-0CA20-0BA0**
• Push-in terminals with LEDs and one isolating terminal per channel	**6ES7924-0CH20-0BC0**
• Screw-type terminals with LEDs and one isolating terminal per channel	**6ES7924-0CH20-0BA0**
• Push-in terminals with LEDs and one fuse per channel	**6ES7924-0CL20-0BC0**
• Screw-type terminals with LEDs and one fuse per channel	**6ES7924-0CL20-0BA0**
For 3-wire connection, for 50-pin connecting cables	
• Push-in terminals without LEDs	**6ES7924-2CA20-0AC0**
• Screw-type terminals without LEDs	**6ES7924-2CA20-0AA0**
• Push-in terminals with LEDs	**6ES7924-2CA20-0BC0**
• Screw-type terminals with LEDs	**6ES7924-2CA20-0BA0**
Terminal module TPRo	
Relay module for 8 outputs, relay as normally open contact	
• Push-in terminals with LEDs	**6ES7924-0BD20-0BC0**
• Screw-type terminals with LEDs	**6ES7924-0BD20-0BA0**
Terminal module TPRi	
Relay module for 8 outputs (110 V AC), relay as normally open contact	
• Push-in terminals with LEDs	**6ES7924-0BG20-0BC0**
• Screw-type terminals with LEDs	**6ES7924-0BG20-0BA0**

	Article No.
Terminal module TPRi	
Relay module for 8 outputs (230 V AC), relay as normally open contact	
• Push-in terminals with LEDs	**6ES7924-0BE20-0BC0**
• Screw-type terminals with LEDs	**6ES7924-0BE20-0BA0**
Terminal module TPOo	
Optocoupler module for 8 outputs (max. 24 V DC/4 A)	
• Push-in terminals with LEDs	**6ES7924-0BF20-0BC0**
• Screw-type terminals with LEDs	**6ES7924-0BF20-0BA0**
Terminal module for digital output modules 2 A	
Terminal module TP2	
• Push-in terminals without LEDs	**6ES7924-0BB20-0AC0**
• Screw-type terminals without LEDs	**6ES7924-0BB20-0AA0**
Terminal module for analog modules	
Terminal module TPA, 16-pin	
• Push-in terminals without LEDs	**6ES7924-0CC20-0AC0**
• Screw-type terminals without LEDs	**6ES7924-0CC20-0AA0**
Terminal module TPA, 50-pin	
• Push-in terminals without LEDs	**6ES7924-2CC20-0AC0**
• Screw-type terminals without LEDs	**6ES7924-2CC20-0AA0**
Accessories	
ID labels for terminal modules in S7-1500 design	
ID labels, insertable P. unit = 340 units	**3RT1900-1SB20**
Shield plate for analog terminal module	
P. unit = 4 units (for connection of 15-pin connecting cable)	**6ES7928-1AA20-4AA0**
P. unit = 4 units (for connection of 15-pin connecting cable)	**6ES7928-1BA20-4AA0**
Shield connection clamp	
For shield plate at SIMATIC end, P. unit = 10 units	**6ES7590-5BA00-0AA0**
For shield plate at field end, 2 x 2 ... 6 mm	**6ES7390-5AB00-0AA0**
For shield plate at field end, 3 ... 8 mm	**6ES7390-5BA00-0AA0**
For shield plate at field end, 4 ... 13 mm	**6ES7390-5CA00-0AA0**

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Overview



Can be used for SIMATIC S7-1500 and ET 200MP digital modules (24 V DC, 35 mm design)

The front connectors with single cores replace the SIMATIC standard connectors

- 6ES7592-1AM00-0XB0 and 6ES7592-1BM00-0XB0

Technical specifications

Front connector with single cores for 16 channels (pins 1-20)	
Rated operating voltage	24 V DC
Permissible continuous current with simultaneous load of all cores, max.	1.5 A
Permissible ambient temperature	0 to 60 °C
Core type	H05V-K, UL 1007/1569; CSA TR64, or halogen-free
Number of single cores	20
Core cross-section	0.5 mm^2; Cu
Bundle diameter in mm	approx. 15
Wire color	Blue, RAL 5010
Designation of cores	Numbered from 1 to 20 (front connector contact = core number)
Assembly	Screw contacts

Front connector with single cores for 32 channels (pins 1-40)	
Rated operating voltage	24 V DC
Permissible continuous current with simultaneous load of all cores, max.	1.5 A
Permissible ambient temperature	0 to 60 °C
Core type	H05V-K, UL 1007/1569; CSA TR64, or halogen-free
Number of single cores	40
Core cross-section	0.5 mm^2; Cu
Bundle diameter in mm	approx. 17
Wire color	Blue, RAL 5010
Designation of cores	Numbered from 1 to 40 (front connector contact = core number)
Assembly	Screw contacts

Ordering data

	Article No.
Front connector with single cores for 32 channels (pins 1-40)	
Core type H05V-K (0.5 mm^2 with screw connection)	
• 2.5 m	**6ES7922-5BC50-0AC0**
• 3.2 m	**6ES7922-5BD20-0AC0**
• 5.0 m	**6ES7922-5BF00-0AC0**
• 6.5 m	**6ES7922-5BG50-0AC0**
• 8.0 m	**6ES7922-5BJ00-0AC0**
• 10.0 m	**6ES7922-5CB00-0AC0**
Core type H05Z-K, halogen-free (0.5 mm^2 with screw connection)	
• 2.5 m	**6ES7922-5BC50-0HC0**
• 3.2 m	**6ES7922-5BD20-0HC0**
• 5.0 m	**6ES7922-5BF00-0HC0**
• 6.5 m	**6ES7922-5BG50-0HC0**
• 8.0 m	**6ES7922-5BJ00-0HC0**
• 10.0 m	**6ES7922-5CB00-0HC0**
Core type UL/CSA-certified (0.5 mm^2 with screw connection)	
• 3.2 m	**6ES7922-5BD20-0UC0**
• 5.0 m	**6ES7922-5BF00-0UC0**
• 6.5 m	**6ES7922-5BG50-0UC0**
Front connector with single cores for 16 channels (pins 1-20)	
Core type H05V-K (0.5 mm^2 with screw connection)	
• 2.5 m	**6ES7922-5BC50-0AB0**
• 3.2 m	**6ES7922-5BD20-0AB0**
• 5.0 m	**6ES7922-5BF00-0AB0**
• 6.5 m	**6ES7922-5BG50-0AB0**
• 8.0 m	**6ES7922-5BJ00-0AB0**
• 10.0 m	**6ES7922-5CB00-0AB0**
Core type H05Z-K, halogen-free (0.5 mm^2 with screw connection)	
• 2.5 m	**6ES7922-5BC50-0HB0**
• 3.2 m	**6ES7922-5BD20-0HB0**
• 5.0 m	**6ES7922-5BF00-0HB0**
• 6.5 m	**6ES7922-5BG50-0HB0**
• 8.0 m	**6ES7922-5BJ00-0HB0**
• 10.0 m	**6ES7922-5CB00-0HB0**
Core type UL/CSA-certified (0.5 mm^2 with screw connection)	
• 3.2 m	**6ES7922-5BD20-0UB0**
• 5.0 m	**6ES7922-5BF00-0UB0**
• 6.5 m	**6ES7922-5BG50-0UB0**

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F-digital input modules

Overview



Fail-safe digital input module: F-DI 16x24VDC PROFISAFE

Important properties:

- 16-channel fail-safe digital input module for ET 200MP/S7-1500
- For fail-safe reading of sensor information (1 or 2 channels)
- Provides integral discrepancy evaluation for 2-out-of-2 signals
- 4 internal sensor supplies (incl. test function) onboard
- Certified up to SIL 3 (IEC 61508), PL e (ISO 13849)
- LED display for error, operation, supply voltage and status
- Clear module labeling
  - Plain text identification of the module type
  - Complete Article No.
  - 2D matrix code (article and serial number)
  - Connection diagram
  - Hardware and firmware version
- Optional labeling accessories
  - Labeling sheets, yellow
- The modules support PROFIsafe in both PROFIBUS and PROFINET configurations. Can be used with all fail-safe SIMATIC S7-1500 F-CPUs in the central configuration, as well as ET 200MP distributed I/O with all other SIMATIC S7 F-CPUs.

Technical specifications

Article number	**6ES7526-1BH00-0AB0** ET 200MP, F-DI 16X24VDC
Engineering with	
• STEP 7 TIA Portal configurable/ integrated as of version	V13 SP1 with HSP 0086
Operating mode	
• DI	Yes
Supply voltage	
Rated value (DC)	24 V
Reverse polarity protection	Yes
Encoder supply	
Number of outputs	4
Short-circuit protection	Yes; Electronic (response threshold 0.7 A to 1.8 A)
24 V encoder supply	
• 24 V	Yes; min. L+ (-1.5 V)
• Short-circuit protection	Yes
• Output current, max.	300 mA; Max. 100 mA when mounted vertically
Digital inputs	
Number of digital inputs	16
Source/sink input	Yes; P-reading
Input characteristic curve in accordance with IEC 61131, type 1	Yes
Input voltage	
• Rated value (DC)	24 V
• for signal "0"	-30 to +5V
• for signal "1"	+15 to +30V
Input current	
• for signal "1", typ.	3.7 mA
Input delay (for rated value of input voltage)	
for standard inputs	
- parameterizable	Yes
Interrupts/diagnostics/ status information	
Diagnostics function	Yes
Alarms	
• Diagnostic alarm	Yes
• Hardware interrupt	No
Diagnostic messages	
• Monitoring the supply voltage	Yes
• Wire-break	No
• Short-circuit	Yes
• Group error	Yes
Diagnostics indication LED	
• RUN LED	Yes; Green LED
• ERROR LED	Yes; Red LED
• Channel status display	Yes; Green LED
• for channel diagnostics	Yes; Red LED
• for module diagnostics	Yes; Red LED
Potential separation	
Potential separation channels	
• between the channels and backplane bus	Yes
Standards, approvals, certificates	
Suitable for safety functions	Yes

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Technical specifications (continued)

Article number	**6ES7526-1BH00-0AB0**
	ET 200MP, F-DI 16X24VDC
Highest safety class achievable in safety mode	
• Performance level according to ISO 13849-1	PLe
• SIL acc. to IEC 61508	SIL 3
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	0 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	0 °C
• vertical installation, max.	40 °C

Article number	**6ES7526-1BH00-0AB0**
	ET 200MP, F-DI 16X24VDC
Dimensions	
Width	35 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	280 g

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Ordering data

	Article No.
F-digital input module	
16 inputs, 24 V DC, PROFISAFE	**6ES7526-1BH00-0AB0**
Accessories	
Coding elements	**6ES7592-6EF00-1AA0**
E-coding element type F for ET 200 MP-module F-DI/F-DQ; 5 units, spare part	
Front connectors	
Incl. four potential bridges, cable ties and individual labeling strips, 40-pin	
• Screw terminals	**6ES7592-1AM00-0XB0**
• Push-in	**6ES7592-1BM00-0XB0**
DIN A4 labeling sheets	**6ES7592-2CX00-0AA0**
For 35-mm F-modules; 10 sheets with 10 labeling strips each for I/O modules; perforated, yellow	
U connector	**6ES7590-0AA00-0AA0**
5 units; spare part	
Front door for F-I/O modules	
5 front doors; with 5 labeling strips (front) and 5 cabling diagrams per front door; spare part	**6ES7528-0AA10-7AA0**
STEP 7 Safety Advanced V15.1	
Task: Engineering tool for configuring and programming fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-1500F Software Controller, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller and the fail-safe ET 200SP, ET 200MP, ET 200S, ET 200M, ET 200iSP, ET 200pro and ET 200eco I/O Requirement: STEP 7 Professional V15.1	
Floating license for 1 user; software and documentation on DVD; license key on USB flash drive	**6ES7833-1FA15-0YA5**
Floating license for 1 user; software, documentation and license key for download[1]; email address required for delivery	**6ES7833-1FA15-0YH5**

	Article No.
S7 Distributed Safety V5.4 SP5 Update 2 programming tool	
Task: Configuration software for configuring fail-safe user programs for SIMATIC S7-300F, S7-400F, WinAC RTX F, ET 200S, ET 200M, ET 200iSP, ET 200pro, ET 200eco, ET 200SP Requirement: Windows 7 SP1 (64-bit), Windows 10 Professional/Enterprise (64-bit), Windows Server 2008 R2 SP1 (64-bit), Windows Server 2012 R2 (64-bit), Windows Server 2016 (64-bit); STEP 7 from V5.5 SP1; Please also note the operating systems that have been released for the STEP 7 version used	
Floating license for 1 user; software and documentation on DVD; license key on USB flash drive	**6ES7833-1FC02-0YA5**
Floating license for 1 user; software, documentation and license key for download[1]; email address required for delivery	**6ES7833-1FC02-0YH5**

[1] For up-to-date information and download availability, see: http://www.siemens.com/tia-online-software-delivery

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F-digital output modules

Overview



Fail-safe digital output module: F-DQ 8x24VDC 2A PPM PROFISAFE

Important properties:

- 8-channel digital fail-safe output module for ET 200MP/S7-1500
- Fail-safe 2-channel activation (parameterizable PM/PP switching) of actuators
- Actuators can be controlled up to 2 A
- Certified up to SIL 3 (IEC 61508), PL e (ISO 13849)
- LED display for error, operation, supply voltage and status
- Clear module labeling
  - Plain text identification of the module type
  - Complete Article No.
  - 2D matrix code (article and serial number)
  - Connection diagram
  - Hardware and firmware version
- Optional labeling accessories
  - Labeling sheets, yellow
- The module supports PROFIsafe in both PROFIBUS and PROFINET configurations.
- Can be used with all fail-safe SIMATIC S7-1500 F-CPUs in the central configuration, as well as ET 200MP distributed I/O with all other SIMATIC S7 F-CPUs.

Technical specifications

Article number	**6ES7526-2BF00-0AB0**
	ET 200MP, F-DQ 8x24VDC 2A PPM
Engineering with	
• STEP 7 TIA Portal configurable/ integrated as of version	V13 SP1 with HSP 0086
Operating mode	
• DQ	Yes
Supply voltage	
Rated value (DC)	24 V
Reverse polarity protection	Yes
Digital outputs	
Number of digital outputs	8
Current-sinking	Yes
Current-sourcing	Yes
Short-circuit protection	Yes
Open-circuit detection	Yes
Overload protection	Yes
Limitation of inductive shutdown voltage to	PM-switching: -24 V + (-47 V), PP-switching: -24 V
Switching capacity of the outputs	
• with resistive load, max.	2 A
• on lamp load, max.	10 W
Load resistance range	
• lower limit	12 Ω
• upper limit	2 000 Ω
Output voltage	
• Type of output voltage	DC
• for signal "1", min.	24 V; L+ (-0.5 V)

Article number	**6ES7526-2BF00-0AB0**
	ET 200MP, F-DQ 8x24VDC 2A PPM
Output current	
• for signal "1" rated value	2 A
• for signal "0" residual current, max.	0.5 mA; Current-sourcing, or current sourcing and sinking switches individually, current sinking: max. 1 mA
Switching frequency	
• with resistive load, max.	30 Hz
• with inductive load, max.	0.1 Hz
• on lamp load, max.	10 Hz
Total current of the outputs	
• Current per channel, max.	2 A
Total current of the outputs (per module)	
horizontal installation	
- up to 40 °C, max.	16 A
- up to 60 °C, max.	8 A
vertical installation	
- up to 40 °C, max.	8 A
Cable length	
• shielded, max.	1 000 m
• unshielded, max.	500 m

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Technical specifications (continued)

Article number	**6ES7526-2BF00-0AB0**
	ET 200MP, F-DQ 8x24VDC 2A PPM
Interrupts/diagnostics/ status information	
Diagnostics function	Yes
Substitute values connectable	No
Alarms	
• Diagnostic alarm	Yes
Diagnostic messages	
• Monitoring the supply voltage	Yes
• Wire-break	Yes
• Short-circuit	Yes
• Group error	Yes
Diagnostics indication LED	
• RUN LED	Yes; Green LED
• ERROR LED	Yes; Red LED
• Monitoring of the supply voltage (PWR-LED)	Yes
• Channel status display	Yes; Green LED
• for channel diagnostics	Yes; Red LED
• for module diagnostics	Yes; Red LED
Potential separation	
Potential separation channels	
• between the channels and backplane bus	Yes
Standards, approvals, certificates	
Suitable for safety functions	Yes

Article number	**6ES7526-2BF00-0AB0**
	ET 200MP, F-DQ 8x24VDC 2A PPM
Highest safety class achievable in safety mode	
• Performance level according to ISO 13849-1	PLe
• SIL acc. to IEC 61508	SIL 3
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	0 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	0 °C
• vertical installation, max.	40 °C
Dimensions	
Width	35 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	300 g

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F-digital output modules

Ordering data	Article No.
F-digital output module	
8 outputs, 24 V DC, 2 A, PROFISAFE, p/m-switching	**6ES7526-2BF00-0AB0**
Accessories	
Coding elements	**6ES7592-6EF00-1AA0**
E-coding element type F for ET 200 MP-module F-DI/F-DQ; 5 units, spare part	
Front connectors	
Incl. four potential bridges, cable ties and individual labeling strips, 40-pin	
• Screw terminals	**6ES7592-1AM00-0XB0**
• Push-in	**6ES7592-1BM00-0XB0**
DIN A4 labeling sheets	**6ES7592-2CX00-0AA0**
For 35-mm F-modules; 10 sheets with 10 labeling strips each for I/O modules; perforated, yellow	
U connector	**6ES7590-0AA00-0AA0**
5 units; spare part	
Front door for F-I/O modules	
5 front doors; with 5 labeling strips (front) and 5 cabling diagrams per front door; spare part	**6ES7528-0AA10-7AA0**
STEP 7 Safety Advanced V15.1	
Task: Engineering tool for configuring and programming fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-1500F Software Controller, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller and the fail-safe ET 200SP, ET 200MP, ET 200S, ET 200M, ET 200iSP, ET 200pro and ET 200eco I/O Requirement: STEP 7 Professional V15.1	
Floating license for 1 user; software and documentation on DVD; license key on USB flash drive	**6ES7833-1FA15-0YA5**
Floating license for 1 user; software, documentation and license key for download[1]; email address required for delivery	**6ES7833-1FA15-0YH5**
S7 Distributed Safety V5.4 SP5 Update 2 programming tool	
Task: Configuration software for configuring fail-safe user programs for SIMATIC S7-300F, S7-400F, WinAC RTX F, ET 200S, ET 200M, ET 200iSP, ET 200pro, ET 200eco, ET 200SP Requirement: Windows 7 SP1 (64-bit), Windows 10 Professional/Enterprise (64-bit), Windows Server 2008 R2 SP1 (64-bit), Windows Server 2012 R2 (64-bit), Windows Server 2016 (64-bit); STEP 7 from V5.5 SP1; Please also note the operating systems that have been released for the STEP 7 version used	
Floating license for 1 user; software and documentation on DVD; license key on USB flash drive	**6ES7833-1FC02-0YA5**
Floating license for 1 user; software, documentation and license key for download[1]; email address required for delivery	**6ES7833-1FC02-0YH5**

[1] For up-to-date information and download availability, see: http://www.siemens.com/tia-online-software-delivery

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Overview



The design and functionality of the SIMATIC PM 1507 single-phase load power supply (PM = power module) with automatic range selection of the input voltage makes it an optimal match to the SIMATIC S7-1500 PLC. It supplies the S7-1500 system components such as CPU, system power supply (PS), I/O circuits of the input and output modules and, if necessary, the sensors and actuators with 24 V DC.

Technical specifications

Article number	**6EP1332-4BA00**	**6EP1333-4BA00**
Product	S7-1500 PM1507	S7-1500 PM1507
Power supply, type	24 V/3 A	24 V/8 A
Input		
Input	1-phase AC	1-phase AC
• Note	Automatic range selection	Automatic range selection
Supply voltage		
• 1 at AC Rated value	120 V	120 V
• 2 at AC Rated value	230 V	230 V
Input voltage		
• 1 at AC	85 ... 132 V	85 ... 132 V
• 2 at AC	170 ... 264 V	170 ... 264 V
Wide-range input	No	No
Overvoltage resistance	2.3 × $V_{in\ rated}$, 1.3 ms	2.3 × $V_{in\ rated}$, 1.3 ms
Mains buffering at $I_{out\ rated}$, min.	20 ms; at V_{in} = 93/187 V	20 ms; at V_{in} = 93/187 V
Rated line frequency 1	50 Hz	50 Hz
Rated line frequency 2	60 Hz	60 Hz
Rated line range	45 ... 65 Hz	45 ... 65 Hz
Input current		
• at rated input voltage 120 V	1.4 A	3.7 A
• at rated input voltage 230 V	0.8 A	1.7 A
Switch-on current limiting (+25 °C), max.	23 A	62 A
Duration of inrush current limiting at 25 °C		
• maximum	3 ms	3 ms
I^2t, max.	1.3 $A^2 \cdot s$	12 $A^2 \cdot s$
Built-in incoming fuse	T 3,15 A/250 V (not accessible)	T 6.3 A/250 V (not accessible)
Protection in the mains power input (IEC 898)	Recommended miniature circuit breaker: 10 A characteristic B or 6 A characteristic C	Recommended miniature circuit breaker: 16 A characteristic B or 10 A characteristic C

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Technical specifications (continued)

Article number	6EP1332-4BA00	6EP1333-4BA00
Product	S7-1500 PM1507	S7-1500 PM1507
Power supply, type	24 V/3 A	24 V/8 A
Output		
Output	Controlled, isolated DC voltage	Controlled, isolated DC voltage
Rated voltage V_{out} DC	24 V	24 V
Total tolerance, static ±	1 %	1 %
Static mains compensation, approx.	0.1 %	0.1 %
Static load balancing, approx.	0.1 %	0.1 %
Residual ripple peak-peak, max.	50 mV	50 mV
Spikes peak-peak, max. (bandwidth: 20 MHz)	150 mV	150 mV
Product function Output voltage adjustable	No	No
Status display	LED green for 24 V OK; LED red for error; LED yellow for stand-by	LED green for 24 V OK; LED red for error; LED yellow for stand-by
On/off behavior	No overshoot of Vout (soft start)	No overshoot of Vout (soft start)
Startup delay, max.	1.5 s	1.5 s
Voltage rise, typ.	10 ms	10 ms
Rated current value Iout rated	3 A	8 A
Current range	0 ... 3 A	0 ... 8 A
Supplied active power typical	72 W	192 W
Short-term overload current		
• on short-circuiting during the start-up typical	12 A	35 A
• at short-circuit during operation typical	12 A	35 A
Duration of overloading capability for excess current		
• on short-circuiting during the start-up	70 ms	70 ms
• at short-circuit during operation	70 ms	70 ms
Parallel switching for enhanced performance	No	No
Efficiency		
Efficiency at $V_{out\ rated}$, $I_{out\ rated}$, approx.	87 %	90 %
Power loss at $V_{out\ rated}$, $I_{out\ rated}$, approx.	11 W	21 W
Closed-loop control		
Dynamic mains compensation ($V_{in\ rated}$ ±15 %), max.	0.1 %	0.1 %
Dynamic load smoothing (I_{out}: 50/100/50 %), U_{out} ± typ.	1 %	2 %
Dynamic load smoothing (I_{out}: 10/90/10 %), U_{out} ± typ.	3 %	3 %
Load step setting time 10 to 90%, typ.	5 ms	5 ms
Load step setting time 90 to 10%, typ.	5 ms	5 ms
Setting time maximum	5 ms	5 ms
Protection and monitoring		
Output overvoltage protection	Additional control loop, limitation (closed loop control) at < 28.8 V	Additional control loop, limitation (closed loop control) at < 28.8 V
Current limitation	3.15 ... 3.6 A	8.4 ... 9.6 A
Current limitation, typ.	3.4 A	9 A
Property of the output Short-circuit proof	Yes	Yes
Short-circuit protection	Electronic shutdown, automatic restart	Electronic shutdown, automatic restart
Overload/short-circuit indicator	-	-
Safety		
Primary/secondary isolation	Yes	Yes
Galvanic isolation	Safety extra-low output voltage U_{out} acc. to EN 60950-1 and EN 50178 and EN 61131-2	Safety extra-low output voltage U_{out} acc. to EN 60950-1 and EN 50178 and EN 61131-2
Protection class	Class I	Class I
Leakage current		
• maximum	3.5 mA	3.5 mA
• typical	0.4 mA	1.3 mA

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Technical specifications (continued)

Article number	6EP1332-4BA00	6EP1333-4BA00
Product	S7-1500 PM1507	S7-1500 PM1507
Power supply, type	24 V/3 A	24 V/8 A
CE mark	Yes	Yes
UL/cUL (CSA) approval	cULus-Listed (UL 508, CSA C22.2 No. 142), File E143289	cULus-Listed (UL 508, CSA C22.2 No. 142), File E143289
Explosion protection	IECEx Ex nA nC IIC T4 Gc; ATEX (EX) II 3G Ex nA nC IIC T4 Gc; cULus (ANSI/ISA 12.12.01, CSA C22.2 No.213) Class I, Div. 2, Group ABCD, T4, File E330455	IECEx Ex nA nC IIC T3 Gc; ATEX (EX) II 3G Ex nA nC IIC T3 Gc; cULus (ANSI/ISA 12.12.01, CSA C22.2 No.213) Class I, Div. 2, Group ABCD, T3, File E330455
FM approval	Class I, Div. 2, Group ABCD, T4	Class I, Div. 2, Group ABCD, T4
CB approval	Yes	Yes
Marine approval	ABS, BV, DNV GL	ABS, BV, DNV GL
Degree of protection (EN 60529)	IP20	IP20
EMC		
Emitted interference	EN 55022 Class B	EN 55022 Class B
Supply harmonics limitation	EN 61000-3-2	EN 61000-3-2
Noise immunity	EN 61000-6-2	EN 61000-6-2
Operating data		
Ambient temperature		
• during operation	0 ... 60 °C	0 ... 60 °C
- Note	with natural convection	with natural convection
• during transport	-40 ... +85 °C	-40 ... +85 °C
• during storage	-40 ... +85 °C	-40 ... +85 °C
Humidity class according to EN 60721	Climate class 3K3, no condensation	Climate class 3K3, no condensation
Mechanics		
Connection technology	Screw-/spring clamp connection	Screw-/spring clamp connection
Connections		
• Supply input	L, N, PE: 1 screw terminal each for 0.5 ... 2.5 mm^2	L, N, PE: 1 screw terminal each for 0.5 ... 2.5 mm^2
• Output	L+, M: 2 spring-loaded terminals each for 0.5 to 2.5 mm^2	L+, M: 2 spring-loaded terminals each for 0.5 to 2.5 mm^2
Product function		
• removable terminal at input	Yes	Yes
• removable terminal at output	Yes	Yes
Width of the enclosure	50 mm	75 mm
Height of the enclosure	147 mm	147 mm
Depth of the enclosure	129 mm	129 mm
Required spacing		
• top	40 mm	40 mm
• bottom	40 mm	40 mm
• left	0 mm	0 mm
• right	0 mm	0 mm
Weight, approx.	0.45 kg	0.74 kg
Product feature of the enclosure housing for side-by-side mounting	Yes	Yes
Installation	Can be mounted onto S7-1500 rail	Can be mounted onto S7-1500 rail
MTBF at 40 °C	1 611 993 h	1 362 918 h
Other information	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)

Ordering data

	Article No.		Article No.
SIMATIC PM 1507	**6EP1332-4BA00**	**SIMATIC PM 1507**	**6EP1333-4BA00**
Stabilized power supply for SIMATIC S7-1500 Input: 120/230 V AC Output: 24 V DC/3 A		Stabilized power supply for SIMATIC S7-1500 Input: 120/230 V AC Output: 24 V DC/8 A	

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System power supplies

Overview



- System power supplies for SIMATIC S7-1500
- For conversion of AC or DC line voltages to the operating voltages required for the internal electronics
- 25 or 60 W output power
- Can be used for S7-1500 or ET 200MP
- Engineering and configuration via STEP 7 V12 and higher (PS 60W 24/48/60V DC HF: from STEP 7 V14 SP1)
- In addition with PS 60W 24/48/60V DC HF: Retentive storage of CPU work memory (data) for all S7-1500 CPUs

Technical specifications

Article number	**6ES7505-0KA00-0AB0** S7-1500, PS 25W 24V DC	**6ES7505-0RA00-0AB0** S7-1500, PS 60W 24/48/60V DC	**6ES7505-0RB00-0AB0** S7-1500, PS 60W 24/48/60V DC HF	**6ES7507-0RA00-0AB0** S7-1500, PS 60W 120/230V AC/DC
General information				
Product type designation	PS 25W 24VDC	PS 60 W 24/48/60 V DC	PS 60 W 24/48/60 V DC HF	PS 60 W 120/230 V AC/DC
Engineering with				
• STEP 7 TIA Portal configurable/ integrated as of version	V12 / V12	V12 / V12	V14 SP1	V12 / V12
• STEP 7 configurable/integrated as of version	V5.5 SP3 or higher	V5.5 SP3 or higher		V5.5 SP3 or higher
Supply voltage				
Rated value (DC)	24 V	24 V / 48 V / 60 V	24 V / 48 V / 60 V	120 V / 230 V
permissible range, lower limit (DC)	Static 19.2 V, dynamic 18.5 V	Static 19.2 V, dynamic 18.5 V	Static 19.2 V, dynamic 18.5 V	88 V
permissible range, upper limit (DC)	Static 28.8 V, dynamic 30.2 V	Static 72 V, dynamic 75.5 V	Static 72 V, dynamic 75.5 V	300 V
Rated value (AC)				120 V / 230 V
permissible range, lower limit (AC)				85 V
permissible range, upper limit (AC)				264 V
Reverse polarity protection	Yes	Yes	Yes	
Short-circuit protection	Yes	Yes	Yes	Yes
Line frequency				
• Rated value 50 Hz				Yes
• permissible range, lower limit				47 Hz
• permissible range, upper limit				63 Hz
Mains buffering				
• Mains/voltage failure stored energy time	20 ms	20 ms	20 ms	20 ms
Input current				
Rated value at 24 V DC	1.3 A	3 A	3 A	
Rated value at 48 V DC		1.5 A	1.5 A	
Rated value at 60 V DC		1.2 A	1.2 A	
Rated value at 120 V DC				0.6 A
Rated value at 230 V DC				0.3 A
Rated value at 120 V AC				0.6 A
Rated value at 230 V AC				0.34 A
Inrush current, max.			≤ 8 A for t ≤ 1 s	
Output current				
Short-circuit protection	Yes	Yes	Yes	Yes

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Technical specifications (continued)

Article number	**6ES7505-0KA00-0AB0** S7-1500, PS 25W 24V DC	**6ES7505-0RA00-0AB0** S7-1500, PS 60W 24/48/60V DC	**6ES7505-0RB00-0AB0** S7-1500, PS 60W 24/48/60V DC HF	**6ES7507-0RA00-0AB0** S7-1500, PS 60W 120/230V AC/DC
Power				
Infeed power to the backplane bus	25 W	60 W	60 W	60 W
Power loss				
Power loss at nominal rating conditions	6.2 W	12 W	12 W	12 W
Interrupts/diagnostics/ status information				
Status indicator	Yes	Yes	Yes	Yes
Potential separation				
primary/secondary	Yes	Yes; Electrical isolation for 230 V AC (reinforced isolation)		Yes
EMC				
Interference immunity against voltage surge				
• on the supply lines acc. to IEC 61000-4-5	Yes; ±1 kV (acc. to IEC 61000-4-5; 1995; surge symm.), ±2 kV (acc. to IEC 61000-4-5; 1995; surge asymm.), no external protective circuit required	Yes; ±1 kV (acc. to IEC 61000-4-5; 1995; surge symm.), ±2 kV (acc. to IEC 61000-4-5; 1995; surge asymm.), no external protective circuit required	Yes; ±1 kV (acc. to IEC 61000-4-5; 1995; surge symm.), ±2 kV (acc. to IEC 61000-4-5; 1995; surge asymm.), no external protective circuit required	Yes; ±1 kV (acc. to IEC 61000-4-5; 1995; surge symm.), ±2 kV (acc. to IEC 61000-4-5; 1995; surge asymm.), no external protective circuit required
Degree and class of protection				
Degree of protection acc. to EN 60529	IP20	IP20	IP20	IP20
Equipment protection class	III, with protective conductor	I, with protective conductor	I, with protective conductor	I, with protective conductor
Dimensions				
Width	35 mm	70 mm	105 mm	70 mm
Height	147 mm	147 mm	147 mm	147 mm
Depth	129 mm	129 mm	129 mm	129 mm
Weights				
Weight, approx.	350 g	600 g	865 g	600 g

Ordering data

	Article No.
Power supply	
For supplying the backplane bus of the S7-1500 controller	
24 V DC input voltage, power 25 W	**6ES7505-0KA00-0AB0**
24/48/60 V DC input voltage, power 60 W	**6ES7505-0RA00-0AB0**
24/48/60 V DC input voltage, power 60 W, buffering functionality	**6ES7505-0RB00-0AB0**
120/230 V AC input voltage, power 60 W	**6ES7507-0RA00-0AB0**

	Article No.
Accessories	
SIMATIC S7-1500 DIN rail	
Fixed lengths, with grounding elements	
• 160 mm	**6ES7590-1AB60-0AA0**
• 245 mm	**6ES7590-1AC40-0AA0**
• 482 mm	**6ES7590-1AE80-0AA0**
• 530 mm	**6ES7590-1AF30-0AA0**
• 830 mm	**6ES7590-1AJ30-0AA0**
For cutting to length by customer, without drill holes; grounding elements must be ordered separately	
• 2000 mm	**6ES7590-1BC00-0AA0**
PE connection element for DIN rail 2000 mm	**6ES7590-5AA00-0AA0**
Spare part, 20 units	
Power connector	**6ES7590-8AA00-0AA0**
With coding element for power supply module; spare part, 10 units	

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Overview



The design and functionality of the SIMATIC PM 1507 single-phase load power supply (PM = power module) with automatic range selection of the input voltage makes it an optimal match to the SIMATIC S7-1500 PLC. It supplies the S7-1500 system components such as CPU, system power supply (PS), I/O circuits of the input and output modules and, if necessary, the sensors and actuators with 24 V DC.

Note:

SIPLUS extreme products are based on Siemens standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

Article No.	**6AG1332-4BA00-7AA0**	**6AG1333-4BA00-7AA0**
Article number based on	**6EP1332-4BA00**	**6EP1333-4BA00**
Ambient temperature range	-40 ... +70 °C	
Conformal coating	Coating of the printed circuit boards and the electronic components	
Technical specifications	The technical specifications of the standard product apply, except for the ambient conditions.	
Ambient conditions		

Extended range of environmental conditions
• with reference to ambient temperature, air pressure and altitude
	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) //
	Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) //
	Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)	

Relative humidity • with condensation, max.	100 %; RH incl. bedewing/frost (no commissioning in bedewed state)	
Resistance • to biologically active substances/compliance with EN 60721-3-3 • to chemically active substances/compliance with EN 60721-3-3 • to mechanically active substances, compliance with EN 60721-3-3	Yes; Class 3B2 mold and fungal spores (except fauna); the supplied plug covers must remain in place on the unused interfaces during operation. Yes; Class 3C4 (RH < 75%) incl. salt spray in accordance with EN 60068-2-52 (severity 3); the supplied plug covers must remain in place on the unused interfaces during operation. Yes; Class 3S4 incl. sand, dust; the supplied plug covers must remain in place on unused interfaces during operation.	

Ordering data

	Article No.
SIPLUS S7-1500 PM 1507	
(Extended temperature range and medial exposure)	
Input 120/230 V AC, output 24 V DC, 3 A	**6AG1332-4BA00-7AA0**
Input 120/230 V AC, output 24 V DC, 8 A	**6AG1333-4BA00-7AA0**

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Overview



- System power supplies for the SIMATIC S7-1500
- For conversion of AC or DC line voltages to the operating voltages required for the internal electronics
- 25 or 60 W output power
- Can be used for S7-1500 or ET 200MP
- Engineering and configuration via STEP 7 V12

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

Technical specifications

Article number	**6AG1505-0KA00-7AB0**	**6AG1505-0RA00-7AB0**	**6AG1507-0RA00-7AB0**
Based on	**6ES7505-0KA00-0AB0**	**6ES7505-0RA00-0AB0**	**6ES7507-0RA00-0AB0**
	SIPLUS S7-1500 PS 25W 24V DC	SIPLUS S7-1500 PS 60W 24/48/60V DC	SIPLUS S7-1500 PS 60W 120/230V AC/DC
Ambient conditions			
Ambient temperature during operation			
• min.	-40 °C; = Tmin (incl. condensation/ frost); start-up @ -25 °C	-40 °C; = Tmin (incl. condensation/ frost); start-up @ -25 °C	-40 °C; = Tmin (incl. condensation/ frost); start-up @ -25 °C
• max.	70 °C; = Tmax; for vertical mounting position Tmax = +40 °C	70 °C; = Tmax; > +60 °C max. power input 30 W; for vertical mounting position Tmax = +40 °C	70 °C; = Tmax; for vertical mounting position Tmax = +40 °C
Altitude during operation relating to sea level			
• Installation altitude above sea level, max.	5 000 m	5 000 m	2 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)
Relative humidity			
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance			
Coolants and lubricants			
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems			
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *

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Technical specifications (continued)

Article number	6AG1505-0KA00-7AB0	6AG1505-0RA00-7AB0	6AG1507-0RA00-7AB0
Based on	6ES7505-0KA00-0AB0	6ES7505-0RA00-0AB0	6ES7507-0RA00-0AB0
	SIPLUS S7-1500 PS 25W 24V DC	SIPLUS S7-1500 PS 60W 24/48/60V DC	SIPLUS S7-1500 PS 60W 120/230V AC/DC
Use on ships/at sea			
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Remark			
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating			
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability	Yes; Class 2 for high availability	Yes; Class 2 for high availability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

Ordering data

	Article No.
SIPLUS S7-1500 system power supply	
(Extended temperature range and exposure to media)	
For supplying the backplane bus of the S7-1500 controller	
24 V DC input voltage, power 25 W	**6AG1505-0KA00-7AB0**
24/48/60 V DC input voltage, power 60 W	**6AG1505-0RA00-7AB0**
120/230 V AC input voltage, power 60 W	**6AG1507-0RA00-7AB0**

	Article No.
Accessories	See SIMATIC S7-1500, system power supplies, page 4/185

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Overview



Basic Panels (2nd Generation)

SIMATIC HMI Basic Panels (2nd Generation) with their fully developed HMI basic functions are the ideal entry-level series for simple HMI applications.

The device family offers panels with 4", 7", 9" and 12" displays, as well as combined key and touch operation.

The innovative high-resolution widescreen displays with 64 000 colors are also suitable for upright installation, and they can be dimmed down to 100%. The innovative operator interface with improved usability opens up a diverse range of options thanks to new controls and graphics. The new USB interface enables the connection of keyboard, mouse or barcode scanner, and supports the simple archiving of data on a USB flash drive as well as the manual backup and restoring of the complete panel.

The integrated Ethernet or RS 485/422 interface (version-specific) enables simple connection to the controller.

For more information, see chapter 3, page 3/181.



Comfort Panel family, KP, TP, KTP

SIMATIC HMI Comfort Panels - Standard devices

- Excellent HMI functionality for demanding applications
- Widescreen TFT displays with 4", 7", 9", 12", 15", 19" and 22" diagonals (all 16 million colors) with up to 40% more visualization area as compared to the predecessor devices
- Integrated high-end functionality with archives, scripts, PDF/Word/Excel viewer, Internet Explorer, Media Player and Web Server
- Dimmable displays from 0 to 100% via PROFIenergy, via the HMI project or via a controller
- Modern industrial design, cast aluminum fronts for 7" upwards
- Upright installation for all touch devices
- Data security in the event of a power failure for the device and for the SIMATIC HMI memory card
- Innovative service and commissioning concept
- Maximum performance with short screen refresh times
- Suitable for extremely harsh industrial environments thanks to extended approvals such as ATEX 2/22 and marine approvals
- All versions can be used as an OPC UA client or as a server
- Key-operated devices with LED in every function key and new text input mechanism, similar to the keypads of mobile phones
- All keys have a service life of 2 million operations
- Configuring with the WinCC engineering software of the TIA Portal engineering framework

Note:

A 7" and a 15" Comfort Outdoor version are available. These devices have been specially designed for outdoor applications in difficult environments. Best display quality, even under sunlight, UV-resistant fronts and much more.

For more information, see chapter 3, page 3/182.

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Overview

SIPLUS extreme products are based on SIMATIC standard products.

For SIPLUS technical documentation, see:
http://www.siemens.com/siplus-extreme

For more information, see chapter 3, page 3/184.

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Overview



- Aluminum rail for mounting the SIMATIC S7-1500 or ET 200MP
- With integrated DIN rail for snapping on a wide range of standard components
- Attachment of modules with a single screw
- Installation by screwing to the control cabinet wall
- Entire length of rail can be used
- Can also be mounted on low or flat DIN rails, e.g. in control cabinets and terminals boxes, using standard mounting rail adapter

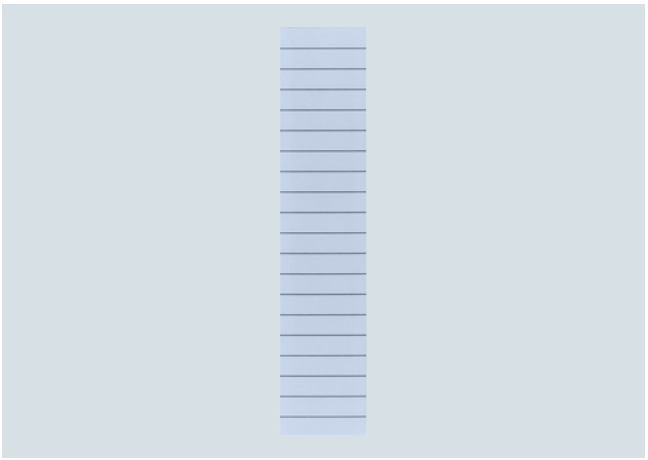
Ordering data

	Article No.
SIMATIC S7-1500 DIN rail	
Fixed lengths, with grounding elements	
• 160 mm	**6ES7590-1AB60-0AA0**
• 245 mm	**6ES7590-1AC40-0AA0**
• 482 mm	**6ES7590-1AE80-0AA0**
• 530 mm	**6ES7590-1AF30-0AA0**
• 830 mm	**6ES7590-1AJ30-0AA0**
For cutting to length by customer, without drill holes; grounding elements must be ordered separately	
• 2 000 mm	**6ES7590-1BC00-0AA0**
PE connection element for DIN rail 2 000 mm	**6ES7590-5AA00-0AA0**
20 units	
DIN rail adapter	**6ES7590-6AA00-0AA0**
For adapting S7-1500 DIN rails on low or flat standard mounting rails, as pre-assembled in control cabinets and terminal boxes, for example. An adapter must be placed every 25 cm. Including mounting hardware. 10 units per packaging unit	
SIMATIC Manual Collection	**6ES7998-8XC01-8YE0**
Electronic manuals on DVD, multi-language: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC Distributed I/O, SIMATIC HMI, SIMATIC sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	
SIMATIC Manual Collection update service for 1 year	**6ES7998-8XC01-8YE2**
Current "Manual Collection" DVD and the three subsequent updates	

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Labeling sheets

Overview



- Film sheets for the application-specific, automatic labeling of SIMATIC S7-1500 I/O modules using standard laser printers
- Direct printing possible from the TIA Portal
  - No double entry of symbols and/or addresses
  - Saves time and avoids typing errors
- Plain color films, tear-resistant, dirt-repellent
- Simple handling:
  - Perforated labeling sheets in DIN A4 format for easy separation of the labeling strips.
  - Detached strips can be inserted directly into the I/O modules.
- Different colors to differentiate module types; yellow reserved for failsafe systems

Ordering data

	Article No.
DIN A4 labeling sheet	
For 35 mm module; 10 sheets with 10 labeling strips each for I/O modules; perforated, Al gray	**6ES7592-2AX00-0AA0**
For 25 mm modules; 10 sheets with 20 labeling strips each for I/O modules; perforated, Al gray	**6ES7592-1AX00-0AA0**
SIMATIC Manual Collection	**6ES7998-8XC01-8YE0**
Electronic manuals on DVD, multi-language: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC Distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	
SIMATIC Manual Collection update service for 1 year	**6ES7998-8XC01-8YE2**
Current "Manual Collection" DVD and the three subsequent updates	

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Overview

Front doors



- Versions:
  - Universal front doors for digital and analog I/O modules
  - Universal front doors for the interface module IM155-5 PN ST
- Included in the scope of supply of the respective modules. Can be ordered as a spare part in a set consisting of five universal (unlabeled) front doors.
- Front doors for I/O modules: Universal labeling sheets and cabling diagrams are included. Cabling diagrams can be detached from preperforated sheets and inserted inside the door.

U connector



- To interconnect the modules (self-assembling backplane bus)
- Implementation of a rugged, interference-free station setup through
  - Consistent separation of supply voltage of modules and data signals
  - Fully shielded, gold-plated contacts for the data bus
- Included in the scope of supply of each module. Available as spare part in sets of 5.

Shielding



- Components for implementing the integrated S7-1500 shielding concept:
  - 24 V DC infeed element for supplying the analog module: strict separation of infeed and analog signals ensures high EMC stability.
  - Shield bracket for insertion in the front connector: allows a low-impedance connection and optimally dissipates interference.
  - Universal shield terminal: connects the cable shield with the shield bracket and is simultaneously used for mechanical fixing.
- Included in the scope of supply of the analog modules. Available as a spare part in two versions:
  - Shielding set, comprising infeed element, shield bracket, and shield terminal (pack of 5 units each)
  - Individual shield terminals (pack of 20)
- No tool required for assembly/disassembly

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Spare parts

Ordering data	Article No.
Universal front door for IM 155-5 PN ST 5 front doors; spare part	**6ES7528-0AA70-7AA0**
Universal front door for I/O modules 5 front doors; with 5 labeling strips (front) and 5 cabling diagrams per front door; spare part	
• For 35 mm modules	**6ES7528-0AA00-7AA0**
• For 25 mm modules	**6ES7528-0AA00-0AA0**
U connector 5 units; spare part	**6ES7590-0AA00-0AA0**
Shielding set I/O Infeed element, shield clamp, and shield terminal; 5 units, spare part	
• For 35 mm modules	**6ES7590-5CA00-0AA0**
• For 25 mm modules	**6ES7590-5CA10-0XA0**
Shield terminal element 10 units; spare part	**6ES7590-5BA00-0AA0**

	Article No.
SIMATIC Manual Collection Electronic manuals on DVD, multi-language: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC Distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	**6ES7998-8XC01-8YE0**
SIMATIC Manual Collection update service for 1 year Current "Manual Collection" DVD and the three subsequent updates	**6ES7998-8XC01-8YE2**

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Overview



S7-300

- The modular mini PLC system for the low and mid-performance ranges
- With comprehensive range of modules for optimum adaptation to the automation task
- Flexible use through simple implementation of distributed structures and versatile networking
- User-friendly handling and uncomplicated design without a fan
- Can be expanded without problems when the tasks increase
- Powerful thanks to a range of integrated functions

S7-300F

- Fail-safe automation system for plants with increased safety requirements for production technology
- Based on S7-300
- Additional ET 200S and ET 200M distributed I/O stations complete with safety-related modules can be connected
- Safety-related communication via PROFIBUS DP with PROFIsafe profile
- Standard modules can be used in addition for non-safety-relevant applications

Availability

As part of our established product portfolio, the SIMATIC S7-300/ET 200M system families will generally be available until 2023.
Following the product phase-out declaration, products will be available as spare parts for another ten years.

Technical specifications

General technical data SIMATIC S7-300	
Degree of protection	IP20 according to IEC 60 529
Ambient temperature	
• For horizontal installation	0 to 60 °C
• For vertical installation	0 to 40 °C
Relative humidity	10 to 95%, non-condensing, corresponds to relative humidity (RH), stress level 2 acc. to IEC 61131, Part 2
Air pressure	From 1080 to 795 hPa (corresponds to an altitude of -1000 to +2000 m)
Insulation	
• < 50 V	500 V DC test voltage
• < 150 V	2500 V DC test voltage
• < 250 V	4000 V DC test voltage
Electromagnetic compatibility	Requirements of the EMC directive; interference immunity according to IEC 61000-6-2
• Pulse-shaped disturbance variables	Test according to: Electrostatic discharge according to IEC 61000-4-2, burst pulses according to IEC 61000-4-4, energy single pulse (surge) according to IEC 61000-4-5,
• Sinusoidal disturbance variables	Test according to: HF irradiation according to IEC 61000-4-3, HF decoupling according to IEC 61000-4-6
• Emission of radio interference	Interference emission according to EN 50081-2
	Test according to: Emitted interference of electromagnetic fields according to EN 55016: Limit value class A, (measured at a distance of 10 m)
	Interference emission via AC mains according to EN 55011: Limit value class A, Group 1
Mechanical strength	
• Vibrations	Frequency range 10 Hz ≤ f ≤ 58 Hz • Continuous: 0.0375 mm amplitude • Occasionally 0.75 mm amplitude
	Frequency range 58 Hz ≤ f ≤ 150 Hz • Continuous: 0.5 g constant acceleration • Occasionally 1 g constant acceleration
	Testing according to IEC 60068-2-6 Tested with:
	5 Hz ≤ f ≤ 9 Hz, constant amplitude 3.5 mm; 9 Hz ≤ f ≤ 150 Hz, constant acceleration 1 g;
	Duration of oscillation: 10 frequency passes per axis in each direction of the 3 mutually perpendicular axes
• Shock	Testing according to IEC 60068-2-27 Tested with:
	Half-sine wave: strength of shock 15 g peak value, 11 ms duration;
	Shock direction: 3 shocks each in ± direction in each of the 3 mutually vertical axes

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Technical specifications (continued)

General technical data of SIPLUS S7-300	
Ambient temperature range	-40/-25 ... +60/70 °C
Conformal coating	Coating of the printed circuit boards and the electronic components
Technical data	The technical data of the standard product applies except for the environmental conditions.
Ambient conditions	
Extended range of environmental conditions	
• with reference to ambient temperature, air pressure and altitude	Tmin ... Tmax at 1080 hPa ... 795 hPa (-1000 m ... +2000 m) // Tmin ... (Tmax - 10K) at 795 hPa ... 658 hPa (+2000 m ... +3500 m) // Tmin ... (Tmax - 20K) at 658 hPa ... 540 hPa (+3500 m ... +5000 m)
• At cold restart, min.	0° C
Relative humidity	
• with condensation, max.	100 %; RH incl. bedewing/frost (no commissioning in bedewed state)
Resistance	
• to biologically active substances/ compliance with EN 60721-3-3	Yes; Class 3B2 mold and fungal spores (except fauna); the supplied plug covers must remain in place on the unused interfaces during operation.
• to chemically active substances/ compliance with EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray in accordance with EN 60068-2-52 (severity 3); the supplied plug covers must remain in place on the unused interfaces during operation.
• to mechanically active substances, compliance with EN 60721-3-3	Yes; Class 3S4 incl. sand, dust; the supplied plug covers must remain in place on unused interfaces during operation.

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Overview CPU 312



- The entry level CPU in Totally Integrated Automation (TIA)
- For smaller applications with moderate processing performance requirements

SIMATIC Micro Memory Card required for operation of the CPU.

Overview CPU 314



- For plants with medium program scope requirements
- High processing power in binary and floating-point arithmetic

SIMATIC Micro Memory Card required for operation of CPU.

Overview CPU 315-2 DP



- The CPU with medium to large program memory and quantity structures for optional use of SIMATIC engineering tools
- High processing power in binary and floating-point arithmetic
- Used as central controller in production lines with central and distributed I/O
- PROFIBUS DP master/slave interface
- For comprehensive I/O expansion
- For configuring distributed I/O structures
- Isochronous mode on PROFIBUS

SIMATIC Micro Memory Card required for operation of CPU.

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Standard CPUs

Overview 315-2 PN/DP



- The CPU with mid-range program memory and quantity frameworks
- High processing power in binary and floating-point arithmetic
- Used as central controller in production lines with central and distributed I/O
- PROFINET interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET I/O Controller
- Component Based Automation (CBA) on PROFINET
- PROFINET proxy for intelligent devices on PROFIBUS DP in Component Based Automation (CBA)
- Integrated web server with the option of creating user-defined web pages
- Combined MPI/PROFIBUS DP master/slave interface
- Isochronous mode on PROFIBUS and PROFINET

SIMATIC Micro Memory Card required for operation of CPU.

Overview CPU 317-2 DP



- The CPU with a large program memory and quantity framework for demanding applications
- For cross-industry automation tasks in series machine, special machine and plant construction
- Used as central controller in production lines with central and distributed I/O
- High processing power in binary and floating-point arithmetic
- 2 PROFIBUS DP master/slave interfaces
- For comprehensive I/O expansion
- For configuring distributed I/O structures
- Isochronous mode on PROFIBUS
- Optionally supports the use of SIMATIC engineering tools

SIMATIC Micro Memory Card required for operation of CPU.

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Overview CPU 317-2 PN/DP



- The CPU with a large program memory and quantity framework for demanding applications
- For cross-industry automation tasks in series machine, special machine and plant construction
- Used as central controller in production lines with central and distributed I/O
- High processing power in binary and floating-point arithmetic
- PROFINET interface with 2-port switch
- PROFINET I/O Controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET I/O Controller
- Distributed intelligence in Component Based Automation (CBA) on PROFINET
- PROFINET proxy for intelligent devices on PROFIBUS DP in Component Based Automation (CBA)
- Integrated web server with the option of creating user-defined web pages
- Combined MPI/PROFIBUS DP master/slave interface
- Isochronous mode on PROFIBUS and PROFINET
- Optionally supports the use of SIMATIC engineering tools

SIMATIC Micro Memory Card required for operation of CPU.

Overview CPU 319-3 PN/DP



- The CPU with high command processing performance, large program memory and quantity framework for demanding applications
- For cross-industry automation tasks in series machine, special machine and plant construction
- Used as central controller in production lines with central and distributed I/O on PROFIBUS and PROFINET
- PROFINET I/O controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET I/O controller
- PROFINET interface with 2-port switch
- Isochronous mode on PROFIBUS or PROFINET
- Integrated web server with the option of creating user-defined web pages
- Distributed intelligence in Component Based Automation (CBA) on PROFINET
- PROFINET proxy for intelligent devices on PROFIBUS DP in Component Based Automation (CBA)
- Optionally supports the use of SIMATIC engineering tools

SIMATIC Micro Memory Card required for operation of the CPU.

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Technical specifications

Article number	**6ES7312-1AE14-0AB0** CPU312, 32KB	**6ES7314-1AG14-0AB0** CPU314, 128 KB	**6ES7315-2AH14-0AB0** CPU315-2DP, 256 KB	**6ES7315-2EH14-0AB0** CPU315-2 PN/DP, 384 KB
General information				
Engineering with				
• Programming package	STEP 7 V5.5 + SP1 or higher or STEP 7 V5.2 + SP1 or higher with HSP 218	STEP 7 V5.5 + SP1 or higher or STEP 7 V5.2 + SP1 or higher with HSP 218	STEP 7 V5.5 + SP1 or higher or STEP 7 V5.2 + SP1 or higher with HSP 218	STEP 7 V5.5 or higher
Supply voltage				
Rated value (DC)				
• 24 V DC	Yes	Yes	Yes	Yes
Power loss				
Power loss, typ.	4 W	4 W	4.5 W	4.65 W
Memory				
Work memory				
• integrated	32 kbyte	128 kbyte	256 kbyte	384 kbyte
• expandable	No	No	No	No
• Size of retentive memory for retentive data blocks	32 kbyte	64 kbyte	128 kbyte	128 kbyte
Load memory				
• Plug-in (MMC), max.	8 Mbyte	8 Mbyte	8 Mbyte	8 Mbyte
CPU processing times				
for bit operations, typ.	0.1 µs	0.06 µs	0.05 µs	0.05 µs
for word operations, typ.	0.24 µs	0.12 µs	0.09 µs	0.09 µs
for fixed point arithmetic, typ.	0.32 µs	0.16 µs	0.12 µs	0.12 µs
for floating point arithmetic, typ.	1.1 µs	0.59 µs	0.45 µs	0.45 µs
Counters, timers and their retentivity				
S7 counter				
• Number	256	256	256	256
IEC counter				
• present	Yes	Yes	Yes	Yes
S7 times				
• Number	256	256	256	256
IEC timer				
• present	Yes	Yes	Yes	Yes
Data areas and their retentivity				
Flag				
• Number, max.	256 byte	256 byte	2 048 byte	2 048 byte
Address area				
I/O address area				
• Inputs	1 024 byte	1 024 byte	2 048 byte	2 048 byte
• Outputs	1 024 byte	1 024 byte	2 048 byte	2 048 byte
Process image				
• Inputs, adjustable	1 024 byte	1 024 byte	2 048 byte	2 048 byte
• Outputs, adjustable	1 024 byte	1 024 byte	2 048 byte	2 048 byte
Time of day				
Clock				
• Hardware clock (real-time)		Yes	Yes	Yes
• Software clock	Yes			
Operating hours counter				
• Number	1	1	1	1
1. Interface				
Interface type	Integrated RS 485 interface	Integrated RS 485 interface	Integrated RS 485 interface	Integrated RS 485 interface
Physics	RS 485	RS 485	RS 485	RS 485
Protocols				
• MPI	Yes	Yes	Yes	Yes
• PROFIBUS DP master	No	No	No	Yes
• PROFIBUS DP slave	No	No	No	Yes
• Point-to-point connection	No	No	No	No
PROFIBUS DP master				
• Number of DP slaves, max.				124

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Technical specifications (continued)

Article number	**6ES7312-1AE14-0AB0**	**6ES7314-1AG14-0AB0**	**6ES7315-2AH14-0AB0**	**6ES7315-2EH14-0AB0**
	CPU312, 32KB	CPU314, 128 KB	CPU315-2DP, 256 KB	CPU315-2 PN/DP, 384 KB
2. Interface				
Interface type			Integrated RS 485 interface	PROFINET
Physics			RS 485	Ethernet RJ45
Interface types				
• Number of ports				2
Protocols				
• MPI			No	No
• PROFINET IO Controller				Yes; Also simultaneously with IO-Device functionality
• PROFINET IO Device				Yes; Also simultaneously with IO Controller functionality
• PROFINET CBA				Yes
• PROFIBUS DP master			Yes	No
• PROFIBUS DP slave			Yes	No
PROFIBUS DP master				
• Number of DP slaves, max.			124; Per station	
PROFINET IO Controller				
Services				
- Number of connectable IO Devices, max.				128
- Of which IO devices with IRT, max.				64
- Number of IO Devices with IRT and the option "high flexibility"				128
- Number of connectable IO Devices for RT, max..				128
Protocols				
Open IE communication				
• TCP/IP				Yes; via integrated PROFINET interface and loadable FBs
- Number of connections, max.				8
• ISO-on-TCP (RFC1006)				Yes; via integrated PROFINET interface and loadable FBs
- Number of connections, max.				8
• UDP				Yes; via integrated PROFINET interface and loadable FBs
- Number of connections, max.				8
Web server				
• supported				Yes
Isochronous mode				
Isochronous operation (application synchronized up to terminal)			Yes	Yes; Via PROFIBUS DP or PROFINET interface
Communication functions				
PG/OP communication	Yes	Yes	Yes	Yes
Data record routing	No	No	Yes	Yes
Global data communication				
• supported	Yes	Yes	Yes	Yes
S7 basic communication				
• supported	Yes	Yes	Yes	Yes
S7 communication				
• supported	Yes	Yes	Yes	Yes
S5 compatible communication				
• supported	Yes; via CP and loadable FC	Yes; via CP and loadable FC	Yes; via CP and loadable FC	Yes; via CP and loadable FC
Number of connections				
• overall	6	12	16	16

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Technical specifications (continued)

Article number	**6ES7312-1AE14-0AB0**	**6ES7314-1AG14-0AB0**	**6ES7315-2AH14-0AB0**	**6ES7315-2EH14-0AB0**
	CPU312, 32KB	CPU314, 128 KB	CPU315-2DP, 256 KB	CPU315-2 PN/DP, 384 KB
Ambient conditions				
Ambient temperature during operation				
• min.	0 °C	0 °C	0 °C	0 °C
• max.	60 °C	60 °C	60 °C	60 °C
Configuration				
Programming				
Programming language				
- LAD	Yes	Yes	Yes	Yes
- FBD	Yes	Yes	Yes	Yes
- STL	Yes	Yes	Yes	Yes
- SCL	Yes	Yes	Yes	Yes
- CFC		Yes	Yes	Yes
- GRAPH	Yes	Yes	Yes	Yes
- HiGraph®	Yes	Yes	Yes	Yes
Know-how protection				
• User program protection/ password protection	Yes	Yes	Yes	Yes
• Block encryption	Yes; With S7 block Privacy	Yes; With S7 block Privacy	Yes; With S7 block Privacy	Yes; With S7 block Privacy
Dimensions				
Width	40 mm	40 mm	40 mm	40 mm
Height	125 mm	125 mm	125 mm	125 mm
Depth	130 mm	130 mm	130 mm	130 mm
Weights				
Weight, approx.	270 g	280 g	290 g	340 g

Article number	**6ES7317-2AK14-0AB0**	**6ES7317-2EK14-0AB0**	**6ES7318-3EL01-0AB0**
	CPU317-2 DP, 1 MB	CPU317-2 PN/DP, 1 MB	CPU319-3 PN/DP, 2 MB
General information			
Engineering with			
• Programming package	STEP 7 as of V5.5 + SP1 or STEP 7 V5.2 + SP1 or higher with HSP 202	STEP 7 V5.5 or higher	STEP 7 V5.5 or higher
Supply voltage			
Rated value (DC)			
• 24 V DC	Yes	Yes	Yes
Power loss			
Power loss, typ.	4.5 W	4.65 W	14 W
Memory			
Work memory			
• integrated	1 024 kbyte	1 024 kbyte	2 048 kbyte
• expandable	No	No	No
• Size of retentive memory for retentive data blocks	256 kbyte	256 kbyte	700 kbyte
Load memory			
• Plug-in (MMC), max.	8 Mbyte	8 Mbyte	8 Mbyte
CPU processing times			
for bit operations, typ.	0.025 µs	0.025 µs	0.004 µs
for word operations, typ.	0.03 µs	0.03 µs	0.01 µs
for fixed point arithmetic, typ.	0.04 µs	0.04 µs	0.01 µs
for floating point arithmetic, typ.	0.16 µs	0.16 µs	0.04 µs

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Technical specifications (continued)

Article number	**6ES7317-2AK14-0AB0** CPU317-2 DP, 1 MB	**6ES7317-2EK14-0AB0** CPU317-2 PN/DP, 1 MB	**6ES7318-3EL01-0AB0** CPU319-3 PN/DP, 2 MB
Counters, timers and their retentivity			
S7 counter			
• Number	512	512	2 048
IEC counter			
• present	Yes	Yes	Yes
S7 times			
• Number	512	512	2 048
IEC timer			
• present	Yes	Yes	Yes
Data areas and their retentivity			
Flag			
• Number, max.	4 096 byte	4 096 byte	8 192 byte
Address area			
I/O address area			
• Inputs	8 192 byte	8 192 byte	8 192 byte
• Outputs	8 192 byte	8 192 byte	8 192 byte
Process image			
• Inputs, adjustable	8 192 byte	8 192 byte	8 192 byte
• Outputs, adjustable	8 192 byte	8 192 byte	8 192 byte
Time of day			
Clock			
• Hardware clock (real-time)	Yes	Yes	Yes
Operating hours counter			
• Number	4	4	4
1. Interface			
Interface type	Integrated RS 485 interface	Integrated RS 485 interface	Integrated RS 485 interface
Physics	RS 485	RS 485	RS 485
Protocols			
• MPI	Yes	Yes	Yes
• PROFIBUS DP master	Yes	Yes	Yes
• PROFIBUS DP slave	Yes; A DP slave at both interfaces simultaneously is not possible	Yes	Yes; A DP slave at both interfaces simultaneously is not possible
• Point-to-point connection	No	No	No
PROFIBUS DP master			
• Number of DP slaves, max.	124	124	124
2. Interface			
Interface type	Integrated RS 485 interface	PROFINET	Integrated RS 485 interface
Physics	RS 485	Ethernet RJ45	RS 485
Interface types			
• Number of ports		2	
Protocols			
• MPI	No	No	No
• PROFINET IO Controller		Yes; Also simultaneously with IO-Device functionality	No
• PROFINET IO Device		Yes; Also simultaneously with IO Controller functionality	No
• PROFINET CBA		Yes	No
• PROFIBUS DP master	Yes	No	Yes
• PROFIBUS DP slave	Yes; A DP slave at both interfaces simultaneously is not possible	No	Yes; A DP slave at both interfaces simultaneously is not possible
PROFIBUS DP master			
• Number of DP slaves, max.	124		124
PROFINET IO Controller			
Services			
- Number of connectable IO Devices, max.		128	
- Of which IO devices with IRT, max.		64	
- Number of IO Devices with IRT and the option "high flexibility"		128	
- Number of connectable IO Devices for RT, max.		128	

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Technical specifications (continued)

Article number	6ES7317-2AK14-0AB0 CPU317-2 DP, 1 MB	6ES7317-2EK14-0AB0 CPU317-2 PN/DP, 1 MB	6ES7318-3EL01-0AB0 CPU319-3 PN/DP, 2 MB
3. Interface			
Interface type			PROFINET
Physics			Ethernet RJ45
Interface types			
• Number of ports			2
Protocols			
• MPI			No
• PROFINET IO Controller			Yes; Also simultaneously with I-Device functionality
• PROFINET IO Device			Yes; Also simultaneously with IO Controller functionality
• PROFINET CBA			Yes
• PROFIBUS DP master			No
• PROFIBUS DP slave			No
PROFINET IO Controller			
Services			
- Number of connectable IO Devices, max.			256
- Of which IO devices with IRT, max.			64
- Number of IO Devices with IRT and the option "high flexibility"			256
- Number of connectable IO Devices for RT, max..			256
Protocols			
Open IE communication			
• TCP/IP		Yes; via integrated PROFINET interface and loadable FBs	Yes; via integrated PROFINET interface and loadable FBs
- Number of connections, max.		16	32
• ISO-on-TCP (RFC1006)		Yes; via integrated PROFINET interface and loadable FBs	Yes; via integrated PROFINET interface and loadable FBs
- Number of connections, max.		16	32
• UDP		Yes; via integrated PROFINET interface and loadable FBs	Yes; via integrated PROFINET interface and loadable FBs
- Number of connections, max.		16	32
Web server			
• supported		Yes	Yes
Isochronous mode			
Isochronous operation (application synchronized up to terminal)		Yes; Via PROFIBUS DP or PROFINET interface	Yes; Via 2nd PROFIBUS DP or PROFINET interface
Communication functions			
PG/OP communication	Yes	Yes	Yes
Data record routing	Yes	Yes	Yes
Global data communication			
• supported	Yes	Yes	Yes
S7 basic communication			
• supported	Yes	Yes	Yes
S7 communication			
• supported	Yes	Yes	Yes
S5 compatible communication			
• supported	Yes; via CP and loadable FC	Yes; via CP and loadable FC	Yes; via CP and loadable FC
Number of connections			
• overall	32	32	32
Ambient conditions			
Ambient temperature during operation			
• min.	0 °C	0 °C	0 °C
• max.	60 °C	60 °C	60 °C

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Technical specifications (continued)

Article number	6ES7317-2AK14-0AB0 CPU317-2 DP, 1 MB	6ES7317-2EK14-0AB0 CPU317-2 PN/DP, 1 MB	6ES7318-3EL01-0AB0 CPU319-3 PN/DP, 2 MB
Configuration			
Programming			
Programming language			
- LAD	Yes	Yes	Yes
- FBD	Yes	Yes	Yes
- STL	Yes	Yes	Yes
- SCL	Yes	Yes	Yes
- CFC	Yes	Yes	Yes
- GRAPH	Yes	Yes	Yes
- HiGraph®	Yes	Yes	Yes
Know-how protection			
• User program protection/ password protection	Yes	Yes	Yes
• Block encryption	Yes; With S7 block Privacy	Yes; With S7 block Privacy	Yes; With S7 block Privacy
Dimensions			
Width	40 mm	40 mm	120 mm
Height	125 mm	125 mm	125 mm
Depth	130 mm	130 mm	130 mm
Weights			
Weight, approx.	360 g	340 g	1 250 g

Ordering data

	Article No.
CPU 312 Work memory 32 KB, supply voltage 24 V DC, MPI; MMC required	**6ES7312-1AE14-0AB0**
CPU 314 Work memory 128 KB, supply voltage 24 V DC, MPI; MMC required	**6ES7314-1AG14-0AB0**
CPU 315-2 DP Work memory 256 KB, supply voltage 24 V DC, MPI, PROFIBUS DP master/slave interface; MMC required	**6ES7315-2AH14-0AB0**
CPU 315-2 PN/DP Work memory 384 KB, 24 V DC power supply, combined MPI/PROFIBUS DP master/slave interface, Ethernet/PROFINET interface with 2-port switch; MMC required	**6ES7315-2EH14-0AB0**
CPU 317-2 DP Work memory 1 MB, supply voltage 24 V DC, MPI, PROFIBUS DP master/slave interface; MMC required	**6ES7317-2AK14-0AB0**
CPU 317-2 PN/DP Work memory 1 MB, 24 V DC power supply, combined MPI/PROFIBUS DP master/slave interface, Ethernet/PROFINET interface with 2-port switch; MMC required	**6ES7317-2EK14-0AB0**
CPU 319-3 PN/DP Work memory 2 MB, power supply 24 V DC, combined MPI/PROFIBUS DP master/slave interface, PROFIBUS DP master/ slave interface, Ethernet/PROFINET interface with 2-port switch; MMC required	**6ES7318-3EL01-0AB0**

	Article No.
SIMATIC Micro Memory Card	
64 KB	**6ES7953-8LF31-0AA0**
128 KB	**6ES7953-8LG31-0AA0**
512 KB	**6ES7953-8LJ31-0AA0**
2 MB	**6ES7953-8LL31-0AA0**
4 MB	**6ES7953-8LM31-0AA0**
8 MB	**6ES7953-8LP31-0AA0**
MPI cable for connection of SIMATIC S7 and PG via MPI; 5 m in length	**6ES7901-0BF00-0AA0**
Slot number plates	**6ES7912-0AA00-0AA0**
SIMATIC Manual Collection Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC Distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	**6ES7998-8XC01-8YE0**
SIMATIC Manual Collection update service for 1 year Current "Manual Collection" DVD and the three subsequent updates	**6ES7998-8XC01-8YE2**
Power supply connector 10 units, spare part	**6ES7391-1AA00-0AA0**
USB A2 PC adapter For connecting a PG/PC or notebook to PROFIBUS or MPI; USB cable included in scope of supply	**6GK1571-0BA00-0AA0**

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Standard CPUs

Ordering data	Article No.
PROFIBUS bus components	
PROFIBUS DP bus connector RS 485	
• With 90° cable outlet, max. transfer rate 12 Mbps	
- without PG interface	**6ES7972-0BA12-0XA0**
- with PG interface	**6ES7972-0BB12-0XA0**
• with 90° cable outlet for FastConnect connection system, max. transfer rate 12 Mbps	
- without PG interface, 1 unit	**6ES7972-0BA52-0XA0**
- without PG interface, 100 units	**6ES7972-0BA52-0XB0**
- with PG interface, 1 unit	**6ES7972-0BB52-0XA0**
- with PG interface, 100 units	**6ES7972-0BB52-0XB0**
• with axial cable outlet for SIMATIC OP, for connecting to PPI, MPI, PROFIBUS	**6GK1500-0EA02**
PROFIBUS Fast Connect bus cable	**6XV1830-0EH10**
Standard type with special design for quick mounting, 2-wire, shielded, sold by the meter, max. delivery unit 1000 m, minimum order quantity 20 m	
RS 485 repeater for PROFIBUS	**6ES7972-0AA02-0XA0**
Transmission rate up to 12 Mbps; 24 V DC; IP20 enclosure	

	Article No.
PROFINET bus components	
IE FC TP Standard Cable GP 2x2	**6XV1840-2AH10**
4-wire, shielded TP installation cable for connecting to IE FC RJ45 outlet/IE FC RJ45 plug; PROFINET-compatible; with UL approval; Sold by the meter	
FO Standard Cable GP (50/125)	**6XV1873-2A**
Standard cable, splittable, UL approval, sold by the meter	
SCALANCE X204-2 Industrial Ethernet Switch	**6GK5204-2BB10-2AA3**
Industrial Ethernet switches with integral SNMP access, Web diagnostics, copper cable diagnostics and PROFINET diagnostics for configuring line, star and ring topologies; four 10/100 Mbps RJ45 ports and two FO ports	
Compact Switch Module CSM 377	**6GK7377-1AA00-0AA0**
Unmanaged switch for connecting SIMATIC S7-300, ET 200M and up to three other stations to Industrial Ethernet with 10/100 Mbps; 4 x RJ45 ports; external 24 V DC power supply, LED diagnostics, S7-300 module incl. electronic manual on CD-ROM	
IE FC RJ45 plugs	
RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables	
IE FC RJ45 plug 145	
145° cable outlet	
1 unit	**6GK1901-1BB30-0AA0**
10 units	**6GK1901-1BB30-0AB0**
50 units	**6GK1901-1BB30-0AE0**
IE FC RJ45 plug 180	
180° cable outlet	
1 unit	**6GK1901-1BB10-2AA0**
10 units	**6GK1901-1BB10-2AB0**
50 units	**6GK1901-1BB10-2AE0**
PROFIBUS/PROFINET bus components	See Catalogs IK PI, CA 01
For establishing MPI/PROFIBUS/ PROFINET communication	

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Overview SIPLUS CPU 314



- For plants with medium requirements on the program scope
- High processing performance in binary and floating-point arithmetic

SIMATIC Micro Memory Card required for operation of CPU.

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

Overview SIPLUS CPU 315-2 DP



- The CPU with medium to large program memory and quantity structures for optional use of SIMATIC engineering tools
- High processing performance in binary and floating-point arithmetic
- PROFIBUS DP master/slave interface
- For comprehensive I/O expansion
- For configuring distributed I/O structures

SIMATIC Micro Memory Card required for operation of CPU.

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

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Overview SIPLUS CPU 315-2 PN/DP



- The CPU with medium-sized program memory and quantity frameworks
- High processing performance in binary and floating-point arithmetic
- Used as central controller in production lines with central and distributed I/O
- Component Based Automation (CBA) on PROFINET
- PROFINET proxy for intelligent devices on PROFIBUS DP in Component Based Automation (CBA)
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET interface with 2-port switch
- Combined MPI/PROFIBUS DP master/slave interface
- Isochronous mode on PROFIBUS

SIMATIC Micro Memory Card required for operation of CPU.

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

Overview SIPLUS CPU 317-2 PN/DP



- The CPU with a large program memory and quantity framework for demanding applications
- Distributed intelligence in Component Based Automation (CBA) on PROFINET
- PROFINET proxy for intelligent devices on PROFIBUS DP in Component Based Automation (CBA)
- PROFINET I/O Controller for operating distributed I/O on PROFINET
- For cross-industry automation tasks in series machine, special machine and plant construction
- Used as central controller in production lines with central and distributed I/O
- For comprehensive I/O expansion
- For configuring distributed I/O structures
- High processing performance in binary and floating-point arithmetic
- Combined MPI/PROFIBUS DP master/slave interface
- Optionally supports the use of SIMATIC engineering tools

Micro Memory Card required for operation of CPU.

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

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Technical specifications

Article number	**6AG1314-1AG14-2AY0**	**6AG1314-1AG14-7AB0**	**6AG1315-2AH14-2AY0**	**6AG1315-2AH14-7AB0**
Based on	**6ES7314-1AG14-0AB0**	**6ES7314-1AG14-0AB0**	**6ES7315-2AH14-0AB0**	**6ES7315-2AH14-0AB0**
	SIPLUS CPU314 EN50155	SIPLUS S7-300 CPU314	SIPLUS CPU 315-2DP EN50155	SIPLUS S7-300 CPU 315-2DP
Ambient conditions				
Ambient temperature during operation				
• min.	-25 °C; = Tmin	-25 °C; = Tmin	-25 °C; = Tmin	-25 °C; = Tmin
• max.	60 °C; = Tmax; the rated temperature range of -25 ... +55 °C (T1) applies for the use on railway vehicles according to EN50155	70 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use	60 °C; = Tmax; the rated temperature range of -25 ... +55 °C (T1) applies for the use on railway vehicles according to EN50155	70 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity				
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance				
Use in stationary industrial systems				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
Use on land craft, rail vehicles and special-purpose vehicles				
- to biologically active substances according to EN 60721-3-5	Yes; Class 5B2 mold, fungus and dry rot spores (with the exception of fauna); Class 5B3 on request		Yes; Class 5B2 mold, fungus and dry rot spores (with the exception of fauna); Class 5B3 on request	
- to chemically active substances according to EN 60721-3-5	Yes; Class 5C3 (RH < 75 %) incl. salt spray acc. to EN 50155 (ST2); *		Yes; Class 5C3 (RH < 75 %) incl. salt spray acc. to EN 50155 (ST2); *	
- to mechanically active substances according to EN 60721-3-5	Yes; Class 5S3 incl. sand, dust; *		Yes; Class 5S3 incl. sand, dust; *	
Use on ships/at sea				
- to biologically active substances according to EN 60721-3-6		Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request		Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6		Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *		Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6		Yes; Class 6S3 incl. sand, dust; *		Yes; Class 6S3 incl. sand, dust; *
Remark				
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!

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Technical specifications (continued)

Article number	6AG1315-2EH14-2AY0	6AG1315-2EH14-7AB0	6AG1317-2EK14-2AY0	6AG1317-2EK14-7AB0
Based on	6ES7315-2EH14-0AB0	6ES7315-2EH14-0AB0	6ES7317-2EK14-0AB0	6ES7317-2EK14-0AB0
	SIPLUS S7-300 CPU315-2PN/DP EN50155	SIPLUS S7-300 CPU315-2PN/DP	SIPLUS S7-300 CPU317-2PN/DP EN50155	SIPLUS S7-300 CPU317-2PN/DP
Ambient conditions				
Ambient temperature during operation				
• min.	-25 °C; = Tmin	-25 °C; = Tmin	-25 °C; = Tmin	-25 °C; = Tmin
• max.	60 °C; = Tmax; the rated temperature range of -25 ... +55 °C (T1) applies for the use on railway vehicles according to EN50155	70 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use	60 °C; = Tmax; the rated temperature range of -25 ... +55 °C (T1) applies for the use on railway vehicles according to EN50155	70 °C; = Tmax; @ 60°C for UL/ATEX/FM use
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity				
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance				
Use in stationary industrial systems				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
Use on land craft, rail vehicles and special-purpose vehicles				
- to biologically active substances according to EN 60721-3-5	Yes; Class 5B2 mold, fungus and dry rot spores (with the exception of fauna); Class 5B3 on request		Yes; Class 5B2 mold, fungus and dry rot spores (with the exception of fauna); Class 5B3 on request	
- to chemically active substances according to EN 60721-3-5	Yes; Class 5C3 (RH < 75 %) incl. salt spray acc. to EN 50155 (ST2); *		Yes; Class 5C3 (RH < 75 %) incl. salt spray acc. to EN 50155 (ST2); *	
- to mechanically active substances according to EN 60721-3-5	Yes; Class 5S3 incl. sand, dust; *		Yes; Class 5S3 incl. sand, dust; *	
Use on ships/at sea				
- to biologically active substances according to EN 60721-3-6		Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request		Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6		Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *		Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6		Yes; Class 6S3 incl. sand, dust; *		Yes; Class 6S3 incl. sand, dust; *
Remark				
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!

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Ordering data	Article No.
SIPLUS S7-300 CPU 314	
For industrial applications with extended ambient conditions	
CPU, work memory 128 KB, power supply 24 V DC, MPI; MMC required	
Extended temperature range and exposure to media	**6AG1314-1AG14-7AB0**
For rolling stock railway applications	
CPU, work memory 128 KB, power supply 24 V DC, MPI; MMC required	
Conforms to EN 50155	**6AG1314-1AG14-2AY0**
SIPLUS S7-300 CPU 315-2 DP	
For industrial applications with extended ambient conditions	
CPU, work memory 256 KB, power supply 24 V DC, MPI, PROFIBUS DP master/slave interface; MMC required	
Extended temperature range and exposure to media	**6AG1315-2AH14-7AB0**
For rolling stock railway applications	
CPU, work memory 256 KB, power supply 24 V DC, MPI, PROFIBUS DP master/slave interface; MMC required	
Conforms to EN 50155	**6AG1315-2AH14-2AY0**
SIPLUS S7-300 CPU 315-2 PN/DP	
For industrial applications with extended ambient conditions	
CPU, work memory 384 KB, power supply 24 V DC, combined MPI/PROFIBUS DP master/slave interface, Ethernet/PROFINET interface with 2-port switch; MMC required	
Extended temperature range and exposure to media	**6AG1315-2EH14-7AB0**
For rolling stock railway applications	
CPU, work memory 384 KB, power supply 24 V DC, combined MPI/PROFIBUS DP master/slave interface, Ethernet/PROFINET interface with 2-port switch; MMC required	
Conforms to EN 50155	**6AG1315-2EH14-2AY0**

	Article No.
SIPLUS S7-300 CPU 317-2 PN/DP	
For industrial applications with extended ambient conditions	
CPU, work memory 1 MB, power supply 24 V DC, combined MPI/PROFIBUS DP master/slave interface, Ethernet/PROFINET interface; MMC required	
Extended temperature range and exposure to media	**6AG1317-2EK14-7AB0**
For rolling stock railway applications	
CPU, work memory 1 MB, power supply 24 V DC, combined MPI/PROFIBUS DP master/slave interface, Ethernet/PROFINET interface; MMC required	
Conforms to EN 50155	**6AG1317-2EK14-2AY0**
Accessories	
Mandatory	
SIMATIC Micro Memory Card	
64 KB	**6ES7953-8LF31-0AA0**
128 KB	**6ES7953-8LG31-0AA0**
512 KB	**6ES7953-8LJ31-0AA0**
2 MB	**6ES7953-8LL31-0AA0**
4 MB	**6ES7953-8LM31-0AA0**
8 MB	**6ES7953-8LP31-0AA0**
For communication within the application	
PROFIBUS DP RS 485 bus connector	
(Extended temperature range and exposure to media)	
With 90° cable outlet, max. transfer rate 12 Mbps	
• without PG interface	**6AG1972-0BA12-2XA0**
• with PG interface	**6AG1972-0BB12-2XA0**
With inclined cable outlet, max. transmission rate 12 Mbps	
• without PG interface	**6AG1972-0BA42-7XA0**
• with PG interface	**6AG1972-0BB42-7XA0**
With insulation displacement terminals, max. transfer rate 12 Mbps	
• with PG interface, grounding via control cabinet cover	**6AG1972-0BB70-7XA0**
(Extended temperature range)	
With axial cable outlet for SIMATIC OP, for connecting to PPI, MPI, PROFIBUS	**6AG1500-0EA02-2AA0**

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SIPLUS S7-300 standard CPUs

Ordering data	Article No.
IE FC RJ45 plug 180 (Extended temperature range and media exposure) 180° cable outlet • 1 unit	 **6AG1901-1BB10-7AA0**
SIPLUS SCALANCE X-200 Industrial Ethernet Switches Industrial Ethernet switches with integral SNMP access, web diagnostics, copper cable diagnostics and PROFINET diagnostics for configuring line, star and ring topologies; with integrated redundancy manager (except: SCALANCE X208PRO); incl. operating instructions, Industrial Ethernet network manual and configuration software on CD-ROM • With electrical and optical ports for glass multimode FOC up to 3 km • Extended temperature range and exposure to media • **SIPLUS SCALANCE X204-2** with four 10/100 Mbps RJ45 ports and two fiber-optic ports	 **6AG1204-2BB10-4AA3**
PROFIBUS FastConnect bus cable Standard type with special design for quick mounting, 2-wire, shielded, sold by the meter, max. delivery unit 1000 m, minimum order quantity 20 m	**6XV1830-0EH10**
RS 485 repeater for PROFIBUS (Extended temperature range and exposure to media) Transmission rate up to 12 Mbps; 24 V DC; IP20 enclosure	**6AG1972-0AA02-7XA0**

	Article No.
IE FC TP Standard Cable GP 2x2 4-wire, shielded TP installation cable for connecting to IE FC RJ45 outlet/IE FC RJ45 plug; PROFINET-compatible; with UL approval; Sold by the meter	**6XV1840-2AH10**
FO Standard Cable GP (50/125) Standard cable, splittable, UL approval, sold by the meter	**6XV1873-2A**
For commissioning	
MPI cable For connection of SIMATIC S7 and PG via MPI; 5 m in length	**6ES7901-0BF00-0AA0**
USB A2 PC adapter For connecting a PG/PC or notebook to PROFIBUS or MPI; USB cable included in scope of supply	**6GK1571-0BA00-0AA0**
Consumables	
Power supply connector 10 units, spare part	**6ES7391-1AA00-0AA0**
Slot number plates	**6ES7912-0AA00-0AA0**
Documentation	
SIMATIC Manual Collection Electronic manuals on DVD, multi-language: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC Distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	**6ES7998-8XC01-8YE0**
SIMATIC Manual Collection update service for 1 year Current "Manual Collection" DVD and the three subsequent updates	**6ES7998-8XC01-8YE2**

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Overview CPU 312C



- The compact CPU with integral digital inputs/outputs
- For small applications with increased processing performance requirements
- With technological functions

SIMATIC Micro Memory Card required for operation of CPU.

Overview CPU 313C-2 PtP



- The compact CPU with integrated digital inputs/outputs as well as second serial interface
- For plants with high processing performance and response time requirements
- With technological functions

SIMATIC Micro Memory Card required for operation of the CPU.

Overview CPU 313C



- The compact CPU with integral digital and analog inputs/outputs
- For plants with high processing performance and response time requirements
- With technological functions

SIMATIC Micro Memory Card required for operation of the CPU.

Overview CPU 313C-2 DP



- The compact CPU with integral digital inputs/outputs and PROFIBUS DP master/slave interface
- For plants with high processing performance and response time requirements
- With technological functions
- For tasks with special functions
- For connecting distributed I/Os

SIMATIC Micro Memory Card required for operation of the CPU.

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Compact CPUs

Overview CPU 314C-2 PtP



- The compact CPU with integrated digital and analog inputs/outputs as well as second serial interface
- For plants with high processing performance and response time requirements
- With technological functions

SIMATIC Micro Memory Card required for operation of the CPU.

Overview CPU 314C-2 DP



- The compact CPU with integral digital and analog inputs/outputs and PROFIBUS DP master/slave interface
- With technological functions
- For plants with high processing performance and response time requirements
- For connecting distributed I/Os

SIMATIC Micro Memory Card required for operation of the CPU.

Overview CPU 314C-2 PN/DP



- The compact CPU with integral digital and analog inputs/outputs and technological functions
- High processing performance in binary and floating-point arithmetic
- For connecting distributed I/O via PROFIBUS and PROFINET
- Combined MPI/PROFIBUS DP master/slave interface
- PROFINET interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET IO controller
- Component Based Automation (CBA) on PROFINET
- PROFINET proxy for intelligent devices on PROFIBUS DP in Component Based Automation (CBA)
- Integrated web server with the option of creating user-defined web pages
- Isochronous mode on PROFINET

SIMATIC Micro Memory Card required for operation of CPU.

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Technical specifications

Article number	**6ES7312-5BF04-0AB0**	**6ES7313-5BG04-0AB0**	**6ES7313-6BG04-0AB0**	**6ES7313-6CG04-0AB0**
	CPU312C, 10DI/6DO, 64 KB	CPU313C, 24DI/16DO/5AI/2AO, 128 KB	CPU313C-2 PTP, 16DI/16DO, 128 KB	CPU313C-2 DP, 16DI/16DO, 128 KB
General information				
Engineering with				
• Programming package	STEP 7 V5.5 + SP1 or higher or STEP 7 V5.3 + SP2 or higher with HSP 203	STEP 7 V5.5 + SP1 or higher or STEP 7 V5.3 + SP2 or higher with HSP 203	STEP 7 as of V5.5 + SP1 or STEP 7 V5.3 + SP2 or higher with HSP 204	STEP 7 V5.5 + SP1 or higher or STEP 7 V5.3 + SP2 or higher with HSP 203
Supply voltage				
Rated value (DC)				
• 24 V DC	Yes	Yes	Yes	Yes
Power loss				
Power loss, typ.	8 W	12 W	9 W	9 W
Memory				
Work memory				
• integrated	64 kbyte	128 kbyte	128 kbyte	128 kbyte
• expandable	No	No	No	No
• Size of retentive memory for retentive data blocks	64 kbyte	64 kbyte	64 kbyte	64 kbyte
Load memory				
• Plug-in (MMC), max.	8 Mbyte	8 Mbyte	8 Mbyte	8 Mbyte
CPU processing times				
for bit operations, typ.	0.1 µs	0.07 µs	0.07 µs	0.07 µs
for word operations, typ.	0.24 µs	0.15 µs	0.15 µs	0.15 µs
for fixed point arithmetic, typ.	0.32 µs	0.2 µs	0.2 µs	0.2 µs
for floating point arithmetic, typ.	1.1 µs	0.72 µs	0.72 µs	0.72 µs
Counters, timers and their retentivity				
S7 counter				
• Number	256	256	256	256
IEC counter				
• present	Yes	Yes	Yes	Yes
S7 times				
• Number	256	256	256	256
IEC timer				
• present	Yes	Yes	Yes	Yes
Data areas and their retentivity				
Flag				
• Number, max.	256 byte	256 byte	256 byte	256 byte
Address area				
I/O address area				
• Inputs	1 024 byte	1 024 byte	1 024 byte	2 048 byte
• Outputs	1 024 byte	1 024 byte	1 024 byte	2 048 byte
Process image				
• Inputs, adjustable	1 024 byte	1 024 byte	1 024 byte	2 048 byte
• Outputs, adjustable	1 024 byte	1 024 byte	1 024 byte	2 048 byte
Time of day				
Clock				
• Hardware clock (real-time)		Yes	Yes	Yes
• Software clock	Yes			
Operating hours counter				
• Number	1	1	1	1
Digital inputs				
integrated channels (DI)	10	24	16	16
Digital outputs				
integrated channels (DO)	6	16	16	16

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Technical specifications (continued)

Article number	6ES7312-5BF04-0AB0 CPU312C, 10DI/6DO, 64 KB	6ES7313-5BG04-0AB0 CPU313C, 24DI/16DO/5AI/2AO, 128 KB	6ES7313-6BG04-0AB0 CPU313C-2 PTP, 16DI/16DO, 128 KB	6ES7313-6CG04-0AB0 CPU313C-2 DP, 16DI/16DO, 128 KB
Analog inputs				
integrated channels (AI)	0	5; 4x current/voltage, 1x resistance	0	0
Input ranges				
• Voltage		Yes; ±10 V / 100 kΩ; 0 V to 10 V / 100 kΩ		
• Current		Yes; ±20 mA / 100 Ω; 0 mA to 20 mA / 100 Ω; 4 mA to 20 mA / 100 Ω		
• Resistance thermometer		Yes; Pt 100 / 10 MΩ		
• Resistance		Yes; 0 Ω to 600 Ω / 10 MΩ		
Analog outputs				
integrated channels (AO)	0	2	0	0
Output ranges, voltage				
• 0 to 10 V		Yes		
• -10 V to +10 V		Yes		
Output ranges, current				
• 0 to 20 mA		Yes		
• -20 mA to +20 mA		Yes		
• 4 mA to 20 mA		Yes		
1. Interface				
Interface type	Integrated RS 485 interface	Integrated RS 485 interface	Integrated RS 485 interface	Integrated RS 485 interface
Physics	RS 485	RS 485	RS 485	RS 485
Protocols				
• MPI	Yes	Yes	Yes	Yes
• PROFIBUS DP master	No	No	No	No
• PROFIBUS DP slave	No	No	No	No
• Point-to-point connection	No	No	No	No
2. Interface				
Interface type			Integrated RS 422/ 485 interface	Integrated RS 485 interface
Physics			RS 422 / 485 (X.27)	RS 485
Protocols				
• MPI			No	No
• PROFINET IO Controller			No	No
• PROFINET IO Device			No	No
• PROFINET CBA			No	No
• PROFIBUS DP master			No	Yes
• PROFIBUS DP slave			No	Yes
PROFIBUS DP master				
• Number of DP slaves, max.				124
Communication functions				
PG/OP communication	Yes	Yes	Yes	Yes
Data record routing	No	No	No	Yes
Global data communication				
• supported	Yes	Yes	Yes	Yes
S7 basic communication				
• supported	Yes	Yes	Yes; Server	Yes
S7 communication				
• supported	Yes	Yes	Yes	Yes
S5 compatible communication				
• supported	Yes; via CP and loadable FC	Yes; via CP and loadable FC	Yes; via CP and loadable FC	Yes; via CP and loadable FC
Number of connections				
• overall	6	8	8	8

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Technical specifications (continued)

Article number	**6ES7312-5BF04-0AB0**	**6ES7313-5BG04-0AB0**	**6ES7313-6BG04-0AB0**	**6ES7313-6CG04-0AB0**
	CPU312C, 10DI/6DO, 64 KB	CPU313C, 24DI/16DO/5AI/2AO, 128 KB	CPU313C-2 PTP, 16DI/16DO, 128 KB	CPU313C-2 DP, 16DI/16DO, 128 KB
Integrated Functions				
Number of counters	2; See "Technological Functions" manual	3; See "Technological Functions" manual	3; See "Technological Functions" manual	3; See "Technological Functions" manual
Counting frequency (counter) max.	10 kHz	30 kHz	30 kHz	30 kHz
Frequency measurement	Yes	Yes	Yes	Yes
Number of frequency meters	2; up to 10 kHz (see "Technological Functions" manual)	3; up to 30 kHz (see "Technological Functions" manual)	3; up to 30 kHz (see "Technological Functions" manual)	3; up to 30 kHz (see "Technological Functions" manual)
controlled positioning	No	No	No	No
integrated function blocks (closed-loop control)	No	Yes; PID controller (see "Technological Functions" manual)	Yes; PID controller (see "Technological Functions" manual)	Yes; PID controller (see "Technological Functions" manual)
PID controller	No	Yes	Yes	Yes
Number of pulse outputs	2; Pulse width modulation up to 2.5 kHz (see "Technological Functions" Manual)	3; Pulse width modulation up to 2.5 kHz (see "Technological Functions" Manual)	3; Pulse width modulation up to 2.5 kHz (see "Technological Functions" Manual)	3; Pulse width modulation up to 2.5 kHz (see "Technological Functions" Manual)
Limit frequency (pulse)	2.5 kHz	2.5 kHz	2.5 kHz	2.5 kHz
Ambient conditions				
Ambient temperature during operation				
• min.	0 °C	0 °C	0 °C	0 °C
• max.	60 °C	60 °C	60 °C	60 °C
Configuration				
Programming				
Programming language				
- LAD	Yes	Yes	Yes	Yes
- FBD	Yes	Yes	Yes	Yes
- STL	Yes	Yes	Yes	Yes
- SCL	Yes	Yes	Yes	Yes
- CFC		Yes	Yes	Yes
- GRAPH	Yes	Yes	Yes	Yes
- HiGraph®	Yes	Yes	Yes	Yes
Know-how protection				
• User program protection/ password protection	Yes	Yes	Yes	Yes
• Block encryption	Yes; With S7 block Privacy	Yes; With S7 block Privacy	Yes; With S7 block Privacy	Yes; With S7 block Privacy
Dimensions				
Width	80 mm	120 mm	80 mm	80 mm
Height	125 mm	125 mm	125 mm	125 mm
Depth	130 mm	130 mm	130 mm	130 mm
Weights				
Weight, approx.	410 g	660 g	500 g	500 g

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Technical specifications (continued)

Article number	**6ES7314-6BH04-0AB0** CPU314C-2PTP, 24DI/16DO/5AI/2AO, 192 KB	**6ES7314-6CH04-0AB0** CPU314C-2DP, 24DI/16DO/5AI/2AO, 192 KB	**6ES7314-6EH04-0AB0** CPU314C-2PN/DP, 24DI/16DO/4AI/2AO, 192KB
General information			
Engineering with			
• Programming package	STEP 7 as of V5.5 + SP1 or STEP 7 V5.3 + SP2 or higher with HSP 204	STEP 7 V5.5 + SP1 or higher or STEP 7 V5.3 + SP2 or higher with HSP 203	STEP 7 V5.5 or higher with HSP 191
Supply voltage			
Rated value (DC)			
• 24 V DC	Yes	Yes	Yes
Power loss			
Power loss, typ.	13 W	13 W	14 W
Memory			
Work memory			
• integrated	192 kbyte	192 kbyte	192 kbyte
• expandable	No	No	No
• Size of retentive memory for retentive data blocks	64 kbyte	64 kbyte	64 kbyte
Load memory			
• Plug-in (MMC), max.	8 Mbyte	8 Mbyte	8 Mbyte
CPU processing times			
for bit operations, typ.	0.06 µs	0.06 µs	0.06 µs
for word operations, typ.	0.12 µs	0.12 µs	0.12 µs
for fixed point arithmetic, typ.	0.16 µs	0.16 µs	0.16 µs
for floating point arithmetic, typ.	0.59 µs	0.59 µs	0.59 µs
Counters, timers and their retentivity			
S7 counter			
• Number	256	256	256
IEC counter			
• present	Yes	Yes	Yes
S7 times			
• Number	256	256	256
IEC timer			
• present	Yes	Yes	Yes
Data areas and their retentivity			
Flag			
• Number, max.	256 byte	256 byte	256 byte
Address area			
I/O address area			
• Inputs	1 024 byte	2 048 byte	2 048 byte
• Outputs	1 024 byte	2 048 byte	2 048 byte
Process image			
• Inputs, adjustable	1 024 byte	2 048 byte	2 048 byte
• Outputs, adjustable	1 024 byte	2 048 byte	2 048 byte
Time of day			
Clock			
• Hardware clock (real-time)	Yes	Yes	Yes
Operating hours counter			
• Number	1	1	1
Digital inputs			
integrated channels (DI)	24	24	24
Digital outputs			
integrated channels (DO)	16	16	16

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Technical specifications (continued)

Article number	**6ES7314-6BH04-0AB0** CPU314C-2PTP, 24DI/16DO/5AI/2AO, 192 KB	**6ES7314-6CH04-0AB0** CPU314C-2DP, 24DI/16DO/5AI/2AO, 192 KB	**6ES7314-6EH04-0AB0** CPU314C-2PN/DP, 24DI/16DO/4AI/2AO, 192KB
Analog inputs			
integrated channels (AI)	5; 4x current/voltage, 1x resistance	5; 4x current/voltage, 1x resistance	5; 4x current/voltage, 1x resistance
Input ranges			
• Voltage	Yes; ±10 V / 100 kΩ; 0 V to 10 V / 100 kΩ	Yes; ±10 V / 100 kΩ; 0 V to 10 V / 100 kΩ	Yes; ±10 V / 100 kΩ; 0 V to 10 V / 100 kΩ
• Current	Yes; ±20 mA / 100 Ω; 0 mA to 20 mA / 100 Ω; 4 mA to 20 mA / 100 Ω	Yes; ±20 mA / 100 Ω; 0 mA to 20 mA / 100 Ω; 4 mA to 20 mA / 100 Ω	Yes; ±20 mA / 100 Ω; 0 mA to 20 mA / 100 Ω; 4 mA to 20 mA / 100 Ω
• Resistance thermometer	Yes; Pt 100 / 10 MΩ	Yes; Pt 100 / 10 MΩ	Yes; Pt 100 / 10 MΩ
• Resistance	Yes; 0 Ω to 600 Ω / 10 MΩ	Yes; 0 Ω to 600 Ω / 10 MΩ	Yes; 0 Ω to 600 Ω / 10 MΩ
Analog outputs			
integrated channels (AO)	2	2	2
Output ranges, voltage			
• 0 to 10 V	Yes	Yes	Yes
• -10 V to +10 V	Yes	Yes	Yes
Output ranges, current			
• 0 to 20 mA	Yes	Yes	Yes
• -20 mA to +20 mA	Yes	Yes	Yes
• 4 mA to 20 mA	Yes	Yes	Yes
1. Interface			
Interface type	Integrated RS 485 interface	Integrated RS 485 interface	Integrated RS 485 interface
Physics	RS 485	RS 485	RS 485
Protocols			
• MPI	Yes	Yes	Yes
• PROFIBUS DP master	No	No	Yes
• PROFIBUS DP slave	No	No	Yes
• Point-to-point connection	No	No	No
PROFIBUS DP master			
• Number of DP slaves, max.			124
2. Interface			
Interface type	Integrated RS 422/ 485 interface	Integrated RS 485 interface	PROFINET
Physics	RS 422 / 485 (X.27)	RS 485	Ethernet RJ45
Interface types			
• Number of ports			2
Protocols			
• MPI	No	No	No
• PROFINET IO Controller	No	No	Yes; Also simultaneously with IO-Device functionality
• PROFINET IO Device	No	No	Yes; Also simultaneously with IO Controller functionality
• PROFINET CBA	No	No	Yes
• PROFIBUS DP master	No	Yes	No
• PROFIBUS DP slave	No	Yes	No
PROFIBUS DP master			
• Number of DP slaves, max.		124	
PROFINET IO Controller			
Services			
- Number of connectable IO Devices, max.			128
- Of which IO devices with IRT, max.			64
- Number of IO Devices with IRT and the option "high flexibility"			128
- Number of connectable IO Devices for RT, max..			128

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Technical specifications (continued)

Article number	**6ES7314-6BH04-0AB0** CPU314C-2PTP, 24DI/16DO/5AI/2AO, 192 KB	**6ES7314-6CH04-0AB0** CPU314C-2DP, 24DI/16DO/5AI/2AO, 192 KB	**6ES7314-6EH04-0AB0** CPU314C-2PN/DP, 24DI/16DO/4AI/2AO, 192KB
Protocols			
Open IE communication			
• TCP/IP			Yes; via integrated PROFINET interface and loadable FBs
- Number of connections, max.			8
• ISO-on-TCP (RFC1006)			Yes; via integrated PROFINET interface and loadable FBs
- Number of connections, max.			8
• UDP			Yes; via integrated PROFINET interface and loadable FBs
- Number of connections, max.			8
Web server			
• supported			Yes
Isochronous mode			
Isochronous operation (application synchronized up to terminal)			Yes; For PROFINET only
Communication functions			
PG/OP communication	Yes	Yes	Yes
Data record routing	No	Yes	Yes
Global data communication			
• supported	Yes	Yes	Yes
S7 basic communication			
• supported	Yes	Yes	Yes
S7 communication			
• supported	Yes	Yes	Yes
S5 compatible communication			
• supported	Yes; via CP and loadable FC	Yes; via CP and loadable FC	Yes; via CP and loadable FC
Number of connections			
• overall	12	12	12
Integrated Functions			
Number of counters	4; See "Technological Functions" manual	4; See "Technological Functions" manual	4; See "Technological Functions" manual
Counting frequency (counter) max.	60 kHz	60 kHz	60 kHz
Frequency measurement	Yes	Yes	Yes
Number of frequency meters	4; up to 60 kHz (see "Technological Functions" manual)	4; up to 60 kHz (see "Technological Functions" manual)	4; up to 60 kHz (see "Technological Functions" manual)
controlled positioning	Yes	Yes	Yes
integrated function blocks (closed-loop control)	Yes; PID controller (see "Technological Functions" manual)	Yes; PID controller (see "Technological Functions" manual)	Yes; PID controller (see "Technological Functions" manual)
PID controller	Yes	Yes	Yes
Number of pulse outputs	4; Pulse width modulation up to 2.5 kHz (see "Technological Functions" Manual)	4; Pulse width modulation up to 2.5 kHz (see "Technological Functions" Manual)	4; Pulse width modulation up to 2.5 kHz (see "Technological Functions" Manual)
Limit frequency (pulse)	2.5 kHz	2.5 kHz	2.5 kHz
Ambient conditions			
Ambient temperature during operation			
• min.	0 °C	0 °C	0 °C
• max.	60 °C	60 °C	60 °C
Configuration			
Programming			
Programming language			
- LAD	Yes	Yes	Yes
- FBD	Yes	Yes	Yes
- STL	Yes	Yes	Yes
- SCL	Yes	Yes	Yes
- CFC	Yes	Yes	Yes
- GRAPH	Yes	Yes	Yes
- HiGraph®	Yes	Yes	Yes

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Technical specifications (continued)

Article number	6ES7314-6BH04-0AB0 CPU314C-2PTP, 24DI/16DO/5AI/2AO, 192 KB	6ES7314-6CH04-0AB0 CPU314C-2DP, 24DI/16DO/5AI/2AO, 192 KB	6ES7314-6EH04-0AB0 CPU314C-2PN/DP, 24DI/16DO/4AI/2AO, 192KB
Know-how protection			
• User program protection/ password protection	Yes	Yes	Yes
• Block encryption	Yes; With S7 block Privacy	Yes; With S7 block Privacy	Yes; With S7 block Privacy
Dimensions			
Width	120 mm	120 mm	120 mm
Height	125 mm	125 mm	125 mm
Depth	130 mm	130 mm	130 mm
Weights			
Weight, approx.	680 g	680 g	730 g

Ordering data

	Article No.
CPU 312C Compact CPU, work memory 64 KB, supply voltage 24 V DC, 10 DI/6 DQ integrated, integrated functions, MPI; including slot number labels; MMC required	**6ES7312-5BF04-0AB0**
CPU 313C Compact CPU, work memory 128 KB, supply voltage 24 V DC, 24 DI/16 DQ, 4 AI/2 AQ integrated, integrated functions, MPI; MMC required	**6ES7313-5BG04-0AB0**
CPU 313C-2 PtP Compact CPU, work memory 128 KB, supply voltage 24 V DC, 16 DI/16 DQ integrated, integrated functions, MPI, RS 422/485 interface; MMC required	**6ES7313-6BG04-0AB0**
CPU 313C-2 DP Compact CPU, work memory 128 KB, 24 V DC power supply, 16 DI/16 DQ integrated, integrated functions, MPI, PROFIBUS DP master/slave interface; MMC required	**6ES7313-6CG04-0AB0**
CPU 314C-2 PtP Compact CPU, work memory 192 KB, supply voltage 24 V DC, 24 DI/16 DQ/4 AI/2 AQ integrated, integrated functions, MPI, RS 422/485 interface; MMC required	**6ES7314-6BH04-0AB0**
CPU 314C-2 DP Compact CPU, work memory 192 KB, supply voltage 24 V DC, 24 DI/16 DQ/4 AI/2 AQ integrated, integrated functions, MPI, PROFIBUS DP master/slave interface; MMC required	**6ES7314-6CH04-0AB0**
CPU 314C-2 PN/DP Compact CPU, work memory 192 KB, supply voltage 24 V DC, 24 DI/16 DO/4 AI/2 AO integrated, integrated functions, MPI; PROFIBUS DP master/slave interface; PROFINET IO controller/ I-device interface, MMC required	**6ES7314-6EH04-0AB0**

	Article No.
SIMATIC Micro Memory Card	
64 KB	**6ES7953-8LF31-0AA0**
128 KB	**6ES7953-8LG31-0AA0**
512 KB	**6ES7953-8LJ31-0AA0**
2 MB	**6ES7953-8LL31-0AA0**
4 MB	**6ES7953-8LM31-0AA0**
8 MB	**6ES7953-8LP31-0AA0**
MPI cable for connection of SIMATIC S7 and PG via MPI; 5 m in length	**6ES7901-0BF00-0AA0**
Point-to-point link cable For connection to CPU 31xC-2 PtP	
5 m	**6ES7902-3AB00-0AA0**
10 m	**6ES7902-3AC00-0AA0**
50 m	**6ES7902-3AG00-0AA0**
Front connector (1 unit) For compact CPUs	
40-pin, with screw contacts	
• 1 unit	**6ES7392-1AM00-0AA0**
• 100 units	**6ES7392-1AM00-1AB0**
40-pin, with spring-loaded contacts	
• 1 unit	**6ES7392-1BM01-0AA0**
• 100 units	**6ES7392-1BM01-1AB0**
SIMATIC TOP connect	See page 5/251; for information about which components can be used for the respective module, see Industry Mall
Front door, elevated design For compact CPUs; for connecting 1.3 mm²/16 AWG wires; wiring diagram and labels in petrol	**6ES7328-7AA20-0AA0**
Slot number plates	**6ES7912-0AA00-0AA0**

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Ordering data	Article No.
SIMATIC Manual Collection Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC Distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	**6ES7998-8XC01-8YE0**
SIMATIC Manual Collection update service for 1 year Current "Manual Collection" DVD and the three subsequent updates	**6ES7998-8XC01-8YE2**
Power supply connector 10 units, spare part	**6ES7391-1AA00-0AA0**
Labeling strips 10 units, spare part	**6ES7392-2XX00-0AA0**
Label cover 10 units, spare part	**6ES7392-2XY00-0AA0**
Labeling sheets for machine inscription for modules with 40-pin front connector, DIN A4, for printing with laser printer; 10 units	
Petrol	**6ES7392-2AX10-0AA0**
Light beige	**6ES7392-2BX10-0AA0**
Yellow	**6ES7392-2CX10-0AA0**
Red	**6ES7392-2DX10-0AA0**
USB A2 PC adapter For connecting a PG/PC or notebook to PROFIBUS or MPI; USB cable included in scope of supply	**6GK1571-0BA00-0AA0**
PROFIBUS DP bus connector RS 485	
• With 90° cable outlet, max. transfer rate 12 Mbps	
- without PG interface	**6ES7972-0BA12-0XA0**
- with PG interface	**6ES7972-0BB12-0XA0**
• with 90° cable outlet for FastConnect connection system, max. transfer rate 12 Mbps	
- without PG interface, 1 unit	**6ES7972-0BA52-0XA0**
- without PG interface, 100 units	**6ES7972-0BA52-0XB0**
- with PG interface, 1 unit	**6ES7972-0BB52-0XA0**
- with PG interface, 100 units	**6ES7972-0BB52-0XB0**
• with axial cable outlet for SIMATIC OP, for connecting to PPI, MPI, PROFIBUS	**6GK1500-0EA02**
PROFIBUS Fast Connect bus cable Standard type with special design for quick mounting, 2-wire, shielded, sold by the meter, max. delivery unit 1000 m, minimum order quantity 20 m	**6XV1830-0EH10**
RS 485 repeater for PROFIBUS Transmission rate up to 12 Mbps; 24 V DC; IP20 enclosure	**6ES7972-0AA02-0XA0**

	Article No.
PROFINET bus components	
IE FC TP Standard Cable GP 2x2 4-wire, shielded TP installation cable for connecting to IE FC RJ45 outlet/IE FC RJ45 plug; PROFINET-compatible; with UL approval; Sold by the meter: Max. delivery unit 1000 m Minimum order quantity 20 m	**6XV1840-2AH10**
FO Standard Cable GP (50/125) Standard cable, splittable, UL approval, sold by the meter Max. delivery unit 1000 m Minimum order quantity 20 m	**6XV1873-2A**
SCALANCE X204-2 Industrial Ethernet Switch Industrial Ethernet switches with integral SNMP access, Web diagnostics, copper cable diagnostics and PROFINET diagnostics for configuring line, star and ring topologies; four 10/100 Mbps RJ45 ports and two FO ports	**6GK5204-2BB10-2AA3**
Compact Switch Module CSM 377 Unmanaged switch for connecting SIMATIC S7-300, ET 200M and up to three other stations to Industrial Ethernet with 10/100 Mbps; 4 x RJ45 ports; external 24 V DC power supply, LED diagnostics, S7-300 module incl. electronic manual on CD-ROM	**6GK7377-1AA00-0AA0**
IE FC RJ45 plugs RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables	
IE FC RJ45 plug 180 180° cable outlet	
1 unit	**6GK1901-1BB10-2AA0**
10 units	**6GK1901-1BB10-2AB0**
50 units	**6GK1901-1BB10-2AE0**
PROFIBUS/PROFINET bus components For establishing MPI/PROFIBUS/PROFINET communication	See Catalogs IK PI, CA 01

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Overview SIPLUS CPU 312C



- The compact CPU with integral digital inputs/outputs
- For small applications with increased processing performance requirements
- With technological functions

Micro Memory Card required for operation of CPU.

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

Overview SIPLUS CPU 313C-2 DP



- The compact CPU with integral digital inputs/outputs and PROFIBUS DP master/slave interface
- With technological functions
- For tasks with special functions
- For connecting distributed I/O

Micro Memory Card required for operation of CPU.

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

Overview SIPLUS CPU 313C



- The compact CPU with integral digital and analog inputs/outputs
- For plants with high processing performance and response time requirements
- With technological functions

Micro Memory Card required to operate the CPU.

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

Overview SIPLUS CPU 314C-2 PtP



- The compact CPU with integrated digital and analog inputs/outputs as well as second serial interface
- For plants with high processing performance and response time requirements
- With technological functions

SIMATIC Micro Memory Card required for operation of CPU.

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

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Overview SIPLUS CPU 314C-2 DP



- The compact CPU with integral digital and analog inputs/outputs and PROFIBUS DP master/slave interface
- With technological functions
- For tasks with special functions
- For connecting distributed I/O

Micro Memory Card required for operation of CPU.

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

Overview SIPLUS CPU 314C-2 PN/DP



- The compact CPU with integral digital and analog inputs/outputs and technological functions
- High processing performance in binary and floating-point arithmetic
- For connecting distributed I/O via PROFIBUS and PROFINET
- Combined MPI/PROFIBUS DP master/slave interface
- PROFINET interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as intelligent PROFINET device under a SIMATIC or non-Siemens PROFINET I/O controller
- Component Based Automation (CBA) on PROFINET
- PROFINET proxy for intelligent devices on PROFIBUS DP in Component Based Automation (CBA)
- Integrated Web server with the option of creating user-defined web pages
- Isochronous mode on PROFINET

SIMATIC Micro Memory Card required for operation of CPU.

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

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Technical specifications

Article number	**6AG1312-5BF04-2AY0**	**6AG1312-5BF04-7AB0**	**6AG1313-5BG04-2AY0**	**6AG1313-5BG04-7AB0**
Based on	**6ES7312-5BF04-0AB0**	**6ES7312-5BF04-0AB0**	**6ES7313-5BG04-0AB0**	**6ES7313-5BG04-0AB0**
	SIPLUS S7-300 CPU312C EN50155	SIPLUS S7-300 CPU312C	SIPLUS S7-300 CPU313C EN50155	SIPLUS S7-300 CPU313C
Ambient conditions				
Ambient temperature during operation				
• min.	-25 °C; = Tmin	-25 °C; = Tmin	-25 °C; = Tmin	-25 °C; = Tmin
• max.	60 °C; = Tmax; the rated temperature range of -25 ... +55 °C (T1) applies for the use on railway vehicles according to EN50155	70 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use	60 °C; = Tmax; the rated temperature range of -25 ... +55 °C (T1) applies for the use on railway vehicles according to EN50155	70 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity				
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance				
Use in stationary industrial systems				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
Use on land craft, rail vehicles and special-purpose vehicles				
- to biologically active substances according to EN 60721-3-5	Yes; Class 5B2 mold, fungus and dry rot spores (with the exception of fauna); Class 5B3 on request		Yes; Class 5B2 mold, fungus and dry rot spores (with the exception of fauna); Class 5B3 on request	
- to chemically active substances according to EN 60721-3-5	Yes; Class 5C3 (RH < 75 %) incl. salt spray acc. to EN 50155 (ST2); *		Yes; Class 5C3 (RH < 75 %) incl. salt spray acc. to EN 50155 (ST2); *	
- to mechanically active substances according to EN 60721-3-5	Yes; Class 5S3 incl. sand, dust; *		Yes; Class 5S3 incl. sand, dust; *	
Use on ships/at sea				
- to biologically active substances according to EN 60721-3-6		Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request		Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6		Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *		Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6		Yes; Class 6S3 incl. sand, dust; *		Yes; Class 6S3 incl. sand, dust; *
Remark				
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!

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Technical specifications (continued)

Article number	6AG1313-6CG04-2AY0	6AG1313-6CG04-7AB0	6AG1314-6BH04-7AB0
Based on	6ES7313-6CG04-0AB0	6ES7313-6CG04-0AB0	6ES7314-6BH04-0AB0
	SIPLUS S7-300 CPU313C-2DP EN50155	SIPLUS S7-300 CPU313C-2DP	SIPLUS S7-300 CPU314C-2 PtP
Ambient conditions			
Ambient temperature during operation			
• min.	-25 °C; = Tmin	-25 °C; = Tmin	-25 °C; = Tmin
• max.	70 °C; = Tmax; the rated temperature range of -25 ... +55 °C (T1) applies for the use on railway vehicles according to EN50155	70 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use	70 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use
Altitude during operation relating to sea level			
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m

• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at
	1 140 hPa ... 795 hPa
	(-1 000 m ... +2 000 m) //
	Tmin ... (Tmax - 10 K) at
	795 hPa ... 658 hPa
	(+2 000 m ... +3 500 m) //
	Tmin ... (Tmax -20 K) at
	658 hPa ... 540 hPa
	(+3 500 m ... +5 000 m)
		Tmin ... Tmax at
		1 140 hPa ... 795 hPa
		(-1 000 m ... +2 000 m) //
		Tmin ... (Tmax - 10 K) at
		795 hPa ... 658 hPa
		(+2 000 m ... +3 500 m) //
		Tmin ... (Tmax -20 K) at
		658 hPa ... 540 hPa
		(+3 500 m ... +5 000 m)
			Tmin ... Tmax at
			1 140 hPa ... 795 hPa
			(-1 000 m ... +2 000 m) //
			Tmin ... (Tmax - 10 K) at
			795 hPa ... 658 hPa
			(+2 000 m ... +3 500 m) //
			Tmin ... (Tmax -20 K) at
			658 hPa ... 540 hPa
			(+3 500 m ... +5 000 m)

Relative humidity			
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance			
Use in stationary industrial systems			
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
Use on land craft, rail vehicles and special-purpose vehicles			
- to biologically active substances according to EN 60721-3-5	Yes; Class 5B2 mold, fungus and dry rot spores (with the exception of fauna); Class 5B3 on request		
- to chemically active substances according to EN 60721-3-5	Yes; Class 5C3 (RH < 75 %) incl. salt spray acc. to EN 50155 (ST2); *		
- to mechanically active substances according to EN 60721-3-5	Yes; Class 5S3 incl. sand, dust; *		
Use on ships/at sea			
- to biologically active substances according to EN 60721-3-6		Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6		Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6		Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Remark			
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!

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Technical specifications (continued)

Article number	**6AG1314-6CH04-2AY0**	**6AG1314-6CH04-7AB0**	**6AG1314-6EH04-7AB0**
Based on	**6ES7314-6CH04-0AB0**	**6ES7314-6CH04-0AB0**	**6ES7314-6EH04-0AB0**
	SIPLUS S7-300 CPU314C-2DP EN50155	SIPLUS S7-300 CPU314C-2DP	SIPLUS S7-300 CPU314C-2PN/DP
Ambient conditions			
Ambient temperature during operation			
• min.	-25 °C; = Tmin	-25 °C; = Tmin	-25 °C; = Tmin
• max.	60 °C; = Tmax; the rated temperature range of -25 ... +55 °C (T1) applies for the use on railway vehicles according to EN50155	70 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use	70 °C; = Tmax; @ 60°C for UL/ATEX/FM use
Altitude during operation relating to sea level			
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m

• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at
	1 140 hPa ... 795 hPa
	(-1 000 m ... +2 000 m) //
	Tmin ... (Tmax - 10 K) at
	795 hPa ... 658 hPa
	(+2 000 m ... +3 500 m) //
	Tmin ... (Tmax -20 K) at
	658 hPa ... 540 hPa
	(+3 500 m ... +5 000 m)
		Tmin ... Tmax at
		1 140 hPa ... 795 hPa
		(-1 000 m ... +2 000 m) //
		Tmin ... (Tmax - 10 K) at
		795 hPa ... 658 hPa
		(+2 000 m ... +3 500 m) //
		Tmin ... (Tmax -20 K) at
		658 hPa ... 540 hPa
		(+3 500 m ... +5 000 m)
			Tmin ... Tmax at
			1 140 hPa ... 795 hPa
			(-1 000 m ... +2 000 m) //
			Tmin ... (Tmax - 10 K) at
			795 hPa ... 658 hPa
			(+2 000 m ... +3 500 m) //
			Tmin ... (Tmax -20 K) at
			658 hPa ... 540 hPa
			(+3 500 m ... +5 000 m)

Relative humidity			
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance			
Use in stationary industrial systems			
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
Use on land craft, rail vehicles and special-purpose vehicles			
- to biologically active substances according to EN 60721-3-5	Yes; Class 5B2 mold, fungus and dry rot spores (with the exception of fauna); Class 5B3 on request		
- to chemically active substances according to EN 60721-3-5	Yes; Class 5C3 (RH < 75 %) incl. salt spray acc. to EN 50155 (ST2); *		
- to mechanically active substances according to EN 60721-3-5	Yes; Class 5S3 incl. sand, dust; *		
Use on ships/at sea			
- to biologically active substances according to EN 60721-3-6		Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6		Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6		Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Remark			
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!

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SIPLUS S7-300 compact CPUs

Ordering data	Article No.
SIPLUS S7-300 CPU 312C	
For industrial applications with extended ambient conditions	
Compact CPU, work memory 64 KB, supply voltage 24 V DC, 10 DI/6 DQ integrated, integrated functions, MPI; including slot number labels; MMC required	
Extended temperature range and exposure to media	**6AG1312-5BF04-7AB0**
For rolling stock railway applications	
Compact CPU, work memory 64 KB, supply voltage 24 V DC, 10 DI/6 DQ integrated, integrated functions, MPI; including slot number labels; MMC required	
Conforms to EN 50155	**6AG1312-5BF04-2AY0**
SIPLUS S7-300 CPU 313C	
For industrial applications with extended ambient conditions	
Compact CPU, work memory 128 KB, supply voltage 24 V DC, 24 DI/16 DQ, 4 AI/2 AQ integrated, integrated functions, MPI; MMC required	
Extended temperature range and exposure to media	**6AG1313-5BG04-7AB0**
For rolling stock railway applications	
Compact CPU, work memory 128 KB, supply voltage 24 V DC, 24 DI/16 DQ, 4 AI/2 AQ integrated, integrated functions, MPI; MMC required	
Conforms to EN 50155	**6AG1313-5BG04-2AY0**
SIPLUS S7-300 CPU 313C-2 DP	
For industrial applications with extended ambient conditions	
Compact CPU, work memory 128 KB, supply voltage 24 V DC, 16 DI/16 DQ integrated, integrated functions, MPI, PROFIBUS DP master/slave interface; MMC required	
Extended temperature range and exposure to media	**6AG1313-6CG04-7AB0**
For rolling stock railway applications	
Compact CPU, work memory 128 KB, supply voltage 24 V DC, 16 DI/16 DQ integrated, integrated functions, MPI, PROFIBUS DP master/slave interface; MMC required	
Conforms to EN 50155	**6AG1313-6CG04-2AY0**

Ordering data	Article No.
SIPLUS S7-300 CPU 314C-2 PtP	
For industrial applications with extended ambient conditions	
Compact CPU, work memory 192 KB, supply voltage 24 V DC, 24 DI/16 DQ, 4 AI/2 AQ integrated, integrated functions, MPI, RS 422/485 interface; MMC required	
Extended temperature range and exposure to media	**6AG1314-6BH04-7AB0**
SIPLUS S7-300 CPU 314C-2 DP	
For industrial applications with extended ambient conditions	
Compact CPU, work memory 192 KB, supply voltage 24 V DC, 24 DI/16 DQ, 4 AI/2 AQ integrated, integrated functions, MPI, PROFIBUS DP master/slave interface; MMC required	
Extended temperature range and exposure to media	**6AG1314-6CH04-7AB0**
For rolling stock railway applications	
Compact CPU, work memory 192 KB, supply voltage 24 V DC, 24 DI/16 DQ, 4 AI/2 AQ integrated, integrated functions, MPI, PROFIBUS DP master/slave interface; MMC required	
Conforms to EN 50155	**6AG1314-6CH04-2AY0**
SIPLUS S7-300 CPU 314C-2 PN/DP	
For industrial applications with particularly demanding environmental conditions	
Compact CPU, work memory 192 KB, supply voltage 24 V DC, 24 DI/16 DQ, 4 AI/2 AQ integrated, integrated functions, MPI; PROFIBUS DP master/slave interface; PROFINET IO controller/ I-Device interface, MMC required	
Extended temperature range and exposure to media	**6AG1314-6EH04-7AB0**
Accessories	
Mandatory	
SIMATIC Micro Memory Card	
64 KB	**6ES7953-8LF31-0AA0**
128 KB	**6ES7953-8LG31-0AA0**
512 KB	**6ES7953-8LJ31-0AA0**
2 MB	**6ES7953-8LL31-0AA0**
4 MB	**6ES7953-8LM31-0AA0**
8 MB	**6ES7953-8LP31-0AA0**
Front connector (1 unit)	
For compact CPUs	
40-pin, with spring-loaded contacts	
• 1 unit	**6ES7392-1BM01-0AA0**
• 100 units	**6ES7392-1BM01-1AB0**

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Ordering data	Article No.
For communication within the application	
PROFIBUS DP bus connector RS 485	
(Extended temperature range and exposure to media)	
With 90° cable outlet, max. transfer rate 12 Mbps	
• without PG interface	**6AG1972-0BA12-2XA0**
• with PG interface	**6AG1972-0BB12-2XA0**
With angled cable outlet, max. transfer rate 12 Mbps	
• without PG interface	**6AG1972-0BA42-7XA0**
• with PG interface	**6AG1972-0BB42-7XA0**
(Extended temperature range)	
With axial cable outlet for SIMATIC OP, for connecting to PPI, MPI, PROFIBUS	**6AG1500-0EA02-2AA0**
IE FC RJ45 plug 180	
(Extended temperature range and exposure to media)	
180° cable outlet	
• 1 unit	**6AG1901-1BB10-7AA0**
SIPLUS SCALANCE X-200 Industrial Ethernet Switches	
Industrial Ethernet switches with integral SNMP access, online diagnostics, copper cable diagnostics and PROFINET diagnostics for configuring line, star and ring topologies; with integrated redundancy manager (exception: SCALANCE X208PRO); incl. operating instructions, Industrial Ethernet network manual and configuration software on CD-ROM	
• With electrical and optical ports for glass multimode FOC up to 3 km	
• Extended temperature range and exposure to media	
• **SIPLUS SCALANCE X204-2** With four 10/100 Mbps RJ45 ports and two fiber-optic ports	**6AG1204-2BB10-4AA3**
PROFIBUS FastConnect bus cable	**6XV1830-0EH10**
Standard type with special design for quick mounting, 2-wire, shielded, sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	
IE FC TP Standard Cable GP 2x2	**6XV1840-2AH10**
4-wire, shielded TP installation cable for connecting to IE FC RJ45 outlet/IE FC RJ45 plug; PROFINET-compatible; with UL approval	
Sold by the meter; max. delivery unit 1 000 m minimum order quantity 20 m	
FO Standard Cable GP (50/125)	**6XV1873-2A**
Standard cable, splittable, UL approval, sold by the meter: max. delivery unit 1 000 m minimum order quantity 20 m	

	Article No.
RS 485 repeater for PROFIBUS	**6AG1972-0AA02-7XA0**
(Extended temperature range and exposure to media)	
Transmission rate up to 12 Mbps; 24 V DC; IP20 enclosure	
Point-to-point link cable	
For connection to CPU 31xC-2 PtP	
5 m	**6ES7902-3AB00-0AA0**
10 m	**6ES7902-3AC00-0AA0**
50 m	**6ES7902-3AG00-0AA0**
For commissioning	
MPI cable	**6ES7901-0BF00-0AA0**
For connection of SIMATIC S7 and PG via MPI; length 5 m	
USB A2 PC adapter	**6GK1571-0BA00-0AA0**
For connecting a PG/PC or notebook to PROFIBUS or MPI; USB cable included in scope of supply	
Consumables	
Front door, elevated design	**6ES7328-7AA20-0AA0**
For compact CPUs; for connecting 1.3 mm^2/16 AWG wires; wiring diagram and labels in petrol	
Power supply connector	**6ES7391-1AA00-0AA0**
10 units, spare part	
Slot number plates	**6ES7912-0AA00-0AA0**
Labeling strips	**6ES7392-2XX00-0AA0**
10 units, spare part	
Label cover	**6ES7392-2XY00-0AA0**
10 units, spare part	
Labeling sheets for machine inscription	
For modules with 40-pin front connector, DIN A4, for printing with laser printer; 10 units	
Petrol	**6ES7392-2AX10-0AA0**
Light beige	**6ES7392-2BX10-0AA0**
Yellow	**6ES7392-2CX10-0AA0**
Red	**6ES7392-2DX10-0AA0**
Documentation	
SIMATIC Manual Collection	**6ES7998-8XC01-8YE0**
Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC Distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	
SIMATIC Manual Collection update service for 1 year	**6ES7998-8XC01-8YE2**
Current "Manual Collection" DVD and the three subsequent updates	

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Overview CPU 315F-2 DP



- Based on the SIMATIC CPU 315-2 DP
- For constructing a fail-safe automation system for plants with increased safety requirements
- Complies with safety requirements to SIL 3 acc. to IEC 61508 and PL e acc. to ISO 13849.1
- Distributed fail-safe I/O modules can be connected locally via the integrated PROFIBUS DP interface (PROFIsafe)
- Fail-safe ET 200M I/O modules can also be centrally connected
- Central and distributed use of standard modules for non safety-oriented applications

SIMATIC Micro Memory Card required for operation of CPU.

Overview CPU 315F-2 PN/DP



- Based on CPU 315-2 PN/DP
- The CPU with medium-sized program memory and quantity structures for setting up a fail-safe automation system in plants with increased safety requirements
- Complies with safety requirements to SIL 3 acc. to IEC 61508 and PL e acc. to ISO 13849.1
- Distributed fail-safe I/O modules can be locally connected via the integrated PROFINET interface (PROFIsafe) and/or via the integrated PROFIBUS DP interface (PROFIsafe)
- Fail-safe ET 200M I/O modules can also be connected centrally
- Central and distributed use of standard modules for non safety-oriented applications
- Component Based Automation (CBA) on PROFINET
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET interface with 2-port switch
- PROFINET proxy for intelligent devices on PROFIBUS DP in Component Based Automation (CBA)

SIMATIC Micro Memory Card required for operation of CPU.

Overview CPU 317F-2 DP



- The fail-safe CPU with a large program memory and quantity framework for demanding applications
- For constructing a fail-safe automation system for plants with increased safety requirements
- Complies with safety requirements to SIL 3 acc. to IEC 61508 and PL e acc. to ISO 13849.1
- Fail-safe I/O modules can be connected in a distributed configuration to both integral PROFIBUS DP interfaces (PROFIsafe)
- Fail-safe ET 200M I/O modules can also be connected centrally
- Central and distributed use of standard modules for non safety-oriented applications

SIMATIC Micro Memory Card required for operation of CPU.

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Overview CPU 317F-2 PN/DP



- Based on CPU 317-2 PN/DP
- The fail-safe CPU with a large program memory and quantity framework for demanding applications; for setting up a fail-safe automation system in plants with increased safety requirements.
- Complies with safety requirements to SIL 3 acc. to IEC 61508 and PL e acc. to ISO 13849.1
- Distributed fail-safe I/O modules can be locally connected via the integrated PROFINET interface (PROFIsafe) and/or via the integrated PROFIBUS DP interface (PROFIsafe)
- Fail-safe ET 200M I/O modules can also be connected centrally
- Central and distributed use of standard modules for non safety-oriented applications
- Component Based Automation (CBA) on PROFINET
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET interface with 2-port switch
- PROFINET proxy for intelligent devices on PROFIBUS DP in Component Based Automation (CBA)

SIMATIC Micro Memory Card required for operation of CPU.

Overview CPU 319F-3 PN/DP



- The fail-safe CPU with high-performance command processing, large program memory and large quantity structure for demanding applications
- For constructing a fail-safe automation system for plants with increased safety requirements
- Complies with safety requirements to SIL 3 acc. to IEC 61508 and PL e acc. to 13849.1
- Distributed fail-safe I/O modules can be locally connected via the integrated PROFINET interface (PROFIsafe) and/or via the integrated PROFIBUS DP interface (PROFIsafe);
- Fail-safe ET 200M I/O modules can also be connected centrally
- Standard modules for non-safety-related applications can be operated centrally and locally
- Distributed intelligence in Component Based Automation (CBA) on PROFINET
- Isochronous mode on PROFIBUS
- PROFINET proxy for intelligent devices on PROFIBUS DP in Component Based Automation (CBA)

SIMATIC Micro Memory Card required for operation of CPU.

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Technical specifications

Article number	**6ES7315-6FF04-0AB0**	**6ES7315-2FJ14-0AB0**	**6ES7317-6FF04-0AB0**	**6ES7317-2FK14-0AB0**	**6ES7318-3FL01-0AB0**
	CPU315F, 384KB	CPU315F-2 PN/DP, 512 KB	CPU317F-2DP, 1.5 MB	CPU317F-2 PN/DP, 1.5 MB	CPU319F-3 PN/DP, 2.5 MB
General information					
Engineering with					
• Programming package	STEP 7 V5.5 + SP1 or higher or STEP 7 V5.2 + SP1 or higher with HSP 218 + Distributed Safety	STEP 7 V5.5 or higher, Distributed Safety V5.4 SP4	STEP 7 V5.5 + SP1 or higher or STEP 7 V5.2 + SP1 or higher with HSP 202 + Distributed Safety	STEP 7 V5.5 or higher, Distributed Safety V5.4 SP4	STEP 7 V5.5 or higher, Distributed Safety V5.4 SP4
Supply voltage					
Rated value (DC)					
• 24 V DC	Yes	Yes	Yes	Yes	Yes
Power loss					
Power loss, typ.	4.5 W	4.65 W	4.5 W	4.65 W	14 W
Memory					
Work memory					
• integrated	384 kbyte	512 kbyte	1 536 kbyte	1 536 kbyte	2 560 kbyte
• expandable	No	No	No	No	No
• Size of retentive memory for retentive data blocks	128 kbyte	128 kbyte	256 kbyte	256 kbyte	700 kbyte
Load memory					
• Plug-in (MMC), max.	8 Mbyte	8 Mbyte	8 Mbyte	8 Mbyte	8 Mbyte
CPU processing times					
for bit operations, typ.	0.05 µs	0.05 µs	0.025 µs	0.025 µs	0.004 µs
for word operations, typ.	0.09 µs	0.09 µs	0.03 µs	0.03 µs	0.01 µs
for fixed point arithmetic, typ.	0.12 µs	0.12 µs	0.04 µs	0.04 µs	0.01 µs
for floating point arithmetic, typ.	0.45 µs	0.45 µs	0.16 µs	0.16 µs	0.04 µs
Counters, timers and their retentivity					
S7 counter					
• Number	256	256	512	512	2 048
IEC counter					
• present	Yes	Yes	Yes	Yes	Yes
S7 times					
• Number	256	256	512	512	2 048
IEC timer					
• present	Yes	Yes	Yes	Yes	Yes
Data areas and their retentivity					
Flag					
• Number, max.	2 048 byte	2 048 byte	4 096 byte	4 096 byte	8 192 byte
Address area					
I/O address area					
• Inputs	2 048 byte	2 048 byte	8 192 byte	8 192 byte	8 192 byte
• Outputs	2 048 byte	2 048 byte	8 192 byte	8 192 byte	8 192 byte
Process image					
• Inputs, adjustable	2 048 byte	2 048 byte	8 192 byte	8 192 byte	8 192 byte
• Outputs, adjustable	2 048 byte	2 048 byte	8 192 byte	8 192 byte	8 192 byte
Time of day					
Clock					
• Hardware clock (real-time)	Yes	Yes	Yes	Yes	Yes
Operating hours counter					
• Number	1	1	4	4	4

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Technical specifications (continued)

Article number	**6ES7315-6FF04-0AB0**	**6ES7315-2FJ14-0AB0**	**6ES7317-6FF04-0AB0**	**6ES7317-2FK14-0AB0**	**6ES7318-3FL01-0AB0**
	CPU315F, 384KB	CPU315F-2 PN/DP, 512 KB	CPU317F-2DP, 1.5 MB	CPU317F-2 PN/DP, 1.5 MB	CPU319F-3 PN/DP, 2.5 MB
1. Interface					
Interface type	Integrated RS 485 interface	Integrated RS 485 interface	Integrated RS 485 interface	Integrated RS 485 interface	Integrated RS 485 interface
Physics	RS 485	RS 485	RS 485	RS 485	RS 485
Protocols					
• MPI	Yes	Yes	Yes	Yes	Yes
• PROFIBUS DP master	No	Yes	Yes	Yes	Yes
• PROFIBUS DP slave	No	Yes	Yes; A DP slave at both interfaces simultaneously is not possible	Yes	Yes; A DP slave at both interfaces simultaneously is not possible
• Point-to-point connection	No	No	No	No	No
PROFIBUS DP master					
• Number of DP slaves, max.		124	124	124	124
2. Interface					
Interface type	Integrated RS 485 interface	PROFINET	Integrated RS 485 interface	PROFINET	Integrated RS 485 interface
Physics	RS 485	Ethernet RJ45	RS 485	Ethernet RJ45	RS 485
Interface types					
• Number of ports		2		2	
Protocols					
• MPI	No	No	No	No	No
• PROFINET IO Controller		Yes; Also simultaneously with IO-Device functionality		Yes; Also simultaneously with IO-Device functionality	No
• PROFINET IO Device		Yes; Also simultaneously with IO Controller functionality		Yes; Also simultaneously with IO Controller functionality	No
• PROFINET CBA		Yes		Yes	No
• PROFIBUS DP master	Yes	No	Yes	No	Yes
• PROFIBUS DP slave	Yes	No	Yes; A DP slave at both interfaces simultaneously is not possible	No	Yes; A DP slave at both interfaces simultaneously is not possible
PROFIBUS DP master					
• Number of DP slaves, max.	124; Per station		124		124
PROFINET IO Controller					
Services					
- Number of connectable IO Devices, max.		128		128	
- Of which IO devices with IRT, max.		64		64	
- Number of IO Devices with IRT and the option "high flexibility"		128		128	
- Number of connectable IO Devices for RT, max..		128		128	

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Technical specifications (continued)

Article number	6ES7315-6FF04-0AB0	6ES7315-2FJ14-0AB0	6ES7317-6FF04-0AB0	6ES7317-2FK14-0AB0	6ES7318-3FL01-0AB0
	CPU315F, 384KB	CPU315F-2 PN/DP, 512 KB	CPU317F-2DP, 1.5 MB	CPU317F-2 PN/DP, 1.5 MB	CPU319F-3 PN/DP, 2.5 MB
3. Interface					
Interface type					PROFINET
Physics					Ethernet RJ45
Interface types					
• Number of ports					2
Protocols					
• MPI					No
• PROFINET IO Controller					Yes; Also simultaneously with I-Device functionality
• PROFINET IO Device					Yes; Also simultaneously with IO Controller functionality
• PROFINET CBA					Yes
• PROFIBUS DP master					No
• PROFIBUS DP slave					No
PROFINET IO Controller					
Services					
- Number of connectable IO Devices, max.					256
- Of which IO devices with IRT, max.					64
- Number of IO Devices with IRT and the option "high flexibility"					256
- Number of connectable IO Devices for RT, max..					256
Protocols					
Open IE communication					
• TCP/IP		Yes; via integrated PROFINET interface and loadable FBs		Yes; via integrated PROFINET interface and loadable FBs	Yes; via integrated PROFINET interface and loadable FBs
- Number of connections, max.		8		16	32
• ISO-on-TCP (RFC1006)		Yes; via integrated PROFINET interface and loadable FBs		Yes; via integrated PROFINET interface and loadable FBs	Yes; via integrated PROFINET interface and loadable FBs
- Number of connections, max.		8		16	32
• UDP		Yes; via integrated PROFINET interface and loadable FBs		Yes; via integrated PROFINET interface and loadable FBs	Yes; via integrated PROFINET interface and loadable FBs
- Number of connections, max.		8		16	32
Web server					
• supported		Yes; only read function		Yes	Yes
Isochronous mode					
Isochronous operation (application synchronized up to terminal)	Yes	Yes; Via PROFIBUS DP or PROFINET interface		Yes; Via PROFIBUS DP or PROFINET interface	Yes; Via 2nd PROFIBUS DP or PROFINET interface
Communication functions					
PG/OP communication	Yes	Yes	Yes	Yes	Yes
Data record routing	Yes	Yes	Yes	Yes	Yes
Global data communication					
• supported	Yes	Yes	Yes	Yes	Yes
S7 basic communication					
• supported	Yes	Yes	Yes	Yes	Yes
S7 communication					
• supported	Yes	Yes	Yes	Yes	Yes
S5 compatible communication					
• supported	Yes; via CP and loadable FC	Yes; via CP and loadable FC	Yes; via CP and loadable FC	Yes; via CP and loadable FC	Yes; via CP and loadable FC
Number of connections					
• overall	16	16	32	32	32

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Technical specifications (continued)

Article number	**6ES7315-6FF04-0AB0**	**6ES7315-2FJ14-0AB0**	**6ES7317-6FF04-0AB0**	**6ES7317-2FK14-0AB0**	**6ES7318-3FL01-0AB0**
	CPU315F, 384KB	CPU315F-2 PN/DP, 512 KB	CPU317F-2DP, 1.5 MB	CPU317F-2 PN/DP, 1.5 MB	CPU319F-3 PN/DP, 2.5 MB
Ambient conditions					
Ambient temperature during operation					
• min.	0 °C	0 °C	0 °C	0 °C	0 °C
• max.	60 °C	60 °C	60 °C	60 °C	60 °C
Configuration					
Programming					
Programming language					
- LAD	Yes	Yes	Yes	Yes	Yes
- FBD	Yes	Yes	Yes	Yes	Yes
- STL	Yes	Yes	Yes	Yes	Yes
- SCL	Yes	Yes	Yes	Yes	Yes
- CFC	Yes	Yes	Yes	Yes	Yes
- GRAPH	Yes	Yes	Yes	Yes	Yes
- HiGraph®	Yes	Yes	Yes	Yes	Yes
Know-how protection					
• User program protection/ password protection	Yes	Yes	Yes	Yes	Yes
• Block encryption	Yes; With S7 block Privacy	Yes; With S7 block Privacy	Yes; With S7 block Privacy	Yes; With S7 block Privacy	Yes; With S7 block Privacy
Dimensions					
Width	40 mm	40 mm	40 mm	40 mm	120 mm
Height	125 mm	125 mm	125 mm	125 mm	125 mm
Depth	130 mm	130 mm	130 mm	130 mm	130 mm
Weights					
Weight, approx.	290 g	340 g	360 g	340 g	1 250 g

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Fail-safe CPUs

Ordering data	Article No.
CPU 315F-2 DP CPU for SIMATIC S7-300F; work memory 384 KB, supply voltage 24 V DC, MPI, PROFIBUS DP master/slave interface, incl. slot number labels; MMC required	**6ES7315-6FF04-0AB0**
CPU 315F-2 PN/DP CPU for SIMATIC S7-300F; work memory, 512 KB supply voltage 24 V DC; MPI/PROFIBUS DP master/slave interface; Industrial Ethernet/ PROFINET interface; incl. slot number labels; MMC required	**6ES7315-2FJ14-0AB0**
CPU 317F-2 DP Work memory 1.5 MB, supply voltage 24 V DC, MPI, PROFIBUS DP master/slave interface, MMC required	**6ES7317-6FF04-0AB0**
CPU 317F-2 PN/DP Work memory 1.5 MB, supply voltage 24 V DC, MPI/PROFIBUS DP master/slave interface, Industrial Ethernet/ PROFINET interface; MMC required	**6ES7317-2FK14-0AB0**
CPU 319F-3 PN/DP Work memory 2.5 MB, supply voltage 24 V DC, combined MPI/PROFIBUS DP master/slave interface, PROFIBUS DP master/ slave interface, Ethernet/PROFINET interface; MMC required	**6ES7318-3FL01-0AB0**
S7 Distributed Safety V5.4 SP5 Update 2 programming tool Task: Configuration software for configuring fail-safe user programs for SIMATIC S7-300F, S7-400F, WinAC RTX F, ET 200S, ET 200M, ET 200iSP, ET 200pro, ET 200eco Requirement: Windows 7 SP1 (64-bit) Windows 10 Professional/Enterprise (64-bit) Windows Server 2008 R2 SP1 (64-bit) Windows Server 2012 R2 (64-bit), Windows Server 2016 (64-bit) STEP 7 from V5.5 SP1; please also consider the operating systems that have been released for the STEP 7 version used	
Floating license for 1 user; software and documentation on DVD; license key on USB flash drive	**6ES7833-1FC02-0YA5**
Floating license for 1 user; software, documentation and license key for download[1]; email address required for delivery	**6ES7833-1FC02-0YH5**
S7 Distributed Safety upgrade From V5.x to V5.4; floating license for 1 user; software and documentation on DVD; license key on USB flash drive	**6ES7833-1FC02-0YE5**

Ordering data	Article No.
STEP 7 Safety Advanced V15.1 Task: Engineering tool for configuring and programming fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-1500F Software Controller, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller and the fail-safe ET 200SP, ET 200MP, ET 200S, ET 200M, ET 200iSP, ET 200pro and ET 200eco I/O Requirement: STEP 7 Professional V15.1	
Floating license for 1 user; software and documentation on DVD; license key on USB flash drive	**6ES7833-1FA15-0YA5**
Floating license for 1 user; software, documentation and license key for download[1]; email address required for delivery	**6ES7833-1FA15-0YH5**
SIMATIC Micro Memory Card	
64 KB	**6ES7953-8LF31-0AA0**
128 KB	**6ES7953-8LG31-0AA0**
512 KB	**6ES7953-8LJ31-0AA0**
2 MB	**6ES7953-8LL31-0AA0**
4 MB	**6ES7953-8LM31-0AA0**
8 MB	**6ES7953-8LP31-0AA0**
MPI cable for connection of SIMATIC S7 and PG via MPI; 5 m in length	**6ES7901-0BF00-0AA0**
Slot number plates	**6ES7912-0AA00-0AA0**
SIMATIC Manual Collection Electronic manuals on DVD, multi-language: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC Distributed I/O, SIMATIC HMI, SIMATIC sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	**6ES7998-8XC01-8YE0**
SIMATIC Manual Collection update service for 1 year Current "Manual Collection" DVD and the three subsequent updates	**6ES7998-8XC01-8YE2**
Power supply connector 10 units, spare part	**6ES7391-1AA00-0AA0**
USB A2 PC adapter For connecting a PG/PC or notebook to PROFIBUS or MPI; USB cable included in scope of supply	**6GK1571-0BA00-0AA0**

[1] For up-to-date information and download availability, see: http://www.siemens.com/tia-online-software-delivery

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Ordering data	Article No.
PROFIBUS bus components	
PROFIBUS DP bus connector RS 485	
• With 90° cable outlet, max. transfer rate 12 Mbps	
- without PG interface	**6ES7972-0BA12-0XA0**
- with PG interface	**6ES7972-0BB12-0XA0**
• with 90° cable outlet for FastConnect connection system, max. transfer rate 12 Mbps	
- without PG interface, 1 unit	**6ES7972-0BA52-0XA0**
- without PG interface, 100 units	**6ES7972-0BA52-0XB0**
- with PG interface, 1 unit	**6ES7972-0BB52-0XA0**
- with PG interface, 100 units	**6ES7972-0BB52-0XB0**
• with axial cable outlet for SIMATIC OP, for connecting to PPI, MPI, PROFIBUS	**6GK1500-0EA02**
PROFIBUS Fast Connect bus cable Standard type with special design for quick mounting, 2-wire, shielded, sold by the meter, max. delivery unit 1 000 m, minimum order quantity 20 m	**6XV1830-0EH10**
RS 485 repeater for PROFIBUS Transmission rate up to 12 Mbps; 24 V DC; IP20 enclosure	**6ES7972-0AA02-0XA0**
PROFINET bus components	
IE FC TP Standard Cable GP 2x2 4-wire, shielded TP installation cable for connecting to IE FC RJ45 outlet/IE FC RJ45 plug; PROFINET-compatible; with UL approval; Sold by the meter	**6XV1840-2AH10**
FO Standard Cable GP (50/125) Standard cable, splittable, UL approval, sold by the meter	**6XV1873-2A**

	Article No.
SCALANCE X204-2 Industrial Ethernet Switch Industrial Ethernet switches with integral SNMP access, Web diagnostics, copper cable diagnostics and PROFINET diagnostics for configuring line, star and ring topologies; four 10/100 Mbps RJ45 ports and two FO ports	**6GK5204-2BB10-2AA3**
Compact Switch Module CSM 377 Unmanaged switch for connecting SIMATIC S7-300, ET 200M and up to three other stations to Industrial Ethernet with 10/100 Mbps; 4 x RJ45 ports; external 24 V DC power supply, LED diagnostics, S7-300 module incl. electronic manual on CD-ROM	**6GK7377-1AA00-0AA0**
IE FC RJ45 plugs RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables	
IE FC RJ45 plug 145	
145° cable outlet	
1 unit	**6GK1901-1BB30-0AA0**
10 units	**6GK1901-1BB30-0AB0**
50 units	**6GK1901-1BB30-0AE0**
IE FC RJ45 plug 180	
180° cable outlet	
1 unit	**6GK1901-1BB10-2AA0**
10 units	**6GK1901-1BB10-2AB0**
50 units	**6GK1901-1BB10-2AE0**
PROFIBUS/PROFINET bus components For establishing MPI/PROFIBUS/ PROFINET communication	See Catalogs IK PI, CA 01

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Overview SIPLUS CPU 315F-2 DP



- For configuring a fail-safe automation system for plants with increased safety requirements
- Complies with safety requirements up to SIL 3 according to IEC 61508 and up to Cat. 4 according to EN 954-1
- Distributed fail-safe I/O modules can be connected through the integral PROFIBUS DP interface (PROFIsafe)
- Fail-safe ET 200M I/O modules are also centrally connectable
- The standard modules for non-safety applications can be operated both centrally and locally

Micro Memory Card required for operation of CPU.

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

Overview SIPLUS CPU 315F-2 PN/DP



- The CPU with a medium sized program memory and quantity structures to build a fail-safe automation system for plants with increased safety requirements
- Complies with safety requirements up to SIL 3 according to IEC 61508, PL e in accordance with ISO 13849 and up to Cat. 4 of EN 954-1
- The fail-safe I/O modules can be locally connected to the integrated PROFINET interface (PROFIsafe) and/or to the integrated PROFIBUS DP interface (PROFIsafe)
- Fail-safe ET 200M I/O modules are also centrally connectable
- The standard modules for non-safety applications can be operated both centrally and locally
- Component Based Automation (CBA) on PROFINET
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET interface with 2-port switch
- PROFINET proxy for intelligent devices on PROFIBUS DP in Component Based Automation (CBA)

Micro Memory Card required for operation of CPU.

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

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Overview SIPLUS CPU 317F-2 DP



- The fail-safe CPU with a large program memory and quantity framework for demanding applications
- For configuring a fail-safe automation system for plants with increased safety requirements
- Complies with safety requirements up to SIL 3 according to IEC 61508 and up to Cat. 4 according to EN 954-1
- Fail-safe I/O modules can be connected in a distributed configuration to both integral PROFIBUS DP interfaces (PROFIsafe)
- Fail-safe ET 200M I/O modules are also centrally connectable
- The standard modules for non-safety applications can be operated both centrally and locally

Micro Memory Card required for operation of CPU.

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

Overview SIPLUS CPU 317F-2 PN/DP



- The failsafe CPU with a large program memory and quantity structures for demanding applications to build a fail-safe automation system for plants with increased safety requirements
- Complies with safety requirements up to SIL 3 according to IEC 61508, PL e in accordance with ISO 13849-1 and up to category 4 of EN 954-1
- The fail-safe I/O modules can be locally connected via the integrated PROFINET interface (PROFIsafe) and/or via the integrated PROFIBUS DP interface (PROFIsafe)
- Fail-safe ET 200M I/O modules are also centrally connectable
- The standard modules for non-safety applications can be operated both centrally and locally
- Component Based Automation (CBA) on PROFINET
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET interface with 2-port switch
- PROFINET proxy for intelligent devices on PROFIBUS DP in Component Based Automation (CBA)

SIMATIC Micro Memory Card required for operation of CPU.

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

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Technical specifications

Article number	**6AG1315-6FF04-2AB0**	**6AG1315-6FF04-2AY0**	**6AG1315-2FJ14-2AB0**	**6AG1315-2FJ14-2AY0**
Based on	**6ES7315-6FF04-0AB0**	**6ES7315-6FF04-0AB0**	**6ES7315-2FJ14-0AB0**	**6ES7315-2FJ14-0AB0**
	SIPLUS S7-300 CPU 315F-2DP	SIPLUS S7-300 CPU 315F-2DP EN50155	SIPLUS S7-300 CPU315F-2PN/DP	SIPLUS S7-300 CPU315F-2PN/DP EN50155
Ambient conditions				
Ambient temperature during operation				
• min.	-25 °C	-25 °C; = Tmin	-25 °C; = Tmin	-25 °C; = Tmin
• max.	60 °C	60 °C; = Tmax; the rated temperature range of -25 ... +55 °C (T1) applies for the use on railway vehicles according to EN50155	60 °C; = Tmax	60 °C; = Tmax; the rated temperature range of -25 ... +55 °C (T1) applies for the use on railway vehicles according to EN50155
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.	2 000 m	2 000 m	2 000 m	2 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)
Relative humidity				
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance				
Use in stationary industrial systems				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
Use on land craft, rail vehicles and special-purpose vehicles				
- to biologically active substances according to EN 60721-3-5		Yes; Class 5B2 mold, fungus and dry rot spores (with the exception of fauna); Class 5B3 on request		Yes; Class 5B2 mold, fungus and dry rot spores (with the exception of fauna); Class 5B3 on request
- to chemically active substances according to EN 60721-3-5		Yes; Class 5C3 (RH < 75 %) incl. salt spray acc. to EN 50155 (ST2); *		Yes; Class 5C3 (RH < 75 %) incl. salt spray acc. to EN 50155 (ST2); *
- to mechanically active substances according to EN 60721-3-5		Yes; Class 5S3 incl. sand, dust; *		Yes; Class 5S3 incl. sand, dust; *
Use on ships/at sea				
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request		Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *		Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *		Yes; Class 6S3 incl. sand, dust; *	
Remark				
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!

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Technical specifications (continued)

Article number	**6AG1317-6FF04-2AB0**	**6AG1317-2FK14-2AB0**	**6AG1317-2FK14-2AY0**
Based on	**6ES7317-6FF04-0AB0**	**6ES7317-2FK14-0AB0**	**6ES7317-2FK14-0AB0**
	SIPLUS S7-300 CPU317F-2DP	SIPLUS S7-300 CPU317F-2PN/DP	SIPLUS S7-300 CPU317F-2PN/DP EN50155
Ambient conditions			
Ambient temperature during operation			
• min.	-25 °C; = Tmin	-25 °C; = Tmin	-25 °C; = Tmin
• max.	60 °C; = Tmax	60 °C; = Tmax	60 °C; = Tmax; the rated temperature range of -25 ... +55 °C (T1) applies for the use on railway vehicles according to EN50155
Altitude during operation relating to sea level			
• Installation altitude above sea level, max.	2 000 m	2 000 m	2 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)
Relative humidity			
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance			
Use in stationary industrial systems			
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
Use on land craft, rail vehicles and special-purpose vehicles			
- to biologically active substances according to EN 60721-3-5			Yes; Class 5B2 mold, fungus and dry rot spores (with the exception of fauna); Class 5B3 on request
- to chemically active substances according to EN 60721-3-5			Yes; Class 5C3 (RH < 75 %) incl. salt spray acc. to EN 50155 (ST2); *
- to mechanically active substances according to EN 60721-3-5			Yes; Class 5S3 incl. sand, dust; *
Use on ships/at sea			
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	
Remark			
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!

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SIPLUS S7-300 fail-safe CPUs

Ordering data	Article No.
SIPLUS S7-300 CPU 315F-2 DP	
For industrial applications with extended ambient conditions	
CPU for SIPLUS S7-300F; work memory 384 KB, supply voltage 24 V DC, MPI, PROFIBUS DP master/slave interface; incl. slot number labels; MMC required	
Extended temperature range and exposure to media	**6AG1315-6FF04-2AB0**
For rolling stock railway applications	
Conforms to EN 50155	**6AG1315-6FF04-2AY0**
SIPLUS S7-300 CPU 315F-2 PN/DP	
For industrial applications with extended ambient conditions	
CPU for SIPLUS S7-300F; work memory 512 KB, supply voltage 24 V DC, MPI/PROFIBUS DP master/slave interface, Industrial Ethernet/ PROFINET interface; incl. slot number labels	
Extended temperature range and exposure to media	**6AG1315-2FJ14-2AB0**
For rolling stock railway applications	
CPU for SIPLUS S7-300F; work memory 512 KB, supply voltage 24 V DC, MPI/PROFIBUS DP master/slave interface, Industrial Ethernet/ PROFINET interface; incl. slot number labels	
Conforms to EN 50155	**6AG1315-2FJ14-2AY0**
SIPLUS S7-300 CPU 317F-2 DP	
For industrial applications with extended ambient conditions	
CPU for SIPLUS S7-300F, work memory 1.5 MB, supply voltage 24 V DC, MPI, PROFIBUS DP master/slave interface; MMC required	
Extended temperature range and exposure to media	**6AG1317-6FF04-2AB0**

Ordering data	Article No.
SIPLUS S7-300 CPU 317F-2 PN/DP	
For industrial applications with extended ambient conditions	
CPU for SIPLUS S7-300F, work memory 1.5 MB, supply voltage 24 V DC, MPI/PROFIBUS DP master/slave interface; Industrial Ethernet/ PROFINET interface; MMC required	
Extended temperature range and exposure to media	**6AG1317-2FK14-2AB0**
For rolling stock railway applications	
CPU for SIPLUS S7-300F, work memory 1.5 MB, supply voltage 24 V DC, MPI/PROFIBUS DP master/slave interface; Industrial Ethernet/ PROFINET interface; MMC required	
Conforms to EN 50155	**6AG1317-2FK14-2AY0**
Accessories	
Mandatory	
SIMATIC Micro Memory Card	
64 KB	**6ES7953-8LF31-0AA0**
128 KB	**6ES7953-8LG31-0AA0**
512 KB	**6ES7953-8LJ31-0AA0**
2 MB	**6ES7953-8LL31-0AA0**
4 MB	**6ES7953-8LM31-0AA0**
8 MB	**6ES7953-8LP31-0AA0**
For communication within the application	
PROFIBUS DP bus connector RS 485	
(Extended temperature range and exposure to media)	
With 90° cable outlet, max. transfer rate 12 Mbps	
• Without PG interface	**6AG1972-0BA12-2XA0**
• With PG interface	**6AG1972-0BB12-2XA0**
With angled cable outlet, max. transfer rate 12 Mbps	
• Without PG interface	**6AG1972-0BA42-7XA0**
• With PG interface	**6AG1972-0BB42-7XA0**
(Extended temperature range)	
With axial cable outlet for SIMATIC OP, for connecting to PPI, MPI, PROFIBUS	**6AG1500-0EA02-2AA0**
RS 485 repeater for PROFIBUS	**6AG1972-0AA02-7XA0**
(Extended temperature range and exposure to media)	
Transmission rate up to 12 Mbps; 24 V DC; IP20 enclosure	
IE FC RJ45 plug 180	
(Extended temperature range and exposure to media)	
180° cable outlet	
• 1 unit	**6AG1901-1BB10-7AA0**

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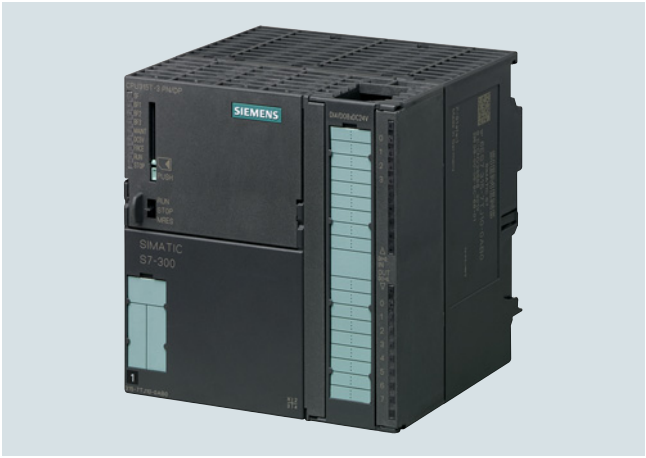
Ordering data	Article No.
SIPLUS SCALANCE X-200 Industrial Ethernet Switches	
Industrial Ethernet switches with integral SNMP access, web diagnostics, copper cable diagnostics and PROFINET diagnostics for configuring line, star and ring topologies; with integrated redundancy manager (exception: SCALANCE X208PRO); incl. operating instructions, Industrial Ethernet network manual and configuration software on CD-ROM	
• With electrical and optical ports for glass multimode FOC up to 3 km	
• Extended temperature range and exposure to media	
• SIPLUS SCALANCE X204-2 with four 10/100 Mbps RJ45 ports and two FO ports	**6AG1204-2BB10-4AA3**
PROFIBUS FastConnect bus cable	**6XV1830-0EH10**
Standard type with special design for quick mounting, 2-wire, shielded, sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	
IE FC TP Standard Cable GP 2x2	**6XV1840-2AH10**
4-wire, shielded TP installation cable for connecting to IE FC RJ45 outlet/IE FC RJ45 plug; PROFINET-compatible; with UL approval	
Sold by the meter	
FO Standard Cable GP (50/125)	**6XV1873-2A**
For commissioning	
MPI cable	**6ES7901-0BF00-0AA0**
For connection of SIMATIC S7 and programming devices via MPI; length 5 m	
USB A2 PC adapter	**6GK1571-0BA00-0AA0**
For connecting a programming device/PC or notebook to PROFIBUS or MPI; USB cable included in scope of supply	
S7 Distributed Safety V5.4 SP5 Update 2 programming tool	
Task: Configuration software for configuring fail-safe user programs for SIMATIC S7-300F, S7-400F, WinAC RTX F, ET 200S, ET 200M, ET 200iSP, ET 200pro, ET 200eco Requirement: Windows 7 SP1 (64-bit) Windows 10 Professional/Enterprise (64-bit) Windows Server 2008 R2 SP1 (64-bit) Windows Server 2012 R2 (64-bit), Windows Server 2016 (64-bit) STEP 7 from V5.5 SP1; please also consider the operating systems that have been released for the STEP 7 version used	
Floating license for 1 user; software and documentation on DVD; license key on USB flash drive	**6ES7833-1FC02-0YA5**
Floating license for 1 user, software, documentation and license key for download[1]; email address required for delivery	**6ES7833-1FC02-0YH5**
S7 Distributed Safety upgrade	
From V5.x to V5.4; floating license for 1 user; software and documentation on DVD; license key on USB flash drive	**6ES7833-1FC02-0YE5**
STEP 7 Safety Advanced V15.1	
Task: Engineering tool for configuring and programming fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-1500F Software Controller, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller and the fail-safe ET 200SP, ET 200MP, ET 200S, ET 200M, ET 200iSP, ET 200pro and ET 200eco I/O Requirement: STEP 7 Professional V15.1	
Floating license for 1 user, software and documentation on DVD; license key on USB flash drive	**6ES7833-1FA15-0YA5**
Floating license for 1 user, software, documentation and license key for download[1]; email address required for delivery	**6ES7833-1FA15-0YH5**
Consumables	
Power supply connector	**6ES7391-1AA00-0AA0**
10 units, spare part	
Slot number plates	**6ES7912-0AA00-0AA0**
Documentation	
SIMATIC Manual Collection	**6ES7998-8XC01-8YE0**
Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC Distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	
SIMATIC Manual Collection update service for 1 year	**6ES7998-8XC01-8YE2**
Current "Manual Collection" DVD and the three subsequent updates	

[1] For up-to-date information and download availability, see: http://www.siemens.com/tia-online-software-delivery

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Overview CPU 315T-3 PN/DP



- SIMATIC CPU with integral technology/motion control functionality
- With full standard CPU 315-2 PN/DP functionality (except for CBA)
- For cross-industry automation tasks in series machine, special machine and plant construction
- Ideal for synchronized motion, such as coupling to a virtual/real master, gear synchronization, cam disk, path interpolation, or print mark compensation
- 3D path interpolation with different kinematics
- Position and pressure-regulated hydraulic axes
- Used as central controller in production lines with central and distributed I/O
- With integrated I/O for high-speed technology functions (e.g. camming, reference point acquisition)
- PROFIBUS DP (DRIVE) interface for isochronous connection of drive components
- PROFINET interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- One common S7 user program for control and motion control tasks (no additional programming language necessary for motion control)
- "S7 Technology" option package required (version V4.2 SP3 and higher)

SIMATIC Micro Memory Card (8 MB) required for operation of the CPU.

Overview CPU 317T-3 PN/DP



- SIMATIC CPU with integral technology/motion control functionality
- With full standard CPU 317-2 PN/DP functionality (except for CBA)
- For cross-industry automation tasks in series machine, special machine and plant construction
- Ideal for synchronized motion, such as coupling to a virtual/real master, gear synchronization, cam disk, path interpolation, or print mark compensation
- 3D path interpolation with different kinematics
- Position and pressure-regulated hydraulic axes
- Used as central controller in production lines with central and distributed I/O
- With integrated I/O for high-speed technology functions (e.g. camming, reference point acquisition)
- PROFIBUS DP (DRIVE) interface for isochronous connection of drive components
- PROFINET interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- One common S7 user program for control and motion control tasks (no additional programming language necessary for motion control)
- "S7 Technology" option package required (version V4.2 SP3 and higher)

SIMATIC Micro Memory Card (8 MB) required for operation of the CPU.

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Overview CPU 317TF-3 PN/DP



- Fail-safe SIMATIC CPU 317TF-3 PN/DP with integral technology/motion control functionality
- Spare-part-compatible successor to the CPU 317TF-2 DP (Article No. 6ES7317-6TF14-0AB0)
- With full functionality of the standard CPU 317-2 PN/DP and CPU 317F-2 PN/DP (except for CBA)
- For cross-industry automation tasks in series machine, special machine and plant construction
- Ideal for synchronized motion, such as coupling to a virtual/real master, gear synchronization, cam disk, path interpolation, or print mark compensation
- 3D path interpolation with different kinematics
- Position and pressure-regulated hydraulic axes
- Used as central controller in production lines with central and distributed I/O
- With integrated I/O for high-speed technology functions (e.g. camming, reference point acquisition)
- PROFIBUS DP (DRIVE) interface for isochronous connection of drive components
- PROFINET interface with 2-port switch
- PROFINET IO controller for operating distributed I/O on PROFINET
- One common S7 user program for control and motion control tasks (no additional programming language necessary for motion control)
- "S7 Technology" option package required
- "S7 Distributed Safety" option package required (version V4.2 SP3 and higher)

SIMATIC Micro Memory Card (8 MB) required for operation of the CPU.

Technical specifications

Article number	**6ES7315-7TJ10-0AB0** CPU315T-3 PN/DP, 384KB	**6ES7317-7TK10-0AB0** CPU317T-3 PN/DP, 1024KB	**6ES7317-7UL10-0AB0** CPU317TF-3 PN/DP, 1,5 MB
General information			
Engineering with			
• Programming package	STEP 7 V5.5 SP2 or higher and S7-Technology option package V4.2 SP3	STEP 7 V5.5 SP2 or higher and S7-Technology option package V4.2 SP3	STEP 7 V5.5 SP2 or higher; S7-Technology option package V4.2 SP3 or higher, Distributed Safety V5.4 SP5 or higher, S7-F Configuration Pack V5.5 SP10 or higher
Supply voltage			
Rated value (DC)			
• 24 V DC	Yes	Yes	Yes
Power loss			
Power loss, typ.	7.5 W	7.5 W	8.5 W
Memory			
Work memory			
• integrated	384 kbyte	1 024 kbyte	1 536 kbyte
• expandable	No	No	No
• Size of retentive memory for retentive data blocks	128 kbyte	256 kbyte	256 kbyte
Load memory			
• Plug-in (MMC), max.	8 Mbyte	8 Mbyte	8 Mbyte
CPU processing times			
for bit operations, typ.	0.05 µs	0.025 µs	0.025 µs
for word operations, typ.	0.09 µs	0.03 µs	0.03 µs
for fixed point arithmetic, typ.	0.12 µs	0.04 µs	0.04 µs
for floating point arithmetic, typ.	0.45 µs	0.16 µs	0.16 µs

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Technical specifications (continued)

Article number	6ES7315-7TJ10-0AB0 CPU315T-3 PN/DP, 384KB	6ES7317-7TK10-0AB0 CPU317T-3 PN/DP, 1024KB	6ES7317-7UL10-0AB0 CPU317TF-3 PN/DP, 1,5 MB
Counters, timers and their retentivity			
S7 counter			
• Number	256	512	512
IEC counter			
• present	Yes	Yes	Yes
S7 times			
• Number	256	512	512
IEC timer			
• present	Yes	Yes	Yes
Data areas and their retentivity			
Flag			
• Number, max.	2 048 byte	4 096 byte	4 096 byte
Address area			
I/O address area			
• Inputs	2 048 byte	8 192 byte	8 192 byte
• Outputs	2 048 byte	8 192 byte	8 192 byte
Process image			
• Inputs, adjustable	2 048 byte	8 192 byte	8 192 byte
• Outputs, adjustable	2 048 byte	8 192 byte	8 192 byte
Time of day			
Clock			
• Hardware clock (real-time)	Yes	Yes	Yes
Operating hours counter			
• Number	1	4	4
Digital outputs			
Integrated high-speed cams			
• Switching accuracy (+/-)	70 µs	70 µs	70 µs
1. Interface			
Interface type	Integrated RS 485 interface	Integrated RS 485 interface	Integrated RS 485 interface
Physics	RS 485	RS 485	RS 485
Protocols			
• MPI	Yes	Yes	Yes
• PROFIBUS DP master	Yes	Yes	Yes
• PROFIBUS DP slave	Yes	Yes	Yes
• Point-to-point connection	No	No	No
PROFIBUS DP master			
• Number of DP slaves, max.	124	124	124
2. Interface			
Interface type	Integrated RS 485 interface	Integrated RS 485 interface	Integrated RS 485 interface
Physics	RS 485	RS 485	RS 485
Protocols			
• MPI	No	No	No
• PROFIBUS DP master	Yes; DP(DRIVE)-Master	Yes; DP(DRIVE)-Master	Yes; DP(DRIVE)-Master
• PROFIBUS DP slave	No	No	No
PROFIBUS DP master			
• Number of DP slaves, max.	64	64	64
3. Interface			
Interface type	PROFINET	PROFINET	PROFINET
Physics	Ethernet RJ45	Ethernet RJ45	Ethernet RJ45
Interface types			
• Number of ports	2	2	2
Protocols			
• MPI	No	No	No
• PROFINET IO Controller	Yes; Also simultaneously with IO-Device functionality	Yes; Also simultaneously with IO-Device functionality	Yes; Also simultaneously with IO-Device functionality
• PROFINET IO Device	Yes; Also simultaneously with IO Controller functionality	Yes; Also simultaneously with IO Controller functionality	Yes; Also simultaneously with IO Controller functionality
• PROFIBUS DP master	No	No	No
• PROFIBUS DP slave	No	No	No

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Technical specifications (continued)

Article number	**6ES7315-7TJ10-0AB0**	**6ES7317-7TK10-0AB0**	**6ES7317-7UL10-0AB0**
	CPU315T-3 PN/DP, 384KB	CPU317T-3 PN/DP, 1024KB	CPU317TF-3 PN/DP, 1,5 MB
PROFINET IO Controller			
Services			
- Number of connectable IO Devices, max.	128	128	128
- Of which IO devices with IRT, max.	64	64	64
- Number of connectable IO Devices for RT, max..	128	128	128
Protocols			
Open IE communication			
• TCP/IP	Yes; via integrated PROFINET interface and loadable FBs	Yes; via integrated PROFINET interface and loadable FBs	Yes; via integrated PROFINET interface and loadable FBs
- Number of connections, max.	8	16	16
• ISO-on-TCP (RFC1006)	Yes; via integrated PROFINET interface and loadable FBs	Yes; via integrated PROFINET interface and loadable FBs	Yes; via integrated PROFINET interface and loadable FBs
- Number of connections, max.	8	16	16
• UDP	Yes; via integrated PROFINET interface and loadable FBs	Yes; via integrated PROFINET interface and loadable FBs	Yes; via integrated PROFINET interface and loadable FBs
- Number of connections, max.	8	16	16
Web server			
• supported	Yes	Yes	Yes
Isochronous mode			
Isochronous operation (application synchronized up to terminal)	Yes; Via PROFIBUS DP or PROFINET interface	Yes; Via PROFIBUS DP or PROFINET interface	Yes; Via PROFIBUS DP or PROFINET interface
Communication functions			
PG/OP communication	Yes	Yes	Yes
Data record routing	Yes	Yes	Yes
Global data communication			
• supported	Yes	Yes	Yes
S7 basic communication			
• supported	Yes	Yes	Yes
S7 communication			
• supported	Yes	Yes	Yes
S5 compatible communication			
• supported	Yes; via CP and loadable FC	Yes; via CP and loadable FC	Yes; via CP and loadable FC
Number of connections			
• overall	16	32	32
Ambient conditions			
Ambient temperature during operation			
• min.	0 °C	0 °C	0 °C
• max.	60 °C	60 °C	60 °C
Configuration			
Programming			
Programming language			
- LAD	Yes	Yes	Yes
- FBD	Yes	Yes	Yes
- STL	Yes	Yes	Yes
- SCL	Yes	Yes	Yes
- CFC	Yes	Yes	Yes
- GRAPH	Yes	Yes	Yes
- HiGraph®	Yes	Yes	Yes
Know-how protection			
• User program protection/ password protection	Yes	Yes	Yes
• Block encryption	Yes; With S7 block Privacy	Yes; With S7 block Privacy	Yes; With S7 block Privacy
Dimensions			
Width	120 mm	120 mm	120 mm
Height	125 mm	125 mm	125 mm
Depth	130 mm	130 mm	130 mm
Weights			
Weight, approx.	640 g	640 g	640 g

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Ordering data	Article No.
CPU 315T-3 PN/DP Work memory 384 KB, supply voltage 24 V DC, MPI, PROFIBUS DP master/slave interface, PROFIBUS DP(DRIVE) interface, Ethernet/PROFINET interface with 2-port switch; with technology/motion control functions; MMC required	**6ES7315-7TJ10-0AB0**
CPU 317T-3 PN/DP Work memory 1024 KB, supply voltage 24 V DC, MPI, PROFIBUS DP master/slave interface, PROFIBUS DP(DRIVE) interface, Ethernet/PROFINET interface with 2-port switch; with technology/motion control functions; MMC required	**6ES7317-7TK10-0AB0**
CPU 317TF-3 PN/DP Work memory 1.5 MB, supply voltage 24 V DC, MPI, PROFIBUS DP master/slave interface, PROFIBUS DP(DRIVE) interface, Ethernet/PROFINET interface with 2-port switch; with technology/motion control functions; MMC required	**6ES7317-7UL10-0AB0**
S7-Technology V4.2 V4.2 SP3 and higher can be used for CPU 317TF-3 PN/DP Task: Option package for configuring and programming technology tasks with SIMATIC S7 CPU 31xT and SIMATIC S7 CPU 317TF Requirement: STEP 7 V5.6 and higher Type of delivery: on DVD; incl. documentation for CPU 31xT, CPU 317TF (included on DVD)	
Floating license	**6ES7864-1CC42-0YA5**
Floating license for 1 user; license key download without software or documentation[1]; email address required for delivery	**6ES7864-1CC42-0XH5**
S7 Distributed Safety V5.4 SP5 Update 2 programming tool Task: Configuration software for configuring fail-safe user programs for SIMATIC S7-300F, S7-400F, WinAC RTX F, ET 200S, ET 200M, ET 200iSP, ET 200pro, ET 200eco, ET 200SP Requirement: Windows 7 SP1 (64-bit), Windows 10 Professional/Enterprise (64-bit), Windows Server 2008 R2 SP1 (64-bit), Windows Server 2012 R2 (64-bit), Windows Server 2016 (64-bit); STEP 7 from V5.5 SP1; Please also note the operating systems that have been released for the STEP 7 version used	
Floating license for 1 user; software and documentation on DVD; license key on USB flash drive	**6ES7833-1FC02-0YA5**
Floating license for 1 user; software, documentation and license key for download[1]; email address required for delivery	**6ES7833-1FC02-0YH5**
S7 Distributed Safety upgrade From V5.x to V5.4; floating license for 1 user; software and documentation on DVD; license key on USB flash drive	**6ES7833-1FC02-0YE5**
SIMATIC Micro Memory Card	
8 MB	**6ES7953-8LP31-0AA0**
MPI cable for connection of SIMATIC S7 and PG via MPI; 5 m in length	**6ES7901-0BF00-0AA0**
Front connectors	
40-pin, with screw contacts	
• 1 unit	**6ES7392-1AM00-0AA0**
• 100 units	**6ES7392-1AM00-1AB0**
40-pin, with spring-loaded contacts	
• 1 unit	**6ES7392-1BM01-0AA0**
• 100 units	**6ES7392-1BM01-1AB0**
Slot number plates	**6ES7912-0AA00-0AA0**
SIMATIC Manual Collection Electronic manuals on DVD, multi-language: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC Distributed I/O, SIMATIC HMI, SIMATIC sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	**6ES7998-8XC01-8YE0**
SIMATIC Manual Collection update service for 1 year Current "Manual Collection" DVD and the three subsequent updates	**6ES7998-8XC01-8YE2**

[1] For up-to-date information and download availability, see: http://www.siemens.com/tia-online-software-delivery

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Ordering data	Article No.
Power supply connector 10 units, spare part	**6ES7391-1AA00-0AA0**
Labeling strips 10 units, spare part	**6ES7392-2XX00-0AA0**
Label cover 10 units, spare part	**6ES7392-2XY00-0AA0**
Labeling sheets for machine inscription for modules with 40-pin front connector, DIN A4, for printing with laser printer; 10 units	
Petrol	**6ES7392-2AX10-0AA0**
Light beige	**6ES7392-2BX10-0AA0**
Yellow	**6ES7392-2CX10-0AA0**
Red	**6ES7392-2DX10-0AA0**
USB A2 PC adapter For connecting a PG/PC or notebook to PROFIBUS or MPI; USB cable included in scope of supply	**6GK1571-0BA00-0AA0**
PROFIBUS bus components	
PROFIBUS DP bus connector RS 485	
• With 90° cable outlet, max. transfer rate 12 Mbps	
- without PG interface	**6ES7972-0BA12-0XA0**
- with PG interface	**6ES7972-0BB12-0XA0**
• with 90° cable outlet for FastConnect connection system, max. transfer rate 12 Mbps	
- without PG interface, 1 unit	**6ES7972-0BA52-0XA0**
- without PG interface, 100 units	**6ES7972-0BA52-0XB0**
- with PG interface, 1 unit	**6ES7972-0BB52-0XA0**
- with PG interface, 100 units	**6ES7972-0BB52-0XB0**
• with axial cable outlet for SIMATIC OP, for connecting to PPI, MPI, PROFIBUS	**6GK1500-0EA02**
PROFIBUS Fast Connect bus cable Standard type with special design for quick mounting, 2-wire, shielded, sold by the meter, max. delivery unit 1 000 m, minimum order quantity 20 m	**6XV1830-0EH10**
RS 485 repeater for PROFIBUS Transmission rate up to 12 Mbps; 24 V DC; IP20 enclosure	**6ES7972-0AA02-0XA0**

	Article No.
PROFINET bus components	
IE FC TP Standard Cable GP 2x2 4-wire, shielded TP installation cable for connecting to IE FC RJ45 outlet/IE FC RJ45 plug; PROFINET-compatible; with UL approval; sold by the meter	**6XV1840-2AH10**
FO Standard Cable GP (50/125) Standard cable, splittable, UL approval, sold by the meter	**6XV1873-2A**
SCALANCE X204-2 Industrial Ethernet Switch Industrial Ethernet switches with integral SNMP access, Web diagnostics, copper cable diagnostics and PROFINET diagnostics for configuring line, star and ring topologies; four 10/100 Mbps RJ45 ports and two FO ports	**6GK5204-2BB10-2AA3**
Compact Switch Module CSM 377 Unmanaged switch for connecting SIMATIC S7-300, ET 200M and up to three other stations to Industrial Ethernet with 10/100 Mbps; 4 x RJ45 ports; external 24 V DC power supply, LED diagnostics, S7-300 module incl. electronic manual on CD-ROM	**6GK7377-1AA00-0AA0**
IE FC RJ45 plugs RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables	
IE FC RJ45 plug 180 180° cable outlet	
1 unit	**6GK1901-1BB10-2AA0**
10 units	**6GK1901-1BB10-2AB0**
50 units	**6GK1901-1BB10-2AE0**
PROFIBUS/PROFINET bus components For establishing MPI/PROFIBUS/ PROFINET communication	See Catalogs IK PI, CA 01

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SM 321 digital input modules

Overview



- Digital inputs
- For connecting standard switches and two-wire proximity switches (BEROs)

Technical specifications

Article number	**6ES7321-1BH02-0AA0** SM321, 16DI, 24 V DC	**6ES7321-1BH50-0AA0** SM321, 16DI, 24 V DC, sourcing input	**6ES7321-1BL00-0AA0** SM321, 32DI, 24 V DC	**6ES7321-1BP00-0AA0** SM321, 64 DI, DC 24 V DC, 3MS, P/M reading	**6ES7321-1BH10-0AA0** SM321,16DI, 24 V DC, 0.05ms Input Delay
Supply voltage					
Load voltage L+					
• Rated value (DC)	24 V	24 V	24 V	24 V	24 V
Input current					
from backplane bus 5 V DC, max.	10 mA	10 mA	15 mA	100 mA	110 mA
Power loss					
Power loss, typ.	3.5 W	3.5 W	6.5 W	7 W	3.8 W
Digital inputs					
Number of digital inputs	16	16	32	64	16
Input characteristic curve in accordance with IEC 61131, type 1	Yes	Yes	Yes	Yes	Yes
Number of simultaneously controllable inputs					
horizontal installation					
- up to 40 °C, max.	16	16	32	64	16
- up to 60 °C, max.	16	16	16	32	16
vertical installation					
- up to 40 °C, max.	16	16	32	32	16
Input voltage					
• Type of input voltage	DC	DC	DC	DC	DC
• Rated value (DC)	24 V	24 V	24 V	24 V	24 V
• for signal "0"	-30 to +5V	-5 to +30V	-30 to +5V	-30 to +5V	-30 to +5V
• for signal "1"	13 to 30V	-13 to -30V	13 to 30V	13 to 30V	13 to 30V
Input current					
• for signal "1", typ.	7 mA	7 mA	7 mA	4.2 mA	7 mA
Input delay (for rated value of input voltage)					
for standard inputs					
- parameterizable	No	No	No	No	No
- at "0" to "1", min.	1.2 ms	1.2 ms	1.2 ms	1.2 ms	25 µs
- at "0" to "1", max.	4.8 ms	4.8 ms	4.8 ms	4.8 ms	75 µs
Cable length					
• shielded, max.	1 000 m	1 000 m	1 000 m	1 000 m	1 000 m
• unshielded, max.	600 m	600 m	600 m	600 m	600 m

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Technical specifications (continued)

Article number	**6ES7321-1BH02-0AA0**	**6ES7321-1BH50-0AA0**	**6ES7321-1BL00-0AA0**	**6ES7321-1BP00-0AA0**	**6ES7321-1BH10-0AA0**
	SM321, 16DI, 24 V DC	SM321, 16DI, 24 V DC, sourcing input	SM321, 32DI, 24 V DC	SM321, 64 DI, DC 24 V DC, 3MS, P/M reading	SM321,16DI, 24 V DC, 0.05ms Input Delay
Encoder					
Connectable encoders					
• 2-wire sensor	Yes	Yes	Yes	No	Yes
- permissible quiescent current (2-wire sensor), max.	1.5 mA	1.5 mA	1.5 mA		1.5 mA
Isochronous mode					
Isochronous operation (application synchronized up to terminal)	No	No	No	No	Yes
Interrupts/diagnostics/ status information					
Diagnostics function	No	No	No	No	No
Alarms					
• Diagnostic alarm	No	No	No	No	No
• Hardware interrupt	No	No	No	No	No
Potential separation					
Potential separation digital inputs					
• between the channels	No	No	No	No	No
• between the channels, in groups of	16	16	16	16	16
• between the channels and backplane bus	Yes; Optocoupler	Yes; Optocoupler	Yes; Optocoupler	Yes; Optocoupler	Yes; Optocoupler
Connection method					
required front connector	20-pin	20-pin	40-pin	Cable: 6ES7392-4Bxx0-0AA0 terminal blocks: 6ES7392-1xN00-0AA0	20-pin
Dimensions					
Width	40 mm	40 mm	40 mm	40 mm	40 mm
Height	125 mm	125 mm	125 mm	125 mm	125 mm
Depth	120 mm	120 mm	120 mm	112 mm	120 mm
Weights					
Weight, approx.	200 g	200 g	260 g	230 g	200 g

Article number	**6ES7321-7BH01-0AB0**	**6ES7321-1CH00-0AA0**	**6ES7321-1CH20-0AA0**	**6ES7321-1FH00-0AA0**
	SM321, 16DI, 24V DC	SM321, 16 DI, AC/DC 24-48V, 1ch/common	SM321, 16DI, DC48-125V	SM321, 16 DI, 120/230V AC
Supply voltage				
Load voltage L+				
• Rated value (DC)	24 V	24 V	48 V	
Load voltage L1				
• Rated value (AC)		24 V		230 V; 120/230 V AC; all load voltages must have the same phase.
Input current				
from load voltage L+ (without load), max.	90 mA			
from backplane bus 5 V DC, max.	130 mA	100 mA	40 mA	29 mA
Power loss				
Power loss, typ.	4 W	1.5 W; at 24 V; 2,8 W at 48 V	4.3 W	4.9 W
Digital inputs				
Number of digital inputs	16	16	16	16
Input characteristic curve in accordance with IEC 61131, type 1		Yes	Yes	Yes
Input characteristic curve in accordance with IEC 61131, type 2	Yes			

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Technical specifications (continued)

Article number	6ES7321-7BH01-0AB0 SM321, 16DI, 24V DC	6ES7321-1CH00-0AA0 SM321, 16 DI, AC/DC 24-48V, 1ch/common	6ES7321-1CH20-0AA0 SM321, 16DI, DC48-125V	6ES7321-1FH00-0AA0 SM321, 16 DI, 120/230V AC
Number of simultaneously controllable inputs				
horizontal installation				
- up to 40 °C, max.	16	16	8	16
- up to 60 °C, max.	16	16	8; 6 to Ue 146 V	16
vertical installation				
- up to 40 °C, max.	16	16	8	16
Input voltage				
• Type of input voltage	DC	AC/DC	DC	AC
• Rated value (DC)	24 V	24 V; DC 24 or 48 V	48 V; 48 V DC to 125 V DC	
• Rated value (AC)		24 V; 24 V AC or 48 V AC (0 ... 63 Hz)		230 V; 120/230 V AC (47 ... 63 Hz)
• for signal "0"	-30 to +5V	-5V AC to +5V AC	-146 V DC to +15 V DC	0 to 40V
• for signal "1"	13 to 30V	14V AC to 60V AC	30 V DC to 146 V DC	79 to 264V
Input current				
• for signal "1", typ.	7 mA	2.7 mA	3.5 mA	6.5 mA; (120V, 60Hz), 16mA (230V, 50Hz)
Input delay (for rated value of input voltage)				
for standard inputs				
- parameterizable	Yes; 0.1 / 0.5 / 3 / 15 / 20 ms	No	No	No
- at "0" to "1", min.		16 ms	0.1 ms	25 ms
- at "0" to "1", max.		16 ms	3.5 ms	25 ms
Cable length				
• shielded, max.	1 000 m	1 000 m	1 000 m	1 000 m
• unshielded, max.	600 m	600 m	600 m	600 m
Encoder				
Connectable encoders				
• 2-wire sensor	Yes	Yes	Yes	Yes
- permissible quiescent current (2-wire sensor), max.	2 mA	1 mA	1 mA	2 mA
Isochronous mode				
Isochronous operation (application synchronized up to terminal)	Yes	No	No	No
Interrupts/diagnostics/ status information				
Diagnostics function	Yes; Parameterizable	No	No	No
Alarms				
• Diagnostic alarm	Yes; Parameterizable	No	No	No
• Hardware interrupt	Yes; Parameterizable	No	No	No
Potential separation				
Potential separation digital inputs				
• between the channels	No	Yes	No	No
• between the channels, in groups of	16	1	8	4
• between the channels and backplane bus	Yes; Optocoupler	Yes; Optocoupler	Yes; Optocoupler	Yes; Optocoupler
Connection method				
required front connector	20-pin	40-pin	20-pin	20-pin
Dimensions				
Width	40 mm	40 mm	40 mm	40 mm
Height	125 mm	125 mm	125 mm	125 mm
Depth	120 mm	120 mm	120 mm	120 mm
Weights				
Weight, approx.	200 g	260 g	200 g	240 g

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Technical specifications (continued)

Article number	**6ES7321-1EL00-0AA0** SM321, 32DI, AC120V	**6ES7321-1FF01-0AA0** SM321, 8DI, AC120/230V	**6ES7321-1FF10-0AA0** SM321, 8 DI, AC 120/230V, 1ch/common
Load voltage L1			
• Rated value (AC)	120 V	230 V; 120/230 V AC	230 V; 120/230 V AC; all load voltages must have the same phase.
Input current			
from backplane bus 5 V DC, max.	16 mA	29 mA	100 mA
Power loss			
Power loss, typ.	4 W	4.9 W	4.9 W
Digital inputs			
Number of digital inputs	32	8	8
Input characteristic curve in accordance with IEC 61131, type 1		Yes	Yes
Input characteristic curve in accordance with IEC 61131, type 2	Yes		
Number of simultaneously controllable inputs			
horizontal installation			
- up to 40 °C, max.	32		
- up to 60 °C, max.	24	8	8
vertical installation			
- up to 40 °C, max.	32	8	8
Input voltage			
• Type of input voltage	AC	AC	AC
• Rated value (AC)	120 V; 47 ... 63 Hz	230 V; 120/230 V AC (47 ... 63 Hz)	120 V; 120/230 V AC (47 ... 63 Hz)
• for signal "0"	0 to 20V	0 to 40V	0 to 40V
• for signal "1"	74 to 132V	79 to 264V	79 to 264V
Input current			
• for signal "1", typ.	21 mA	6.5 mA; (120 V); 11 mA (230 V)	7.5 mA; (120 V); 17.3 mA (230 V)
Input delay (for rated value of input voltage)			
for standard inputs			
- parameterizable	No	No	No
- at "0" to "1", max.	15 ms	25 ms	25 ms
Cable length			
• shielded, max.	1 000 m	1 000 m	1 000 m
• unshielded, max.	600 m	600 m	600 m
Encoder			
Connectable encoders			
• 2-wire sensor	Yes	Yes	Yes
- permissible quiescent current (2-wire sensor), max.	4 mA	2 mA	2 mA
Isochronous mode			
Isochronous operation (application synchronized up to terminal)	No	No	No

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Technical specifications (continued)

Article number	6ES7321-1EL00-0AA0 SM321, 32DI, AC120V	6ES7321-1FF01-0AA0 SM321, 8DI, AC120/230V	6ES7321-1FF10-0AA0 SM321, 8 DI, AC 120/230V, 1ch/common
Interrupts/diagnostics/ status information			
Diagnostics function	No	No	No
Alarms			
• Diagnostic alarm	No	No	No
• Hardware interrupt	No	No	No
Potential separation			
Potential separation digital inputs			
• between the channels	No	No	Yes
• between the channels, in groups of	8	2	1
• between the channels and backplane bus	Yes; Optocoupler	Yes; Optocoupler	Yes; Optocoupler
Connection method			
required front connector	40-pin	20-pin	40-pin
Dimensions			
Width	40 mm	40 mm	40 mm
Height	125 mm	125 mm	125 mm
Depth	120 mm	120 mm	120 mm
Weights			
Weight, approx.	300 g	240 g	240 g

Ordering data

	Article No.
SM 321 digital input modules	
Incl. labeling strips, bus connector	
16 inputs, 24 V DC	**6ES7321-1BH02-0AA0**
16 inputs, 24 V DC, active low	**6ES7321-1BH50-0AA0**
32 inputs, 24 V DC	**6ES7321-1BL00-0AA0**
64 inputs, 24 V DC, active high/low	**6ES7321-1BP00-0AA0**
Note: 6ES7392-4...0-0AA0 connecting cable and 6ES7392-1.N00-0AA0 terminal blocks necessary.	
16 inputs, 24 to 48 V DC	**6ES7321-1CH00-0AA0**
16 inputs, 48 to 125 V DC	**6ES7321-1CH20-0AA0**
16 inputs, 24 V DC, for isochronous mode	**6ES7321-1BH10-0AA0**
32 inputs, 120 V AC	**6ES7321-1EL00-0AA0**
8 inputs, 120/230 V AC	**6ES7321-1FF01-0AA0**
8 inputs, 120/230 V AC, single root	**6ES7321-1FF10-0AA0**
16 inputs, 120/230 V AC	**6ES7321-1FH00-0AA0**
16 inputs, 24 V DC, for isochronous mode, diagnostics-capable	**6ES7321-7BH01-0AB0**

	Article No.
Front connector	
20-pin, with screw contacts	
• 1 unit	**6ES7392-1AJ00-0AA0**
• 100 units	**6ES7392-1AJ00-1AB0**
20-pin, with spring-loaded contacts	
• 1 unit	**6ES7392-1BJ00-0AA0**
• 100 units	**6ES7392-1BJ00-1AB0**
40-pin, with screw contacts	
• 1 unit	**6ES7392-1AM00-0AA0**
• 100 units	**6ES7392-1AM00-1AB0**
40-pin, with spring-loaded contacts	
• 1 unit	**6ES7392-1BM01-0AA0**
• 100 units	**6ES7392-1BM01-1AB0**
S7-300 connecting cable	
For 64-channel modules; 2 units	
1 m	**6ES7392-4BB00-0AA0**
2.5 m	**6ES7392-4BC50-0AA0**
5 m	**6ES7392-4BF00-0AA0**
Terminal block	
For 64-channel modules; 2 units	
With screw contacts	**6ES7392-1AN00-0AA0**
With spring-loaded contacts	**6ES7392-1BN00-0AA0**

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Ordering data	Article No.
Front door, elevated design	**6ES7328-0AA00-7AA0**
e.g. for 32-channel modules; for connecting 1.3 mm^2/16 AWG conductors; circuit diagram and nameplates in petrol	
SIMATIC TOP connect	see page 5/251
Bus connectors	**6ES7390-0AA00-0AA0**
1 unit (spare part)	
Labeling strips	
10 units (spare part)	
for modules with 20-pin front connector	**6ES7392-2XX00-0AA0**
for modules with 40-pin front connector	**6ES7392-2XX10-0AA0**
Label cover	
10 units (spare part)	
for modules with 20-pin front connector	**6ES7392-2XY00-0AA0**
for modules with 40-pin front connector	**6ES7392-2XY10-0AA0**
Labeling sheets for machine inscription	
For modules with 20-pin front connector, DIN A4, for printing with laser printer; 10 units	
Petrol	**6ES7392-2AX00-0AA0**
Light beige	**6ES7392-2BX00-0AA0**
Yellow	**6ES7392-2CX00-0AA0**
Red	**6ES7392-2DX00-0AA0**
For modules with 40-pin front connector, DIN A4, for printing with laser printer; 10 units	
Petrol	**6ES7392-2AX10-0AA0**
Light beige	**6ES7392-2BX10-0AA0**
Yellow	**6ES7392-2CX10-0AA0**
Red	**6ES7392-2DX10-0AA0**

	Article No.
SIMATIC Manual Collection	**6ES7998-8XC01-8YE0**
Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC Distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	
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SM 322 digital output modules

Overview



- Digital outputs
- For connecting solenoid valves, contactors, low-power motors, lamps and motor starters

Technical specifications

Article number	**6ES7322-1BH01-0AA0**	**6ES7322-1BH10-0AA0**	**6ES7322-1BL00-0AA0**	**6ES7322-1BP00-0AA0**	**6ES7322-1BP50-0AA0**	**6ES7322-8BF00-0AB0**
	SM322, 16DQ 24V DC, 0.5A	SM322 High Speed, 16DQ 24V DC, 0.5A	SM322, 32DQ 24V DC, 0.5A	SM322 64DQ, DC24V, 0,3A P-write	SM322 64DQ, DC24V, 0.3A M-write	SM322, 8DQ, 24V DC, 0.5A
General information						
Product type designation	SM 322, DQ 16x24 V DC/0.5 A	SM 322, DQ 16x24 V DC/0.5 A HS	SM 322, DQ 32x24 V DC/0.5 A	SM 322, DQ 64x24 V DC/0.3 A sourcing	SM 322, DQ 64x24 V DC/0.3 A sinking	SM 322, DQ 8x24 V DC/0.5 A
Supply voltage						
Load voltage L+						
• Rated value (DC)	24 V	24 V	24 V	24 V	24 V	24 V
Input current						
from load voltage L+ (without load), max.	80 mA	110 mA	160 mA	75 mA	75 mA	90 mA
from backplane bus 5 V DC, max.	80 mA	70 mA	110 mA	100 mA	100 mA	70 mA
Power loss						
Power loss, typ.	4.9 W	5 W	6.6 W	6 W	6 W	5 W
Digital outputs						
Number of digital outputs	16	16	32	64	64	8
Limitation of inductive shutdown voltage to	L+ (-53 V)	L+ (-53 V)	L+ (-53 V)	L+ (-53 V)	M+ (45 V)	L+ (-45 V)
Switching capacity of the outputs						
• on lamp load, max.	5 W	5 W	5 W	5 W	5 W	5 W
Load resistance range						
• lower limit	48 Ω	48 Ω	48 Ω	80 Ω	80 Ω	48 Ω
• upper limit	4 kΩ	4 kΩ	4 kΩ	10 kΩ	10 kΩ	3 kΩ
Output voltage						
• for signal "1", min.	L+ (-0.8 V)	L+ (-0.8 V)	L+ (-0.8 V)	L+ (-0.5 V)	M+ (0.5 V)	L+ (-0.8 to -1.6 V)
Output current						
• for signal "1" rated value	0.5 A	0.5 A	0.5 A	0.3 A	0.3 A	0.5 A
• for signal "1" permissible range, min.				2.4 mA	2.4 mA	
• for signal "1" permissible range, max.				0.36 A	0.36 A	
• for signal "1" permissible range for 0 to 40 °C, min.	5 mA	5 mA	5 mA			10 mA
• for signal "1" permissible range for 0 to 40 °C, max.	0.6 A	0.6 A	0.6 A			0.6 A
• for signal "1" permissible range for 40 to 60 °C, min.	5 mA	5 mA	5 mA			10 mA
• for signal "1" permissible range for 40 to 60 °C, max.	0.6 A	0.6 A	0.6 A			0.6 A
• for signal "1" minimum load current	5 mA	5 mA	5 mA			10 mA
• for signal "0" residual current, max.	0.5 mA	0.5 mA	0.5 mA	0.1 mA		0.5 mA

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Technical specifications (continued)

Article number	6ES7322-1BH01-0AA0	6ES7322-1BH10-0AA0	6ES7322-1BL00-0AA0	6ES7322-1BP00-0AA0	6ES7322-1BP50-0AA0	6ES7322-8BF00-0AB0
	SM322, 16DQ 24V DC, 0.5A	SM322 High Speed, 16DQ 24V DC, 0.5A	SM322, 32DQ 24V DC, 0.5A	SM322 64DQ, DC24V, 0,3A P-write	SM322 64DQ, DC24V, 0.3A M-write	SM322, 8DQ, 24V DC, 0.5A
Switching frequency						
• with resistive load, max.	100 Hz	1 000 Hz	100 Hz	100 Hz	100 Hz	100 Hz
• with inductive load, max.	0.5 Hz	0.5 Hz	0.5 Hz	0.5 Hz	0.5 Hz	2 Hz
• on lamp load, max.	10 Hz	10 Hz	10 Hz	10 Hz	10 Hz	10 Hz
Total current of the outputs (per group)						
horizontal installation						
- up to 40 °C, max.	4 A	4 A	4 A	1.6 A	1.6 A	4 A
- up to 60 °C, max.	3 A	3 A	3 A	1.2 A	1.2 A	3 A
vertical installation						
- up to 40 °C, max.	2 A	2 A	2 A	1.6 A	1.6 A	4 A
Total current of the outputs (per module)						
horizontal installation						
- up to 60 °C, max.				4.8 A	4.8 A	
all other mounting positions						
- up to 40 °C, max.				6.4 A	6.4 A	
Cable length						
• shielded, max.	1 000 m	1 000 m	1 000 m	1 000 m	1 000 m	1 000 m
• unshielded, max.	600 m	600 m	600 m	600 m	600 m	600 m
Interrupts/diagnostics/ status information						
Diagnostics function	No	No	No	No	No	Yes; Parameterizable
Alarms						
• Diagnostic alarm	No	No	No	No	No	Yes; Parameterizable
Potential separation						
Potential separation digital outputs						
• between the channels	Yes	Yes	Yes	No	No	
• between the channels, in groups of	8	8	8	16	16	8
• between the channels and backplane bus	Yes; Optocoupler	Yes; Optocoupler	Yes; Optocoupler	Yes; Optocoupler	Yes; Optocoupler	Yes; Optocoupler
Connection method						
required front connector	20-pin	20-pin	40-pin	Cable: 6ES7392-4Bxx0-0AA0 terminal blocks: 6ES7392-1xN00-0AA0	Cable: 6ES7392-4Bxx0-0AA0 terminal blocks: 6ES7392-1xN00-0AA0	20-pin
Dimensions						
Width	40 mm	40 mm	40 mm	40 mm	40 mm	40 mm
Height	125 mm	125 mm	125 mm	125 mm	125 mm	125 mm
Depth	120 mm	120 mm	120 mm	112 mm	112 mm	120 mm
Weights						
Weight, approx.	190 g	200 g	260 g	230 g	230 g	210 g

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Technical specifications (continued)

Article number	6ES7322-5GH00-0AB0	6ES7322-1CF00-0AA0	6ES7322-1BF01-0AA0	6ES7322-1FF01-0AA0	6ES7322-5FF00-0AB0	6ES7322-1FH00-0AA0
	SM322, 16DQ, AC/DC24-48V, 0.5A	SM322, 8DQ, 48-125V DC, 1,5A	SM322, 8DQ, 24V DC, 2A	SM322, 8DQ, 120/230V AC, 1A	SM322, 8DQ, AC120/230V, 2A	SM322, 16DQ, 120/230V AC, 1A
General information						
Product type designation	SM 322, DQ 16x24/48 V UC/ 0.5 A	SM 322, DQ 8x48 ... 125 V DC/ 1.5 A	SM 322, DQ 8x24 V DC/2 A	SM 322, DQ 8x120/230 V AC/ 2 A	SM 322, DQ 8x120/230 V AC/ 2 A ISOL	SM 322, DQ 16x120/230 V AC/ 1 A
Supply voltage						
Load voltage L+						
• Rated value (DC)	24 V; 24 / 48	48 V; 48 V DC to 125 V DC	24 V			
Load voltage L1						
• Rated value (AC)				230 V; 120/230 V AC	230 V; 120/230 V AC	230 V; 120/230 V AC
Input current						
from supply voltage L+, max.	200 mA					
from load voltage L+ (without load), max.		2 mA	60 mA			
from load voltage L1 (without load), max.				2 mA	2 mA	2 mA
from backplane bus 5 V DC, max.	100 mA	100 mA	40 mA	100 mA	100 mA	200 mA
Power loss						
Power loss, typ.	2.8 W	7.2 W	6.8 W	8.6 W	8.6 W	8.6 W
Digital outputs						
Number of digital outputs	16	8	8	8	8	16
Limitation of inductive shutdown voltage to		M (-1 V)	L+ (-48 V)			
Switching capacity of the outputs						
• on lamp load, max.	2.5 W	15 W; 15 W (48 V) or 40 W (125 V)	10 W	50 W	50 W	50 W
Load resistance range						
• lower limit			12 Ω			
• upper limit			4 kΩ			
Output voltage						
• for signal "1", min.	L+ (-0.25 V)	L+ (-1.2 V)	L+ (-0.8 V)	L1 (-1.5 V)	L1 (-8.5 V)	
Output current						
• for signal "1" rated value	0.5 A	1.5 A	2 A	2 A	2 A	1 A
• for signal "1" permissible range for 0 to 40 °C, min.		10 mA	5 mA	10 mA	10 mA	10 mA
• for signal "1" permissible range for 0 to 40 °C, max.	0.5 A	1.5 A	2.4 A	2 A	2 A	1 A
• for signal "1" permissible range for 40 to 60 °C, min.		10 mA	5 mA	10 mA	10 mA	10 mA
• for signal "1" permissible range for 40 to 60 °C, max.	0.5 A	1.5 A	2.4 A	1 A	1 A	0.5 A
• for signal "1" minimum load current		10 mA	5 mA	10 mA	10 mA	10 mA
• for signal "1" permissible surge current, max.	1.5 A; for 50 ms, 1 A 2 s one-time	3 A; for 10 ms		20 A; max. 1 AC cycle	20 A; with 2 half waves	20 A; with 2 half waves
• for signal "0" residual current, max.	10 µA	0.5 mA	0.5 mA	2 mA	2 mA	2 mA
Switching frequency						
• with resistive load, max.	10 Hz	25 Hz	100 Hz	10 Hz	10 Hz	10 Hz
• with inductive load, max.	0.5 Hz	0.5 Hz	0.5 Hz	0.5 Hz	0.5 Hz	0.5 Hz
• on lamp load, max.	0.5 Hz	10 Hz	10 Hz	1 Hz	1 Hz	1 Hz

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Technical specifications (continued)

Article number	**6ES7322-5GH00-0AB0**	**6ES7322-1CF00-0AA0**	**6ES7322-1BF01-0AA0**	**6ES7322-1FF01-0AA0**	**6ES7322-5FF00-0AB0**	**6ES7322-1FH00-0AA0**
	SM322, 16DQ, AC/DC24-48V, 0.5A	SM322, 8DQ, 48-125V DC, 1,5A	SM322, 8DQ, 24V DC, 2A	SM322, 8DQ, 120/230V AC, 1A	SM322, 8DQ, AC120/230V, 2A	SM322, 16DQ, 120/230V AC, 1A
Total current of the outputs (per group)						
horizontal installation						
- up to 40 °C, max.	0.5 A; 8 A per module	6 A	4 A	4 A	8 A	4 A
- up to 60 °C, max.	0.5 A; 8 A per module	3 A	4 A	2 A	4 A	2 A
vertical installation						
- up to 40 °C, max.	0.5 A; 8 A per module	4 A	4 A	2 A	4 A	2 A
Cable length						
• shielded, max.	1 000 m	1 000 m	1 000 m	1 000 m	1 000 m	1 000 m
• unshielded, max.	600 m	600 m	600 m	600 m	600 m	600 m
Interrupts/diagnostics/ status information						
Diagnostics function	Yes; Parameterizable	No	No	Yes; Fuse blown or load voltage missing	Yes; Parameterizable	Yes; Fuse blown or load voltage missing
Alarms						
• Diagnostic alarm	Yes; Parameterizable	No	No	No	Yes; Parameterizable	No
Potential separation						
Potential separation digital outputs						
• between the channels	Yes	Yes	Yes	Yes	Yes	
• between the channels, in groups of	1	4	4	4	1	8
• between the channels and backplane bus	Yes; Optocoupler	Yes; Optocoupler	Yes; Optocoupler	Yes; Optocoupler	Yes; Optocoupler	Yes; Optocoupler
Connection method						
required front connector	40-pin	20-pin	20-pin	20-pin	40-pin	20-pin
Dimensions						
Width	40 mm	40 mm	40 mm	40 mm	40 mm	40 mm
Height	125 mm	125 mm	125 mm	125 mm	125 mm	125 mm
Depth	120 mm	120 mm	120 mm	120 mm	120 mm	120 mm
Weights						
Weight, approx.	260 g	250 g	190 g	275 g	275 g	275 g

Article number	**6ES7322-1FL00-0AA0**	**6ES7322-1HF01-0AA0**	**6ES7322-1HF10-0AA0**	**6ES7322-5HF00-0AB0**	**6ES7322-1HH01-0AA0**
	SM322, 32DQ, 120/230V AC, 1A	SM322, 8DQ, 24V DC/2A or 230V AC/2A	SM322, 8DQ, 24V DC/5A OR 230V AC/5A	SM322, 8DQ Relay, 24VDC, 120-230V AC, 5A	SM322, 16DQ Relay
General information					
Product type designation	SM 322, DQ 32x120/230 V AC/1 A	SM 322, DQ 8x relay 24 V DC/ 230 V AC/2 A	SM 322, DQ 8x relay 24 V DC/ 230 V AC/5 A	SM 322, DQ 8x relay 24 V DC/ 230 V AC/5 A	SM 322, DQ 16xrelay 24 V DC/ 120/230 V AC/8 A
Supply voltage					
Load voltage L+					
• Rated value (DC)		24 V	120 V	24 V	120 V
Load voltage L1					
• Rated value (AC)	120 V; 120/230 V AC		230 V	230 V	230 V
Input current					
from supply voltage L+, max.		160 mA	125 mA	160 mA	250 mA
from load voltage L1 (without load), max.	10 mA				
from backplane bus 5 V DC, max.	190 mA	40 mA	40 mA	100 mA	100 mA
Power loss					
Power loss, typ.	25 W	3.2 W	3.2 W	3.5 W	4.5 W

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Technical specifications (continued)

Article number	6ES7322-1FL00-0AA0	6ES7322-1HF01-0AA0	6ES7322-1HF10-0AA0	6ES7322-5HF00-0AB0	6ES7322-1HH01-0AA0
	SM322, 32DQ, 120/230V AC, 1A	SM322, 8DQ, 24V DC/2A or 230V AC/2A	SM322, 8DQ, 24V DC/5A OR 230V AC/5A	SM322, 8DQ Relay, 24VDC, 120-230V AC, 5A	SM322, 16DQ Relay
Digital outputs					
Number of digital outputs	32	8; Relays	8; Relays	8; Relays	16; Relays
Switching capacity of the outputs					
• on lamp load, max.	50 W	50 W	1 500 W; 230 V AC	1 500 W; 230 V AC	50 W; 230 V AC
Output voltage					
• for signal "1", min.	L1 (-0.8 V)				
Output current					
• for signal "1" rated value	1 A	2 A	5 A	5 A	2 A
• for signal "1" permissible range for 0 to 40 °C, min.	10 mA				
• for signal "1" permissible range for 0 to 40 °C, max.	1 A				
• for signal "1" permissible range for 40 to 60 °C, min.	10 mA				
• for signal "1" permissible range for 40 to 60 °C, max.	1 A				
• for signal "1" minimum load current	10 mA	5 mA	5 mA	10 mA	10 mA
• for signal "1" permissible surge current, max.	10 A; per group (for 2 AC cycles)				
• for signal "0" residual current, max.	2 mA				
Switching frequency					
• with resistive load, max.	10 Hz	2 Hz	2 Hz	2 Hz	1 Hz
• with inductive load, max.	0.5 Hz	0.5 Hz	0.5 Hz	0.5 Hz	0.5 Hz
• on lamp load, max.	1 Hz	2 Hz	2 Hz	2 Hz	1 Hz
• mechanical, max.		10 Hz	10 Hz	10 Hz	10 Hz
Total current of the outputs (per group)					
horizontal installation					
- up to 40 °C, max.	4 A				
- up to 60 °C, max.	3 A		5 A	5 A	8 A
vertical installation					
- up to 40 °C, max.	4 A		5 A	5 A	8 A
Relay outputs					
• Rated supply voltage of relay coil L+ (DC)		24 V; 110 mA	24 V		24 V
• Number of operating cycles, max.		300 000; 230 V AC: 100 000; 120 V AC: 200 000; 24 V DC: 300 000 (at 2 A)	300 000; 300 000 (24 V DC, at 2 A); 200 000 (120 V AC, at 3 A); 100 000 (230 V AC, at 3 A)	100 000; 100 000 (24 V DC, at 5 A), 100 000 (230 V AC, at 5 A)	100 000; 50 000 (24 V DC, at 2 A); 700 000 (120 V AC, at 2 A); 100 000 (230 V AC, at 2 A)
Switching capacity of contacts					
- with inductive load, max.		2 A; 2 A (230 V AC), 2 A (24 V DC)	3 A; 3 A (230 V DC), 2 A (24 V AC)	5 A; 5 A (230 V DC), 5 A (24 V AC)	2 A; 2 A (230 V AC), 2 A (24 V DC)
- with resistive load, max.		2 A	8 A; 8 A (230 V DC), 5 A (24 V AC)	5 A; 5 A (230 V DC), 5 A (24 V AC)	2 A; 2 A (230 V AC), 2 A (24 V DC)
Cable length					
• shielded, max.	1 000 m	1 000 m	1 000 m	1 000 m	1 000 m
• unshielded, max.	600 m	600 m	600 m	600 m	600 m
Interrupts/diagnostics/ status information					
Diagnostics function	Yes; Fuse blown or load voltage missing	No	No	Yes; Parameterizable	No
Alarms					
• Diagnostic alarm	No	No	No	Yes; Parameterizable	No

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Technical specifications (continued)

Article number	6ES7322-1FL00-0AA0	6ES7322-1HF01-0AA0	6ES7322-1HF10-0AA0	6ES7322-5HF00-0AB0	6ES7322-1HH01-0AA0
	SM322, 32DQ, 120/230V AC, 1A	SM322, 8DQ, 24V DC/2A or 230V AC/2A	SM322, 8DQ, 24V DC/5A OR 230V AC/5A	SM322, 8DQ Relay, 24VDC, 120-230V AC, 5A	SM322, 16DQ Relay
Potential separation					
Potential separation digital outputs					
• between the channels	Yes	Yes	Yes	Yes	Yes
• between the channels, in groups of	8	2	1	1	8
• between the channels and backplane bus	Yes; Optocoupler	Yes; Optocoupler	Yes; Optocoupler	Yes; Optocoupler	Yes; Optocoupler
Connection method					
required front connector	20-pin	20-pin	40-pin	40-pin	20-pin
Dimensions					
Width	80 mm	40 mm	40 mm	40 mm	40 mm
Height	125 mm	125 mm	125 mm	125 mm	125 mm
Depth	117 mm	120 mm	120 mm	120 mm	120 mm
Weights					
Weight, approx.	500 g	190 g	320 g	320 g	250 g

Ordering data

	Article No.
SM 322 digital output modules	
incl. labeling strips, bus connector	
8 outputs, 24 V DC, 2 A	**6ES7322-1BF01-0AA0**
16 outputs, 24 V DC, 0.5 A	**6ES7322-1BH01-0AA0**
16 outputs, 24 V DC, 0.5 A, high speed	**6ES7322-1BH10-0AA0**
32 outputs, 24 V DC, 0.5 A	**6ES7322-1BL00-0AA0**
64 outputs, 24 V DC, 0.3 A	**6ES7322-1BP00-0AA0**
Note: 6ES7392-4...0-0AA0 connection cable and 6ES7392-1.N00-0AA0 terminal blocks necessary.	
64 outputs, 24 V DC, 0.3 A, sink output	**6ES7322-1BP50-0AA0**
Note: 6ES7392-4...0-0AA0 connection cable and 6ES7392-1.N00-0AA0 terminal blocks necessary.	
8 outputs, 24 V DC, 0.5 A, diagnostics-capable	**6ES7322-8BF00-0AB0**
16 outputs, 24/48 V DC, 0.5 A	**6ES7322-5GH00-0AB0**
8 outputs, 48 to 125 V DC, 1.5 A	**6ES7322-1CF00-0AA0**
8 outputs, 120/230 V AC, 1 A	**6ES7322-1FF01-0AA0**
8 outputs, 120/230 V AC, 2 A	**6ES7322-5FF00-0AB0**
16 outputs, 120/230 V AC, 1 A	**6ES7322-1FH00-0AA0**
32 outputs, 120 V AC, 1 A	**6ES7322-1FL00-0AA0**
8 outputs, relay contacts, 2 A	**6ES7322-1HF01-0AA0**
8 outputs, relay contacts, 5 A	**6ES7322-1HF10-0AA0**
8 outputs, relay contacts, 5 A, with RC filter, overvoltage protection	**6ES7322-5HF00-0AB0**
16 outputs, relay contacts, 8 A	**6ES7322-1HH01-0AA0**

	Article No.
Front connector	
20-pin, with screw contacts	
• 1 unit	**6ES7392-1AJ00-0AA0**
• 100 units	**6ES7392-1AJ00-1AB0**
20-pin, with spring-loaded contacts	
• 1 unit	**6ES7392-1BJ00-0AA0**
• 100 units	**6ES7392-1BJ00-1AB0**
40-pin, with screw contacts	
• 1 unit	**6ES7392-1AM00-0AA0**
• 100 units	**6ES7392-1AM00-1AB0**
40-pin, with spring-loaded contacts	
• 1 unit	**6ES7392-1BM01-0AA0**
• 100 units	**6ES7392-1BM01-1AB0**
S7-300 connecting cable	
For 64-channel modules; 2 units	
1 m	**6ES7392-4BB00-0AA0**
2.5 m	**6ES7392-4BC50-0AA0**
5 m	**6ES7392-4BF00-0AA0**
Terminal block	
For 64-channel modules; 2 units	
With screw contacts	**6ES7392-1AN00-0AA0**
With spring-loaded contacts	**6ES7392-1BN00-0AA0**
Front door, elevated design	**6ES7328-0AA00-7AA0**
e.g. for 32-channel modules; for connecting 1.3 mm^2/16 AWG conductors	

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SM 322 digital output modules

Ordering data	Article No.
SIMATIC TOP connect	see page 5/251
Bus connectors	**6ES7390-0AA00-0AA0**
1 unit (spare part)	
Set of fuses for SM 322	
10 fuses 8 A quick-response, 2 fuse holders; for 6ES7 322-1FF01-0AA0, 6ES7 322-1FH00-0AA0	**6ES7973-1HD00-0AA0**
10 fuses 6.3 A; for 6ES7 322-1CF00-0AA0	**6ES7973-1GC00-0AA0**
Labeling strips	
10 units (spare part)	
for modules with 20-pin front connector	**6ES7392-2XX00-0AA0**
for modules with 40-pin front connector	**6ES7392-2XX10-0AA0**
Label cover	
10 units (spare part)	
for modules with 20-pin front connector	**6ES7392-2XY00-0AA0**
for modules with 40-pin front connector	**6ES7392-2XY10-0AA0**

	Article No.
Labeling sheets for machine inscription	
for modules with 20-pin front connector, DIN A4, for printing with laser printer; 10 units	
Petrol	**6ES7392-2AX00-0AA0**
Light beige	**6ES7392-2BX00-0AA0**
Yellow	**6ES7392-2CX00-0AA0**
Red	**6ES7392-2DX00-0AA0**
for modules with 40-pin front connector, DIN A4, for printing with laser printer; 10 units	
Petrol	**6ES7392-2AX10-0AA0**
Light beige	**6ES7392-2BX10-0AA0**
Yellow	**6ES7392-2CX10-0AA0**
Red	**6ES7392-2DX10-0AA0**
SIMATIC Manual Collection	**6ES7998-8XC01-8YE0**
Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC Distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	
SIMATIC Manual Collection update service for 1 year	**6ES7998-8XC01-8YE2**
Current "Manual Collection" DVD and the three subsequent updates	

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Overview



- Digital inputs and outputs
- For connection of switches, 2-wire proximity switches (BEROs), solenoid valves, contactors, low-power motors, lamps and motor starters

Technical specifications

Article number	**6ES7323-1BH01-0AA0** SM323, 8DI/8DQ, DC24V, 0.5A	**6ES7323-1BL00-0AA0** SM323, 16DI/DQ, DC24V, 0.5A	**6ES7327-1BH00-0AB0** SM327, 8DI/8DX, DC24V, 0.5A
Supply voltage			
Load voltage L+			
• Rated value (DC)	24 V	24 V	24 V
Input current			
from load voltage L+ (without load), max.	40 mA	80 mA	20 mA
from backplane bus 5 V DC, max.	40 mA	80 mA	60 mA
Power loss			
Power loss, typ.	3.5 W	6.5 W	3 W
Digital inputs			
Number of digital inputs	8	16	8; 8 hard-wired, 8 others individually parameterizable
Input characteristic curve in accordance with IEC 61131, type 1	Yes	Yes	Yes
Number of simultaneously controllable inputs			
horizontal installation			
- up to 60 °C, max.	8	8	16
vertical installation			
- up to 40 °C, max.	8	16	16
Input voltage			
• Type of input voltage	DC	DC	DC
• Rated value (DC)	24 V	24 V	24 V
• for signal "0"	-30 to +5V	-30 to +5V	-30 to +5V
• for signal "1"	13 to 30V	13 to 30V	+15 to +30V
Input current			
• for signal "1", typ.	7 mA	7 mA	6 mA
Input delay (for rated value of input voltage)			
for standard inputs			
- at "0" to "1", min.	1.2 ms	1.2 ms	1.2 ms
- at "0" to "1", max.	4.8 ms	4.8 ms	4.8 ms
Cable length			
• shielded, max.	1 000 m	1 000 m	1 000 m
• unshielded, max.	600 m	600 m	600 m

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Technical specifications (continued)

Article number	**6ES7323-1BH01-0AA0** SM323, 8DI/8DQ, DC24V, 0.5A	**6ES7323-1BL00-0AA0** SM323, 16DI/DQ, DC24V, 0.5A	**6ES7327-1BH00-0AB0** SM327, 8DI/8DX, DC24V, 0.5A
Digital outputs			
Number of digital outputs	8	16	8; can also be parameterized individually as DI
Short-circuit protection	Yes	Yes	Yes
• Response threshold, typ.	1 A	1 A	1 A
Limitation of inductive shutdown voltage to	L+ (-53 V)	L+ (-48 V)	L+ (-54 V)
Controlling a digital input	Yes	Yes	Yes
Switching capacity of the outputs			
• on lamp load, max.	5 W	5 W	5 W
Load resistance range			
• lower limit	48 Ω	48 Ω	48 Ω
• upper limit	4 kΩ	4 kΩ	4 kΩ
Output voltage			
• for signal "1", min.	L+ (-0.8 V)	L+ (-0.8 V)	L+ (-1.5 V)
Output current			
• for signal "1" rated value	0.5 A	0.5 A	0.5 A
• for signal "1" permissible range, min.	5 mA	5 mA	5 mA
• for signal "1" permissible range, max.	0.6 A	0.6 A	0.6 A
• for signal "1" minimum load current	5 mA	5 mA	
• for signal "0" residual current, max.	0.5 mA	0.5 mA	0.5 mA
Output delay with resistive load			
• "0" to "1", max.	100 µs	100 µs	350 µs
• "1" to "0", max.	500 µs	500 µs	500 µs
Parallel switching of two outputs			
• for uprating	No	No	No
• for redundant control of a load	Yes; only outputs of the same group	Yes; only outputs of the same group	Yes; only outputs of the same group
Switching frequency			
• with resistive load, max.	100 Hz	100 Hz	100 Hz
• with inductive load, max.	0.5 Hz	0.5 Hz	0.5 Hz
• on lamp load, max.	10 Hz	100 Hz	10 Hz
Total current of the outputs (per group)			
horizontal installation			
- up to 40 °C, max.	4 A	4 A	4 A
- up to 60 °C, max.	4 A	3 A	3 A
vertical installation			
- up to 40 °C, max.	4 A	2 A	2 A
Cable length			
• shielded, max.	1 000 m	1 000 m	1 000 m
• unshielded, max.	600 m	600 m	600 m
Encoder			
Connectable encoders			
• 2-wire sensor	Yes	Yes	Yes
- permissible quiescent current (2-wire sensor), max.	2 mA	1.5 mA	1.5 mA

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Technical specifications (continued)

Article number	**6ES7323-1BH01-0AA0** SM323, 8DI/8DQ, DC24V, 0.5A	**6ES7323-1BL00-0AA0** SM323, 16DI/DQ, DC24V, 0.5A	**6ES7327-1BH00-0AB0** SM327, 8DI/8DX, DC24V, 0.5A
Isochronous mode			
Isochronous operation (application synchronized up to terminal)	No	No	No
Interrupts/diagnostics/ status information			
Alarms	No	No	No
Diagnostics function	No	No	No
Diagnostics indication LED			
• Status indicator digital input (green)	Yes	Yes	Yes
• Status indicator digital output (green)	Yes	Yes	Yes
Potential separation			
Potential separation digital inputs			
• between the channels	Yes	Yes	No
• between the channels, in groups of	8	16	
• between the channels and backplane bus	Yes; Optocoupler	Yes; Optocoupler	Yes; Optocoupler
Potential separation digital outputs			
• between the channels	Yes	Yes	No
• between the channels, in groups of	8	8	
• between the channels and backplane bus	Yes; Optocoupler	Yes; Optocoupler	Yes; Optocoupler
Connection method			
required front connector	20-pin	40-pin	20-pin
Dimensions			
Width	40 mm	40 mm	40 mm
Height	125 mm	125 mm	125 mm
Depth	120 mm	120 mm	120 mm
Weights			
Weight, approx.	220 g	260 g	200 g

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SM 323/SM 327 digital input/output modules

Ordering data	Article No.
SM 323 digital input/output modules	
incl. labeling strips, bus connector	
8 inputs, 8 outputs	**6ES7323-1BH01-0AA0**
16 inputs, 16 outputs	**6ES7323-1BL00-0AA0**
SM 327 digital input/output modules	
incl. labeling strips, bus connector	
8 inputs, 8 inputs or outputs (can be configured)	**6ES7327-1BH00-0AB0**
Front connector	
20-pin, with screw contacts	
• 1 unit	**6ES7392-1AJ00-0AA0**
• 100 units	**6ES7392-1AJ00-1AB0**
20-pin, with spring-loaded contacts	
• 1 unit	**6ES7392-1BJ00-0AA0**
• 100 units	**6ES7392-1BJ00-1AB0**
40-pin, with screw contacts	
• 1 unit	**6ES7392-1AM00-0AA0**
• 100 units	**6ES7392-1AM00-1AB0**
40-pin, with spring-loaded contacts	
• 1 unit	**6ES7392-1BM01-0AA0**
• 100 units	**6ES7392-1BM01-1AB0**
Front door, elevated design	**6ES7328-0AA00-7AA0**
e.g. for 32 channel modules; enables connection of 1.3 mm^2/16 AWG wires	
SIMATIC TOP connect	see page 5/251
Bus connectors	**6ES7390-0AA00-0AA0**
1 unit (spare part)	
Labeling strips	
10 units (spare part)	
for modules with 20-pin front connector	**6ES7392-2XX00-0AA0**
for modules with 40-pin front connector	**6ES7392-2XX10-0AA0**
Label cover	
10 units (spare part)	
for modules with 20-pin front connector	**6ES7392-2XY00-0AA0**
for modules with 40-pin front connector	**6ES7392-2XY10-0AA0**

	Article No.
Labeling sheets for machine inscription	
for modules with 20-pin front connector, DIN A4, for printing with laser printer; 10 units	
Petrol	**6ES7392-2AX00-0AA0**
Light beige	**6ES7392-2BX00-0AA0**
Yellow	**6ES7392-2CX00-0AA0**
Red	**6ES7392-2DX00-0AA0**
for modules with 40-pin front connector, DIN A4, for printing with laser printer; 10 units	
Petrol	**6ES7392-2AX10-0AA0**
Light beige	**6ES7392-2BX10-0AA0**
Yellow	**6ES7392-2CX10-0AA0**
Red	**6ES7392-2DX10-0AA0**
SIMATIC Manual Collection	**6ES7998-8XC01-8YE0**
Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC Distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	
SIMATIC Manual Collection update service for 1 year	**6ES7998-8XC01-8YE2**
Current "Manual Collection" DVD and the three subsequent updates	

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Overview



- Digital inputs
- For connection of switches and 2-wire proximity switches (BEROs)

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

Technical specifications

Article number	**6AG1321-1BH02-2AA0**	**6AG1321-1BL00-2AA0**	**6AG1321-1CH20-2AA0**	**6AG1321-1FF01-2AA0**	**6AG1321-1FF10-7AA0**
Based on	**6ES7321-1BH02-0AA0**	**6ES7321-1BL00-0AA0**	**6ES7321-1CH20-0AA0**	**6ES7321-1FF01-0AA0**	**6ES7321-1FF10-0AA0**
	SIPLUS SM321 16DI/24VDC	SIPLUS SM321 32DI/24VDC	SIPLUS SM 321 16DI/ DC 48-125 V	SIPLUS S7-300 SM321 8DI/120/230VAC	SIPLUS S7-300 SM321 8 DI
Ambient conditions					
Ambient temperature during operation					
• min.	-40 °C; = Tmin	-40 °C; = Tmin	-25 °C	-40 °C; = Tmin	-25 °C
• max.	70 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use	70 °C; = Tmax; for use on railway vehicles according to EN50155, the rated temperature range -25 ... +55 °C (T1) or 60 °C @ UL/ULhaz/ ATEX/FM use applies	70 °C; = Tmax; for use on railway vehicles according to EN50155, the rated temperature range -25 ... +55 °C (T1) or 60 °C @ UL/ULhaz/ ATEX/FM use applies	70 °C; = Tmax; for use on railway vehicles according to EN50155, the rated temperature range -25 ... +55 °C (T1) or 60 °C @ UL/ULhaz/ ATEX/FM use applies	70 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use
Ambient temperature during storage/transportation					
• min.	-40 °C	-40 °C	-40 °C	-40 °C	-40 °C
• max.	70 °C	70 °C	70 °C	70 °C	70 °C
Altitude during operation relating to sea level					
• Installation altitude above sea level, max.	5 000 m	5 000 m	2 000 m	2 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity					
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)

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Technical specifications (continued)

Article number	**6AG1321-1BH02-2AA0**	**6AG1321-1BL00-2AA0**	**6AG1321-1CH20-2AA0**	**6AG1321-1FF01-2AA0**	**6AG1321-1FF10-7AA0**
Based on	**6ES7321-1BH02-0AA0**	**6ES7321-1BL00-0AA0**	**6ES7321-1CH20-0AA0**	**6ES7321-1FF01-0AA0**	**6ES7321-1FF10-0AA0**
	SIPLUS SM321 16DI/24VDC	SIPLUS SM321 32DI/24VDC	SIPLUS SM 321 16DI/ DC 48-125 V	SIPLUS S7-300 SM321 8DI/120/230VAC	SIPLUS S7-300 SM321 8 DI
Resistance					
Use in stationary industrial systems					
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
Use on land craft, rail vehicles and special-purpose vehicles					
- to biologically active substances according to EN 60721-3-5	Yes; Class 5B2 mold, fungus and dry rot spores (with the exception of fauna); Class 5B3 on request	Yes; Class 5B2 mold, fungus and dry rot spores (with the exception of fauna); Class 5B3 on request	Yes; Class 5B2 mold, fungus and dry rot spores (with the exception of fauna); Class 5B3 on request		
- to chemically active substances according to EN 60721-3-5	Yes; Class 5C3 (RH < 75 %) incl. salt spray acc. to EN 50155 (ST2); *	Yes; Class 5C3 (RH < 75 %) incl. salt spray acc. to EN 50155 (ST2); *	Yes; Class 5C3 (RH < 75 %) incl. salt spray acc. to EN 50155 (ST2); *		
- to mechanically active substances according to EN 60721-3-5	Yes; Class 5S3 incl. sand, dust; *	Yes; Class 5S3 incl. sand, dust; *	Yes; Class 5S3 incl. sand, dust; *		
Use on ships/at sea					
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Remark					
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!

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Technical specifications (continued)

Article number	**6AG1321-1FH00-7AA0** **6ES7321-1FH00-0AA0** SIPLUS S7-300 SM321 16DI	**6AG1321-7BH01-2AB0** **6ES7321-7BH01-0AB0** SIPLUS SM321 16DI/24VDC	**6AG1321-7TH00-4AB0** **6ES7321-7TH00-0AB0** SIPLUS PCS 7 SM321 16DI
Ambient conditions			
Ambient temperature during operation			
• min.	-40 °C; = Tmin	-25 °C	0 °C
• max.	70 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use	70 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use	60 °C
• At cold restart, min.			0 °C
Ambient temperature during storage/transportation			
• min.	-40 °C	-40 °C	-40 °C
• max.	70 °C	70 °C	70 °C
Altitude during operation relating to sea level			
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m

• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at
	1 140 hPa ... 795 hPa
	(-1 000 m ... +2 000 m) //
	Tmin ... (Tmax - 10 K) at
	795 hPa ... 658 hPa
	(+2 000 m ... +3 500 m) //
	Tmin ... (Tmax -20 K) at
	658 hPa ... 540 hPa
	(+3 500 m ... +5 000 m)
		Tmin ... Tmax at
		1 140 hPa ... 795 hPa
		(-1 000 m ... +2 000 m) //
		Tmin ... (Tmax - 10 K) at
		795 hPa ... 658 hPa
		(+2 000 m ... +3 500 m) //
		Tmin ... (Tmax -20 K) at
		658 hPa ... 540 hPa
		(+3 500 m ... +5 000 m)
			Tmin ... Tmax at
			1 140 hPa ... 795 hPa
			(-1 000 m ... +2 000 m) //
			Tmin ... (Tmax - 10 K) at
			795 hPa ... 658 hPa
			(+2 000 m ... +3 500 m) //
			Tmin ... (Tmax -20 K) at
			658 hPa ... 540 hPa
			(+3 500 m ... +5 000 m)

Relative humidity			
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance			
Use in stationary industrial systems			
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
Use on land craft, rail vehicles and special-purpose vehicles			
- to biologically active substances according to EN 60721-3-5		Yes; Class 5B2 mold, fungus and dry rot spores (with the exception of fauna); Class 5B3 on request	
- to chemically active substances according to EN 60721-3-5		Yes; Class 5C3 (RH < 75 %) incl. salt spray acc. to EN 50155 (ST2); *	
- to mechanically active substances according to EN 60721-3-5		Yes; Class 5S3 incl. sand, dust; *	
Use on ships/at sea			
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Remark			
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!

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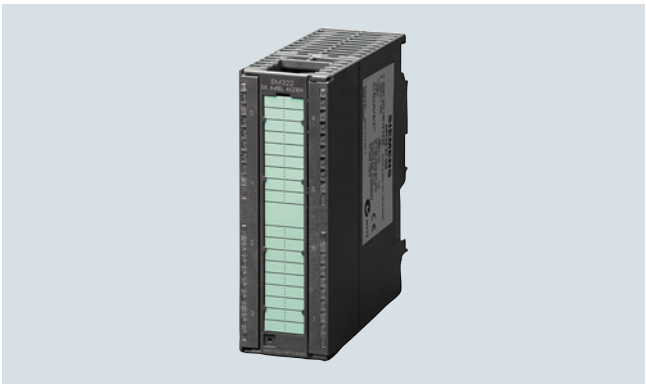
SIPLUS S7-300 SM 321

Ordering data	Article No.
SIPLUS S7-300 SM 321 digital input modules	
For industrial applications with extended ambient conditions	
Extended temperature range and exposure to media	
16 inputs, 24 V DC	**6AG1321-1BH02-2AA0**
32 inputs, 24 V DC	**6AG1321-1BL00-2AA0**
16 inputs, 48 to 120 V DC	**6AG1321-1CH20-2AA0**
8 inputs, 120/230 V AC	**6AG1321-1FF01-2AA0**
8 inputs, 120/230 V AC, single root	**6AG1321-1FF10-7AA0**
16 inputs, 120/230 V AC	**6AG1321-1FH00-7AA0**
16 inputs, 24 V DC, diagnostics-capable	**6AG1321-7BH01-2AB0**
Exposure to media	
16 inputs, NAMUR, redundant design possible	**6AG1321-7TH00-4AB0**
For rolling stock railway applications	
Conforms to EN 50155	
16 inputs, 24 V DC	**6AG1321-1BH02-2AA0**
32 inputs, 24 V DC	**6AG1321-1BL00-2AA0**
16 inputs, 48 to 120 V DC	**6AG1321-1CH20-2AA0**
8 inputs, 120/230 V AC	**6AG1321-1FF01-2AA0**
16 inputs, 24 V DC, diagnostics-capable	**6AG1321-7BH01-2AB0**
Accessories	
Mandatory	
Front connector	
20-pin, with spring-loaded contacts	
• 1 unit	**6ES7392-1BJ00-0AA0**
• 100 units	**6ES7392-1BJ00-1AB0**
40-pin, with spring-loaded contacts	
• 1 unit	**6ES7392-1BM01-0AA0**
• 100 units	**6ES7392-1BM01-1AB0**

	Article No.
Consumables	
Front door, elevated design	**6ES7328-0AA00-7AA0**
E.g. for 32-channel modules; for connecting 1.3 mm^2/16 AWG conductors; circuit diagram and nameplates in petrol	
Bus connectors	**6ES7390-0AA00-0AA0**
1 unit (spare part)	
Labeling strips	
10 units; spare part	
For modules with 20-pin front connector	**6ES7392-2XX00-0AA0**
For modules with 40-pin front connector	**6ES7392-2XX10-0AA0**
Label cover	
10 units; spare part	
For modules with 20-pin front connector	**6ES7392-2XY00-0AA0**
For modules with 40-pin front connector	**6ES7392-2XY10-0AA0**
Documentation	
SIMATIC Manual Collection	**6ES7998-8XC01-8YE0**
Electronic manuals on DVD, multi-language: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC Distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	
SIMATIC Manual Collection update service for 1 year	**6ES7998-8XC01-8YE2**
Current "Manual Collection" DVD and the three subsequent updates	

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Overview



- Digital outputs
- For connecting solenoid valves, contactors, small-power motors, lamps and motor starters

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

Technical specifications

Article number	**6AG1322-1BF01-2XB0**	**6AG1322-8BF00-2AB0**	**6AG1322-1BH01-2AA0**	**6AG1322-1BL00-2AA0**
Based on	**6ES7322-1BF01-0XB0**	**6ES7322-8BF00-0AB0**	**6ES7322-1BH01-0AA0**	**6ES7322-1BL00-0AA0**
	SIPLUS S7-300 SM322 8DQ/24VDC 2A	SIPLUS SM322 8DQ/24VDC	SIPLUS S7-300 SM322 16DQ/24VDC 0.5A	SIPLUS S7-300 SM322 32DQ/24VDC 0.5A
Ambient conditions				
Ambient temperature during operation				
• min.	-25 °C	-25 °C; = Tmin	-25 °C	-25 °C; = Tmin
• max.	70 °C; = Tmax; 60 °C @ UL/cUL use	70 °C; = Tmax; 60 °C @ UL/cUL use	70 °C; = Tmax; for use on railway vehicles according to EN50155, the rated temperature range -25 ... +55 °C (T1) or 60 °C @ UL/ULhaz/ATEX/FM use applies	70 °C; = Tmax; for use on railway vehicles according to EN50155, the rated temperature range -25 ... +55 °C (T1) or 60 °C @ UL/ULhaz/ATEX/FM use applies
Ambient temperature during storage/transportation				
• min.	-40 °C		-40 °C	-40 °C
• max.	70 °C		70 °C	70 °C
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity				
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)

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Technical specifications (continued)

Article number	6AG1322-1BF01-2XB0	6AG1322-8BF00-2AB0	6AG1322-1BH01-2AA0	6AG1322-1BL00-2AA0
Based on	6ES7322-1BF01-0XB0	6ES7322-8BF00-0AB0	6ES7322-1BH01-0AA0	6ES7322-1BL00-0AA0
	SIPLUS S7-300 SM322 8DQ/24VDC 2A	SIPLUS SM322 8DQ/24VDC	SIPLUS S7-300 SM322 16DQ/24VDC 0.5A	SIPLUS S7-300 SM322 32DQ/24VDC 0.5A
Resistance				
Use in stationary industrial systems				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
Use on land craft, rail vehicles and special-purpose vehicles				
- to biologically active substances according to EN 60721-3-5		Yes; Class 5B2 mold, fungus and dry rot spores (with the exception of fauna); Class 5B3 on request	Yes; Class 5B2 mold, fungus and dry rot spores (with the exception of fauna); Class 5B3 on request	Yes; Class 5B2 mold, fungus and dry rot spores (with the exception of fauna); Class 5B3 on request
- to chemically active substances according to EN 60721-3-5		Yes; Class 5C3 (RH < 75 %) incl. salt spray acc. to EN 50155 (ST2); *	Yes; Class 5C3 (RH < 75 %) incl. salt spray acc. to EN 50155 (ST2); *	Yes; Class 5C3 (RH < 75 %) incl. salt spray acc. to EN 50155 (ST2); *
- to mechanically active substances according to EN 60721-3-5		Yes; Class 5S3 incl. sand, dust; *	Yes; Class 5S3 incl. sand, dust; *	Yes; Class 5S3 incl. sand, dust; *
Use on ships/at sea				
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Remark				
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!

Article number	6AG1322-1CF00-7AA0	6AG1322-1HF10-2AA0	6AG1322-5HF00-4AB0	6AG1322-1FF01-7AA0
Based on	6ES7322-1CF00-0AA0	6ES7322-1HF10-0AA0	6ES7322-5HF00-0AB0	6ES7322-1FF01-0AA0
	SIPLUS SM322 8DQ/48-125VDC	SIPLUS SM322 8DQ - Relay	SIPLUS_SM322_8RO	SIPLUS S7-300 SM322 8DQ/120/230VAC
Ambient conditions				
Ambient temperature during operation				
• min.	-25 °C	-25 °C	0 °C; = Tmin	-40 °C
• max.	70 °C; = Tmax; for use on railway vehicles according to EN50155, the rated temperature range -25 ... +55 °C (T1) or 60 °C @ UL/ULhaz/ATEX/FM use applies	60 °C	60 °C; = Tmax	70 °C; = Tmax; for use on railway vehicles according to EN 50155, the rated temperature range -25 ... +55 °C (T1) or 60 °C @ UL/UL hazardous use applies
Ambient temperature during storage/transportation				
• min.	-40 °C	-40 °C	-40 °C	-40 °C
• max.	70 °C	70 °C	70 °C	70 °C
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.	2 000 m	2 000 m	2 000 m	2 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)
Relative humidity				
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)

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Technical specifications (continued)

Article number	**6AG1322-1CF00-7AA0**	**6AG1322-1HF10-2AA0**	**6AG1322-5HF00-4AB0**	**6AG1322-1FF01-7AA0**
Based on	**6ES7322-1CF00-0AA0**	**6ES7322-1HF10-0AA0**	**6ES7322-5HF00-0AB0**	**6ES7322-1FF01-0AA0**
	SIPLUS SM322 8DQ/48-125VDC	SIPLUS SM322 8DQ - Relay	SIPLUS_SM322_8RO	SIPLUS S7-300 SM322 8DQ/120/230VAC
Resistance				
Use in stationary industrial systems				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
Use on land craft, rail vehicles and special-purpose vehicles				
- to biologically active substances according to EN 60721-3-5		Yes; Class 5B2 mold, fungus and dry rot spores (with the exception of fauna); Class 5B3 on request		
- to chemically active substances according to EN 60721-3-5		Yes; Class 5C3 (RH < 75 %) incl. salt spray acc. to EN 50155 (ST2); *		
- to mechanically active substances according to EN 60721-3-5		Yes; Class 5S3 incl. sand, dust; *		
Use on ships/at sea				
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Remark				
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!

Article number	**6AG1322-5FF00-4AB0**	**6AG1322-1FH00-7AA0**	**6AG1322-1HH01-2AA0**
Based on	**6ES7322-5FF00-0AB0**	**6ES7322-1FH00-0AA0**	**6ES7322-1HH01-0AA0**
	SIPLUS S7-300 SM322 8DQ	SIPLUS S7-300 SM322 16DQ	SIPLUS SM322
Ambient conditions			
Ambient temperature during operation			
• min.	0 °C; = Tmin	-40 °C; = Tmin	-40 °C
• max.	60 °C; = Tmax	70 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use	70 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use
Ambient temperature during storage/transportation			
• min.	-40 °C	-40 °C	-40 °C
• max.	70 °C	70 °C	70 °C
Altitude during operation relating to sea level			
• Installation altitude above sea level, max.	5 000 m	5 000 m	2 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)

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Technical specifications (continued)

Article number	6AG1322-5FF00-4AB0	6AG1322-1FH00-7AA0	6AG1322-1HH01-2AA0
Based on	6ES7322-5FF00-0AB0	6ES7322-1FH00-0AA0	6ES7322-1HH01-0AA0
	SIPLUS S7-300 SM322 8DQ	SIPLUS S7-300 SM322 16DQ	SIPLUS SM322
Relative humidity			
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance			
Use in stationary industrial systems			
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
Use on land craft, rail vehicles and special-purpose vehicles			
- to biologically active substances according to EN 60721-3-5			Yes; Class 5B2 mold, fungus and dry rot spores (with the exception of fauna); Class 5B3 on request
- to chemically active substances according to EN 60721-3-5			Yes; Class 5C3 (RH < 75 %) incl. salt spray acc. to EN 50155 (ST2); *
- to mechanically active substances according to EN 60721-3-5			Yes; Class 5S3 incl. sand, dust; *
Use on ships/at sea			
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Remark			
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!

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Ordering data

	Article No.
SIPLUS S7-300 SM 322 digital output modules	
For industrial applications with extended ambient conditions	
Extended temperature range and exposure to media	
8 outputs, 24 V DC, 2 A	**6AG1322-1BF01-2XB0**
16 outputs, 24 V DC, 0.5 A	**6AG1322-1BH01-2AA0**
32 outputs, 24 V DC, 0.5 A	**6AG1322-1BL00-2AA0**
8 outputs, 48 to 125 V DC, 1.5 A	**6AG1322-1CF00-7AA0**
8 outputs, 120/230 V AC, 1 A	**6AG1322-1FF01-7AA0**
16 outputs, 120/230 V AC, 1 A	**6AG1322-1FH00-7AA0**
8 outputs, relay contacts, 5 A	**6AG1322-1HF10-2AA0**
16 outputs, relay contacts, 8 A	**6AG1322-1HH01-2AA0**
8 outputs, 24 V DC, 0.5 A, diagnostics-capable	**6AG1322-8BF00-2AB0**
Exposure to media	
8 outputs, 120/230 V AC, 2 A	**6AG1322-5FF00-4AB0**
8 outputs, relay contacts, 5 A, with RC filter, overvoltage protection	**6AG1322-5HF00-4AB0**
For rolling stock railway applications	
Conforms to EN 50155	
16 outputs, 24 V DC, 0.5 A, high speed	**6AG1322-1BH01-2AA0**
32 outputs, 24 V DC, 0.5 A	**6AG1322-1BL00-2AA0**
8 outputs, relay contacts, 5 A	**6AG1322-1HF10-2AA0**
16 outputs, relay contacts, 8 A	**6AG1322-1HH01-2AA0**
8 outputs, 24 V DC, 0.5 A, diagnostics-capable	**6AG1322-8BF00-2AB0**
Accessories	
Mandatory	
Front connector	
20-pin, with spring-loaded contacts	
• 1 unit	**6ES7392-1BJ00-0AA0**
• 100 units	**6ES7392-1BJ00-1AB0**
40-pin, with spring-loaded contacts	
• 1 unit	**6ES7392-1BM01-0AA0**
• 100 units	**6ES7392-1BM01-1AB0**
Consumables	
Front door, elevated design	**6ES7328-0AA00-7AA0**
E.g. for 32-channel modules; for connecting 1.3 mm^2/16 AWG conductors; circuit diagram and nameplates in petrol	
Bus connectors	**6ES7390-0AA00-0AA0**
1 unit (spare part)	
Labeling strips	
10 units; spare part	
For modules with 20-pin front connector	**6ES7392-2XX00-0AA0**
For modules with 40-pin front connector	**6ES7392-2XX10-0AA0**
Label cover	
10 units; spare part	
For modules with 20-pin front connector	**6ES7392-2XY00-0AA0**
For modules with 40-pin front connector	**6ES7392-2XY10-0AA0**
Documentation	
SIMATIC Manual Collection	**6ES7998-8XC01-8YE0**
Electronic manuals on DVD, multi-language: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC Distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	
SIMATIC Manual Collection update service for 1 year	**6ES7998-8XC01-8YE2**
Current "Manual Collection" DVD and the three subsequent updates	

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Overview



- Digital inputs and outputs
- For connection of switches, 2-wire proximity switches (BEROs), solenoid valves, contactors, low-power motors, lamps and motor starters

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

Technical specifications

Article number	**6AG1323-1BH01-2AA0**
Based on	**6ES7323-1BH01-0AA0**
	SIPLUS SM323 8DI/8DQ
Ambient conditions	
Ambient temperature during operation	
• min.	-40 °C; = Tmin
• max.	70 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m

• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at
	1 140 hPa ... 795 hPa
	(-1 000 m ... +2 000 m) //
	Tmin ... (Tmax - 10 K) at
	795 hPa ... 658 hPa
	(+2 000 m ... +3 500 m) //
	Tmin ... (Tmax -20 K) at
	658 hPa ... 540 hPa
	(+3 500 m ... +5 000 m)

Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance	
Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
Use on land craft, rail vehicles and special-purpose vehicles	
- to biologically active substances according to EN 60721-3-5	Yes; Class 5B2 mold, fungus and dry rot spores (with the exception of fauna); Class 5B3 on request
- to chemically active substances according to EN 60721-3-5	Yes; Class 5C3 (RH < 75 %) incl. salt spray acc. to EN 50155 (ST2); *
- to mechanically active substances according to EN 60721-3-5	Yes; Class 5S3 incl. sand, dust; *
Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
Remark	
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!

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Ordering data

	Article No.
SIPLUS S7-300 SM 323 digital input/output module	
For industrial applications with extended ambient conditions	
Extended temperature range and exposure to media	
8 inputs, 8 outputs	**6AG1323-1BH01-2AA0**
For rolling stock railway applications	
Conforms to EN 50155	
8 inputs, 8 outputs	**6AG1323-1BH01-2AA0**
Accessories	
Mandatory	
Front connector	
20-pin, with spring-loaded contacts	
• 1 unit	**6ES7392-1BJ00-0AA0**
• 100 units	**6ES7392-1BJ00-1AB0**
40-pin, with spring-loaded contacts	
• 1 unit	**6ES7392-1BM01-0AA0**
• 100 units	**6ES7392-1BM01-1AB0**
Consumables	
Front door, elevated design	**6ES7328-0AA00-7AA0**
E.g. for 32-channel modules; for connecting 1.3 mm^2/16 AWG conductors; circuit diagram and nameplates in petrol	
Bus connectors	**6ES7390-0AA00-0AA0**
1 unit (spare part)	

	Article No.
Labeling strips	
10 units; spare part	
For modules with 20-pin front connector	**6ES7392-2XX00-0AA0**
For modules with 40-pin front connector	**6ES7392-2XX10-0AA0**
Label cover	
10 units; spare part	
For modules with 20-pin front connector	**6ES7392-2XY00-0AA0**
For modules with 40-pin front connector	**6ES7392-2XY10-0AA0**
Documentation	
SIMATIC Manual Collection	**6ES7998-8XC01-8YE0**
Electronic manuals on DVD, multi-language: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC Distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	
SIMATIC Manual Collection update service for 1 year	**6ES7998-8XC01-8YE2**
Current "Manual Collection" DVD and the three subsequent updates	

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SM 331 analog input modules

Overview



- Analog inputs
- For connection of voltage and current sensors, thermocouples, resistors and resistance thermometers

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Technical specifications

Article number	**6ES7331-7KF02-0AB0** SM331, 8AI, 9/12/14Bit	**6ES7331-7HF01-0AB0** SM331, 8AI, 14BIT, 0,052MS/channel	**6ES7331-1KF02-0AB0** SM331, 8AI, 13bit	**6ES7331-7KB02-0AB0** SM331, 2AI, 9/12/14Bit
Supply voltage				
Load voltage L+				
• Rated value (DC)	24 V	24 V		24 V
Input current				
from load voltage L+ (without load), max.	30 mA	50 mA		30 mA
from backplane bus 5 V DC, max.	50 mA	100 mA	90 mA	50 mA
Power loss				
Power loss, typ.	1 W	1.5 W	0.4 W	1 W
Analog inputs				
Number of analog inputs	8	8	8	2
• For resistance measurement	4		8	1
permissible input voltage for voltage input (destruction limit), max.	20 V; continuous; 75 V for max. 1 s (mark to space ratio 1:20)	20 V; 20 V DC permanent, 75 V DC for max. 1 s (duty factor 1:20)	30 V; 12 V continuous, 30 V for max. 1 s	20 V; continuous; 75 V for max. 1 s (mark to space ratio 1:20)
permissible input current for current input (destruction limit), max.	40 mA	40 mA	40 mA	40 mA
Input ranges (rated values), voltages				
• 0 to +10 V	No	No	Yes	No
• 1 V to 5 V	Yes	Yes	Yes	Yes
• 1 V to 10 V	No		No	No
• -1 V to +1 V	Yes	Yes	Yes	Yes
• -10 V to +10 V	Yes	Yes	Yes	Yes
• -2.5 V to +2.5 V	Yes		No	Yes
• -250 mV to +250 mV	Yes		No	Yes
• -5 V to +5 V	Yes	Yes	Yes	Yes
• -50 mV to +50 mV	No		Yes	No
• -500 mV to +500 mV	Yes	Yes	Yes	Yes
• -80 mV to +80 mV	Yes	Yes	No	Yes
Input ranges (rated values), currents				
• 0 to 20 mA	Yes	Yes	Yes	Yes
• -10 mA to +10 mA	Yes		No	Yes
• -20 mA to +20 mA	Yes	Yes	Yes	Yes
• -3.2 mA to +3.2 mA	Yes		No	Yes
• 4 mA to 20 mA	Yes	Yes	Yes	Yes

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Technical specifications (continued)

Article number	**6ES7331-7KF02-0AB0** SM331, 8AI, 9/12/14Bit	**6ES7331-7HF01-0AB0** SM331, 8AI, 14BIT, 0,052MS/channel	**6ES7331-1KF02-0AB0** SM331, 8AI, 13bit	**6ES7331-7KB02-0AB0** SM331, 2AI, 9/12/14Bit
Input ranges (rated values), thermocouples				
• Type B	No		No	No
• Type C	No		No	
• Type E	Yes		No	Yes
• Type J	Yes		No	Yes
• Type K	Yes		No	Yes
• Type L	Yes		No	No
• Type N	Yes		No	Yes
• Type R	No		No	No
• Type S	No		No	No
• Type T	No		No	No
• Type U	No		No	No
• Type TXK/TXK(L) to GOST	No		No	No
Input ranges (rated values), resistance thermometer				
• Cu 10	No		No	No
• Ni 100	Yes; Standard		Yes; Standard/climate	Yes
• Ni 1000	No		Yes	No
• LG-Ni 1000	No		Yes; Standard/climate	No
• Ni 120	No		No	No
• Ni 200	No		No	No
• Ni 500	No		No	No
• Pt 100	Yes; Standard		Yes; Standard/climate	Yes
• Pt 1000	No		No	No
• Pt 200	No		No	No
• Pt 500	No		No	No
Input ranges (rated values), resistors				
• 0 to 150 ohms	Yes		No	Yes
• 0 to 300 ohms	Yes		No	Yes
• 0 to 600 ohms	Yes		Yes	Yes
• 0 to 6000 ohms	No		Yes	No
Thermocouple (TC)				
Temperature compensation				
- parameterizable	Yes		No	Yes
- internal temperature compensation	Yes		No	Yes
- external temperature compensation with compensations socket	Yes		No	Yes
- for definable comparison point temperature	Yes			Yes
Characteristic linearization				
• parameterizable	Yes		Yes	Yes
- for thermocouples	Type E, J, K, L, N		No	Type E, J, K, L, N
- for resistance thermometer	Pt100 (standard, climatic range), Ni100 (standard, climatic range)		yes; Pt100 standard/air con.; Ni100 standard/air con.; Ni1000 standard/air con.; LG-Ni1000 standard/air con.	Pt100 (standard, climatic range), Ni100 (standard, climatic range)
Cable length				
• shielded, max.	200 m; 50 m at 80 mV and thermocouples	200 m	200 m; max. 50 m at 50 mV	200 m; 50 m at 80 mV and thermocouples

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Technical specifications (continued)

Article number	6ES7331-7KF02-0AB0 SM331, 8AI, 9/12/14Bit	6ES7331-7HF01-0AB0 SM331, 8AI, 14BIT, 0,052MS/channel	6ES7331-1KF02-0AB0 SM331, 8AI, 13bit	6ES7331-7KB02-0AB0 SM331, 2AI, 9/12/14Bit
Analog value generation for the inputs				
Measurement principle	integrating	Actual value encryption	integrating	integrating
Integration and conversion time/ resolution per channel				
• Resolution with overrange (bit including sign), max.	15 bit; Unipolar: 9/12/12/14 bit; bipolar: 9 bit + sign/ 12 bit + sign/12 bit + sign/ 14 bit + sign	14 bit; Unipolar: 14 bit; bipolar: 13 bit + sign	13 bit	15 bit; Unipolar: 9/12/12/14 bit; bipolar: 9 bit + sign/ 12 bit + sign/12 bit + sign/ 14 bit + sign
• Integration time, parameterizable	Yes; 2,5 / 16,67 / 20 / 100 ms	Yes	Yes; 60 / 50 ms	Yes; 2,5 / 16,67 / 20 / 100 ms
• Basic conversion time (ms)	3 / 17 / 22 / 102 ms	52 µs per channel	66 / 55 ms	3 / 17 / 22 / 102 ms
• Interference voltage suppression for interference frequency f1 in Hz	400 / 60 / 50 / 10 Hz	none / 400 / 60 / 50 Hz	50 / 60 Hz	400 / 60 / 50 / 10 Hz
Encoder				
Connection of signal encoders				
• for current measurement as 2-wire transducer	Yes	Yes	Yes; with external supply	Yes
• for current measurement as 4-wire transducer	Yes	Yes	Yes	Yes
• for resistance measurement with two-wire connection	Yes		Yes	Yes
• for resistance measurement with three-wire connection	Yes		Yes	Yes
• for resistance measurement with four-wire connection	Yes		Yes	Yes
Errors/accuracies				
Operational error limit in overall temperature range				
• Voltage, relative to input range, (+/-)	1 %; ±1% (80 mV); ±0.6% (250 mV to 1 000 mV); ±0.8% (2.5 V to 10 V)	0.4 %	0.6 %; ±0.6 % (±5 V, 10 V, 1 to 5 V, 0 to 10 V); ±0.5 % (±50 mV, 500 mV, 1 V)	1 %; ±1% (80 mV); ±0.6% (250 mV to 1 000 mV); ±0.8% (2.5 V to 10 V)
• Current, relative to input range, (+/-)	0.7 %; From 3.2 to 20 mA	0.3 %	0.5 %; ±20 mA, 0 to 20 mA, 4 to 20 mA	0.7 %; From 3.2 to 20 mA
• Resistance, relative to input range, (+/-)	0.7 %; 150, 300, 600 Ohm		0.5 %; 0 to 6 kohms, 0 to 600 kohms	0.7 %; 150, 300, 600 Ohm
• Resistance thermometer, relative to input range, (+/-)	0.7 %; ±0.7 % (Pt100/ Ni100); ±0.8 % (Pt100 climate)		1 Kelvin (Pt100, Ni100, climatic; Ni1000, LG-Ni1000, standard; Ni1000, LG-Ni1000, climatic); 1.2 Kelvin (Pt100, Ni100, standard)	0.7 %; ±0.7 % (Pt100/ Ni100); ±0.8 % (Pt100 climate)
Basic error limit (operational limit at 25 °C)				
• Voltage, relative to input range, (+/-)	0.6 %; ±0.4 % (250 mV to 1 000 mV); ±0.6 % (2.5 mV to 10 mV); ±0.7 % (80 mV)	0.25 %	0.4 %; 0.4% (±5 V, 10 V, 1 to 5 V, 0 to 10 V); 0.3% (±50 mV, 500 mV, 1 V)	0.6 %; ±0.6% (80 mV, 2.5 V to 10 V); ±0.4% (250 mV to 1 000 mV)
• Current, relative to input range, (+/-)	0.5 %; 3.2 to 20 mA	0.2 %	0.3 %; ±20 mA, 0 to 20 mA, 4 to 20 mA	0.5 %; 3.2 to 20 mA
• Resistance, relative to input range, (+/-)	0.5 %; 150, 300, 600 Ohm		0.3 %; 0 to 6 kohms, 0 to 600 kohms	0.5 %; 150, 300, 600 Ohm
• Resistance thermometer, relative to input range, (+/-)	0.6 %; ±0.5% (Pt100/ Ni100), ±0.6% (Pt100 climate)		1 Kelvin (Pt100, Ni100, standard); 0.8 Kelvin (Pt100, Ni100, climatic; Ni1000, LG-Ni1000, standard; Ni1000, LG-Ni1000, climatic)	0.6 %; ±0.5% (Pt100/ Ni100), ±0.6% (Pt100 climate)
Interrupts/diagnostics/ status information				
Diagnostics function	Yes; Parameterizable	Yes	No	Yes; Parameterizable
Alarms				
• Diagnostic alarm	Yes; Parameterizable, channels 0 and 2	Yes; Parameterizable	No	Yes
• Limit value alarm	Yes; Parameterizable	Yes; Parameterizable, channels 0 and 2	No	Yes; Parameterizable, channel 0
Diagnostic messages				
• Diagnostic information readable	Yes	Yes	No	Yes

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Technical specifications (continued)

Article number	**6ES7331-7KF02-0AB0** SM331, 8AI, 9/12/14Bit	**6ES7331-7HF01-0AB0** SM331, 8AI, 14BIT, 0,052MS/channel	**6ES7331-1KF02-0AB0** SM331, 8AI, 13bit	**6ES7331-7KB02-0AB0** SM331, 2AI, 9/12/14Bit
Potential separation				
Potential separation analog inputs				
• between the channels and backplane bus	Yes	Yes	Yes	Yes
Connection method				
required front connector	20-pin	20-pin	40-pin	20-pin
Dimensions				
Width	40 mm	40 mm	40 mm	40 mm
Height	125 mm	125 mm	125 mm	125 mm
Depth	117 mm	117 mm	117 mm	120 mm
Weights				
Weight, approx.	250 g	230 g	250 g	250 g

Article number	**6ES7331-7PF01-0AB0** SM331, 8AI, resistor, PT100/200/1000, .	**6ES7331-7PF11-0AB0** SM331, 8AI, 16BIT, Thermocouples	**6ES7331-7PE10-0AB0** SM331, 6AI, 16bit, Thermocouples	**6ES7331-7NF00-0AB0** SM331,8AI, +/-5/10V,1-5V, +/-20mA,0/4-20mA	**6ES7331-7NF10-0AB0** SM331,8AI, +/-5/10V,1-5V, +/-20mA,0/4-20mA
Supply voltage					
Load voltage L+					
• Rated value (DC)	24 V	24 V	24 V		24 V
Input current					
from load voltage L+ (without load), max.	240 mA	240 mA	150 mA		200 mA
from backplane bus 5 V DC, max.	100 mA	100 mA	100 mA	130 mA	100 mA
Power loss					
Power loss, typ.	4.6 W	3 W	2.2 W	0.6 W	3 W
Analog inputs					
Number of analog inputs	8	8	6	8	8
• For resistance measurement	8				
permissible input voltage for voltage input (destruction limit), max.	75 V; 35 V continuous, 75 V for max. 1 s (mark to space ratio 1:20)	75 V; 20 V DC permanent, 75 V DC for max. 1 s (duty factor 1:20)	35 V; 35 V continuous, 75 V for max. 1 s (mark to space ratio 1:20)	50 V; Permanent	75 V; 35 V continuous, 75 V for max. 1 s (mark to space ratio 1:20)
permissible input current for current input (destruction limit), max.				32 mA	40 mA
Input ranges (rated values), voltages					
• 0 to +10 V	No	No	No	No	No
• 1 V to 5 V	No	No	No	Yes	Yes
• 1 V to 10 V	No	No	No	No	No
• -1 V to +1 V	No	No	Yes	No	No
• -10 V to +10 V	No	No	No	Yes	Yes
• -2.5 V to +2.5 V	No	No	No	No	No
• -250 mV to +250 mV	No	No	Yes	No	No
• -5 V to +5 V	No	No	No	Yes	Yes
• -50 mV to +50 mV	No	No	Yes	No	No
• -500 mV to +500 mV	No	No	Yes	No	No
• -80 mV to +80 mV	No	No	Yes	No	No
Input ranges (rated values), currents					
• 0 to 20 mA	No	No	No	Yes	Yes
• -10 mA to +10 mA	No	No	No	No	No
• -20 mA to +20 mA	No	No	No	Yes	Yes
• -3.2 mA to +3.2 mA	No	No	No	No	No
• 4 mA to 20 mA	No	No	No	Yes	Yes

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Technical specifications (continued)

Article number	**6ES7331-7PF01-0AB0** SM331, 8AI, resistor, PT100/200/1000, .	**6ES7331-7PF11-0AB0** SM331, 8AI, 16BIT, Thermocouples	**6ES7331-7PE10-0AB0** SM331, 6AI, 16bit, Thermocouples	**6ES7331-7NF00-0AB0** SM331,8AI, +/-5/10V,1-5V, +/-20mA,0/4-20mA	**6ES7331-7NF10-0AB0** SM331,8AI, +/-5/10V,1-5V, +/-20mA,0/4-20mA
Input ranges (rated values), thermocouples					
• Type B	No	Yes	Yes	No	No
• Type C	No	Yes	Yes	No	No
• Type E	No	Yes	Yes	No	No
• Type J	No	Yes	Yes	No	No
• Type K	No	Yes	Yes	No	No
• Type L	No	Yes	Yes	No	No
• Type N	No	Yes	Yes	No	No
• Type R	No	Yes	Yes	No	No
• Type S	No	Yes	Yes	No	No
• Type T	No	Yes	Yes	No	No
• Type U	No	Yes	Yes	No	No
• Type TXK/TXK(L) to GOST	No	Yes	Yes	No	No
Input ranges (rated values), resistance thermometer					
• Cu 10	Yes	No	No	No	No
• Ni 100	Yes	No	No	No	No
• Ni 1000	Yes	No	No	No	No
• LG-Ni 1000	Yes	No	No	No	No
• Ni 120	Yes	No	No	No	No
• Ni 200	Yes	No	No	No	No
• Ni 500	Yes	No	No	No	No
• Pt 100	Yes	No	No	No	No
• Pt 1000	Yes	No	No	No	No
• Pt 200	Yes	No	No	No	No
• Pt 500	Yes	No	No	No	No
Input ranges (rated values), resistors					
• 0 to 150 ohms	Yes	No	No	No	No
• 0 to 300 ohms	Yes	No	No	No	No
• 0 to 600 ohms	Yes	No	No	No	No
• 0 to 6000 ohms		No	No	No	No
Thermocouple (TC)					
Temperature compensation					
- parameterizable		Yes	Yes		
- internal temperature compensation		Yes	Yes		
- external temperature compensation with Pt100		Yes	Yes		
- external temperature compensation with compensations socket		Yes	Yes		
- for definable comparison point temperature		Yes	Yes		
Characteristic linearization					
• parameterizable	Yes	Yes	Yes		
- for thermocouples		Type B, E, J, K, L, N, R, S. T, U, C	Type B, E, J, K, L, N, R, S. T, U, C, TXK, XK(L)		
- for resistance thermometer	Pt100, Pt200, Pt500, Pt1000, Ni100, Ni120, Ni200, Ni500, Ni1000, Cu10; (standard/climate)		No		
Cable length					
• shielded, max.	200 m	100 m	200 m	200 m	200 m

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Technical specifications (continued)

Article number	**6ES7331-7PF01-0AB0**	**6ES7331-7PF11-0AB0**	**6ES7331-7PE10-0AB0**	**6ES7331-7NF00-0AB0**	**6ES7331-7NF10-0AB0**
	SM331, 8AI, resistor, PT100/200/1000, .	SM331, 8AI, 16BIT, Thermocouples	SM331, 6AI, 16bit, Thermocouples	SM331,8AI, +/-5/10V,1-5V, +/-20mA,0/4-20mA	SM331,8AI, +/-5/10V,1-5V, +/-20mA,0/4-20mA
Analog value generation for the inputs					
Measurement principle	integrating	integrating	integrating	integrating	integrating
Integration and conversion time/ resolution per channel					
• Resolution with overrange (bit including sign), max.	16 bit; Two's complement	16 bit; Two's complement	16 bit; Two's complement	16 bit; Unipolar: 15/15/15/15 bit; bipolar: 15 bit + sign/ 15 bit + sign/ 15 bit + sign/ 15 bit + sign	16 bit; Unipolar: 15/15/15/15 bit; bipolar: 15 bit + sign/ 15 bit + sign/ 15 bit + sign/ 15 bit + sign
• Integration time, parameterizable	Yes	Yes	Yes	Yes; 10/ 16.67/ 20/ 100 ms	Yes; 23 / 72 / 83 / 95 ms
• Basic conversion time (ms)	up to 4 channels: 10 ms per module, over 5 channels: 190 ms per module, 8 channels: 80 ms	Up to 4 channels: 10 ms per module, 5 channels upwards: 190 ms per module	30 / 50 / 60 / 300 ms		10 ms (4-channel mode); 95/83/72/23 ms (8-channel mode)
• Integration time (ms)			10/ 16.67/ 20/ 100 ms		
• Interference voltage suppression for interference frequency f1 in Hz	400 / 60 / 50 Hz	400 / 60 / 50 Hz	10 / 50 / 60 / 400 Hz	400 / 60 / 50 / 10 Hz	400 / 60 / 50 Hz, combinations of 400, 60, 50 Hz
Encoder					
Connection of signal encoders					
• for current measurement as 2-wire transducer				Yes; with external transmitter; possible with separate supply for transmitter	Yes; with external transmitter, current supply; possible with separate supply for transmitter
• for current measurement as 4-wire transducer				Yes	Yes
• for resistance measurement with two-wire connection	Yes; without resistance correction				
• for resistance measurement with three-wire connection	Yes				
• for resistance measurement with four-wire connection	Yes				
Errors/accuracies					
Operational error limit in overall temperature range					
• Voltage, relative to input range, (+/-)		±1 K	Operating error at 0 ... 60 °C: ±0.12% @ ±25 mV, ±0.08% @ ±50 mV, ±0.6% @ ±80 mV, ±0.05% @ ±250 mV, ±0.05% @ 500 mV, ±0.05% @ ±1 V	0.1 %; At U_{cm} = 0 V or ±0.7 % at U_{cm} = 50 V	0.1 %
• Current, relative to input range, (+/-)				0.3 %; At U_{cm} = 0 V or ±0.9 % at U_{cm} = 50 V	0.1 %
• Resistance, relative to input range, (+/-)	0.1 %				
• Resistance thermometer, relative to input range, (+/-)	±1 K				
Basic error limit (operational limit at 25 °C)					
• Voltage, relative to input range, (+/-)			See manual for details	0.05 %	0.05 %
• Current, relative to input range, (+/-)				0.05 %	0.05 %
• Resistance, relative to input range, (+/-)	0.05 %				
• Resistance thermometer, relative to input range, (+/-)	±0.5 K				

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Technical specifications (continued)

Article number	**6ES7331-7PF01-0AB0** SM331, 8AI, resistor, PT100/200/1000, .	**6ES7331-7PF11-0AB0** SM331, 8AI, 16BIT, Thermocouples	**6ES7331-7PE10-0AB0** SM331, 6AI, 16bit, Thermocouples	**6ES7331-7NF00-0AB0** SM331,8AI, +/-5/10V,1-5V, +/-20mA,0/4-20mA	**6ES7331-7NF10-0AB0** SM331,8AI, +/-5/10V,1-5V, +/-20mA,0/4-20mA
Interrupts/diagnostics/ status information					
Diagnostics function	Yes; Parameterizable	Yes; Parameterizable	Yes; Parameterizable	Yes; Parameterizable	Yes; Parameterizable
Alarms					
• Diagnostic alarm	Yes; Parameterizable per group	Yes; Parameterizable per group	Yes; channel by channel	Yes; Parameterizable	Yes; Parameterizable
• Limit value alarm	Yes; Parameterizable	Yes; Parameterizable	Yes; Parameterizable	Yes; Parameterizable, channels 0 and 2	Yes; Parameterizable all channels (end of cycle interrupt is also supported across modules)
• Hardware interrupt	Yes; Parameterizable, channels 0 to 7	Yes; Parameterizable, channels 0 to 7	Yes; Parameterizable		Yes; Parameterizable, channels 0 to 7 (on exceeding limit value), at end of cycle
Diagnostic messages					
• Diagnostic information readable	Yes	Yes	Yes	Yes	Yes
Potential separation					
Potential separation analog inputs					
• between the channels and backplane bus	Yes	Yes	Yes	Yes	Yes
Connection method					
required front connector	40-pin	40-pin	40-pin	40-pin	40-pin
Dimensions					
Width	40 mm	40 mm	40 mm	40 mm	40 mm
Height	125 mm	125 mm	125 mm	125 mm	125 mm
Depth	120 mm	120 mm	120 mm	117 mm	117 mm
Weights					
Weight, approx.	272 g	272 g	272 g	272 g	272 g

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Ordering data

	Article No.
SM 331 analog input modules	
Including labeling strips, bus connector, measuring range modules	
8 inputs, 13-bit resolution	**6ES7331-1KF02-0AB0**
8 inputs, resolution 9/12/14 bits	**6ES7331-7KF02-0AB0**
2 inputs, resolution 9/12/14 bits	**6ES7331-7KB02-0AB0**
8 inputs, enhanced resolution 16 bits	**6ES7331-7NF00-0AB0**
8 inputs, enhanced resolution 16 bits, 4-channel mode	**6ES7331-7NF10-0AB0**
8 inputs, resolution 14 bits, for isochronous mode	**6ES7331-7HF01-0AB0**
6 inputs, for thermal elements, resolution 16 bits	**6ES7331-7PE10-0AB0**
8 inputs, for thermal resistors	**6ES7331-7PF01-0AB0**
8 inputs, for thermoelements	**6ES7331-7PF11-0AB0**
Measuring range module for analog inputs	**6ES7974-0AA00-0AA0**
1 module for 2 analog inputs; 2 units (spare part)	
Front connector	
20-pin, with screw contacts	
• 1 unit	**6ES7392-1AJ00-0AA0**
• 100 units	**6ES7392-1AJ00-1AB0**
20-pin, with spring-loaded contacts	
• 1 unit	**6ES7392-1BJ00-0AA0**
• 100 units	**6ES7392-1BJ00-1AB0**
40-pin, with screw contacts	
• 1 unit	**6ES7392-1AM00-0AA0**
• 100 units	**6ES7392-1AM00-1AB0**
40-pin, with spring-loaded contacts	
• 1 unit	**6ES7392-1BM01-0AA0**
• 100 units	**6ES7392-1BM01-1AB0**
Front door, elevated design	**6ES7328-0AA00-7AA0**
e.g. for 32-channel modules; for connecting 1.3 mm^2/16 AWG wires	
SIMATIC TOP connect	see page 5/251
Bus connectors	**6ES7390-0AA00-0AA0**
1 unit (spare part)	
Shield connection element	**6ES7390-5AA00-0AA0**
80 mm wide, with 2 rows for 4 shield connection clamps each	

	Article No.
Shield connection clamps	
2 units	
For 2 cables with 2 mm to 6 mm diameter	**6ES7390-5AB00-0AA0**
For 1 cable with 3 mm to 8 mm diameter	**6ES7390-5BA00-0AA0**
For 1 cable with 4 mm to 13 mm diameter	**6ES7390-5CA00-0AA0**
Label cover	**6ES7392-2XY00-0AA0**
10 units (spare part), for modules with 20-pin front connector	
Labeling strips	**6ES7392-2XX00-0AA0**
10 units (spare part), for modules with 20-pin front connector	
Labeling sheets for machine labeling	
For modules with 20-pin front connector, DIN A4, for printing with laser printer; 10 units	
Petrol	**6ES7392-2AX00-0AA0**
Light beige	**6ES7392-2BX00-0AA0**
Yellow	**6ES7392-2CX00-0AA0**
Red	**6ES7392-2DX00-0AA0**
For modules with 40-pin front connector, DIN A4, for printing with laser printer; 10 units	
Petrol	**6ES7392-2AX10-0AA0**
Light beige	**6ES7392-2BX10-0AA0**
Yellow	**6ES7392-2CX10-0AA0**
Red	**6ES7392-2DX10-0AA0**
SIMATIC Manual Collection	**6ES7998-8XC01-8YE0**
Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC Distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	
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SM 332 analog output modules

Overview



- Analog outputs
- For the connection of analog actuators

Technical specifications

Article number	**6ES7332-5HB01-0AB0** SM332, 2AQ, U/I, 11/12Bit	**6ES7332-5HD01-0AB0** SM332, 4AQ, U/I, 11/12Bit	**6ES7332-5HF00-0AB0** SM332, 8AQ, U/I, 11/12Bit	**6ES7332-7ND02-0AB0** SM332, 4AQ, 0-10V, 0-5V,+/-10V,+/-20mA
Supply voltage				
Load voltage L+				
• Rated value (DC)	24 V	24 V	24 V	24 V
Input current				
from load voltage L+ (without load), max.	135 mA	240 mA	340 mA	290 mA
from backplane bus 5 V DC, max.	60 mA	60 mA	100 mA	120 mA
Power loss				
Power loss, typ.	3 W	3 W	6 W	3 W
Analog outputs				
Number of analog outputs	2	4	8	4; Isochronous mode
Voltage output, short-circuit protection	Yes	Yes	Yes	Yes
Voltage output, short-circuit current, max.	25 mA	25 mA	25 mA	40 mA
Current output, no-load voltage, max.	18 V	18 V	18 V	18 V
Output ranges, voltage				
• 0 to 10 V	Yes	Yes	Yes	Yes
• 1 V to 5 V	Yes	Yes	Yes	Yes
• -10 V to +10 V	Yes	Yes	Yes	Yes
Output ranges, current				
• 0 to 20 mA	Yes	Yes	Yes	Yes
• -20 mA to +20 mA	Yes	Yes	Yes	Yes
• 4 mA to 20 mA	Yes	Yes	Yes	Yes
Load impedance (in rated range of output)				
• with voltage outputs, min.	1 kΩ	1 kΩ	1 kΩ	1 kΩ
• with voltage outputs, capacitive load, max.	1 µF	1 µF	1 µF	1 µF
• with current outputs, max.	500 Ω	500 Ω	500 Ω	500 Ω
• with current outputs, inductive load, max.	10 mH	10 mH	10 mH	1 mH
Cable length				
• shielded, max.	200 m	200 m	200 m	200 m

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Technical specifications (continued)

Article number	**6ES7332-5HB01-0AB0** SM332, 2AQ, U/I, 11/12Bit	**6ES7332-5HD01-0AB0** SM332, 4AQ, U/I, 11/12Bit	**6ES7332-5HF00-0AB0** SM332, 8AQ, U/I, 11/12Bit	**6ES7332-7ND02-0AB0** SM332, 4AQ, 0-10V, 0-5V,+/-10V,+/-20mA
Analog value generation for the outputs				
Integration and conversion time/ resolution per channel				
• Resolution with overrange (bit including sign), max.	12 bit; ±10 V, ±20 mA, 4 mA to 20 mA, 1 V to 5 V: 11 bit + sign; 0 V to 10 V, 0 mA to 20 mA: 12 bit	12 bit; ±10 V, ±20 mA, 4 mA to 20 mA, 1 V to 5 V: 11 bit + sign; 0 V to 10 V, 0 mA to 20 mA: 12 bit	12 bit; ±10 V, ±20 mA, 4 mA to 20 mA, 1 V to 5 V: 11 bit + sign; 0 V to 10 V, 0 mA to 20 mA: 12 bit	16 bit
• Conversion time (per channel)	0.8 ms	0.8 ms	0.8 ms	200 µs; in isochronous mode 640 µs
Settling time				
• for resistive load	0.2 ms	0.2 ms	0.2 ms	0.2 ms
• for capacitive load	3.3 ms	3.3 ms	3.3 ms	3.3 ms
• for inductive load	0.5 ms; 0.5 ms (1 mH); 3.3 ms (10 mH)	0.5 ms; 0.5 ms (1 mH); 3.3 ms (10 mH)	0.5 ms; 0.5 ms (1 mH); 3.3 ms (10 mH)	0.5 ms
Errors/accuracies				
Operational error limit in overall temperature range				
• Voltage, relative to output range, (+/-)	0.5 %	0.5 %	0.5 %	0.12 %
• Current, relative to output range, (+/-)	0.6 %	0.6 %	0.6 %	0.18 %
Basic error limit (operational limit at 25 °C)				
• Voltage, relative to output range, (+/-)	0.4 %	0.4 %	0.4 %	0.02 %
• Current, relative to output range, (+/-)	0.5 %	0.5 %	0.5 %	0.02 %
Interrupts/diagnostics/ status information				
Diagnostics function	Yes; Parameterizable	Yes; Parameterizable	Yes; Parameterizable	Yes; Parameterizable
Substitute values connectable	Yes; Parameterizable	Yes; Parameterizable	Yes; Parameterizable	Yes; Parameterizable
Alarms				
• Diagnostic alarm	Yes; Parameterizable	Yes; Parameterizable	Yes; Parameterizable	Yes; Parameterizable
Diagnostic messages				
• Diagnostic information readable	Yes	Yes	Yes	Yes
Potential separation				
Potential separation analog outputs				
• between the channels and backplane bus	Yes	Yes	Yes	Yes
Connection method				
required front connector	20-pin	20-pin	40-pin	20-pin
Dimensions				
Width	40 mm	40 mm	40 mm	40 mm
Height	125 mm	125 mm	125 mm	125 mm
Depth	117 mm	117 mm	117 mm	117 mm
Weights				
Weight, approx.	220 g	220 g	272 g	220 g

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SM 332 analog output modules

Ordering data	Article No.
SM 332 analog output modules	
Incl. labeling strips, bus connector	
4 outputs, 11/12 bit	**6ES7332-5HD01-0AB0**
4 outputs, 16 bit	**6ES7332-7ND02-0AB0**
2 outputs, 11/12 bit	**6ES7332-5HB01-0AB0**
8 outputs, 11/12 bit	**6ES7332-5HF00-0AB0**
Front connector	
20-pin, with screw contacts	
• 1 unit	**6ES7392-1AJ00-0AA0**
• 100 units	**6ES7392-1AJ00-1AB0**
20-pin, with spring-loaded contacts	
• 1 unit	**6ES7392-1BJ00-0AA0**
• 100 units	**6ES7392-1BJ00-1AB0**
40-pin, with screw contacts	
• 1 unit	**6ES7392-1AM00-0AA0**
• 100 units	**6ES7392-1AM00-1AB0**
40-pin, with spring-loaded contacts	
• 1 unit	**6ES7392-1BM01-0AA0**
• 100 units	**6ES7392-1BM01-1AB0**
Front door, elevated design	**6ES7328-0AA00-7AA0**
e.g. for 32-channel modules; for connecting 1.3 mm^2/16 AWG wires	
SIMATIC TOP connect	See page 5/251
Bus connectors	
1 unit (spare part)	**6ES7390-0AA00-0AA0**
Shield connection element	**6ES7390-5AA00-0AA0**
80 mm wide, with 2 rows for 4 shield connection clamps each	
Shield connection clamps	
2 units	
For 2 cables with 2 mm to 6 mm diameter	**6ES7390-5AB00-0AA0**
For 1 cable with 3 mm to 8 mm diameter	**6ES7390-5BA00-0AA0**
For 1 cable with 4 mm to 13 mm diameter	**6ES7390-5CA00-0AA0**

	Article No.
Label cover	**6ES7392-2XY00-0AA0**
10 units (spare part), for modules with 20-pin front connector	
Labeling strips	**6ES7392-2XX00-0AA0**
10 units (spare part), for modules with 20-pin front connector	
Labeling sheets for machine labeling	
For modules with 20-pin front connector, DIN A4, for printing with laser printer; 10 units	
Petrol	**6ES7392-2AX00-0AA0**
Light beige	**6ES7392-2BX00-0AA0**
Yellow	**6ES7392-2CX00-0AA0**
Red	**6ES7392-2DX00-0AA0**
For modules with 40-pin front connector, DIN A4, for printing with laser printer; 10 units	
Petrol	**6ES7392-2AX10-0AA0**
Light beige	**6ES7392-2BX10-0AA0**
Yellow	**6ES7392-2CX10-0AA0**
Red	**6ES7392-2DX10-0AA0**
SIMATIC Manual Collection	**6ES7998-8XC01-8YE0**
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Overview



- Analog inputs and outputs
- For the connection of analog sensors and actuators

Technical specifications

Article number	**6ES7334-0CE01-0AA0** SM334, 4AI, 2AQ, non isolated	**6ES7334-0KE00-0AB0** SM334, 4AI/2AQ, 0-10V f.PT100
Supply voltage		
Load voltage L+		
• Rated value (DC)	24 V	24 V
Input current		
from supply and load voltage L+ (without load), max.	110 mA	80 mA
from backplane bus 5 V DC, max.	55 mA	60 mA
Power loss		
Power loss, typ.	3 W	2 W
Analog inputs		
Number of analog inputs	4	4
• For voltage measurement	4	2
• For resistance measurement		4
permissible input voltage for voltage input (destruction limit), max.	20 V	20 V; continuous; 75 V for max. 1 s (mark to space ratio 1:20)
permissible input current for current input (destruction limit), max.	40 mA	
Cycle time (all channels) max.	5 ms	85 ms
Input ranges (rated values), voltages		
• 0 to +10 V	Yes	Yes
Input ranges (rated values), currents		
• 0 to 20 mA	Yes	
Input ranges (rated values), resistance thermometer		
• Pt 100		Yes; only climatic range
Input ranges (rated values), resistors		
• 0 to 10000 ohms		Yes
Characteristic linearization		
• parameterizable		Yes
- for resistance thermometer		Pt100 (climate)
Cable length		
• shielded, max.	200 m	100 m

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Technical specifications (continued)

Article number	**6ES7334-0CE01-0AA0** SM334, 4AI, 2AQ, non isolated	**6ES7334-0KE00-0AB0** SM334, 4AI/2AQ, 0-10V f.PT100
Analog outputs		
Number of analog outputs	2	2
Voltage output, short-circuit protection	Yes	Yes
Voltage output, short-circuit current, max.	11 mA	30 mA
Current output, no-load voltage, max.	15 V	
Output ranges, voltage		
• 0 to 10 V	Yes	Yes
Output ranges, current		
• 0 to 20 mA	Yes	
Load impedance (in rated range of output)		
• with voltage outputs, min.	5 kΩ	2.5 kΩ
• with voltage outputs, capacitive load, max.	1 µF	1 µF
• with current outputs, max.	300 Ω	
• with current outputs, inductive load, max.	1 mH	
Cable length		
• shielded, max.	200 m	100 m
Analog value generation for the inputs		
Integration and conversion time/ resolution per channel		
• Resolution with overrange (bit including sign), max.	8 bit	12 bit
• Integration time (ms)		16,67 / 20 ms
Analog value generation for the outputs		
Integration and conversion time/ resolution per channel		
• Resolution with overrange (bit including sign), max.	8 bit	12 bit
Settling time		
• for resistive load	0.3 ms	0.8 ms
• for capacitive load	3 ms	0.8 ms
• for inductive load	0.3 ms	
Encoder		
Connection of signal encoders		
• for current measurement as 2-wire transducer	No	
• for current measurement as 4-wire transducer	Yes	
• for resistance measurement with two-wire connection		Yes
• for resistance measurement with three-wire connection		Yes
• for resistance measurement with four-wire connection		Yes

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Technical specifications (continued)

Article number	**6ES7334-0CE01-0AA0** SM334, 4AI, 2AQ, non isolated	**6ES7334-0KE00-0AB0** SM334, 4AI/2AQ, 0-10V f.PT100
Errors/accuracies		
Operational error limit in overall temperature range		
• Voltage, relative to input range, (+/-)	0.9 %	0.7 %; 0 to 10V
• Current, relative to input range, (+/-)	0.8 %	
• Resistance, relative to input range, (+/-)		3.5 %; 10 kOhm
• Resistance thermometer, relative to input range, (+/-)		1 %
• Voltage, relative to output range, (+/-)	0.6 %	1 %
• Current, relative to output range, (+/-)	1 %	
Basic error limit (operational limit at 25 °C)		
• Voltage, relative to input range, (+/-)	0.7 %	0.5 %; 0 to 10V
• Current, relative to input range, (+/-)	0.6 %	
• Resistance, relative to input range, (+/-)		2.8 %; 10 kOhm
• Resistance thermometer, relative to input range, (+/-)		0.8 %
• Voltage, relative to output range, (+/-)	0.5 %	0.85 %
• Current, relative to output range, (+/-)	0.5 %	
Interrupts/diagnostics/ status information		
Alarms	No	No
Diagnostics function	No	No
Potential separation		
Potential separation analog inputs		
• between the channels and backplane bus	No	Yes
Potential separation analog outputs		
• between the channels and backplane bus	No	Yes
Connection method		
required front connector	20-pin	20-pin
Dimensions		
Width	40 mm	40 mm
Height	125 mm	125 mm
Depth	117 mm	117 mm
Weights		
Weight, approx.	285 g	200 g

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SM 334 analog input/output modules

Ordering data	Article No.
SM 334 analog input/output modules	
Incl. labeling strips, bus connector	
4 inputs, 2 outputs	**6ES7334-0CE01-0AA0**
4 inputs, 2 outputs, resistance measurement, Pt 100	**6ES7334-0KE00-0AB0**
Front connector	
20-pin, with screw contacts	
• 1 unit	**6ES7392-1AJ00-0AA0**
• 100 units	**6ES7392-1AJ00-1AB0**
20-pin, with spring-loaded terminals	
• 1 unit	**6ES7392-1BJ00-0AA0**
• 100 units	**6ES7392-1BJ00-1AB0**
Front door, elevated design	**6ES7328-0AA00-7AA0**
e.g. for 32-channel modules; for connecting 1.3 mm^2/16 AWG wires	
SIMATIC TOP connect	See page 5/251
Bus connectors	**6ES7390-0AA00-0AA0**
1 unit (spare part)	
Shield connection element	**6ES7390-5AA00-0AA0**
80 mm wide, with 2 rows for 4 shield connection clamps each	
Shield connection clamps	
2 units	
For 2 cables with 2 mm to 6 mm diameter	**6ES7390-5AB00-0AA0**
For 1 cable with 3 mm to 8 mm diameter	**6ES7390-5BA00-0AA0**
For 1 cable with 4 mm to 13 mm diameter	**6ES7390-5CA00-0AA0**

	Article No.
Label cover	**6ES7392-2XY00-0AA0**
10 units (spare part), for modules with 20-pin front connector	
Labeling strips	**6ES7392-2XX00-0AA0**
10 units (spare part), for modules with 20-pin front connector	
Labeling sheets for machine labeling	
For modules with 20-pin front connector, DIN A4, for printing with laser printer; 10 units	
Petrol	**6ES7392-2AX00-0AA0**
Light beige	**6ES7392-2BX00-0AA0**
Yellow	**6ES7392-2CX00-0AA0**
Red	**6ES7392-2DX00-0AA0**
SIMATIC Manual Collection	**6ES7998-8XC01-8YE0**
Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC Distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	
SIMATIC Manual Collection update service for 1 year	**6ES7998-8XC01-8YE2**
Current "Manual Collection" DVD and the three subsequent updates	

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Overview



- Analog inputs
- For connecting voltage sensors and current sensors, thermocouples, resistors and resistance thermometers

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

Technical specifications

Article number	**6AG1331-1KF02-7AB0**	**6AG1331-7KB02-2AB0**	**6AG1331-7KF02-2AB0**
Based on	**6ES7331-1KF02-0AB0**	**6ES7331-7KB02-0AB0**	**6ES7331-7KF02-0AB0**
	SIPLUS SM331 8AI	SIPLUS SM331 2AI	SIPLUS SM331 8AI
Ambient conditions			
Ambient temperature during operation			
• min.	-25 °C	-25 °C; = Tmin	-25 °C; = Tmin
• max.	70 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use	70 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use	70 °C; = Tmax; for use on railway vehicles according to EN50155, the rated temperature range -25 ... +55 °C (T1) or 60 °C @ UL/ULhaz/ATEX/FM use applies
Altitude during operation relating to sea level			
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m

• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at
	1 140 hPa ... 795 hPa
	(-1 000 m ... +2 000 m) //
	Tmin ... (Tmax - 10 K) at
	795 hPa ... 658 hPa
	(+2 000 m ... +3 500 m) //
	Tmin ... (Tmax -20 K) at
	658 hPa ... 540 hPa
	(+3 500 m ... +5 000 m)
		Tmin ... Tmax at
		1 140 hPa ... 795 hPa
		(-1 000 m ... +2 000 m) //
		Tmin ... (Tmax - 10 K) at
		795 hPa ... 658 hPa
		(+2 000 m ... +3 500 m) //
		Tmin ... (Tmax -20 K) at
		658 hPa ... 540 hPa
		(+3 500 m ... +5 000 m)
			Tmin ... Tmax at
			1 140 hPa ... 795 hPa
			(-1 000 m ... +2 000 m) //
			Tmin ... (Tmax - 10 K) at
			795 hPa ... 658 hPa
			(+2 000 m ... +3 500 m) //
			Tmin ... (Tmax -20 K) at
			658 hPa ... 540 hPa
			(+3 500 m ... +5 000 m)

Relative humidity			
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance			
Use in stationary industrial systems			
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *

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Technical specifications (continued)

Article number	6AG1331-1KF02-7AB0	6AG1331-7KB02-2AB0	6AG1331-7KF02-2AB0
Based on	6ES7331-1KF02-0AB0	6ES7331-7KB02-0AB0	6ES7331-7KF02-0AB0
	SIPLUS SM331 8AI	SIPLUS SM331 2AI	SIPLUS SM331 8AI
Use on land craft, rail vehicles and special-purpose vehicles			
- to biologically active substances according to EN 60721-3-5			Yes; Class 5B2 mold, fungus and dry rot spores (with the exception of fauna); Class 5B3 on request
- to chemically active substances according to EN 60721-3-5			Yes; Class 5C3 (RH < 75 %) incl. salt spray acc. to EN 50155 (ST2); *
- to mechanically active substances according to EN 60721-3-5			Yes; Class 5S3 incl. sand, dust; *
Use on ships/at sea			
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Remark			
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!

Article number	6AG1331-7NF00-2AB0	6AG1331-7NF10-2AB0	6AG1331-7PF01-4AB0	6AG1331-7PF11-4AB0
Based on	6ES7331-7NF00-0AB0	6ES7331-7NF10-0AB0	6ES7331-7PF01-0AB0	6ES7331-7PF11-0AB0
	SIPLUS S7-300 SM331 8AI - 40pol	SIPLUS SM331 8AI - 40pol	SIPLUS SM331 8AI	SIPLUS S7-300 SM331 8AI 40pol
Ambient conditions				
Ambient temperature during operation				
• min.	-25 °C; = Tmin	-25 °C; = Tmin	0 °C; = Tmin	0 °C; = Tmin
• max.	70 °C; = Tmax; for use on railway vehicles according to EN 50155, the rated temperature range -25 ... +55 °C (T1) or 60 °C @ UL/UL hazardous use applies	60 °C; = Tmax	60 °C; = Tmax	60 °C; = Tmax
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity				
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance				
Use in stationary industrial systems				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *

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Technical specifications (continued)

Article number	**6AG1331-7NF00-2AB0**	**6AG1331-7NF10-2AB0**	**6AG1331-7PF01-4AB0**	**6AG1331-7PF11-4AB0**
Based on	**6ES7331-7NF00-0AB0**	**6ES7331-7NF10-0AB0**	**6ES7331-7PF01-0AB0**	**6ES7331-7PF11-0AB0**
	SIPLUS S7-300 SM331 8AI - 40pol	SIPLUS SM331 8AI - 40pol	SIPLUS SM331 8AI	SIPLUS S7-300 SM331 8AI 40pol
Use on land craft, rail vehicles and special-purpose vehicles				
- to biologically active substances according to EN 60721-3-5	Yes; Class 5B2 mold, fungus and dry rot spores (with the exception of fauna); Class 5B3 on request			
- to chemically active substances according to EN 60721-3-5	Yes; Class 5C3 (RH < 75 %) incl. salt spray acc. to EN 50155 (ST2); *			
- to mechanically active substances according to EN 60721-3-5	Yes; Class 5S3 incl. sand, dust; *			
Use on ships/at sea				
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Remark				
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!

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SIPLUS S7-300 SM 331

Ordering data	Article No.
SIPLUS S7-300 SM 331 analog input modules	
For industrial applications with extended ambient conditions	
Extended temperature range and exposure to media	
8 inputs, 13-bit resolution	**6AG1331-1KF02-7AB0**
2 inputs, 9/12/14-bit resolution	**6AG1331-7KB02-2AB0**
8 inputs, 9/12/14-bit resolution	**6AG1331-7KF02-2AB0**
8 inputs, enhanced 16-bit resolution	**6AG1331-7NF00-2AB0**
8 inputs, enhanced 16-bit resolution, 4-channel mode	**6AG1331-7NF10-2AB0**
Exposure to media	
8 inputs, for thermal resistors	**6AG1331-7PF01-4AB0**
8 inputs, for thermocouples	**6AG1331-7PF11-4AB0**
For rolling stock railway applications	
Conforms to EN 50155	
8 inputs, 9/12/14-bit resolution	**6AG1331-7KF02-2AB0**
8 inputs, enhanced 16-bit resolution	**6AG1331-7NF00-2AB0**
Accessories	
Mandatory	
Front connector	
20-pin, with spring-loaded contacts	
• 1 unit	**6ES7392-1BJ00-0AA0**
• 100 units	**6ES7392-1BJ00-1AB0**
40-pin, with spring-loaded contacts	
• 1 unit	**6ES7392-1BM01-0AA0**
• 100 units	**6ES7392-1BM01-1AB0**
Consumables	
Front door, elevated design	**6ES7328-0AA00-7AA0**
E.g. for 32-channel modules; for connecting 1.3 mm^2/16 AWG conductors; circuit diagram and nameplates in petrol	
Bus connectors	**6ES7390-0AA00-0AA0**
1 unit (spare part)	

	Article No.
Labeling strips	
10 units; spare part	
For modules with 20-pin front connector	**6ES7392-2XX00-0AA0**
For modules with 40-pin front connector	**6ES7392-2XX10-0AA0**
Label cover	
10 units; spare part	
For modules with 20-pin front connector	**6ES7392-2XY00-0AA0**
For modules with 40-pin front connector	**6ES7392-2XY10-0AA0**
Documentation	
SIMATIC Manual Collection	**6ES7998-8XC01-8YE0**
Electronic manuals on DVD, multi-language: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC Distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	
SIMATIC Manual Collection update service for 1 year	**6ES7998-8XC01-8YE2**
Current "Manual Collection" DVD and the three subsequent updates	

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Overview



- Analog outputs
- For connection of analog actuators

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

Technical specifications

Article number	**6AG1332-5HD01-7AB0**	**6AG1332-7ND02-4AB0**	**6AG1332-5HB01-2AB0**	**6AG1332-5HF00-2AB0**
Based on	**6ES7332-5HD01-0AB0**	**6ES7332-7ND02-0AB0**	**6ES7332-5HB01-0AB0**	**6ES7332-5HF00-0AB0**
	SIPLUS S7-300 SM332 4AQ U/I	SIPLUS S7-300 SM332 4AQ	SIPLUS S7-300 SM332 2AQ	SIPLUS S7-300 SM 332 8AQ - 40pol
Ambient conditions				
Ambient temperature during operation				
• min.	-25 °C; = Tmin	0 °C; = Tmin	-25 °C; = Tmin	-25 °C
• max.	70 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use	60 °C; = Tmax	70 °C; = Tmax; for use on railway vehicles according to EN50155, the rated temperature range -25 ... +55 °C (T1) or 60 °C @ UL/ULhaz/ATEX/FM use applies	70 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity				
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance				
Use in stationary industrial systems				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *

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Technical specifications (continued)

Article number	**6AG1332-5HD01-7AB0**	**6AG1332-7ND02-4AB0**	**6AG1332-5HB01-2AB0**	**6AG1332-5HF00-2AB0**
Based on	**6ES7332-5HD01-0AB0**	**6ES7332-7ND02-0AB0**	**6ES7332-5HB01-0AB0**	**6ES7332-5HF00-0AB0**
	SIPLUS S7-300 SM332 4AQ U/I	SIPLUS S7-300 SM332 4AQ	SIPLUS S7-300 SM332 2AQ	SIPLUS S7-300 SM 332 8AQ - 40pol
Use on land craft, rail vehicles and special-purpose vehicles				
- to biologically active substances according to EN 60721-3-5			Yes; Class 5B2 mold, fungus and dry rot spores (with the exception of fauna); Class 5B3 on request	
- to chemically active substances according to EN 60721-3-5			Yes; Class 5C3 (RH < 75 %) incl. salt spray acc. to EN 50155 (ST2); *	
- to mechanically active substances according to EN 60721-3-5			Yes; Class 5S3 incl. sand, dust; *	
Use on ships/at sea				
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Remark				
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!

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Ordering data

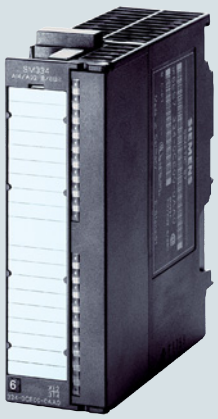
	Article No.
SIPLUS S7-300 SM 332 analog output modules	
For industrial applications with extended ambient conditions	
Extended temperature range and exposure to media	
2 outputs, 11/12-bit	**6AG1332-5HB01-2AB0**
4 outputs, 11/12-bit	**6AG1332-5HD01-7AB0**
8 outputs, 11/12-bit	**6AG1332-5HF00-2AB0**
Exposure to media	
4 outputs, 16-bit; only exposure to media	**6AG1332-7ND02-4AB0**
For rolling stock railway applications	
Conforms to EN 50155	
2 outputs, 11/12-bit	**6AG1332-5HB01-2AB0**
Accessories	
Mandatory	
Front connector	
20-pin, with spring-loaded contacts	
• 1 unit	**6ES7392-1BJ00-0AA0**
• 100 units	**6ES7392-1BJ00-1AB0**
40-pin, with spring-loaded contacts	
• 1 unit	**6ES7392-1BM01-0AA0**
• 100 units	**6ES7392-1BM01-1AB0**
Consumables	
Front door, elevated design	**6ES7328-0AA00-7AA0**
E.g. for 32-channel modules; for connecting 1.3 mm^2/16 AWG conductors; circuit diagram and nameplates in petrol	

	Article No.
Bus connectors	**6ES7390-0AA00-0AA0**
1 unit (spare part)	
Labeling strips	
10 units; spare part	
For modules with 20-pin front connector	**6ES7392-2XX00-0AA0**
For modules with 40-pin front connector	**6ES7392-2XX10-0AA0**
Label cover	
10 units; spare part	
For modules with 20-pin front connector	**6ES7392-2XY00-0AA0**
For modules with 40-pin front connector	**6ES7392-2XY10-0AA0**
Documentation	
SIMATIC Manual Collection	**6ES7998-8XC01-8YE0**
Electronic manuals on DVD, multi-language: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC Distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	

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SIPLUS S7-300 SM 334

Overview



- Analog inputs and outputs
- For connection of analog sensors and actuators

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

Technical specifications

Article number	**6AG1334-0KE00-7AB0**
Based on	**6ES7334-0KE00-0AB0**
	SIPLUS S7-300 SM334 4AE 2AQ
Ambient conditions	
Ambient temperature during operation	
• min.	-25 °C; = Tmin
• max.	70 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m

• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at
	1 140 hPa ... 795 hPa
	(-1 000 m ... +2 000 m) //
	Tmin ... (Tmax - 10 K) at
	795 hPa ... 658 hPa
	(+2 000 m ... +3 500 m) //
	Tmin ... (Tmax -20 K) at
	658 hPa ... 540 hPa
	(+3 500 m ... +5 000 m)

Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance	
Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
Remark	
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!

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Ordering data

	Article No.
SIPLUS S7-300 SM 334 analog input/output modules	
For industrial applications with extended ambient conditions	
Extended temperature range and exposure to media	
4 inputs, 2 outputs; resistance measurement, Pt 100	**6AG1334-0KE00-7AB0**
Accessories	
Mandatory	
Front connector	
20-pin, with spring-loaded contacts	
• 1 unit	**6ES7392-1BJ00-0AA0**
• 100 units	**6ES7392-1BJ00-1AB0**
40-pin, with spring-loaded contacts	
• 1 unit	**6ES7392-1BM01-0AA0**
• 100 units	**6ES7392-1BM01-1AB0**
Consumables	
Front door, elevated design	**6ES7328-0AA00-7AA0**
E.g. for 32-channel modules; for connecting 1.3 mm^2/16 AWG conductors; circuit diagram and nameplates in petrol	

	Article No.
Bus connectors	**6ES7390-0AA00-0AA0**
1 unit (spare part)	
Labeling strips	
10 units; spare part	
For modules with 20-pin front connector	**6ES7392-2XX00-0AA0**
For modules with 40-pin front connector	**6ES7392-2XX10-0AA0**
Label cover	
10 units; spare part	
For modules with 20-pin front connector	**6ES7392-2XY00-0AA0**
For modules with 40-pin front connector	**6ES7392-2XY10-0AA0**
Documentation	
SIMATIC Manual Collection	**6ES7998-8XC01-8YE0**
Electronic manuals on DVD, multi-language: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC Distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	
SIMATIC Manual Collection update service for 1 year	**6ES7998-8XC01-8YE2**
Current "Manual Collection" DVD and the three subsequent updates	

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SM 326 F-digital input modules - Safety Integrated

Overview



- Digital inputs for the fail-safe SIMATIC S7 systems
- For connecting:
  - Switches and 2-wire proximity switches
  - Sensors according to NAMUR and mechanical contacts, also for signals from hazardous areas
- With integral safety functions for fail-safe operation
- Can be used in fail-safe operation
  - Centrally: with S7-31xF-2 DP
  - Distributed in ET 200M: with SIMATIC IM 151-7 F-CPU, S7-31xF-2 DP, S7-416F-2 and S7-400F/FH
- In standard operation can be used in the same way as S7-300 modules

5

Technical specifications

Article number	**6ES7326-1RF01-0AB0** SM326, 8DI, DC24V, failsafe	**6ES7326-1BK02-0AB0** SM326, F-DI 24 X DC24V, failsafe
General information		
Product type designation	SM326, F-DI 8x 24 V DC	SM326, F-DI 24x 24 V DC
Supply voltage		
Rated value (DC)		24 V
Reverse polarity protection	Yes	Yes
Input current		
from load voltage L+ (without load), max.	160 mA	450 mA
from backplane bus 5 V DC, max.	90 mA	100 mA
Encoder supply		
Number of outputs	8	4; Isolated
Type of output voltage	8.2 V DC	
Output current		
• Rated value		400 mA
Power loss		
Power loss, typ.	4.5 W	10 W
Digital inputs		
Number of digital inputs	8	24
Number of simultaneously controllable inputs		
all mounting positions		
- up to 40 °C, max.	8	24
- up to 60 °C, max.	8	24; (at 24 V) or 18 (at 28.8 V)
Input voltage		
• Type of input voltage	DC	DC
• Rated value (DC)		24 V
• for signal "0"		-30 to +5V
• for signal "1"		+11 to +30V
Input current		
• for signal "0", max. (permissible quiescent current)	0.35 to 1.2 mA	2 mA
• for signal "1", typ.	2.1 to 7 mA	10 mA

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Technical specifications (continued)

Article number	**6ES7326-1RF01-0AB0**	**6ES7326-1BK02-0AB0**
	SM326, 8DI, DC24V, failsafe	SM326, F-DI 24 X DC24V, failsafe
Input delay (for rated value of input voltage)		
for standard inputs		
- at "0" to "1", max.		3.4 ms
- at "1" to "0", max.		3.4 ms
for NAMUR inputs		
- at "0" to "1", max.	1.2 to 3 ms	
- at "1" to "0", max.	1.2 to 3 ms	
Cable length		
• shielded, max.	200 m	200 m
• unshielded, max.	100 m	100 m
Encoder		
Connectable encoders		
• 2-wire sensor		Yes; if short-circuit test is deactivated
- permissible quiescent current (2-wire sensor), max.		2 mA
Interrupts/diagnostics/ status information		
Alarms		
• Diagnostic alarm	Yes; Parameterizable	Yes
Diagnostic messages		
• Diagnostic information readable		Yes
Ex(i) characteristics		
Module for Ex(i) protection	Yes	
Maximum values of input circuits (per channel)		
• Co (permissible external capacity), max.	3 µF	
• Io (short-circuit current), max.	13.9 mA	
• Lo (permissible external inductivity), max.	80 mH	
• Po (power of load), max.	33.1 mW	
• Uo (output no-load voltage), max.	10 V	
• Um (fault voltage), max.	60 V DC/30 V AC	
• Ta (permissible ambient temperature), max.	60 °C	60 °C
Potential separation		
Potential separation digital inputs		
• between the channels	Yes	Yes
• between the channels, in groups of		12
• between the channels and backplane bus	Yes	Yes
• between the channels and the power supply of the electronics	Yes	
Standards, approvals, certificates		
Highest safety class achievable in safety mode		
• acc. to DIN VDE 0801		AK 6
• acc. to EN 954	Cat. 4	Cat. 4
• SIL acc. to IEC 61508	SIL 2 (single-channel), SIL 3 (two-channel)	SIL 3
Use in hazardous areas		
• Test number KEMA	99 ATEX 2671 X	
Connection method		
required front connector	1x 40-pin	40-pin
Dimensions		
Width	80 mm	80 mm
Height	125 mm	125 mm
Depth	120 mm	120 mm
Weights		
Weight, approx.	482 g	442 g

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SM 326 F-digital input modules - Safety Integrated

Ordering data	Article No.
SM 326 F-digital input module	
24 inputs, 24 V DC	**6ES7326-1BK02-0AB0**
8 inputs, 24 V DC, NAMUR	**6ES7326-1RF01-0AB0**
S7 Distributed Safety V5.4 SP5 Update 2 programming tool Task: Configuration software for configuring fail-safe user programs for SIMATIC S7-300F, S7-400F, WinAC RTX F, ET 200S, ET 200M, ET 200iSP, ET 200pro, ET 200eco, ET 200SP Requirement: Windows 7 SP1 (64-bit), Windows 10 Professional/Enterprise (64-bit), Windows Server 2008 R2 SP1 (64-bit), Windows Server 2012 R2 (64-bit), Windows Server 2016 (64-bit); STEP 7 from V5.5 SP1; Please also note the operating systems that have been released for the STEP 7 version used	
Floating license for 1 user; software and documentation on DVD; license key on USB flash drive	**6ES7833-1FC02-0YA5**
Floating license for 1 user; software, documentation and license key for download[1]; email address required for delivery	**6ES7833-1FC02-0YH5**
S7 Distributed Safety upgrade	
From V5.x to V5.4; floating license for 1 user; software and documentation on DVD; license key on USB flash drive	**6ES7833-1FC02-0YE5**
STEP 7 Safety Advanced V15.1 Task: Engineering tool for configuring and programming fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-1500F Software Controller, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller and the fail-safe ET 200SP, ET 200MP, ET 200S, ET 200M, ET 200iSP, ET 200pro and ET 200eco I/O Requirement: STEP 7 Professional V15.1	
Floating license for 1 user; software and documentation on DVD; license key on USB flash drive	**6ES7833-1FA15-0YA5**
Floating license for 1 user; software, documentation and license key for download[1]; email address required for delivery	**6ES7833-1FA15-0YH5**

Ordering data	Article No.
DIN rail for active bus modules For max. 5 active bus modules for hot swapping function	
• 483 mm (19") long	**6ES7195-1GA00-0XA0**
• 530 mm long	**6ES7195-1GF30-0XA0**
• 620 mm long	**6ES7195-1GG30-0XA0**
• 2 000 mm long	**6ES7195-1GC00-0XA0**
Active bus module BM 1 x 80 for 1 module with 80 mm width	**6ES7195-7HC00-0XA0**
SITOP power supply module For ET 200M; 120/230 V AC, 24 V DC, 5 A; Type PS 307-1E	**6ES7307-1EA01-0AA0**
Front connectors 40-pin, with screw contacts	
• 1 unit	**6ES7392-1AM00-0AA0**
• 100 units	**6ES7392-1AM00-1AB0**
40-pin, with spring-loaded contacts	
• 1 unit	**6ES7392-1BM01-0AA0**
• 100 units	**6ES7392-1BM01-1AB0**
Front door, higher version, for F-modules For F-modules; for connecting 1.3 mm^2/16 AWG wires; wiring diagram and labels in yellow	**6ES7328-7AA10-0AA0**
Labeling strips For F-modules (spare part); 10 units	**6ES7392-2XX20-0AA0**
Label cover For F-modules (spare part); 10 units	**6ES7392-2XY20-0AA0**
LK 393 cable guide For F-modules; L+ and M connections; 5 units	**6ES7393-4AA10-0AA0**
SIMATIC Manual Collection Electronic manuals on DVD, multi-language: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC Distributed I/O, SIMATIC HMI, SIMATIC sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	**6ES7998-8XC01-8YE0**
SIMATIC Manual Collection update service for 1 year Current "Manual Collection" DVD and the three subsequent updates	**6ES7998-8XC01-8YE2**

[1] For up-to-date information and download availability, see: http://www.siemens.com/tia-online-software-delivery

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Overview



- Digital outputs for the fail-safe SIMATIC S7 systems
- Two versions (1 x current sourcing, 1 x current sinking)
- For connecting solenoid valves, DC contactors and indicator lights
- With integral safety functions for fail-safe operation
- Can be used in fail-safe operation
  - Centrally: with S7-31xF DP, S7-31xF PN/DP
  - Distributed in ET 200M: with SIMATIC IM 151-7 F-CPU, S7-31xF-2 DP, S7-41xF-2 and S7-400F/FH

Technical specifications

Article number	**6ES7326-2BF10-0AB0** SM326, F-DQ10XDC24V/2A PP, failsafe	**6ES7326-2BF41-0AB0** SM 326, F-DQ 8 X DC 24V/2A PM
General information		
Product type designation	SM 326, F-DQ 10x24 V DC/2 A PP	SM 326, F-DQ 8x24 V DC/2 A PM
Supply voltage		
Rated value (DC)	24 V; 1L+	24 V; 1L+
Reverse polarity protection	Yes	Yes
Load voltage L+		
• Rated value (DC)	24 V; 2L+, 3L+	24 V; 2L+, 3L+
• Reverse polarity protection	No	No
Input current		
from supply voltage 1L+, max.	100 mA	75 mA
from load voltage 2L+ (without load), max.	100 mA	100 mA
from load voltage 3L+ (without load), max.	100 mA	100 mA
from backplane bus 5 V DC, max.	100 mA	100 mA
Power loss		
Power loss, typ.	6 W	12 W
Digital outputs		
Number of digital outputs	10	8
Short-circuit protection	Yes	Yes
Limitation of inductive shutdown voltage to		L+ (-33 V)
Switching capacity of the outputs		
• on lamp load, max.	5 W	5 W
Output voltage		
• for signal "1", min.	L+ (-1.0 V)	L+ (-1.0 V)
Output current		
• for signal "1" rated value	2 A	2 A
• for signal "1" permissible range for 0 to 40 °C, min.	7 mA	7 mA
• for signal "1" permissible range for 0 to 40 °C, max.	2.4 A	2 A; 2 A for horizontal installation, 1 A for vertical installation
• for signal "1" permissible range for 40 to 60 °C, min.	7 mA	7 mA
• for signal "1" permissible range for 40 to 60 °C, max.	2.4 A	1 A; for horizontal installation
• for signal "0" residual current, max.	0.5 mA	0.5 mA

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Technical specifications (continued)

Article number	**6ES7326-2BF10-0AB0**	**6ES7326-2BF41-0AB0**
	SM326, F-DQ10XDC24V/2A PP, failsafe	SM 326, F-DQ 8 X DC 24V/2A PM
Switching frequency		
• with resistive load, max.	25 Hz	30 Hz
• with inductive load, max.	25 Hz	2 Hz
• on lamp load, max.	10 Hz	10 Hz
Total current of the outputs (per group)		
horizontal installation		
- up to 40 °C, max.	10 A	7.5 A
- up to 60 °C, max.	6 A	5 A
vertical installation		
- up to 40 °C, max.	5 A	5 A
Cable length		
• shielded, max.	1 000 m	200 m; 200 m for SIL 3, AK 6, Cat 4
• unshielded, max.	600 m	200 m
Interrupts/diagnostics/ status information		
Alarms		
• Diagnostic alarm	Yes	Yes; Parameterizable
Diagnostic messages		
• Diagnostic information readable	Yes	Yes
Potential separation		
Potential separation digital outputs		
• between the channels	Yes	Yes
• between the channels, in groups of	5	4
• between the channels and backplane bus	Yes	Yes
• between the channels and the power supply of the electronics	Yes	Yes
Standards, approvals, certificates		
Highest safety class achievable in safety mode		
• acc. to DIN VDE 0801	AK 5 and 6	
• acc. to EN 954	Cat. 4	Cat. 4
• SIL acc. to IEC 61508	SIL 3	SIL 3
Connection method		
required front connector	40-pin	40-pin
Dimensions		
Width	40 mm	80 mm
Height	125 mm	125 mm
Depth	120 mm	120 mm
Weights		
Weight, approx.	330 g	465 g

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Ordering data	Article No.
SM 326 F-digital output module	
10 outputs, 24 V DC, 2 A PP; width 40 mm	**6ES7326-2BF10-0AB0**
8 outputs, 24 V DC, 2 A PM; width 80 mm	**6ES7326-2BF41-0AB0**
S7 Distributed Safety V5.4 SP5 Update 2 programming tool Task: Configuration software for configuring fail-safe user programs for SIMATIC S7-300F, S7-400F, WinAC RTX F, ET 200S, ET 200M, ET 200iSP, ET 200pro, ET 200eco, ET 200SP Requirement: Windows 7 SP1 (64-bit), Windows 10 Professional/Enterprise (64-bit), Windows Server 2008 R2 SP1 (64-bit), Windows Server 2012 R2 (64-bit), Windows Server 2016 (64-bit); STEP 7 from V5.5 SP1; Please also note the operating systems that have been released for the STEP 7 version used	
Floating license for 1 user; software and documentation on DVD; license key on USB flash drive	**6ES7833-1FC02-0YA5**
Floating license for 1 user; software, documentation and license key for download[1]; email address required for delivery	**6ES7833-1FC02-0YH5**
S7 Distributed Safety upgrade	
From V5.x to V5.4; floating license for 1 user; software and documentation on DVD; license key on USB flash drive	**6ES7833-1FC02-0YE5**
STEP 7 Safety Advanced V15.1 Task: Engineering tool for configuring and programming fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-1500F Software Controller, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller and the fail-safe ET 200SP, ET 200MP, ET 200S, ET 200M, ET 200iSP, ET 200pro and ET 200eco I/O Requirement: STEP 7 Professional V15.1	
Floating license for 1 user; software and documentation on DVD; license key on USB flash drive	**6ES7833-1FA15-0YA5**
Floating license for 1 user; software, documentation and license key for download[1]; email address required for delivery	**6ES7833-1FA15-0YH5**

	Article No.
DIN rail for active bus modules	
For max. 5 active bus modules, for function "Insertion and removal"	
• 483 mm (19") long	**6ES7195-1GA00-0XA0**
• 530 mm long	**6ES7195-1GF30-0XA0**
• 620 mm long	**6ES7195-1GG30-0XA0**
• 2 000 mm long	**6ES7195-1GC00-0XA0**
Active bus modules	
BM 2 x 40 for accepting 2 I/O modules each 40 mm wide	**6ES7195-7HB00-0XA0**
BM 1 x 80 for accepting 1 I/O module 80 mm wide	**6ES7195-7HC00-0XA0**
SITOP power supply module For ET 200M; 120/230 V AC, 24 V DC, 5 A; Type PS 307-1E	**6ES7307-1EA01-0AA0**
Front connectors	
40-pin, with screw contacts	
• 1 unit	**6ES7392-1AM00-0AA0**
• 100 units	**6ES7392-1AM00-1AB0**
40-pin, with spring-loaded contacts	
• 1 unit	**6ES7392-1BM01-0AA0**
• 100 units	**6ES7392-1BM01-1AB0**
Front door, higher version, for F-modules For F-modules; for connecting 1.3 mm^2/16 AWG wires; wiring diagram and labels in yellow	**6ES7328-7AA10-0AA0**
Labeling strips For F-modules (spare part), 10 units	**6ES7392-2XX20-0AA0**
Label cover For F-modules (spare part), 10 units	**6ES7392-2XY20-0AA0**
LK 393 cable guide For F-modules; L+ and M connections, 5 units	**6ES7393-4AA10-0AA0**
SIMATIC Manual Collection Electronic manuals on DVD, multi-language: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC Distributed I/O, SIMATIC HMI, SIMATIC sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	**6ES7998-8XC01-8YE0**
SIMATIC Manual Collection update service for 1 year Current "Manual Collection" DVD and the three subsequent updates	**6ES7998-8XC01-8YE2**

[1] For up-to-date information and download availability, see: http://www.siemens.com/tia-online-software-delivery

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SM 336 F-analog input modules - Safety Integrated

Overview



- Analog inputs for the fail-safe SIMATIC S7 systems
- Applicable in the ET 200M distributed I/O device with IM 153-2 HF as well as centrally with SIMATIC S7-31xF-2 DP
- Properties of the SM 336; F-AI 6 x 0/4 - 20 mA HART:
  - 6 analog inputs with galvanic isolation between channels and backplane bus
  - Input ranges: 0 to 20 mA, 4 to 20 mA
  - Short-circuit proof power supply from 2 or 4-wire transducer via the module
  - External encoder supply possible
  - Applicable in safety mode
  - HART communication
  - Firmware update using HW Config
  - Identification data

5

Technical specifications

Article number	**6ES7336-4GE00-0AB0** SM 336, f.AI 6 X 0/4 ... 20mA HART
Supply voltage	
Rated value (DC)	24 V
Reverse polarity protection	Yes
Input current	
From power supply L+, typ.	150 mA
from backplane bus 5 V DC, max.	90 mA
Power loss	
Power loss, typ.	4.5 W
Analog inputs	
Number of analog inputs	6
permissible input current for current input (destruction limit), max.	40 mA
Input ranges (rated values), currents	
• 0 to 20 mA	Yes
• 4 mA to 20 mA	Yes
Cable length	
• shielded, max.	1 000 m
Analog value generation for the inputs	
Integration and conversion time/ resolution per channel	
• Resolution with overrange (bit including sign), max.	16 bit; 15 bit + sign
• Integration time (ms)	20 ms @ 50 Hz, 16.7 ms @ 60 Hz
• Interference voltage suppression for interference frequency f1 in Hz	f=n x (f1 ±0.5 %)
Encoder	
Connection of signal encoders	
• for current measurement as 2-wire transducer	Yes
• for current measurement as 4-wire transducer	Yes

Article number	**6ES7336-4GE00-0AB0** SM 336, f.AI 6 X 0/4 ... 20mA HART
Errors/accuracies	
Operational error limit in overall temperature range	
• Current, relative to input range, (+/-)	0.2 %; 40 µA
Basic error limit (operational limit at 25 °C)	
• Current, relative to input range, (+/-)	0.1 %
Interrupts/diagnostics/ status information	
Alarms	
• Diagnostic alarm	Yes
Diagnostic messages	
• Diagnostic information readable	Yes
Potential separation	
Potential separation analog inputs	
• between the channels	Yes
• between the channels and backplane bus	Yes
• between the channels and the power supply of the electronics	Yes
Standards, approvals, certificates	
Highest safety class achievable in safety mode	
• acc. to EN 954	4
• SIL acc. to IEC 61508	SIL 3
Connection method	
required front connector	20-pin
Dimensions	
Width	40 mm
Height	125 mm
Depth	120 mm
Weights	
Weight, approx.	350 g

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Ordering data	Article No.
SM 336 F-analog input module	
6 inputs, 15 bit, 0/4 - 20 mA HART	**6ES7336-4GE00-0AB0**
S7 Distributed Safety V5.4 SP5 Update 2 programming tool Task: Configuration software for configuring fail-safe user programs for SIMATIC S7-300F, S7-400F, WinAC RTX F, ET 200S, ET 200M, ET 200iSP, ET 200pro, ET 200eco, ET 200SP Requirement: Windows 7 SP1 (64-bit), Windows 10 Professional/Enterprise (64-bit), Windows Server 2008 R2 SP1 (64-bit), Windows Server 2012 R2 (64-bit), Windows Server 2016 (64-bit); STEP 7 from V5.5 SP1; Please also note the operating systems that have been released for the STEP 7 version used	
Floating license for 1 user; software and documentation on DVD; license key on USB flash drive	**6ES7833-1FC02-0YA5**
Floating license for 1 user; software, documentation and license key for download[1]; email address required for delivery	**6ES7833-1FC02-0YH5**
S7 Distributed Safety upgrade	
From V5.x to V5.4; floating license for 1 user; software and documentation on DVD; license key on USB flash drive	**6ES7833-1FC02-0YE5**
STEP 7 Safety Advanced V15.1 Task: Engineering tool for configuring and programming fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-1500F Software Controller, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller and the fail-safe ET 200SP, ET 200MP, ET 200S, ET 200M, ET 200iSP, ET 200pro and ET 200eco I/O Requirement: STEP 7 Professional V15.1	
Floating license for 1 user; software and documentation on DVD; license key on USB flash drive	**6ES7833-1FA15-0YA5**
Floating license for 1 user; software, documentation and license key for download[1]; email address required for delivery	**6ES7833-1FA15-0YH5**

	Article No.
DIN rail for active bus modules For max. 5 active bus modules for hot swapping function	
• 483 mm long	**6ES7195-1GA00-0XA0**
• 530 mm long	**6ES7195-1GF30-0XA0**
• 620 mm long	**6ES7195-1GG30-0XA0**
• 2 000 mm long	**6ES7195-1GC00-0XA0**
Active bus module BM 2x40 Bus module for accepting 2 I/O modules each 40 mm wide	**6ES7195-7HB00-0XA0**
SITOP power supply module For ET 200M; 120/230 V AC, 24 V DC, 5 A; Type PS 307-1E	**6ES7307-1EA01-0AA0**
Front connectors 20-pin, with screw contacts	
• 1 unit	**6ES7392-1AJ00-0AA0**
• 100 units	**6ES7392-1AJ00-1AB0**
20-pin, with spring-loaded contacts	
• 1 unit	**6ES7392-1BJ00-0AA0**
• 100 units	**6ES7392-1BJ00-1AB0**
Front door, higher version, for F-modules For F-modules; for connecting 1.3 mm^2/16 AWG wires; wiring diagram and labels in yellow	**6ES7328-7AA10-0AA0**
Labeling strips For F-modules (spare part), 10 units	**6ES7392-2XX20-0AA0**
Label cover For F-modules (spare part), 10 units	**6ES7392-2XY20-0AA0**
LK 393 cable guide For F-modules; L+ and M connections, 5 units	**6ES7393-4AA10-0AA0**
SIMATIC Manual Collection Electronic manuals on DVD, multi-language: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC Distributed I/O, SIMATIC HMI, SIMATIC sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	**6ES7998-8XC01-8YE0**
SIMATIC Manual Collection update service for 1 year Current "Manual Collection" DVD and the three subsequent updates	**6ES7998-8XC01-8YE2**

[1] For up-to-date information and download availability, see: http://www.siemens.com/tia-online-software-delivery

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Safety protector

Overview



- Supports mixed operation of fail-safe signal modules in safety mode and S7-300 standard modules in an ET 200M distributed I/O device for achieving Cat. 4 or SIL 3.
- The safety protector is not required if the safety class or safety category to be achieved is less than SIL 3 or Cat. 4, respectively.

When Cat. 4/SIL 3 is required, the safety protector must be implemented in the following situations:

Application	Safety protector must be used
Central use after CPU 31xF-2 DP or CPU 31xF-2 PN/DP	
• Only fail-safe modules in the tier	Yes, behind the CPU
• Standard and fail-safe modules in the tier	Yes, after the last standard module and before the first fail-safe module
Central use after CPU 31xF-2 DP or CPU 31xF-2 PN/DP in an expansion rack	
• Only fail-safe modules in the tier	Yes, after the IM 36x
• Standard and fail-safe modules in the tier	Yes, after the last standard module and before the first fail-safe module
Distributed behind the IM 153-2 with copper connection	
• Only fail-safe modules in the station	Yes, after the IM 153-2
• Standard and fail-safe modules in the station	Yes, after the last standard module and before the first fail-safe module
Distributed behind the IM 153-2 with fiber-optic connection	
• Only fail-safe modules in the station	No
• Standard and fail-safe modules in the station	Yes, after the last standard module and before the first fail-safe module

Technical specifications

Article number	**6ES7195-7KF00-0XA0** Safety Protector betw. F- and Std-Mod.
Weights	
Weight, approx.	10 g

Ordering data

	Article No.
Safety protector For simultaneous operation of fail-safe and standard modules in ET 200M	**6ES7195-7KF00-0XA0**
Bus safety protector For holding the safety protector in ET 200M	**6ES7195-7HG00-0XA0**

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Overview



- Digital inputs for the fail-safe SIPLUS S7 systems
- For connecting:
  - Switches and 2-wire proximity switches
  - Sensors according to NAMUR and mechanical contacts, also for signals from hazardous areas
- With integral safety functions for fail-safe operation
- Can be used in fail-safe operation
  - Centrally: with S7-31xF-2 DP
  - Distributed in ET 200M: With SIMATIC IM 151-7 F-CPU, S7-31xF-2 DP, S7-416F-2 and S7-400F/FH
- In standard operation can be used in the same way as S7-300 modules

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

5

Technical specifications

Article number	**6AG1326-1BK02-2AB0**	**6AG1326-1BK02-2AY0**	**6AG1326-1RF01-4AB0**
Based on	**6ES7326-1BK02-0AB0**	**6ES7326-1BK02-0AB0**	**6ES7326-1RF01-0AB0**
	SIPLUS S7-300 SM326F DI24	SIPLUS S7-300 SM326F DI24	SIPLUS S7-300 SM326F DI8 NAMUR
Ambient conditions			
Ambient temperature during operation			
• min.	-25 °C; = Tmin	-25 °C; = Tmin	0 °C; = Tmin
• max.	60 °C; = Tmax; *+70 °C where forced convection with a minimum air velocity of 0.7 m/s through the modules and rated voltage of 24 V ±5 % are ensured. If in the course of maintenance or automatic diagnosis it is determined that the admissible specified parameters have been exceeded, the modules should be subjected to a proof test (function check) by the manufacturer.	60 °C; = Tmax; the rated temperature range of -25 ... +55 °C (T1) applies for the use on railway vehicles according to EN50155	60 °C; = Tmax
Altitude during operation relating to sea level			
• Installation altitude above sea level, max.	2 000 m	2 000 m	2 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)
Relative humidity			
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance			
Use in stationary industrial systems			
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *

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Technical specifications (continued)

Article number	6AG1326-1BK02-2AB0	6AG1326-1BK02-2AY0	6AG1326-1RF01-4AB0
Based on	6ES7326-1BK02-0AB0	6ES7326-1BK02-0AB0	6ES7326-1RF01-0AB0
	SIPLUS S7-300 SM326F DI24	SIPLUS S7-300 SM326F DI24	SIPLUS S7-300 SM326F DI8 NAMUR
Use on land craft, rail vehicles and special-purpose vehicles			
- to biologically active substances according to EN 60721-3-5		Yes; Class 5B2 mold, fungus and dry rot spores (with the exception of fauna); Class 5B3 on request	
- to chemically active substances according to EN 60721-3-5		Yes; Class 5C3 (RH < 75 %) incl. salt spray acc. to EN 50155 (ST2); *	
- to mechanically active substances according to EN 60721-3-5		Yes; Class 5S3 incl. sand, dust; *	
Use on ships/at sea			
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request		Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *		Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *		Yes; Class 6S3 incl. sand, dust; *
Remark			
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!

Ordering data

	Article No.
SIPLUS S7-300 SM 326 F-digital input	
For industrial applications with extended ambient conditions	
Extended temperature range and exposure to media	
24 inputs, 24 V DC, failsafe, with diagnostics interrupt	**6AG1326-1BK02-2AB0**
8 inputs, 24 V DC, NAMUR, failsafe	**6AG1326-1RF01-4AB0**
For rolling stock railway applications	
Conforms to EN 50155	
24 inputs, 24 V DC, failsafe, with diagnostics interrupt	**6AG1326-1BK02-2AY0**
Accessories	
Mandatory	
Front connector	
40-pin, with spring-loaded contacts	
• 1 unit	**6ES7392-1BM01-0AA0**
• 100 units	**6ES7392-1BM01-1AB0**
Accessories for hot swapping function	
Active bus module	
BM 1 x 80 for 1 module, 80 mm wide	**6AG1195-7HC00-2XA0**

	Article No.
Consumables	
DIN rail for active bus modules	
For max. 5 active bus modules for hot swapping function	
• Length 483 mm (19")	**6ES7195-1GA00-0XA0**
• Length 530 mm	**6ES7195-1GF30-0XA0**
• Length 620 mm	**6ES7195-1GG30-0XA0**
• Length 2000 mm	**6ES7195-1GC00-0XA0**
Front door, elevated design, for F-modules	**6ES7328-7AA10-0AA0**
For F-modules; for connecting 1.3 mm^2/16 AWG wires; wiring diagram and labels in yellow	
Labeling strips	**6ES7392-2XX20-0AA0**
For F-modules (spare part); 10 units	
Label cover	**6ES7392-2XY20-0AA0**
For F-modules (spare part); 10 units	
LK 393 cable guide	**6ES7393-4AA10-0AA0**
For F-modules; L+ and M connections; 5 units	

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Ordering data	Article No.
Programming tools and documentation	
S7 Distributed Safety V5.4 SP5 Update 2 programming tool Task: Configuration software for configuring fail-safe user programs for SIMATIC S7-300F, S7-400F, WinAC RTX F, ET 200S, ET 200M, ET 200iSP, ET 200pro, ET 200eco, ET 200SP Requirement: Windows 7 SP1 (64-bit), Windows 10 Professional/Enterprise (64-bit), Windows Server 2008 R2 SP1 (64-bit), Windows Server 2012 R2 (64-bit), Windows Server 2016 (64-bit); STEP 7 as of V5.5 SP1; Please also consider the operating systems that have been released for the used STEP 7 version	
Floating license for 1 user; software and documentation on DVD; license key on USB flash drive	**6ES7833-1FC02-0YA5**
Floating license for 1 user; software, documentation and license key for download[1]; email address required for delivery	**6ES7833-1FC02-0YH5**
S7 Distributed Safety upgrade	
From V5.x to V5.4; floating license for 1 user; software and documentation on DVD; license key on USB flash drive	**6ES7833-1FC02-0YE5**

	Article No.
STEP 7 Safety Advanced V15.1 Task: Engineering tool for configuring and programming fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-1500F Software Controller, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller and the fail-safe ET 200SP, ET 200MP, ET 200S, ET 200M, ET 200iSP, ET 200pro and ET 200eco I/O Requirement: STEP 7 Professional V15.1	
Floating license for 1 user, software and documentation on DVD; license key on USB flash drive	**6ES7833-1FA15-0YA5**
Floating license for 1 user, software, documentation and license key for download[1]; email address required for delivery	**6ES7833-1FA15-0YH5**
SIMATIC Manual Collection Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC Distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	**6ES7998-8XC01-8YE0**
SIMATIC Manual Collection update service for 1 year Current "Manual Collection" DVD and the three subsequent updates	**6ES7998-8XC01-8YE2**

[1] For up-to-date information and download availability, see: http://www.siemens.com/tia-online-software-delivery

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SIPLUS S7-300 SM 326 - Safety Integrated

Overview



- Digital outputs for the fail-safe SIMATIC S7 systems
- For connection of solenoid valves, DC contactors and indicator lights
- With integral safety functions for fail-safe operation
- Can be used in fail-safe mode
  - Centrally: With S7-31xF-2 DP
  - Distributed in ET 200M: With SIMATIC IM 151-7 F-CPU, S7-31xF-2 DP, S7-416F-2 and S7-400F/FH

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

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Technical specifications

Article number	**6AG1326-2BF10-2AB0**	**6AG1326-2BF10-2AY0**	**6AG1326-2BF41-2AB0**	**6AG1326-2BF41-2AY0**
Based on	**6ES7326-2BF10-0AB0**	**6ES7326-2BF10-0AB0**	**6ES7326-2BF41-0AB0**	**6ES7326-2BF41-0AB0**
	SIPLUS S7-300 SM326F 10 DQ	SIPLUS S7-300 SM326 10F-DQ	SIPLUS S7-300 SM326F DQ8	SIPLUS S7-300 SM326 F DQ8 EN50155
Ambient conditions				
Ambient temperature during operation				
• min.	-25 °C	-25 °C; = Tmin	-25 °C	-25 °C; = Tmin
• max.	60 °C; = T max; *+70 °C when forced convection at a minimum air speed of 0.3 m/s through the modules is ensured. If in the course of maintenance or automatic diagnosis it is determined that the admissible specified parameters have been exceeded, the modules should be subjected to a proof test (function check) by the manufacturer.	60 °C; = Tmax; the rated temperature range of -25 ... +55 °C (T1) applies for the use on railway vehicles according to EN50155	60 °C	60 °C; = Tmax; the rated temperature range of -25 ... +55 °C (T1) applies for the use on railway vehicles according to EN50155
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.	2 000 m	2 000 m	2 000 m	2 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)
Relative humidity				
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance				
Use in stationary industrial systems				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *

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Technical specifications (continued)

Article number	6AG1326-2BF10-2AB0	6AG1326-2BF10-2AY0	6AG1326-2BF41-2AB0	6AG1326-2BF41-2AY0
Based on	6ES7326-2BF10-0AB0	6ES7326-2BF10-0AB0	6ES7326-2BF41-0AB0	6ES7326-2BF41-0AB0
	SIPLUS S7-300 SM326F 10 DQ	SIPLUS S7-300 SM326 10F-DQ	SIPLUS S7-300 SM326F DQ8	SIPLUS S7-300 SM326 F DQ8 EN50155
Use on land craft, rail vehicles and special-purpose vehicles				
- to biologically active substances according to EN 60721-3-5		Yes; Class 5B2 mold, fungus and dry rot spores (with the exception of fauna); Class 5B3 on request		Yes; Class 5B2 mold, fungus and dry rot spores (with the exception of fauna); Class 5B3 on request
- to chemically active substances according to EN 60721-3-5		Yes; Class 5C3 (RH < 75 %) incl. salt spray acc. to EN 50155 (ST2); *		Yes; Class 5C3 (RH < 75 %) incl. salt spray acc. to EN 50155 (ST2); *
- to mechanically active substances according to EN 60721-3-5		Yes; Class 5S3 incl. sand, dust; *		Yes; Class 5S3 incl. sand, dust; *
Use on ships/at sea				
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request		Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *		Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *		Yes; Class 6S3 incl. sand, dust; *	
Remark				
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!

Ordering data

	Article No.
SIPLUS S7-300 SM 326 F-digital output	
For industrial applications with extended ambient conditions	
Extended temperature range and exposure to media	
10 outputs, 24 V DC, 2 A, failsafe	**6AG1326-2BF10-2AB0**
8 outputs, 24 V DC, 2 A, failsafe, current sinking output	**6AG1326-2BF41-2AB0**
For rolling stock railway applications	
Conforms to EN 50155	
10 outputs, 24 V DC, 2 A, failsafe	**6AG1326-2BF10-2AY0**
8 outputs, 24 V DC, 2 A, failsafe, current sinking output	**6AG1326-2BF41-2AY0**
Accessories	
Mandatory	
Front connector	
40-pin, with spring-loaded contacts	
• 1 unit	**6ES7392-1BM01-0AA0**
• 100 units	**6ES7392-1BM01-1AB0**
Accessories for hot swapping function	
Active bus module	
BM 2 x 40 for accepting 2 I/O modules, each 40 mm wide	**6AG1195-7HB00-7XA0**
BM 1 x 80 for 1 module, 80 mm wide	**6AG1195-7HC00-2XA0**
Consumables	
DIN rail for active bus modules	
For max. 5 active bus modules for hot swapping function	
• Length 483 mm (19")	**6ES7195-1GA00-0XA0**
• Length 530 mm	**6ES7195-1GF30-0XA0**
• Length 620 mm	**6ES7195-1GG30-0XA0**
• Length 2000 mm	**6ES7195-1GC00-0XA0**
Front door, elevated design, for F-modules	**6ES7328-7AA10-0AA0**
For F-modules; for connecting 1.3 mm^2/16 AWG wires; wiring diagram and labels in yellow	
Labeling strips	**6ES7392-2XX20-0AA0**
For F-modules (spare part); 10 units	
Label cover	**6ES7392-2XY20-0AA0**
For F-modules (spare part); 10 units	
LK 393 cable guide	**6ES7393-4AA10-0AA0**
For F-modules; L+ and M connections; 5 units	

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SIPLUS S7-300 SM 326 - Safety Integrated

Ordering data	Article No.
Programming tools and documentation	
S7 Distributed Safety V5.4 SP5 Update 2 programming tool Task: Configuration software for configuring fail-safe user programs for SIMATIC S7-300F, S7-400F, WinAC RTX F, ET 200S, ET 200M, ET 200iSP, ET 200pro, ET 200eco, ET 200SP Requirement: Windows 7 SP1 (64-bit), Windows 10 Professional/Enterprise (64-bit), Windows Server 2008 R2 SP1 (64-bit), Windows Server 2012 R2 (64-bit), Windows Server 2016 (64-bit); STEP 7 as of V5.5 SP1; Please also consider the operating systems that have been released for the used STEP 7 version	
Floating license for 1 user; software and documentation on DVD; license key on USB flash drive	**6ES7833-1FC02-0YA5**
Floating license for 1 user; software, documentation and license key for download[1]; email address required for delivery	**6ES7833-1FC02-0YH5**
S7 Distributed Safety upgrade	
From V5.x to V5.4; floating license for 1 user; software and documentation on DVD; license key on USB flash drive	**6ES7833-1FC02-0YE5**
STEP 7 Safety Advanced V15.1 Task: Engineering tool for configuring and programming fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-1500F Software Controller, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller and the fail-safe ET 200SP, ET 200MP, ET 200S, ET 200M, ET 200iSP, ET 200pro and ET 200eco I/O Requirement: STEP 7 Professional V15.1	
Floating license for 1 user, software and documentation on DVD; license key on USB flash drive	**6ES7833-1FA15-0YA5**
Floating license for 1 user, software, documentation and license key for download[1]; email address required for delivery	**6ES7833-1FA15-0YH5**
SIMATIC Manual Collection	**6ES7998-8XC01-8YE0**
Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC Distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	
SIMATIC Manual Collection update service for 1 year	**6ES7998-8XC01-8YE2**
Current "Manual Collection" DVD and the three subsequent updates	

[1] For up-to-date information and download availability, see: http://www.siemens.com/tia-online-software-delivery

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Overview



- Analog inputs for fail-safe SIPLUS S7 systems
- Applicable in the ET 200M distributed I/O device with IM 153-2 HF as well as centrally with SIPLUS S7-31xF-2 DP
- Properties of the SM 336; F-AI 6 x 0/4 ... 20 mA HART:
  - 6 analog inputs with galvanic isolation between channels and backplane bus
  - Input ranges: 0 mA to 20 mA, 4 mA to 20 mA
  - Short-circuit proof power supply of 2 or 4-wire transmitter via the module
  - External encoder supply possible
  - Applicable in safety mode
  - HART communication
  - Firmware update using HW Config
  - Identification data
  - Temperature range -25 ... +70 °C; (+70 °C when ensuring a forced convection with a minimal air velocity of 0.3 m/s through the module. If a violation of the permissible, specified parameters is detected during maintenance or by automatic diagnostics, the modules must be proof-tested by the manufacturer. Without this measure the temperature range is -25…60°C)

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

Technical specifications

Article number	**6AG1336-4GE00-2AB0**
Based on	**6ES7336-4GE00-0AB0**
	SIPLUS S7-300 SM336 F 6AI 15BIT
Ambient conditions	
Ambient temperature during operation	
• min.	-25 °C; = Tmin; Startup @ -25 °C
• max.	60 °C; = T max; *+70 °C when forced convection at a minimum air speed of 0.3 m/s through the modules is ensured. If in the course of maintenance or automatic diagnosis it is determined that the admissible specified parameters have been exceeded, the modules should be subjected to a proof test (function check) by the manufacturer.
• At cold restart, min.	-25 °C
Ambient temperature during storage/transportation	
• min.	-40 °C
• max.	70 °C
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	2 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance	
Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
Remark	
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!

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SIPLUS S7-300 SM 336 - Safety Integrated

Ordering data	Article No.
SIPLUS S7-300 SM 336 F-analog input module	
For industrial applications with extended ambient conditions	
Extended temperature range and exposure to media	
6 inputs, 15 bits, 0/4 ... 20 mA HART	**6AG1336-4GE00-2AB0**
Accessories	
Mandatory	
Front connector	
20-pin, with spring-loaded contacts	
• 1 unit	**6ES7392-1BJ00-0AA0**
• 100 units	**6ES7392-1BJ00-1AB0**
Accessories for hot swapping function	
Active bus module	
BM 2 x 40 for accepting 2 I/O modules, each 40 mm wide	**6AG1195-7HB00-7XA0**
Consumables	
DIN rail for active bus modules	
For max. 5 active bus modules for hot swapping function	
• Length 483 mm (19")	**6ES7195-1GA00-0XA0**
• Length 530 mm	**6ES7195-1GF30-0XA0**
• Length 620 mm	**6ES7195-1GG30-0XA0**
• Length 2000 mm	**6ES7195-1GC00-0XA0**
Front door, elevated design, for F-modules	**6ES7328-7AA10-0AA0**
For F-modules; for connecting 1.3 mm^2/16 AWG wires; wiring diagram and labels in yellow	
Labeling strips	**6ES7392-2XX20-0AA0**
For F-modules (spare part); 10 units	
Label cover	**6ES7392-2XY20-0AA0**
For F-modules (spare part); 10 units	
LK 393 cable guide	**6ES7393-4AA10-0AA0**
For F-modules; L+ and M connections; 5 units	

	Article No.
Programming tools and documentation	
S7 Distributed Safety V5.4 SP5 Update 2 programming tool	
Task: Configuration software for configuring fail-safe user programs for SIMATIC S7-300F, S7-400F, WinAC RTX F, ET 200S, ET 200M, ET 200iSP, ET 200pro, ET 200eco, ET 200SP Requirement: Windows 7 SP1 (64-bit), Windows 10 Professional/Enterprise (64-bit), Windows Server 2008 R2 SP1 (64-bit), Windows Server 2012 R2 (64-bit), Windows Server 2016 (64-bit); STEP 7 as of V5.5 SP1; Please also consider the operating systems that have been released for the used STEP 7 version	
Floating license for 1 user; software and documentation on DVD; license key on USB flash drive	**6ES7833-1FC02-0YA5**
Floating license for 1 user; software, documentation and license key for download[1]; email address required for delivery	**6ES7833-1FC02-0YH5**
S7 Distributed Safety upgrade	
From V5.x to V5.4; floating license for 1 user; software and documentation on DVD; license key on USB flash drive	**6ES7833-1FC02-0YE5**
STEP 7 Safety Advanced V15.1	
Task: Engineering tool for configuring and programming fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-1500F Software Controller, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller and the fail-safe ET 200SP, ET 200MP, ET 200S, ET 200M, ET 200iSP, ET 200pro and ET 200eco I/O Requirement: STEP 7 Professional V15.1	
Floating license for 1 user, software and documentation on DVD; license key on USB flash drive	**6ES7833-1FA15-0YA5**
Floating license for 1 user, software, documentation and license key for download[1]; email address required for delivery	**6ES7833-1FA15-0YH5**
SIMATIC Manual Collection	**6ES7998-8XC01-8YE0**
Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC Distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	
SIMATIC Manual Collection update service for 1 year	**6ES7998-8XC01-8YE2**
Current "Manual Collection" DVD and the three subsequent updates	

[1] For up-to-date information and download availability, see: http://www.siemens.com/tia-online-software-delivery

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Overview



- Allows combined operation of fail-safe signal modules in safety mode and S7-300 standard modules in an ET 200M.
- The safety protector is not required if the safety class SIL 3 or safety category < Cat. 4 is to be achieved.

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

Technical specifications

Article number	**6AG1195-7KF00-2XA0**
Based on	**6ES7195-7KF00-0XA0**
	SIPLUS S7-300 safety protector
Ambient conditions	
Ambient temperature during operation	
• min.	-25 °C; = Tmin
• max.	60 °C; = Tmax
Ambient temperature during storage/transportation	
• min.	-40 °C
• max.	70 °C
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	2 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance	
Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
Remark	
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!

Ordering data

	Article No.
SIPLUS F safety protector	
For the simultaneous operation of fail-safe and standard modules in the same ET 200M	
For industrial applications with extended ambient conditions	
Extended temperature range and exposure to media	**6AG1195-7KF00-2XA0**
Accessories	
SIPLUS ET 200M bus safety protector F	
For the simultaneous operation of fail-safe and standard modules in ET 200 M for the hot swapping function	
Extended temperature range and exposure to media	**6AG1195-7HG00-2XA0**

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Ex digital input modules

Overview



- Digital inputs for signals from the Ex field
- For the connection of intrinsically safe digital equipment from the Ex field
- 4 DI NAMUR
- 4 digital inputs in 4 channel modules (single-channel isolation)
- Connectable encoder in accordance with EN 60947-5-6 and NAMUR, optionally with wired or unwired mechanical contacts
- Diagnostics and diagnostics alarm programmable

5

Technical specifications

Article number	**6ES7321-7RD00-0AB0** SM321, 4DI, DC24V, HAZARDOUS AREAS
Supply voltage	
Load voltage L+	
• Rated value (DC)	24 V
Input current	
from load voltage L+ (without load), max.	50 mA
from backplane bus 5 V DC, max.	80 mA
Encoder supply	
Type of output voltage	via the inputs
Power loss	
Power loss, typ.	1.1 W
Digital inputs	
Number of NAMUR inputs	4
Input voltage	
• Rated value (DC)	8.2 V; from internal power circuit supply
Input current	
• on wire-break, max.	0.1 mA
• on short-circuit, max.	8.5 mA
for NAMUR encoders	
- for signal "0"	0.35 to 1.2 mA
- for signal "1"	2.1 to 7 mA
Input delay (for rated value of input voltage)	
• Input frequency (with a time delay of 0.1 ms), max.	2 kHz
for NAMUR inputs	
- parameterizable	Yes; 0.1 / 0.5 / 3 / 15 / 20 ms (plus 0.25 ms preparation time)
Cable length	
• unshielded, max.	200 m
Encoder	
Connectable encoders	
• NAMUR encoder	Yes; Two-wire connection

Article number	**6ES7321-7RD00-0AB0** SM321, 4DI, DC24V, HAZARDOUS AREAS
Interrupts/diagnostics/ status information	
Diagnostic messages	
• Diagnostic information readable	Yes
Ex(i) characteristics	
Maximum values of input circuits (per channel)	
• Co (permissible external capacity), max.	3 µF
• Io (short-circuit current), max.	14.1 mA
• Lo (permissible external inductivity), max.	100 mH
• Po (power of load), max.	33.7 mW
• Uo (output no-load voltage), max.	10 V
Potential separation	
Potential separation digital inputs	
• Potential separation digital inputs	Yes
• between the channels, in groups of	1
Standards, approvals, certificates	
Use in hazardous areas	
• Type of protection acc. to EN 50020 (CENELEC)	[EEx ib] IIC
• Type of protection acc. to FM	Class II, Division 2, Group A, B, C, D T4
• Test number PTB	Ex-96.D.2094X
Ambient conditions	
Ambient temperature during operation	
• max.	60 °C
Connection method	
required front connector	20-pin
Weights	
Weight, approx.	230 g

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Ordering data

	Article No.
Ex digital input module	
4 inputs, isolated, NAMUR	**6ES7321-7RD00-0AB0**
Front connector	
20-pin, with screw contacts	
• 1 unit	**6ES7392-1AJ00-0AA0**
• 100 units	**6ES7392-1AJ00-1AB0**
Front door, elevated design	
e.g. for 32 channel modules; enables connection of 1.3 mm^2/16 AWG wires	**6ES7328-0AA00-7AA0**
LK 393 cable guide	**6ES7393-4AA00-0AA0**
Mandatory for operation in Ex-hazard areas	
Labeling strips	**6ES7392-2XX00-0AA0**
10 units (spare part), for modules with 20-pin front connector	
Label cover	**6ES7392-2XY00-0AA0**
10 units (spare part), for modules with 20-pin front connector	

	Article No.
Labeling sheets for machine inscription	
for modules with 20-pin front connector, DIN A4, for printing with laser printer; 10 units	
Petrol	**6ES7392-2AX00-0AA0**
Light beige	**6ES7392-2BX00-0AA0**
Yellow	**6ES7392-2CX00-0AA0**
Red	**6ES7392-2DX00-0AA0**
SIMATIC Manual Collection	**6ES7998-8XC01-8YE0**
Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC Distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	
SIMATIC Manual Collection update service for 1 year	**6ES7998-8XC01-8YE2**
Current "Manual Collection" DVD and the three subsequent updates	

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Ex digital output modules

Overview



- Digital outputs for signals from the Ex field
- For the connection of intrinsically safe digital equipment from the Ex field
- 4 DQ 24 V DC/10mA or 4 DQ 15 V DC/20 mA
- 4 digital outputs in 4 channel modules (single-channel isolation)
- Diagnostics and diagnostics alarm programmable
- Substitute value behavior programmable

5

Technical specifications

Article number	**6ES7322-5SD00-0AB0** SM322, 4DQ, 24V DC,10MA, HAZARDOUS AREAS	**6ES7322-5RD00-0AB0** SM322, 4DQ, 15V DC,20MA, HAZARDOUS AREAS
Supply voltage		
Load voltage L+		
• Rated value (DC)	24 V	24 V
Input current		
from load voltage L+ (without load), max.	160 mA	160 mA
from backplane bus 5 V DC, max.	85 mA	85 mA
Power loss		
Power loss, typ.	3 W	3 W
Digital outputs		
Number of digital outputs	4	4
Short-circuit protection	Yes; Electronic	Yes; Electronic
• Response threshold, typ.	Output current with short-circuit protection, min. 10 mA + 10 %	Output current with short-circuit protection, min. 20.5 mA + 10 %
Load resistance range		
• upper limit	390 Ω; Two-wire connection	200 Ω; Two-wire connection
Output voltage		
• Rated value (DC)	24 V	15 V
Output current		
• for signal "1" permissible range for 0 to 60 °C, max.	10 mA; ±10 %	20 mA; ±10 %
Switching frequency		
• with resistive load, max.	100 Hz	100 Hz
Cable length		
• unshielded, max.	200 m	200 m
Interrupts/diagnostics/ status information		
Diagnostic messages		
• Diagnostic information readable	Yes	Yes
• Short-circuit	Yes	Yes
Ex(i) characteristics		
Maximum values of output circuits (per channel)		
• Co (permissible external capacity), max.	90 nF	500 nF
• Io (short-circuit current), max.	70 mA	85 mA
• Lo (permissible external inductivity), max.	6.7 mH	5 mH
• Po (power of load), max.	440 mW	335 mW
• Uo (output no-load voltage), max.	25.2 V	15.75 V

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Technical specifications (continued)

Article number	**6ES7322-5SD00-0AB0** SM322, 4DQ, 24V DC,10MA, HAZARDOUS AREAS	**6ES7322-5RD00-0AB0** SM322, 4DQ, 15V DC,20MA, HAZARDOUS AREAS
Potential separation		
Potential separation digital outputs		
• Potential separation digital outputs	Yes	Yes
• between the channels, in groups of	1	1
Standards, approvals, certificates		
Use in hazardous areas		
• Type of protection acc. to EN 50020 (CENELEC)	[EEx ib] IIC	[EEx ib] IIC
• Type of protection acc. to FM	Class I, Division 2, Group A, B, C, D T4	AIS CL.1, DIV 1, GP A, B, C, D; CL.I, DIV 2, GP A, B, C, D T4
• Test number PTB	Ex-96.D.2093X	Ex-96.D.2102X
Ambient conditions		
Ambient temperature during operation		
• max.	60 °C	60 °C
Connection method		
required front connector	20-pin	20-pin
Weights		
Weight, approx.	230 g	230 g

Ordering data

	Article No.
Ex digital output modules	
4 outputs, isolated, 24 V DC, 10 mA	**6ES7322-5SD00-0AB0**
4 outputs, isolated, 15 V DC, 20 mA	**6ES7322-5RD00-0AB0**
Front connector	
20-pin, with screw contacts	
• 1 unit	**6ES7392-1AJ00-0AA0**
• 100 units	**6ES7392-1AJ00-1AB0**
Front door, elevated design	
e.g. for 32 channel modules; enables connection of 1.3 mm^2/16 AWG wires	**6ES7328-0AA00-7AA0**
LK 393 cable guide	**6ES7393-4AA00-0AA0**
Mandatory for operation in Ex-hazard areas	
Labeling strips	**6ES7392-2XX00-0AA0**
10 units (spare part), for modules with 20-pin front connector	
Label cover	**6ES7392-2XY00-0AA0**
10 units (spare part), for modules with 20-pin front connector	

	Article No.
Labeling sheets for machine inscription	
for modules with 40-pin front connector, DIN A4, for printing with laser printer; 10 units	
Petrol	**6ES7392-2AX00-0AA0**
Light beige	**6ES7392-2BX00-0AA0**
Yellow	**6ES7392-2CX00-0AA0**
Red	**6ES7392-2DX00-0AA0**
SIMATIC Manual Collection	**6ES7998-8XC01-8YE0**
Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC Distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	
SIMATIC Manual Collection update service for 1 year	**6ES7998-8XC01-8YE2**
Current "Manual Collection" DVD and the three subsequent updates	

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SIPLUS S7-300 Ex digital input modules

Overview



- Digital inputs for signals from the Ex field
- For the connection of intrinsically safe digital equipment from the Ex field
- 4 DI NAMUR
- 4 digital inputs in 4 channel modules (single-channel isolation)
- Connectable encoder in accordance with EN 60947-5-6 and NAMUR, optionally with wired or unwired mechanical contacts
- Programmable diagnostics and diagnostic interrupt

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

5

Technical specifications

Article number	**6AG1321-7RD00-4AB0**
Based on	**6ES7321-7RD00-0AB0**
	SIPLUS S7-300 SM 321 4DI NAMUR
Ambient conditions	
Ambient temperature during operation	
• min.	0 °C; = Tmin
• max.	60 °C; = Tmax
Ambient temperature during storage/transportation	
• min.	-40 °C
• max.	70 °C
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)

Article number	**6AG1321-7RD00-4AB0**
Based on	**6ES7321-7RD00-0AB0**
	SIPLUS S7-300 SM 321 4DI NAMUR
Resistance	
Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
Remark	
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!

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Ordering data

	Article No.
SIPLUS S7-300 Ex digital input module	
Exposure to media	
4 inputs, isolated, NAMUR	**6AG1321-7RD00-4AB0**
Accessories	
Mandatory	
Front connector	
20-pin, with spring-loaded contacts	
• 1 unit	**6ES7392-1BJ00-0AA0**
• 100 units	**6ES7392-1BJ00-1AB0**
Consumables	
DIN rail for active bus modules	
For max. 5 active bus modules for hot swapping function	
• Length 483 mm (19")	**6ES7195-1GA00-0XA0**
• Length 530 mm	**6ES7195-1GF30-0XA0**
• Length 620 mm	**6ES7195-1GG30-0XA0**
• Length 2000 mm	**6ES7195-1GC00-0XA0**
Front door, elevated design	**6ES7328-0AA00-7AA0**
E.g. for 32-channel modules; for connecting 1.3 mm^2/16 AWG conductors; circuit diagram and nameplates in petrol	
LK 393 cable guide	**6ES7393-4AA00-0AA0**
Mandatory for operation in hazardous areas	
Labeling strips	**6ES7392-2XX00-0AA0**
10 units (spare part), for modules with 20-pin front connector	
Label cover	**6ES7392-2XY00-0AA0**
10 units (spare part), for modules with 20-pin front connector	

	Article No.
Labeling sheets for machine inscription	
For modules with 20-pin front connector, DIN A4, for printing with laser printer; 10 units	
Petrol	**6ES7392-2AX00-0AA0**
Light beige	**6ES7392-2BX00-0AA0**
Yellow	**6ES7392-2CX00-0AA0**
Red	**6ES7392-2DX00-0AA0**
Documentation	
SIMATIC Manual Collection	**6ES7998-8XC01-8YE0**
Electronic manuals on DVD, multi-language: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC Distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	
SIMATIC Manual Collection update service for 1 year	**6ES7998-8XC01-8YE2**
Current "Manual Collection" DVD and the three subsequent updates	

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Ex analog input modules

Overview



- Analog inputs for signals from the Ex field
- For the connection of intrinsically safe analog equipment from the Ex field
- 8 or 4 analog inputs in 4 channel groups (single-channel isolation)
- Measurement type and range can be selected for each channel
- Diagnostics and diagnostics alarm programmable
- Programmable threshold alarm
- HART-compatible inputs (only 6ES7331-7RD00-0AB0)

5

Technical specifications

Article number	**6ES7331-7RD00-0AB0** SM331, 4AE, 0/4-20MA, EX-ZONE	**6ES7331-7SF00-0AB0** SM331, 8AE THERMO/4AE PT100, EX-ZONE
Supply voltage		
Load voltage L+		
• Rated value (DC)	24 V	24 V
Input current		
from load voltage L+ (without load), max.	250 mA	
from backplane bus 5 V DC, max.	60 mA	120 mA
Output voltage		
Power supply to the transmitters		
• Rated value (DC)	13 V; at 22 mA	
• No-load voltage (DC)	25.2 V	
Power loss		
Power loss, typ.	3 W	0.6 W
Analog inputs		
Number of analog inputs	4	8; 8x thermocouples; 4x RTD thermoresistors
permissible input current for current input (destruction limit), max.	40 mA	
Input ranges (rated values), currents		
• 0 to 20 mA	Yes	
• 4 mA to 20 mA	Yes	
Input ranges (rated values), thermocouples		
• Type B		Yes
• Type E		Yes
• Type J		Yes
• Type K		Yes
• Type L		Yes
• Type N		Yes
• Type R		Yes
• Type S		Yes
• Type T		Yes
• Type U		Yes
Input ranges (rated values), resistance thermometer		
• Ni 100		Yes
• Pt 100		Yes
• Pt 200		Yes
Cable length		
• shielded, max.	200 m	200 m; TC: 50 m

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Technical specifications (continued)

Article number	**6ES7331-7RD00-0AB0** SM331, 4AE, 0/4-20MA, EX-ZONE	**6ES7331-7SF00-0AB0** SM331, 8AE THERMO/4AE PT100, EX-ZONE
Analog value generation for the inputs		
Measurement principle	Sigma Delta	Sigma Delta
Integration and conversion time/ resolution per channel		
• Resolution with overrange (bit including sign), max.	16 bit; 10 bit to 15 bit + sign	16 bit; 10 bit to 15 bit + sign
• Integration time, parameterizable	Yes; 2.5 to 100 ms	Yes; 2.5 to 100 ms
• Interference voltage suppression for interference frequency f1 in Hz	10 to 400 Hz	10 to 400 Hz
Encoder		
Connection of signal encoders		
• for current measurement as 2-wire transducer	Yes	Yes
• for current measurement as 4-wire transducer	Yes	Yes
Errors/accuracies		
Temperature error (relative to input range), (+/-)		0.001 %/K; Temperature error: 0.001 to 0.002 %/K
Operational error limit in overall temperature range		
• Current, relative to input range, (+/-)	0.45 %	
• Resistance thermometer, relative to input range, (+/-)		0.04 %; 0.09 to 0.04%
Basic error limit (operational limit at 25 °C)		
• Current, relative to input range, (+/-)	0.1 %	
• Resistance thermometer, relative to input range, (+/-)		0.008 %; 0.018 ... 0.008%
Interference voltage suppression for f = n x (f1 +/- 1 %), f1 = interference frequency		
• Series mode interference (peak value of interference < rated value of input range), min.	60 dB	60 dB
• Common mode interference, min.	130 dB	130 dB
Interrupts/diagnostics/ status information		
Diagnostic messages		
• Diagnostic information readable	Yes	Yes
• Overrange	Yes	Yes
• Wire-break in signal transmitter cable	Yes	Yes
• Short-circuit of the signal encoder cable	Yes	Yes
Ex(i) characteristics		
Maximum values of input circuits (per channel)		
• Co (permissible external capacity), max.	90 nF	43 µF
• Io (short-circuit current), max.	68.5 mA	28.8 mA
• Lo (permissible external inductivity), max.	7.5 mH	40 mH
• Po (power of load), max.	431 mW	41.4 mW
• Ri, max.	50 Ω	
• Uo (output no-load voltage), max.	25.2 V	5.9 V
Potential separation		
Potential separation analog inputs		
• Potential separation analog inputs	Yes	Yes

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Ex analog input modules

Technical specifications (continued)

Article number	**6ES7331-7RD00-0AB0** SM331, 4AE, 0/4-20MA, EX-ZONE	**6ES7331-7SF00-0AB0** SM331, 8AE THERMO/4AE PT100, EX-ZONE
Permissible potential difference		
between the inputs (UCM)	60 V DC/30 V AC when used in the hazardous area; 400 V DC/250 V AC when used in NON-hazardous area	60 V DC/30 V AC when used in the hazardous area; 400 V DC/250 V AC when used in NON-hazardous area
Between the inputs and MANA (UCM)	60 V DC/30 V AC when used in the hazardous area; 400 V DC/250 V AC when used in NON-hazardous area	60 V DC/30 V AC when used in the hazardous area; 400 V DC/250 V AC when used in NON-hazardous area
Standards, approvals, certificates		
Use in hazardous areas		
• Type of protection acc. to EN 50020 (CENELEC)	[EEx ib] IIC	[EEx ib] IIC
• Type of protection acc. to FM	Class I, Division 2, Group A, B, C, D T4	Class I, Division 2, Group A, B, C, D T4
• Test number PTB	Ex-96.D.2092X	Ex-96.D.2108X
Ambient conditions		
Ambient temperature during operation		
• max.	60 °C	60 °C
Connection method		
required front connector	20-pin	20-pin
Weights		
Weight, approx.	290 g	210 g

Ordering data

	Article No.
Ex analog input modules	
4 inputs, isolated, 0/4 to 20 mA, 15 bit	**6ES7331-7RD00-0AB0**
8/4 inputs, isolated, for thermocouples and Pt100, Pt200, Ni100	**6ES7331-7SF00-0AB0**
Front connector	
20-pin, with screw contacts	
• 1 unit	**6ES7392-1AJ00-0AA0**
• 100 units	**6ES7392-1AJ00-1AB0**
Front door, elevated design	
e.g. for 32 channel modules; enables connection of 1.3 mm^2/16 AWG wires	**6ES7328-0AA00-7AA0**
LK 393 cable guide	**6ES7393-4AA00-0AA0**
Mandatory for operation in Ex-hazard areas	
Labeling strips	**6ES7392-2XX00-0AA0**
10 units (spare part), for modules with 20-pin front connector	
Label cover	**6ES7392-2XY00-0AA0**
10 units (spare part), for modules with 20-pin front connector	

	Article No.
Labeling sheets for machine inscription	
for modules with 20-pin front connector, DIN A4, for printing with laser printer; 10 units	
Petrol	**6ES7392-2AX00-0AA0**
Light beige	**6ES7392-2BX00-0AA0**
Yellow	**6ES7392-2CX00-0AA0**
Red	**6ES7392-2DX00-0AA0**
SIMATIC Manual Collection	**6ES7998-8XC01-8YE0**
Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC Distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	
SIMATIC Manual Collection update service for 1 year	**6ES7998-8XC01-8YE2**
Current "Manual Collection" DVD and the three subsequent updates	

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Overview



- Analog outputs for signals from the Ex field
- For the connection of intrinsically safe analog equipment from the Ex field
- 4 analog outputs in 4 channel modules (single-channel isolation)
- Diagnostics and diagnostics alarm programmable

Technical specifications

Article number	**6ES7332-5RD00-0AB0** SIMATIC S7,SM 332 ANALOG OUTPUT
Supply voltage	
Load voltage L+	
• Rated value (DC)	24 V
Input current	
from load voltage L+ (without load), max.	200 mA
from backplane bus 5 V DC, max.	80 mA
Power loss	
Power loss, typ.	4 W
Analog outputs	
Number of analog outputs	4
Voltage output, short-circuit protection	Yes
Voltage output, short-circuit current, max.	70 mA
Current output, no-load voltage, max.	14 V
Output ranges, current	
• 0 to 20 mA	Yes
• 4 mA to 20 mA	Yes
Connection of actuators	
• for current output two-wire connection	Yes
Load impedance (in rated range of output)	
• with current outputs, max.	500 Ω
Cable length	
• shielded, max.	200 m
Analog value generation for the outputs	
Integration and conversion time/ resolution per channel	
• Resolution with overrange (bit including sign), max.	15 bit
• Basic conversion time (ms)	2.5 ms
Errors/accuracies	
Operational error limit in overall temperature range	
• Current, relative to output range, (+/-)	0.55 %
Basic error limit (operational limit at 25 °C)	
• Current, relative to output range, (+/-)	0.2 %

Article number	**6ES7332-5RD00-0AB0** SIMATIC S7,SM 332 ANALOG OUTPUT
Interrupts/diagnostics/ status information	
Diagnostics function	Yes
Diagnostic messages	
• Diagnostic information readable	Yes
• Overrange	Yes
• Wire-break in actuator cable	Yes
Ex(i) characteristics	
Maximum values of output circuits (per channel)	
• Co (permissible external capacity), max.	850 nF
• Io (short-circuit current), max.	70 mA
• Lo (permissible external inductivity), max.	6.6 mH
• Po (power of load), max.	440 mW
• Uo (output no-load voltage), max.	14 V
Potential separation	
Potential separation analog outputs	
• Potential separation analog outputs	Yes
Permissible potential difference	
between the outputs (UCM)	60 V DC/30 V AC when used in the hazardous area; 400 V DC/250 V AC when used in NON-hazardous area
Between the outputs and MANA (UCM)	60 V DC/30 V AC when used in the hazardous area; 400 V DC/250 V AC when used in NON-hazardous area
Standards, approvals, certificates	
Use in hazardous areas	
• Type of protection acc. to EN 50020 (CENELEC)	[EEx ib] IIC
• Type of protection acc. to FM	Class I, Division 2, Group A, B, C, D T4
• Test number PTB	Ex-96.D.2026X
Ambient conditions	
Ambient temperature during operation	
• max.	60 °C
Connection method	
required front connector	20-pin
Weights	
Weight, approx.	280 g

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Ex analog output modules

Ordering data	Article No.
Ex analog output module	
4 outputs, isolated, 0/4 to 20 mA	**6ES7332-5RD00-0AB0**
Front connector	
20-pin, with screw contacts	
• 1 unit	**6ES7392-1AJ00-0AA0**
• 100 units	**6ES7392-1AJ00-1AB0**
Front door, elevated design	
e.g. for 32 channel modules; enables connection of 1.3 mm^2/16 AWG wires	**6ES7328-0AA00-7AA0**
LK 393 cable guide	**6ES7393-4AA00-0AA0**
Mandatory for operation in hazardous areas	
Labeling strips	**6ES7392-2XX00-0AA0**
10 units (spare part), for modules with 20-pin front connector	
Label cover	**6ES7392-2XY00-0AA0**
10 units (spare part), for modules with 20-pin front connector	
Labeling sheets for machine inscription	
For modules with 20-pin front connector, DIN A4, for printing with laser printer; 10 units	
Petrol	**6ES7392-2AX00-0AA0**
Light beige	**6ES7392-2BX00-0AA0**
Yellow	**6ES7392-2CX00-0AA0**
Red	**6ES7392-2DX00-0AA0**

	Article No.
SIMATIC Manual Collection	**6ES7998-8XC01-8YE0**
Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC Distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	
SIMATIC Manual Collection update service for 1 year	**6ES7998-8XC01-8YE2**
Current "Manual Collection" DVD and the three subsequent updates	

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Overview



- Analog inputs for signals from the Ex field
- For the connection of intrinsically safe analog equipment from the Ex field
- 4 analog inputs in 4 channel groups (single-channel isolation)
- Measurement type and range can be selected for each channel
- Programmable diagnostics and diagnostic interrupt
- Programmable threshold alarm
- HART-compatible inputs (6AG1331-7RD00-2AB0 only)

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

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Technical specifications

Article number	**6AG1331-7RD00-2AB0**	**6AG1331-7SF00-4AB0**
Based on	**6ES7331-7RD00-0AB0**	**6ES7331-7SF00-0AB0**
	SIPLUS S7-300 SM331 4AI	SIPLUS S7-300 SM331 20pol
Ambient conditions		
Ambient temperature during operation		
• min.	-25 °C; = Tmin	0 °C; = Tmin
• max.	60 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use, 70 °C only 4 wire	60 °C; = Tmax
Ambient temperature during storage/transportation		
• min.	-40 °C	-40 °C
• max.	70 °C	70 °C
Altitude during operation relating to sea level		
• Installation altitude above sea level, max.	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity		
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance		
Use in stationary industrial systems		
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
Use on ships/at sea		
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Remark		
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!

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SIPLUS S7-300 Ex analog input modules

Ordering data	Article No.
SIPLUS S7-300 Ex analog input modules	
Extended temperature range and exposure to media	
4 inputs, isolated, 0/4 to 20 mA, 15 bit	**6AG1331-7RD00-2AB0**
Exposure to media	
8/4 inputs, isolated, for thermocouples and Pt100, Pt200, Ni100; medial exposure only	**6AG1331-7SF00-4AB0**
Accessories	
Mandatory	
Front connector	
20-pin, with spring-loaded contacts	
• 1 unit	**6ES7392-1BJ00-0AA0**
• 100 units	**6ES7392-1BJ00-1AB0**
Consumables	
DIN rail for active bus modules	
For max. 5 active bus modules for hot swapping function	
• Length 483 mm (19")	**6ES7195-1GA00-0XA0**
• Length 530 mm	**6ES7195-1GF30-0XA0**
• Length 620 mm	**6ES7195-1GG30-0XA0**
• Length 2000 mm	**6ES7195-1GC00-0XA0**
Front door, elevated design	**6ES7328-0AA00-7AA0**
E.g. for 32-channel modules; for connecting 1.3 mm^2/16 AWG conductors; circuit diagram and nameplates in petrol	
LK 393 cable guide	**6ES7393-4AA00-0AA0**
Mandatory for operation in hazardous areas	
Labeling strips	**6ES7392-2XX00-0AA0**
10 units (spare part), for modules with 20-pin front connector	
Label cover	**6ES7392-2XY00-0AA0**
10 units (spare part), for modules with 20-pin front connector	
Labeling sheets for machine inscription	
For modules with 20-pin front connector, DIN A4, for printing with laser printer; 10 units	
Petrol	**6ES7392-2AX00-0AA0**
Light beige	**6ES7392-2BX00-0AA0**
Yellow	**6ES7392-2CX00-0AA0**
Red	**6ES7392-2DX00-0AA0**
Documentation	
SIMATIC Manual Collection	**6ES7998-8XC01-8YE0**
Electronic manuals on DVD, multi-language: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC Distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	
SIMATIC Manual Collection update service for 1 year	**6ES7998-8XC01-8YE2**
Current "Manual Collection" DVD and the three subsequent updates	

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Overview



- One-channel intelligent counter module for simple counting tasks
- For direct connection of incremental encoders
- Comparison function with 2 specifiable comparison values
- Integrated digital outputs to output the response upon reaching the comparison value.
- Operating modes:
  - Continuous counting
  - One-shot counting
  - Periodic counting
- Special functions:
  - Set counter
  - Latch counter
- Start/stop counter with gate function

Note:

Incremental encoders and pre-assembled connecting cables for counting and positioning functions are offered under SIMODRIVE Sensor or Motion Connect 500.

http://www.siemens.com/simatic-technology

Technical specifications

Article number	**6ES7350-1AH03-0AE0** FM350-1, counter mod. up to 500KHZ
Supply voltage	
Auxiliary voltage 1L+, load voltage 2L+	
• Rated value (DC)	24 V
non-periodic skip	
- Duration	500 ms
- Recovery time	50 s
- Value	35 V
Input current	
from load voltage 1L+ (without load), max.	40 mA
from backplane bus 5 V DC, max.	160 mA
5 V encoder supply	
• 5 V	Yes; 5.2 V ±2 %
• Output current, max.	300 mA
24 V encoder supply	
• 24 V	Yes; 1L+ (-3 V)
• Output current, max.	400 mA
Power loss	
Power loss, typ.	4.5 W
Digital inputs	
Number of digital inputs	3
Functions	1 for gate start, 1 for gate stop, 1 for setting the counter
Input voltage	
• for signal "0"	-28.8 ... +5V
• for signal "1"	+11 to +28.8V
Input current	
• for signal "1", typ.	9 mA
Digital outputs	
Number of digital outputs	2
Short-circuit protection	Yes; Clocked electronically
Limitation of inductive shutdown voltage to	2L+ (-39 V)
Output voltage	
• for signal "0", max.	3 V
• for signal "1", min.	2L+ (-1,5 V)

Article number	**6ES7350-1AH03-0AE0** FM350-1, counter mod. up to 500KHZ
Output current	
• for signal "1" rated value	0.5 A
• for signal "1" permissible range for 0 to 60 °C, min.	5 mA
• for signal "1" permissible range for 0 to 60 °C, max.	0.6 A
Output delay with resistive load	
• "0" to "1", max.	300 µs
Encoder	
Connectable encoders	
• Incremental encoder (symmetrical)	Yes; With 2 pulse trains offset by 90°
• Incremental encoder (asymmetrical)	Yes
• 24 V initiator	Yes
• 24 V directional element	Yes; 1 pulse train, 1 direction level
Counter	
Number of counter inputs	1
Counting range, description	32 bit or ±31 bit
Minimum pulse width, adjustable	Yes; 2.5 or 25 µs
Counter input 5 V	
• Type	RS 422
• Terminating resistor	220 Ω
• Differential input voltage	1,3 V
• Counting frequency, max.	500 kHz
Counter input 24 V	
• Input voltage for signal "0"	-28.8 ... +5V
• Input voltage for signal "1"	+11 to +28.8V
• Input current for signal "1", typ.	9 mA
• Counting frequency, max.	200 kHz
• Minimum pulse width	2.5 µs

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Technical specifications (continued)

Article number	**6ES7350-1AH03-0AE0** FM350-1, counter mod. up to 500KHZ
Potential separation	
Potential separation digital inputs	
• between the channels and backplane bus	Yes; Optocoupler
Potential separation digital outputs	
• between the channels and backplane bus	Yes; Optocoupler
Potential separation counter	
• between the channels and backplane bus	Yes; Optocoupler

Article number	**6ES7350-1AH03-0AE0** FM350-1, counter mod. up to 500KHZ
Connection method	
required front connector	1x 20-pin
Dimensions	
Width	40 mm
Height	125 mm
Depth	120 mm
Weights	
Weight, approx.	250 g

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Ordering data

	Article No.
FM 350-1 counter module With 1 channel, max. 500 kHz; for incremental encoder	**6ES7350-1AH03-0AE0**
Coding plug - Range card for analog inputs Spare part	**6ES7974-0AA00-0AA0**
Front connector	
20-pin, with screw contacts	
• 1 unit	**6ES7392-1AJ00-0AA0**
• 100 units	**6ES7392-1AJ00-1AB0**
20-pin, with spring-loaded contacts	
• 1 unit	**6ES7392-1BJ00-0AA0**
• 100 units	**6ES7392-1BJ00-1AB0**
Bus connectors 1 unit (spare part)	**6ES7390-0AA00-0AA0**
Labeling strips 10 units (spare part)	**6ES7392-2XX00-0AA0**
Labeling sheets for machine inscription	See under "Accessories", page 5/266
Slot number label Spare part	**6ES7912-0AA00-0AA0**
Shield connection element 80 mm wide, with 2 rows for 4 terminals each	**6ES7390-5AA00-0AA0**
Shield connection clamps 2 units	
For 2 cables with 2 mm to 6 mm diameter	**6ES7390-5AB00-0AA0**
For 1 cable with 3 mm to 8 mm diameter	**6ES7390-5BA00-0AA0**
For 1 cable with 4 mm to 13 mm diameter	**6ES7390-5CA00-0AA0**
Connectable incremental encoders 6FX2 001-2...	Refer to the Industry Mall under SIMODRIVE Sensor or Motion Connect 500 (see also http://www.siemens.com/simatic-technology)

	Article No.
Signal cable	
Pre-assembled for HTL and TTL encoder, without sub D connector, UL/DESINA	**6FX5002-2CA12-** ■ ■ ■ **0**
Length code:	
0 m	**1**
100 m	**2**
200 m	**3**
0 m	**A**
10 m	**B**
20 m	**C**
30 m	**D**
40 m	**E**
50 m	**F**
60 m	**G**
70 m	**H**
80 m	**J**
90 m	**K**
0 m	**A**
1 m	**B**
2 m	**C**
3 m	**D**
4 m	**E**
5 m	**F**
6 m	**G**
7 m	**H**
8 m	**J**
9 m	**K**

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Overview



- 8-channel intelligent counter module for universal counting and measuring
- To directly connect 24 V incremental encoders, direction sensors, initiators or NAMUR encoders
- Check function with preselectable set points (number depends on mode)
- Integrated digital outputs to output the response when the setpoint is reached
- Operating modes:
  - Continuous/single/periodic counting
  - Frequency/speed measurement
  - Cycle duration measurement
  - Dosing

Note:

Incremental encoder and pre-assembled connecting cables for counter and positioning function are offered under SIMODRIVE Sensor and Motion Connect 500.

http://www.siemens.com/simatic-technology

5

Technical specifications

Article number	**6ES7350-2AH01-0AE0** FM350-2, Counter Mod., 8 Channels, 20KHz
Supply voltage	
Auxiliary voltage 1L+, load voltage 2L+	
• Rated value (DC)	24 V
Input current	
from load voltage L+ (without load), max.	150 mA
from backplane bus 5 V DC, max.	100 mA
Encoder supply	
Type of output voltage	NAMUR-encoder supply: 8.2 V ±2 %
Short-circuit protection	Yes
Output current	
• Rated value	200 mA
Power loss	
Power loss, typ.	10 W
Digital inputs	
Number of digital inputs	8
Number of NAMUR inputs	8
Functions	1 each for gate start/ gate stop
Input voltage	
• for signal "0"	-3 to +5V
• for signal "1"	11 to 30.2 V
Input current	
• for signal "0", max. (permissible quiescent current)	2 mA
• for signal "1", typ.	9 mA
Input delay (for rated value of input voltage)	
for standard inputs	
- at "0" to "1", max.	50 µs
Cable length	
• shielded, max.	100 m

Article number	**6ES7350-2AH01-0AE0** FM350-2, Counter Mod., 8 Channels, 20KHz
Digital outputs	
Number of digital outputs	8
Short-circuit protection	Yes
Limitation of inductive shutdown voltage to	L+ (-40 V)
Output voltage	
• for signal "1", min.	L+ (-0.8 V)
Output current	
• for signal "1" rated value	0.5 A
• for signal "0" residual current, max.	0.5 mA
Output delay with resistive load	
• "0" to "1", max.	300 µs
Switching frequency	
• with resistive load, max.	500 Hz
• with inductive load, max.	0.5 Hz
Total current of the outputs (per group)	
horizontal installation	
- up to 40 °C, max.	4 A
- up to 60 °C, max.	2 A
all other mounting positions	
- up to 40 °C, max.	2 A
Cable length	
• shielded, max.	600 m
• unshielded, max.	100 m
Encoder	
Connectable encoders	
• Incremental encoder (asymmetrical)	Yes
• 24 V initiator	Yes
• 24 V directional element	Yes
• NAMUR encoder	Yes
• 2-wire sensor	Yes

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Technical specifications (continued)

Article number	**6ES7350-2AH01-0AE0** FM350-2, Counter Mod., 8 Channels, 20KHz
NAMUR encoder	
• Input signal	to DIN 19 234
• Input current for signal "0", max.	1.2 mA
• Input current for signal "1", min.	2.1 mA
• Input delay, max.	50 µs
• Input frequency, max.	20 kHz
• Cable length, shielded, max.	100 m
Interrupts/diagnostics/ status information	
Diagnostics function	Yes; Diagnostic information readable
Alarms	
• Diagnostic alarm	Yes; Parameterizable
• Hardware interrupt	Yes; Parameterizable
Counter input 24 V	
• Number	8; 32 bit or ±31 bit
• Input voltage for signal "0"	-3 to +5V
• Input voltage for signal "1"	11 to 30.2 V
• Input current for signal "0", max. (permissible quiescent current)	2 mA
• Input current for signal "1", typ.	9 mA
• Input delay, max.	50 µs
• Counting frequency, max.	20 kHz; Incremental encoder: 10 kHz
• Cable length, max.	100 m

Article number	**6ES7350-2AH01-0AE0** FM350-2, Counter Mod., 8 Channels, 20KHz
Potential separation	
Potential separation digital inputs	
• between the channels and backplane bus	Yes; and shielding
Potential separation digital outputs	
• between the channels and backplane bus	Yes; and shielding
Potential separation counter	
• between the channels and backplane bus	Yes; and shielding
Connection method	
required front connector	1x 40-pin
Dimensions	
Width	80 mm
Height	125 mm
Depth	120 mm
Weights	
Weight, approx.	460 g

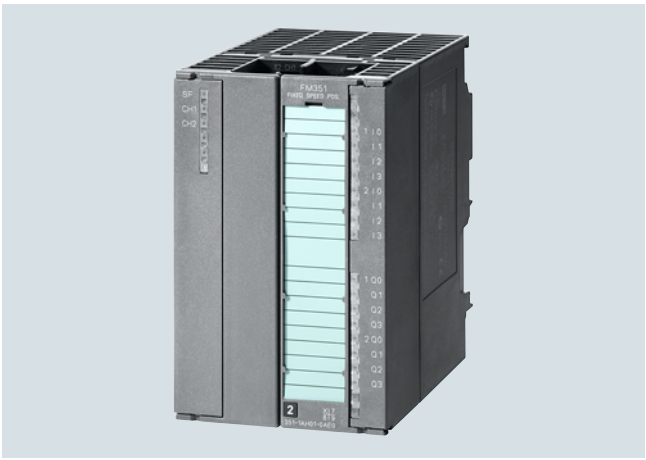
Ordering data

	Article No.
FM 350-2 counter module With 8 channels, max. 20 kHz; for 24 V incremental encoders and NAMUR encoders; incl. configuration package and electronic documentation on CD	**6ES7350-2AH01-0AE0**
Front connector	
40-pin, with screw contacts	
• 1 unit	**6ES7392-1AM00-0AA0**
• 100 units	**6ES7392-1AM00-1AB0**
40-pin, with spring-loaded contacts	
• 1 unit	**6ES7392-1BM01-0AA0**
• 100 units	**6ES7392-1BM01-1AB0**
Bus connectors 1 unit (spare part)	**6ES7390-0AA00-0AA0**
Labeling strips 10 units (spare part)	**6ES7392-2XX10-0AA0**
Labeling sheets for machine inscription	See under "Accessories", page 5/266

	Article No.
Slot number label Spare part	**6ES7912-0AA00-0AA0**
Shield connection element 80 mm wide, with 2 rows for 4 terminals each	**6ES7390-5AA00-0AA0**
Terminal elements	
2 units	
For 2 cables with 2 mm to 6 mm diameter	**6ES7390-5AB00-0AA0**
For 1 cable with 3 mm to 8 mm diameter	**6ES7390-5BA00-0AA0**
For 1 cable with 4 mm to 13 mm diameter	**6ES7390-5CA00-0AA0**
Signal cable	
Pre-assembled for HTL and TTL encoder, without sub D connector, UL/DESINA	**6FX5002-2CA12-** ■■■ **0**
Length code:	See FM 350-1, page 5/142

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Overview



- Two-channel positioning module for rapid-traverse/creep-speed drives
- 4 digital outputs per channel for motor control
- Incremental or synchro-serial position decoding

Note:

Displacement measuring systems and precut/pre-assembled cables for counting and positioning functions are available under SIMODRIVE Sensor or Motion Connect 500.

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Technical specifications

Article number	**6ES7351-1AH02-0AE0** FM351 positioning Mod. rapid/creep Feed
Supply voltage	
Rated value (DC)	
• 24 V DC	Yes
Load voltage L+	
• Rated value (DC)	24 V
Input current	
Current consumption, max.	350 mA
from backplane bus 5 V DC, max.	150 mA
Encoder supply	
5 V encoder supply	
• 5 V	Yes
• Output current, max.	350 mA
• Cable length, max.	32 m
24 V encoder supply	
• 24 V	Yes
• Output current, max.	400 mA; Per channel
• Cable length, max.	100 m
Power loss	
Power loss, typ.	7.9 W

Article number	**6ES7351-1AH02-0AE0** FM351 positioning Mod. rapid/creep Feed
Digital inputs	
Number of digital inputs	8
Functions	Reference cams, reversing cams, flying actual value setting, start/stop positioning
Input voltage	
• Rated value (DC)	24 V
• for signal "0"	-3 to +5V
• for signal "1"	+11 to +30V
Input current	
• for signal "0", max. (permissible quiescent current)	2 mA
• for signal "1", typ.	6 mA
Digital outputs	
Number of digital outputs	8
Functions	Rapid traverse, creep, run right, run left
Short-circuit protection	Yes
Output voltage	
• Rated value (DC)	24 V
• for signal "1", min.	UP - 0.8 V
Output current	
• for signal "1" permissible range for 0 to 60 °C, min.	5 mA; with UPmax
• for signal "1" permissible range for 0 to 60 °C, max.	600 mA; with UPmax
• for signal "0" residual current, max.	0.5 mA

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Technical specifications (continued)

Article number	**6ES7351-1AH02-0AE0** FM351 positioning Mod. rapid/creep Feed
Encoder	
Connectable encoders	
• Incremental encoder (symmetrical)	Yes
• Incremental encoder (asymmetrical)	Yes
• Absolute encoder (SSI)	Yes
• 2-wire sensor	Yes
- permissible quiescent current (2-wire sensor), max.	2 mA; on signal "0", max. 2 mA; on signal "1", max. 6 mA
Encoder signals, incremental encoder (symmetrical)	
• Trace mark signals	A, notA, B, notB
• Zero mark signal	N, notN
• Input voltage	5 V difference signal (phys. RS 422)
• Input frequency, max.	0.5 MHz
Encoder signals, incremental encoder (asymmetrical)	
• Trace mark signals	A, B
• Zero mark signal	N
• Input voltage	24 V
• Input frequency, max.	50 kHz; 50 kHz for 25 m cable length; 25 kHz for 100 m cable length
Encoder signals, absolute encoder (SSI)	
• Input signal	5 V difference signal (phys. RS 422)
• Data signal	DATA, notDATA
• Clock signal	CL, notCL
• Telegram length, parameterizable	13 or 25 bit
• Clock frequency, max.	1.5 MHz
• Gray code	Yes
• Cable length, shielded, max.	200 m; At max. 188 kHz

Article number	**6ES7351-1AH02-0AE0** FM351 positioning Mod. rapid/creep Feed
Potential separation	
Potential separation digital inputs	
• Potential separation digital inputs	Yes
Potential separation digital outputs	
• Potential separation digital outputs	Yes
Connection method	
required front connector	1x 20-pin
Dimensions	
Width	80 mm
Height	125 mm
Depth	120 mm
Weights	
Weight, approx.	550 g

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Ordering data	Article No.
FM 351 positioning module For rapid traverse and creep speed drives	**6ES7351-1AH02-0AE0**
Front connectors	
20-pin, with screw contacts	
• 1 unit	**6ES7392-1AJ00-0AA0**
• 100 units	**6ES7392-1AJ00-1AB0**
20-pin, with spring-loaded contacts	
• 1 unit	**6ES7392-1BJ00-0AA0**
• 100 units	**6ES7392-1BJ00-1AB0**
Bus connectors 1 unit (spare part)	**6ES7390-0AA00-0AA0**
Labeling strips 10 units (spare part)	**6ES7392-2XX00-0AA0**
Slot number label	**6ES7912-0AA00-0AA0**
Labeling sheets for machine inscription Spare part	See under "Accessories", page 5/266
Shield connection element 80 mm wide, with 2 rows for 4 terminals each	**6ES7390-5AA00-0AA0**
Terminal elements	
2 units	
For 2 cables with 2 mm to 6 mm diameter	**6ES7390-5AB00-0AA0**
For 1 cable with 3 mm to 8 mm diameter	**6ES7390-5BA00-0AA0**
For 1 cable with 4 mm to 13 mm diameter	**6ES7390-5CA00-0AA0**

	Article No.
Signal cables	
Preassembled for SSI absolute encoder, UL/DESINA	**6FX50 ■ 2-2CC11- ■ ■ ■ ■**
Preassembled for TTL encoder 6FX2001-1, UL/DESINA	**6FX50 ■ 2-2CD01- ■ ■ ■ ■**
Preassembled for TTL encoder 24 V, UL/DESINA	**6FX50 ■ 2-2CD24- ■ ■ ■ ■**
Not crimped	**0**
Module end crimped, connector case supplied	**1**
Motor end crimped, connector case supplied	**4**
0 m	**1**
100 m	**2**
200 m	**3**
0 m	**A**
10 m	**B**
20 m	**C**
30 m	**D**
40 m	**E**
50 m	**F**
60 m	**G**
70 m	**H**
80 m	**J**
90 m	**K**
0 m	**A**
1 m	**B**
2 m	**C**
3 m	**D**
4 m	**E**
5 m	**F**
6 m	**G**
7 m	**H**
8 m	**J**
9 m	**K**
0.0 m	**0**
0.1 m	**1**
0.2 m	**2**
0.3 m	**3**
0.4 m	**4**
0.5 m	**5**
0.6 m	**6**
0.7 m	**7**
0.8 m	**8**

5

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FM 352 cam controllers

Overview



- Extremely high-speed electronic cam controller
- Low-cost alternative to mechanical cam controllers
- 32 cam tracks, 13 onboard digital outputs for direct output of actions
- Incremental or synchro-serial position decoding

Note:

Displacement measuring systems and precut/pre-assembled cables for counting and positioning functions are available under SIMODRIVE Sensor or Motion Connect 500.

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Technical specifications

Article number	**6ES7352-1AH02-0AE0** FM352 Electron. Cam-operated Control
Supply voltage	
Rated value (DC)	
• 24 V DC	Yes
Input current	
from load voltage L+ (without load), max.	200 mA
from backplane bus 5 V DC, max.	100 mA
Encoder supply	
5 V encoder supply	
• 5 V	Yes
• Output current, max.	300 mA
• Cable length, max.	32 m
24 V encoder supply	
• 24 V	Yes
• Output current, max.	300 mA
• Cable length, max.	100 m
Power loss	
Power loss, typ.	8.1 W
Digital inputs	
Number of digital inputs	4
Functions	Reference point switch, set floating actual value/length measurement, brake release, enable track output no. 3
Input voltage	
• Rated value (DC)	24 V
• for signal "0"	-30 to +5V
• for signal "1"	+11 to +30V
Input current	
• for signal "0", max. (permissible quiescent current)	2 mA
• for signal "1", typ.	9 mA
Digital outputs	
Number of digital outputs	13
Functions	Cam track
Short-circuit protection	Yes
Output voltage	
• Rated value (DC)	24 V
• for signal "1", min.	UP - 0.8 V

Article number	**6ES7352-1AH02-0AE0** FM352 Electron. Cam-operated Control
Output current	
• for signal "1" permissible range for 0 to 60 °C, min.	5 mA; with UPmax
• for signal "1" permissible range for 0 to 60 °C, max.	600 mA; with UPmax
• for signal "0" residual current, max.	0.5 mA
Encoder	
Connectable encoders	
• Incremental encoder (symmetrical)	Yes
• Incremental encoder (asymmetrical)	Yes
• Absolute encoder (SSI)	Yes
• 2-wire sensor	Yes
- permissible quiescent current (2-wire sensor), max.	2 mA
Encoder signals, incremental encoder (symmetrical)	
• Trace mark signals	A, notA, B, notB
• Zero mark signal	N, notN
• Input voltage	5 V difference signal (phys. RS 422)
• Input frequency, max.	1 MHz
Encoder signals, incremental encoder (asymmetrical)	
• Trace mark signals	A, B
• Zero mark signal	N
• Input voltage	24 V
• Input frequency, max.	50 kHz; 50 kHz for 25 m cable length; 25 kHz for 100 m cable length
Encoder signals, absolute encoder (SSI)	
• Data signal	DATA, notDATA
• Clock signal	CL, notCL
• Telegram length, parameterizable	13 or 25 bit
• Clock frequency, max.	1 MHz
• Gray code	Yes
• Cable length, shielded, max.	320 m; at max. 125 kHz

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Technical specifications (continued)

Article number	**6ES7352-1AH02-0AE0** FM352 Electron. Cam-operated Control
Potential separation	
Potential separation digital inputs	
• Potential separation digital inputs	No
Potential separation digital outputs	
• Potential separation digital outputs	No
Connection method	
required front connector	1x 20-pin

Article number	**6ES7352-1AH02-0AE0** FM352 Electron. Cam-operated Control
Dimensions	
Width	80 mm
Height	125 mm
Depth	120 mm
Weights	
Weight, approx.	550 g

Ordering data

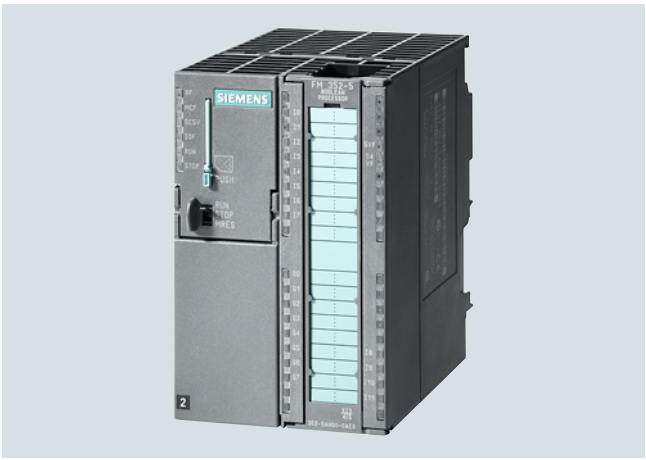
	Article No.
FM352 electronic cam controller	**6ES7352-1AH02-0AE0**
Front connectors	
20-pin, with screw contacts	
• 1 unit	**6ES7392-1AJ00-0AA0**
• 100 units	**6ES7392-1AJ00-1AB0**
20-pin, with spring-loaded contacts	
• 1 unit	**6ES7392-1BJ00-0AA0**
• 100 units	**6ES7392-1BJ00-1AB0**
Bus connectors	**6ES7390-0AA00-0AA0**
1 unit (spare part)	
Labeling strips	**6ES7392-2XX00-0AA0**
10 units (spare part)	
Labeling sheets for machine inscription	See under "Accessories", page 5/266
Slot number label	**6ES7912-0AA00-0AA0**
Spare part	
Shield connection element	**6ES7390-5AA00-0AA0**
80 mm wide, with 2 rows for 4 terminals each	
Shield connection clamps	
2 units	
For 2 cables with 2 mm to 6 mm diameter	**6ES7390-5AB00-0AA0**
For 1 cable with 3 mm to 8 mm diameter	**6ES7390-5BA00-0AA0**
For 1 cable with 4 mm to 13 mm diameter	**6ES7390-5CA00-0AA0**

	Article No.
Signal cable	
Pre-assembled for SSI absolute encoder, UL/DESINA	**6FX50 ■ 2-2CC11- ■ ■ ■ ■**
Pre-assembled for TTL encoder 6FX2001-1, UL/DESINA	**6FX50 ■ 2-2CD01- ■ ■ ■ ■**
Pre-assembled for TTL encoder 24 V, UL/DESINA	**6FX50 ■ 2-2CD24- ■ ■ ■ ■**
Not crimped	**0**
Module end crimped, connector case supplied	**1**
Motor end crimped, connector case supplied	**4**
0 m	**1**
100 m	**2**
200 m	**3**
0 m	**A**
10 m	**B**
20 m	**C**
30 m	**D**
40 m	**E**
50 m	**F**
60 m	**G**
70 m	**H**
80 m	**J**
90 m	**K**
0 m	**A**
1 m	**B**
2 m	**C**
3 m	**D**
4 m	**E**
5 m	**F**
6 m	**G**
7 m	**H**
8 m	**J**
9 m	**K**
0.0 m	**0**
0.1 m	**1**
0.2 m	**2**
0.3 m	**3**
0.4 m	**4**
0.5 m	**5**
0.6 m	**6**
0.7 m	**7**
0.8 m	**8**

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FM 352-5 high-speed Boolean processor

Overview



- The FM 352-5 high-speed Boolean processor provides extremely fast binary control and also some of the fastest switching processes ever possible (cycle time: 1 µs).
- Programming is possible with LAD or FBD.
- The available set of statements comprises bit statements (partial statement set of STEP 7), timers, counters, frequency dividers, frequency generators, shift registers.
- 12 integral DI / 8 integral DQ.
- 2 versions: Current sinking or current sourcing digital outputs.
- 1 channel for connection of a 24-V incremental encoder, a 5-V incremental encoder (RS 422) or an SSI absolute encoder.

Micro Memory Card required for use of the FM 352-5

Note:

Displacement measuring systems and precut/pre-assembled cables for counting and positioning functions are available under SIMODRIVE Sensor or Motion Connect 500.

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Technical specifications

Article number	**6ES7352-5AH01-0AE0** FM 352-5, Boolean Processor 12DI/8DQ	**6ES7352-5AH11-0AE0** FM 352-5 PNP, Boolean Processor 12DI/8DQ
Supply voltage		
Rated value (DC)		
• 24 V DC	Yes	Yes
Load voltage L+		
• Rated value (DC)	24 V	24 V
• Reverse polarity protection	Yes	Yes
Input current		
from load voltage1L+, max.	150 mA; typ. 60 mA	150 mA; typ. 60 mA
from load voltage 2L+ (without load), max.	200 mA; typ. 60 mA, DI/DO supply	200 mA; typ. 60 mA, DI/DO supply
from load voltage 3L+ (with encoder), max.	600 mA; typ. 80 mA plus encoder supply	600 mA; typ. 80 mA plus encoder supply
from load voltage 3L+ (without load), max.	200 mA; typ. 80 mA	200 mA; typ. 80 mA
from backplane bus 5 V DC, typ.	135 mA	135 mA
Encoder supply		
5 V encoder supply		
• 5 V	Yes	Yes
• Short-circuit protection	Yes; Electronic overload protection; no protection on applying a normal or counter voltage.	Yes; Electronic overload protection; no protection on applying a normal or counter voltage.
• Output current, max.	250 mA	250 mA
24 V encoder supply		
• 24 V	Yes	Yes
• Short-circuit protection	Yes; Overvoltage and overheating protection if overloaded; diagnostics if output reaches temperature limit; no protection on applying a normal or counter voltage	Yes; Overvoltage and overheating protection if overloaded; diagnostics if output reaches temperature limit; no protection on applying a normal or counter voltage
• Output current, max.	400 mA	400 mA
Power loss		
Power loss, typ.	6.5 W	6.5 W
Memory		
Type of memory	RAM	RAM
Memory size	128 kbyte; required for operation, MMC	128 kbyte; required for operation, MMC

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Technical specifications (continued)

Article number	**6ES7352-5AH01-0AE0**	**6ES7352-5AH11-0AE0**
	FM 352-5, Boolean Processor 12DI/8DQ	FM 352-5 PNP, Boolean Processor 12DI/8DQ
Digital inputs		
Number of digital inputs	8; Standard and up to 12 with 24 V DC encoder inputs as digital inputs	8; Standard and up to 12 with 24 V DC encoder inputs as digital inputs
Input voltage		
• Rated value (DC)	24 V	24 V
• for signal "0"	-30 to +5V	-30 to +5V
• for signal "1"	+11 to +30V	+11 to +30V
Input current		
• for signal "0", max. (permissible quiescent current)	1.5 mA	1.5 mA
• for signal "1", typ.	3.8 mA	3.8 mA
Input delay (for rated value of input voltage)		
• Input frequency (with a time delay of 0.1 ms), max.	200 kHz	200 kHz
• programmable digital filter delay	None, 5 µs, 10 µs, 15 µs, 20 µs, 50 µs, 1.6 ms	None, 5 µs, 10 µs, 15 µs, 20 µs, 50 µs, 1.6 ms
• Minimum pulse width for program reactions	1 µs, 5 µs, 10 µs, 15 µs, 20 µs, 50 µs, 1,6 ms	1 µs, 5 µs, 10 µs, 15 µs, 20 µs, 50 µs, 1,6 ms
for standard inputs		
- at "0" to "1", max.	3 µs; typ. 1.5 µs	3 µs; typ. 1.5 µs
Cable length		
• shielded, max.	600 m	600 m
• unshielded, max.	100 m; Shielded cable recommended if filtering delay is set to less than 1.6 ms	100 m; Shielded cable recommended if filtering delay is set to less than 1.6 ms
Digital outputs		
Number of digital outputs	8	8
Current-sinking	Yes	No
Current-sourcing	No	Yes
Short-circuit protection	Yes; Overvoltage protection, thermal protection	Yes; Overvoltage protection, thermal protection
• Response threshold, typ.	1.7 to 3.5 A	1.7 to 3.5 A
Limitation of inductive shutdown voltage to	2M -45 V typ., (-40 V to -55 V); comment: no protection against inductive kickback >55 mJ	2M -45 V typ., (-40 V to -55 V); comment: no protection against inductive kickback >55 mJ
Controlling a digital input	No	Yes
Switching capacity of the outputs		
• on lamp load, max.	5 W	5 W
Output voltage		
• Rated value (DC)	24 V	24 V
• for signal "0", max.	28.8 V	28.8 V
• for signal "1", max.	0.5 V	0.5 V
Output current		
• for signal "1" rated value	0.5 A; At 60 °C	0.5 A; At 60 °C
• for signal "1" permissible range for 0 to 60 °C, min.	5 mA	5 mA
• for signal "1" permissible range for 0 to 60 °C, max.	600 mA	600 mA
• for signal "0" residual current, max.	1 mA	1 mA
Output delay with resistive load		
• "0" to "1", max.	1 µs; 0.6 µs 50 mA / 1.0 µs 0.5 A	1 µs; 0.6 µs 50 mA / 1.0 µs 0.5 A
• "1" to "0", max.	1.5 µs; 1.7 µs 50 mA / 1.5 µs 0.5 A	1.5 µs; 1.7 µs 50 mA / 1.5 µs 0.5 A
Parallel switching of two outputs		
• for uprating	Yes; 2	Yes; 2
Switching frequency		
• with resistive load, max.	100 kHz; 20 kHz at 0.5 A; 100 kHz at 0.25 A	100 kHz; 20 kHz at 0.5 A; 100 kHz at 0.25 A
• with inductive load, max.	2 Hz; 2 Hz at 0.5 A with external commutator diodes; 0.5 Hz at 0.5 A without external commutator diodes	2 Hz; 2 Hz at 0.5 A with external commutator diodes; 0.5 Hz at 0.5 A without external commutator diodes
• on lamp load, max.	10 Hz	10 Hz
Cable length		
• shielded, max.	600 m	600 m
• unshielded, max.	100 m	100 m

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Technical specifications (continued)

Article number	**6ES7352-5AH01-0AE0**	**6ES7352-5AH11-0AE0**
	FM 352-5, Boolean Processor 12DI/8DQ	FM 352-5 PNP, Boolean Processor 12DI/8DQ
Encoder		
Connectable encoders		
• Incremental encoder (symmetrical)	Yes	Yes
• Incremental encoder (asymmetrical)	Yes	Yes
• Absolute encoder (SSI)	Yes	Yes
• 2-wire sensor	Yes	Yes
- permissible quiescent current (2-wire sensor), max.	1.5 mA	1.5 mA
Encoder signals, incremental encoder (symmetrical)		
• Trace mark signals	A, notA, B, notB	A, notA, B, notB
• Zero mark signal	N, notN	N, notN
• Input voltage	5 V difference signal (phys. RS 422)	5 V difference signal (phys. RS 422)
• Input frequency, max.	500 kHz	500 kHz
• Cable length, shielded, max.	100 m; 100 m with 24 V supply and 500 kHz; 32 m with 5 V supply and 500 kHz	100 m; 100 m with 24 V supply and 500 kHz; 32 m with 5 V supply and 500 kHz
Encoder signals, incremental encoder (asymmetrical)		
• Trace mark signals	A, B	A, B
• Zero mark signal	N	N
• Input voltage	24 V	24 V
• Input frequency, max.	200 kHz	200 kHz
• Cable length, shielded, max.	50 m; Cable length, HTL incremental encoder, Siemens, type 6FX2001-4: 50 kHz, 25 m shielded, max., 25 kHz, 50 m shielded, max.	50 m; Cable length, HTL incremental encoder, Siemens, type 6FX2001-4: 50 kHz, 25 m shielded, max., 25 kHz, 50 m shielded, max.
Encoder signals, absolute encoder (SSI)		
• Data signal	DATA, notDATA	DATA, notDATA
• Clock signal	CK, notCK	CK, notCK
• Telegram length, parameterizable	13 or 25 bit	13 or 25 bit
• Clock frequency, max.	1 MHz; 125 kHz, 250 kHz, 500 kHz or 1 MHz	1 MHz; 125 kHz, 250 kHz, 500 kHz or 1 MHz
• Cable length, shielded, max.	320 m; At 125 kHz	320 m; At 125 kHz
• Monoflop time	settable: 16/32/48/64 µs	settable: 16/32/48/64 µs
• Listening mode	Yes; one or two stations	Yes; one or two stations
• Multiturn	Yes; 25 bit message frame	Yes; 25 bit message frame
Encoder signal evaluation		
• Counting direction, forward	Yes	Yes
• Counting direction, backward	Yes	Yes
Response times		
Input- to output response time	5 V input to 24 V output, 0 filter: 1 to 4 µs (typ.); 24 V input to 24 V output, 0 filter: 2 to 6 µs (typ.)	5 V input to 24 V output, 0 filter: 1 to 4 µs (typ.); 24 V input to 24 V output, 0 filter: 2 to 6 µs (typ.)
Interfaces		
Point-to-point connection		
• Updating times	PLC interface: 1.7 ms	PLC interface: 1.7 ms
Interrupts/diagnostics/ status information		
Alarms		
• Diagnostic alarm	Yes; 1L, 2L, 3L missing; MMC error; output overload (8); encoder supply overload; differential wire break; parameterization errror; SSI message frame overflow	Yes; 1L, 2L, 3L missing; MMC error; output overload (8); encoder supply overload; differential wire break; parameterization errror; SSI message frame overflow
• Hardware interrupt	Yes; 8 available; for generation by user program	Yes; 8 available; for generation by user program
Diagnostic messages		
• Wire-break in signal transmitter cable	Yes	Yes
• Overflow/underflow	Yes	Yes
• missing load voltage	Yes	Yes

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Technical specifications (continued)

Article number	**6ES7352-5AH01-0AE0** FM 352-5, Boolean Processor 12DI/8DQ	**6ES7352-5AH11-0AE0** FM 352-5 PNP, Boolean Processor 12DI/8DQ
Counter		
Counting range, description	Counting range (16-bit counters): -32 768 to 32 767 (user-specific within this range); counting range (32-bit counters): -2 147 483 648 to 2 147 483 647 (user-specific within this range)	Counting range (16-bit counters): -32 768 to 32 767 (user-specific within this range); counting range (32-bit counters): -2 147 483 648 to 2 147 483 647 (user-specific within this range)
Counting range, lower limit	-2 147 483 648	-2 147 483 648
Counting range, upper limit	2 147 483 647	2 147 483 647
Counting mode		
• Counting mode, individual	Yes	Yes
• Counting mode, continuous	Yes	Yes
• Counting mode, periodic	Yes	Yes
Potential separation		
between 1L and 2L and 3L	Yes	Yes
Potential separation digital inputs		
• Potential separation digital inputs	Yes; Yes CPU, I/O and sensor units are isolated	Yes; Yes CPU, I/O and sensor units are isolated
Configuration		
Programming		
• Program cycle time (scan)	1 µs	1 µs
Connection method		
required front connector	1x 40-pin	1x 40-pin
Dimensions		
Width	80 mm	80 mm
Height	125 mm	125 mm
Depth	120 mm	120 mm
Weights		
Weight, approx.	434 g; Module weight: approx. 434 g (with 1L connection and without I/O connection or MMC); shipping weight: approx. 500 g (with bus and 1L connection and without I/O connection or MMC)	434 g; Module weight: approx. 434 g (with 1L connection and without I/O connection or MMC); shipping weight: approx. 500 g (with bus and 1L connection and without I/O connection or MMC)

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FM 352-5 high-speed Boolean processor

Ordering data	Article No.
FM 352-5 high-speed Boolean processor	
with current sinking digital outputs	**6ES7352-5AH01-0AE0**
with current sourcing digital outputs	**6ES7352-5AH11-0AE0**
Micro Memory Card	
128 KB	**6ES7953-8LG31-0AA0**
512 KB	**6ES7953-8LJ31-0AA0**
2 MB	**6ES7953-8LL31-0AA0**
Front connector	
40-pin, with screw contacts	
• 1 unit	**6ES7392-1AM00-0AA0**
• 100 units	**6ES7392-1AM00-1AB0**
40-pin, with spring-loaded contacts	
• 1 unit	**6ES7392-1BM01-0AA0**
• 100 units	**6ES7392-1BM01-1AB0**

Article No.				
Signal cables				
To HTL and TTL encoders, preassembled, without Sub-D connector	**6FX5002-2CA12-**	■	■	■ **0**
To SSI absolute encoders 6FX2001-5, preassembled, without Sub-D connector	**6FX5002-2CC12-**	■	■	■ ■
Length code:				
0 m		**1**		
100 m		**2**		
200 m		**3**		
0 m			**A**	
10 m			**B**	
20 m			**C**	
30 m			**D**	
40 m			**E**	
50 m			**F**	
60 m			**G**	
70 m			**H**	
80 m			**J**	
90 m			**K**	
0 m				**A**
1 m				**B**
2 m				**C**
3 m				**D**
4 m				**E**
5 m				**F**
6 m				**G**
7 m				**H**
8 m				**J**
9 m				**K**
0.0 m				**0**
0.1 m				**1**
0.2 m				**2**
0.3 m				**3**
0.4 m				**4**
0.5 m				**5**
0.6 m				**6**
0.7 m				**7**
0.8 m				**8**

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Overview



- 4-channel closed-loop controller module for universal control tasks
- Can be used for temperature, pressure, flow and level controls
- Convenient online self-optimization for temperature controls
- Predefined controller structures
- 2 control algorithms
- 2 versions:
  - FM 355 C as continuous controller;
  - FM 355 S as step or pulse controller
- With 4 analog outputs (FM 355 C) or 8 digital outputs (FM 355 S) for direct control of the most common actuators
- Continuation of control mode also possible with CPU stop or failure

Technical specifications

Article number	**6ES7355-0VH10-0AE0** Control unit FM355C, 4 chan.	**6ES7355-1VH10-0AE0** Control unit FM355S, 4 chan.
Supply voltage		
Load voltage L+		
• Rated value (DC)	24 V	24 V
Input current		
from load voltage L+ (without load), max.	310 mA; Typ. 260 mA	270 mA; typ. 220 mA
from backplane bus 5 V DC, max.	75 mA; typ. 50 mA	75 mA; typ. 50 mA
Power loss		
Power loss, typ.	6.5 W	5.5 W
Power loss, max.	7.8 W	6.9 W
Digital inputs		
Number of digital inputs	8	8
Input characteristic curve in accordance with IEC 61131, type 2	Yes	Yes
Input voltage		
• Rated value (DC)	24 V	24 V
• for signal "0"	-3 to +5V	-3 to +5V
• for signal "1"	13 to 30V	13 to 30V
Input current		
• for signal "1", typ.	7 mA	7 mA
Cable length		
• shielded, max.	1 000 m	1 000 m
• unshielded, max.	600 m	600 m
Digital outputs		
Number of digital outputs		8
Short-circuit protection		Yes; Electronic
Limitation of inductive shutdown voltage to		L+ (-1.5 V)
Controlling a digital input		Yes
Switching capacity of the outputs		
• on lamp load, max.		5 W
Load resistance range		
• lower limit		240 Ω
• upper limit		4 kΩ

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Technical specifications (continued)

Article number	**6ES7355-0VH10-0AE0** Control unit FM355C, 4 chan.	**6ES7355-1VH10-0AE0** Control unit FM355S, 4 chan.
Output voltage		
• for signal "1", min.		L+ (-2.5 V)
Output current		
• for signal "1" rated value		100 mA
• for signal "1" permissible range for 0 to 60 °C, min.		5 mA
• for signal "1" permissible range for 0 to 60 °C, max.		150 mA
• for signal "0" residual current, max.		0.5 mA
Parallel switching of two outputs		
• for logic links		Yes
Switching frequency		
• with resistive load, max.		100 Hz
• with inductive load, max.		0.5 Hz
• on lamp load, max.		100 Hz
Total current of the outputs (per group)		
all mounting positions		
- up to 60 °C, max.		400 mA
Cable length		
• shielded, max.		1 000 m
• unshielded, max.		600 m
Analog inputs		
Number of analog inputs	4	4
permissible input voltage for voltage input (destruction limit), max.	30 V	30 V
permissible input current for current input (destruction limit), max.	40 mA	40 mA
Input ranges (rated values), voltages		
• 0 to +10 V	Yes	Yes
• -1.75 V to +11.75 V	Yes	Yes
• -80 mV to +80 mV	Yes	Yes
Input ranges (rated values), currents		
• 0 to 20 mA	Yes	Yes
• 0 to 23.5 mA	Yes	Yes
• -3.5 mA to +23.5 mA	Yes	Yes
• 4 mA to 20 mA	Yes	Yes
Input ranges (rated values), thermocouples		
• Type B	Yes	Yes
• Type J	Yes	Yes
• Type K	Yes	Yes
• Type R	Yes	Yes
• Type S	Yes	Yes
Input ranges (rated values), resistance thermometer		
• Pt 100	Yes	Yes
Thermocouple (TC)		
Temperature compensation		
- internal temperature compensation	Yes	Yes
- external temperature compensation with Pt100	Yes	Yes
Characteristic linearization		
• parameterizable	Yes	Yes
- for thermocouples	Type B, J, K, R, S	Type B, J, K, R, S
- for resistance thermometer	Pt100 (standard)	Pt100 (standard)
Cable length		
• shielded, max.	200 m; 50 m at 80 mV and thermocouples	200 m; 50 m at 80 mV and thermocouples

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Technical specifications (continued)

Article number	**6ES7355-0VH10-0AE0** Control unit FM355C, 4 chan.	**6ES7355-1VH10-0AE0** Control unit FM355S, 4 chan.
Analog outputs		
Number of analog outputs	4	
Voltage output, short-circuit protection	Yes	
Voltage output, short-circuit current, max.	25 mA	
Current output, no-load voltage, max.	18 V	
Output ranges, voltage		
• 0 to 10 V	Yes	
• -10 V to +10 V	Yes	
Output ranges, current		
• 0 to 20 mA	Yes	
• 4 mA to 20 mA	Yes	
Connection of actuators		
• for voltage output two-wire connection	Yes	
• for current output two-wire connection	Yes	
Load impedance (in rated range of output)		
• with voltage outputs, min.	1 kΩ	
• with voltage outputs, capacitive load, max.	1 µF	
• with current outputs, max.	500 Ω	
• with current outputs, inductive load, max.	1 mH	
Cable length		
• shielded, max.	200 m; 50 m at 80 mV and thermocouples	
Analog value generation for the inputs		
Measurement principle	integrating	integrating
Integration and conversion time/ resolution per channel		
• Resolution with overrange (bit including sign), max.	14 bit; 12 bit or 14 bit, parameterizable	14 bit; 12 bit or 14 bit, parameterizable
• Conversion time (per channel)	16.67 ms; for 12 bit: 16 2/3 ms for 60 Hz, 20 ms for 50 Hz; for 14 bit: 100 ms for 50 Hz and 60 Hz	16.67 ms; for 12 bit: 16 2/3 ms for 60 Hz, 20 ms for 50 Hz; for 14 bit: 100 ms for 50 Hz and 60 Hz
Analog value generation for the outputs		
Settling time		
• for resistive load	0.1 ms	
• for capacitive load	3.3 ms	
• for inductive load	0.5 ms	
Encoder		
Connection of signal encoders		
• for voltage measurement	Yes	Yes
• for current measurement as 4-wire transducer	Yes	Yes
Connectable encoders		
• 2-wire sensor	Yes	Yes
- permissible quiescent current (2-wire sensor), max.	1.5 mA	1.5 mA

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Technical specifications (continued)

Article number	6ES7355-0VH10-0AE0 Control unit FM355C, 4 chan.	6ES7355-1VH10-0AE0 Control unit FM355S, 4 chan.
Errors/accuracies		
Linearity error (relative to input range), (+/-)	0.05 %	0.05 %
Temperature error (relative to input range), (+/-)	0.005 %/K	0.005 %/K
Linearity error (relative to output range), (+/-)	0.05 %	
Temperature error (relative to output range), (+/-)	0.02 %/K	
Operational error limit in overall temperature range		
• Voltage, relative to input range, (+/-)	0.6 %; ±0.6 to ±1%	0.6 %; ±0.6 to ±1%
• Current, relative to input range, (+/-)	0.6 %; ±0.6 to ±1%	0.6 %; ±0.6 to ±1%
• Resistance thermometer, relative to input range, (+/-)	0.6 %; ±0.6 to ±1%	0.6 %; ±0.6 to ±1%
• Voltage, relative to output range, (+/-)	0.5 %	
• Current, relative to output range, (+/-)	0.6 %	
Basic error limit (operational limit at 25 °C)		
• Voltage, relative to input range, (+/-)	0.4 %; 80 mV: ±0.6 %; 250 to 1 000 mV: ±0.4 %; 2.5 to 10 V: ±0.6 %; 3.2 to 20 mA: ±0.5 %	0.4 %; 80 mV: ±0.6 %; 250 to 1 000 mV: ±0.4 %; 2.5 to 10 V: ±0.6 %; 3.2 to 20 mA: ±0.5 %
• Current, relative to input range, (+/-)	0.4 %; ±0.4 to ±0.6 %	0.4 %; ±0.4 to ±0.6 %
• Resistance thermometer, relative to input range, (+/-)	0.4 %; ±0.4 to ±0.6 %	0.4 %; ±0.4 to ±0.6 %
• Voltage, relative to output range, (+/-)	0.3 %	
• Current, relative to output range, (+/-)	0.5 %	
Interference voltage suppression for f = n x (f1 +/- 1 %), f1 = interference frequency		
• Series mode interference (peak value of interference < rated value of input range), min.	40 dB	40 dB
• Common mode interference (USS < 2.5 V) , min.	70 dB	70 dB
Interrupts/diagnostics/ status information		
Substitute values connectable	Yes; Parameterizable	Yes; Parameterizable
Integrated Functions		
Control technology		
• Number of closed-loop controllers	4	4
Potential separation		
Potential separation controller		
• between the channels	No	No
• between the channels and backplane bus	Yes; Optocoupler	Yes; Optocoupler
Connection method		
required front connector	2x 20-pin	2x 20-pin
Dimensions		
Width	80 mm	80 mm
Height	125 mm	125 mm
Depth	120 mm	120 mm
Weights		
Weight, approx.	470 g	470 g

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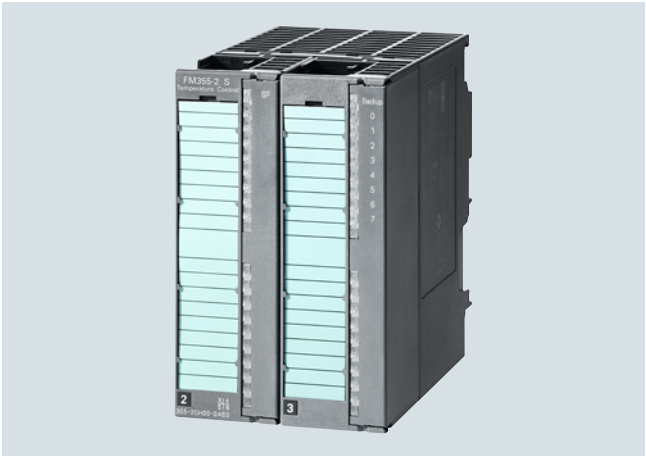
Ordering data	Article No.
FM 355 C controller module With 4 analog outputs for 4 continuous controllers	**6ES7355-0VH10-0AE0**
FM 355 S controller module With 8 digital outputs for 4 step or pulse controllers	**6ES7355-1VH10-0AE0**
Front connector	
20-pin, with screw contacts	
• 1 unit	**6ES7392-1AJ00-0AA0**
• 100 units	**6ES7392-1AJ00-1AB0**
20-pin, with spring-loaded contacts	
• 1 unit	**6ES7392-1BJ00-0AA0**
• 100 units	**6ES7392-1BJ00-1AB0**
Bus connectors 1 unit (spare part)	**6ES7390-0AA00-0AA0**
Labeling strips 10 units (spare part)	**6ES7392-2XX00-0AA0**

	Article No.
Labeling sheets for machine inscription	See under "Accessories", page 5/266
Slot number label Spare part	**6ES7912-0AA00-0AA0**
Shield connection element 80 mm wide, with 2 rows for 4 terminals each	**6ES7390-5AA00-0AA0**
Shield connection clamps	
2 units	
For 2 cables with 2 mm to 6 mm diameter	**6ES7390-5AB00-0AA0**
For 1 cable with 3 mm to 8 mm diameter	**6ES7390-5BA00-0AA0**
For 1 cable with 4 mm to 13 mm diameter	**6ES7390-5CA00-0AA0**

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FM 355-2 temperature controller module

Overview



- 4-channel closed-loop controller module specifically for temperature controls
- Including integrated and easy-to-use online self-optimization
- Heating and cooling controllers as well as combined controllers with heating and active cooling function feasible
- Ready-to-use controller structures
- 2 versions:
  - FM 355-2 C as a continuous controller;
  - FM 355-2 S as step or pulse controllers
- With 4 analog outputs (FM 355-2 C) or 8 digital outputs (FM 355-2 S) to directly control the most common final control elements
- Continuation of control mode also possible with CPU stop or failure

5

Technical specifications

Article number	**6ES7355-2CH00-0AE0** Temp. control unit FM355-2C, 4 chan.	**6ES7355-2SH00-0AE0** Temp. control unit FM355-2S, 4 chan.
Supply voltage		
Load voltage L+		
• Rated value (DC)	24 V	24 V
Input current		
from load voltage L+ (without load), max.	310 mA; Typ. 260 mA	270 mA; typ. 220 mA
from backplane bus 5 V DC, max.	75 mA; typ. 50 mA	75 mA; typ. 50 mA
Power loss		
Power loss, typ.	6.5 W	5.5 W
Power loss, max.	7.8 W	6.9 W
Digital inputs		
Number of digital inputs	8	8
Input characteristic curve in accordance with IEC 61131, type 2	Yes	Yes
Input voltage		
• Rated value (DC)	24 V	24 V
• for signal "0"	-3 to +5V	-3 to +5V
• for signal "1"	13 to 30V	13 to 30V
Input current		
• for signal "1", typ.	7 mA	7 mA
Cable length		
• shielded, max.	1 000 m	1 000 m
• unshielded, max.	600 m	600 m
Digital outputs		
Number of digital outputs		8
Short-circuit protection		Yes; Electronic
Limitation of inductive shutdown voltage to		L+ (-1.5 V)
Controlling a digital input		Yes
Switching capacity of the outputs		
• on lamp load, max.		5 W
Load resistance range		
• lower limit		240 Ω
• upper limit		4 kΩ
Output voltage		
• for signal "1", min.		L+ (-2.5 V)

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Technical specifications (continued)

Article number	**6ES7355-2CH00-0AE0** Temp. control unit FM355-2C, 4 chan.	**6ES7355-2SH00-0AE0** Temp. control unit FM355-2S, 4 chan.
Output current		
• for signal "1" rated value		0.1 A
• for signal "1" permissible range for 0 to 60 °C, min.		5 mA
• for signal "1" permissible range for 0 to 60 °C, max.		150 mA
• for signal "0" residual current, max.		0.5 mA
Parallel switching of two outputs		
• for logic links		Yes
Switching frequency		
• with resistive load, max.		100 Hz
• with inductive load, max.		0.5 Hz
• on lamp load, max.		100 Hz
Total current of the outputs (per group)		
all mounting positions		
- up to 60 °C, max.		400 mA
Cable length		
• shielded, max.		1 000 m
• unshielded, max.		600 m
Analog inputs		
Number of analog inputs	4	4
permissible input voltage for voltage input (destruction limit), max.	20 V	20 V
permissible input current for current input (destruction limit), max.	40 mA	40 mA
Input ranges (rated values), voltages		
• 0 to +10 V	Yes	Yes
• -1.75 V to +11.75 V	Yes	Yes
Input ranges (rated values), currents		
• 0 to 20 mA	Yes	Yes
• 0 to 23.5 mA	Yes	Yes
• -3.5 mA to +23.5 mA	Yes	Yes
• 4 mA to 20 mA	Yes	Yes
Input ranges (rated values), thermocouples		
• Type B	Yes	Yes
• Type E	Yes	Yes
• Type J	Yes	Yes
• Type K	Yes	Yes
• Type R	Yes	Yes
• Type S	Yes	Yes
Input ranges (rated values), resistance thermometer		
• Pt 100	Yes	Yes
Thermocouple (TC)		
Temperature compensation		
- internal temperature compensation	Yes	Yes
- external temperature compensation with Pt100	Yes	Yes
Characteristic linearization		
• parameterizable	Yes	Yes
- for thermocouples	Type B, E, J, K, R, S	Type B, E, J, K, R, S
- for resistance thermometer	Pt100 (standard)	Pt100 (standard)
Cable length		
• shielded, max.	200 m; 50 m at 80 mV and thermocouples	200 m; 50 m at 80 mV and thermocouples

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Technical specifications (continued)

Article number	6ES7355-2CH00-0AE0 Temp. control unit FM355-2C, 4 chan.	6ES7355-2SH00-0AE0 Temp. control unit FM355-2S, 4 chan.
Analog outputs		
Number of analog outputs	4	
Voltage output, short-circuit protection	Yes	
Voltage output, short-circuit current, max.	25 mA	
Current output, no-load voltage, max.	18 V	
Output ranges, voltage		
• 0 to 10 V	Yes	
• -10 V to +10 V	Yes	
Output ranges, current		
• 0 to 20 mA	Yes	
• 4 mA to 20 mA	Yes	
Connection of actuators		
• for voltage output two-wire connection	Yes	
• for current output two-wire connection	Yes	
Load impedance (in rated range of output)		
• with voltage outputs, min.	1 kΩ	
• with voltage outputs, capacitive load, max.	1 µF	
• with current outputs, max.	500 Ω	
• with current outputs, inductive load, max.	1 mH	
Cable length		
• shielded, max.	200 m; 50 m at 80 mV and thermocouples	
Analog value generation for the inputs		
Measurement principle	integrating	integrating
Integration and conversion time/ resolution per channel		
• Resolution with overrange (bit including sign), max.	14 bit	14 bit
• Conversion time (per channel)	100 ms; At 50/60 Hz	100 ms; At 50/60 Hz
Analog value generation for the outputs		
Settling time		
• for resistive load	0.1 ms	
• for capacitive load	3.3 ms	
• for inductive load	0.5 ms	
Encoder		
Connection of signal encoders		
• for voltage measurement	Yes	Yes
• for current measurement as 4-wire transducer	Yes	Yes
Connectable encoders		
• 2-wire sensor	Yes	Yes
- permissible quiescent current (2-wire sensor), max.	1.5 mA	1.5 mA

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Technical specifications (continued)

Article number	**6ES7355-2CH00-0AE0** Temp. control unit FM355-2C, 4 chan.	**6ES7355-2SH00-0AE0** Temp. control unit FM355-2S, 4 chan.
Errors/accuracies		
Linearity error (relative to input range), (+/-)	0.05 %	0.05 %
Temperature error (relative to input range), (+/-)	0.005 %/K	0.005 %/K
Linearity error (relative to output range), (+/-)	0.05 %	
Temperature error (relative to output range), (+/-)	0.02 %/K	
Operational error limit in overall temperature range		
• Voltage, relative to input range, (+/-)	0.6 %; ±0.6 to ±0.7 %	0.06 %; ±0.06 to ±0.7%
• Current, relative to input range, (+/-)	0.6 %; ±0.6 to ±0.7 %	0.06 %; ±0.06 to ±0.7%
• Resistance thermometer, relative to input range, (+/-)	0.6 %; ±0.6 to ±0.7 %	0.06 %; ±0.06 to ±0.7%
• Voltage, relative to output range, (+/-)	0.5 %	
• Current, relative to output range, (+/-)	0.6 %	
Basic error limit (operational limit at 25 °C)		
• Voltage, relative to input range, (+/-)	0.04 %; ±0.04 to ±0.5 %	0.04 %; ±0.04 to ±0.5 %
• Current, relative to input range, (+/-)	0.04 %; ±0.04 to ±0.5 %	0.04 %; ±0.04 to ±0.5 %
• Resistance thermometer, relative to input range, (+/-)	0.04 %; ±0.04 to ±0.5 %	0.04 %; ±0.04 to ±0.5 %
• Voltage, relative to output range, (+/-)	0.4 %	
• Current, relative to output range, (+/-)	0.5 %	
Interference voltage suppression for f = n x (f1 +/- 1 %), f1 = interference frequency		
• Series mode interference (peak value of interference < rated value of input range), min.	40 dB	40 dB
• Common mode interference (USS < 2.5 V) , min.	70 dB	70 dB
Interrupts/diagnostics/ status information		
Substitute values connectable	Yes; Parameterizable	Yes; Parameterizable
Integrated Functions		
Control technology		
• Number of closed-loop controllers	4	4
Potential separation		
Potential separation controller		
• between the channels	No	No
• between the channels and backplane bus	Yes; Optocoupler	Yes; Optocoupler
Connection method		
required front connector	2x 20-pin	2x 20-pin
Dimensions		
Width	80 mm	80 mm
Height	125 mm	125 mm
Depth	120 mm	120 mm
Weights		
Weight, approx.	470 g	470 g

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FM 355-2 temperature controller module

Ordering data	Article No.
FM 355-2 C temperature controller module With 4 analog outputs for 4 continuous-action controllers	**6ES7355-2CH00-0AE0**
FM 355-2 S temperature controller module With 8 digital outputs for 4 step or pulse controllers	**6ES7355-2SH00-0AE0**
Front connector	
20-pin, with screw contacts	
• 1 unit	**6ES7392-1AJ00-0AA0**
• 100 units	**6ES7392-1AJ00-1AB0**
20-pin, with spring-loaded contacts	
• 1 unit	**6ES7392-1BJ00-0AA0**
• 100 units	**6ES7392-1BJ00-1AB0**
Bus connectors 1 unit (spare part)	**6ES7390-0AA00-0AA0**

	Article No.
Labeling strips 10 units (spare part)	**6ES7392-2XX00-0AA0**
Labeling sheets for machine inscription	See under "Accessories", page 5/266
Slot number label Spare part	**6ES7912-0AA00-0AA0**
Shield connection element 80 mm wide, with 2 rows for 4 terminals each	**6ES7390-5AA00-0AA0**
Shield connection clamps 2 units	
For 2 cables with 2 mm to 6 mm diameter	**6ES7390-5AB00-0AA0**
For 1 cable with 3 mm to 8 mm diameter	**6ES7390-5BA00-0AA0**
For 1 cable with 4 mm to 13 mm diameter	**6ES7390-5CA00-0AA0**

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Overview



- Interface between max. 3 absolute-value sensors (SSI) and the CPU
- For provision of the displacement encoder values for further processing in STEP 7 programs
- Enables direct response of controller to encoder values in moving systems

Note:

Displacement measuring systems and precut/pre-assembled cables for counting and positioning functions are available under SIMODRIVE Sensor or Motion Connect 500.

http://www.siemens.com/simatic-technology

Technical specifications

Article number	**6ES7338-4BC01-0AB0** SM 338, f. 3 SSI encoders
Supply voltage	
Load voltage L+	
• Rated value (DC)	24 V
Input current	
from load voltage L+ (without load), max.	100 mA
from backplane bus 5 V DC, max.	160 mA
24 V encoder supply	
• 24 V	Yes; L+ (-0.8 V)
• Output current, max.	900 mA
Power loss	
Power loss, typ.	3 W
Digital inputs	
Input voltage	
• for signal "0"	-3 to +5V
• for signal "1"	11 to 30.2 V
Input current	
• for signal "0", max. (permissible quiescent current)	2 mA
• for signal "1", typ.	9 mA
Input delay (for rated value of input voltage)	
for standard inputs	
- at "0" to "1", min.	300 µs
Cable length	
• shielded, max.	600 m

Article number	**6ES7338-4BC01-0AB0** SM 338, f. 3 SSI encoders
Encoder	
Number of connectable encoders, max.	3
Connectable encoders	
• Absolute encoder (SSI)	Yes
• 2-wire sensor	Yes
Encoder signals, absolute encoder (SSI)	
• Cable length, shielded, max.	320 m; 320 m at 125 kHz; 160 m at 250 kHz; 60 m at 500 kHz; 20 m at 1 MHz
Interrupts/diagnostics/ status information	
Alarms	
• Diagnostic alarm	Yes
Potential separation	
Potential separation exists	No
Connection method	
required front connector	20-pin
Dimensions	
Width	40 mm
Height	125 mm
Depth	120 mm
Weights	
Weight, approx.	235 g

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SM 338 POS input module

Ordering data	Article No.
SM 338 POS input module For position sensing with 3 SSI encoders	**6ES7338-4BC01-0AB0**
Front connector	
20-pin, with screw contacts	
• 1 unit	**6ES7392-1AJ00-0AA0**
• 100 units	**6ES7392-1AJ00-1AB0**
20-pin, with spring-loaded contacts	
• 1 unit	**6ES7392-1BJ00-0AA0**
• 100 units	**6ES7392-1BJ00-1AB0**
Front door, elevated design e.g. for 32-channel modules; for connecting 1.3 mm^2/16 AWG conductors	**6ES7328-0AA00-7AA0**
SIMATIC Manual Collection Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC Distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	**6ES7998-8XC01-8YE0**
SIMATIC Manual Collection update service for 1 year Current "Manual Collection" DVD and the three subsequent updates	**6ES7998-8XC01-8YE2**

	Article No.
Signal cable	
Pre-assembled for SSI absolute encoder 6FX2001-5, without Sub-D connector, UL/DESINA	**6FX5002-2CC12-** ■ ■ ■ ■
0 m	**1**
100 m	**2**
200 m	**3**
0 m	**A**
10 m	**B**
20 m	**C**
30 m	**D**
40 m	**E**
50 m	**F**
60 m	**G**
70 m	**H**
80 m	**J**
90 m	**K**
0 m	**A**
1 m	**B**
2 m	**C**
3 m	**D**
4 m	**E**
5 m	**F**
6 m	**G**
7 m	**H**
8 m	**J**
9 m	**K**
0.0 m	**0**
0.1 m	**1**
0.2 m	**2**
0.3 m	**3**
0.4 m	**4**
0.5 m	**5**
0.6 m	**6**
0.7 m	**7**
0.8 m	**8**

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Overview



- For connecting up to 4 drives with analog setpoint interface or pulse-direction interface to a controller
- Operation with isochronous PROFIBUS DP
- Connectable drives:
  - Electrical drives
  - Hydraulic drives
  - Stepper drives
- Can be used with:
  - SIMATIC CPU 41x-2 DP, CPU 31x-2 DP, CPU 31xT-2 DP, WinAC RTX 2008
  - SIMOTION C2xx, SIMOTION P320-4, SIMOTION D4x5-2
- Can also be used with external encoders

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Technical specifications

Article number	**6ES7174-0AA10-0AA0** IM 174 for connecting analog drives
Supply voltage	
Rated value (DC)	
• 24 V DC	Yes
Input current	
Current consumption, max.	500 mA
from backplane bus 5 V DC, max.	100 mA
Encoder supply	
5 V encoder supply	
• 5 V	Yes
• Output current, max.	1.2 A
• Cable length, max.	25 m
24 V encoder supply	
• 24 V	Yes
• Output current, max.	1.4 A
• Cable length, max.	100 m
Absolute encoder (SSI) encoder supply	
• Absolute encoder (SSI)	Yes
• Short-circuit protection	Yes
Power loss	
Power loss, typ.	12 W
Digital inputs	
Number of digital inputs	10
Input voltage	
• for signal "0"	-3 to +5V
• for signal "1"	+11 to +30V
Input current	
• for signal "0", max. (permissible quiescent current)	2 mA
• for signal "1", typ.	8 mA
Input delay (for rated value of input voltage)	
for standard inputs	
- at "0" to "1", min.	15 µs
Cable length	
• shielded, max.	100 m

Article number	**6ES7174-0AA10-0AA0** IM 174 for connecting analog drives
Digital outputs	
Number of digital outputs	8
Short-circuit protection	Yes
Switching capacity of the outputs	
• with resistive load, max.	1 A
• on lamp load, max.	30 W
Output voltage	
• Rated value (DC)	24 V; L+
• for signal "1", min.	L+ (-3 V)
• for signal "1", max.	3 V
Output current	
• for signal "1" permissible range for 0 to 55 °C, min.	5 mA
• for signal "1" permissible range for 0 to 55 °C, max.	300 mA
• for signal "0" residual current, max.	0.4 mA
Output delay with resistive load	
• "0" to "1", max.	500 µs
Switching frequency	
• with resistive load, max.	500 Hz
• with inductive load, max.	0.5 Hz
Relay outputs	
• Number of relay outputs	4
• Number of operating cycles, max.	50 000
Switching capacity of contacts	
- with resistive load, max.	1 A
Cable length	
• shielded, max.	600 m
Analog outputs	
Number of analog outputs	4
Output ranges, voltage	
• -10 V to +10 V	Yes
Analog value generation for the outputs	
Integration and conversion time/ resolution per channel	
• Resolution with overrange (bit including sign), max.	15 bit

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Technical specifications (continued)

Article number	**6ES7174-0AA10-0AA0** IM 174 for connecting analog drives
Encoder	
Number of connectable encoders, max.	4
Connectable encoders	
• Incremental encoder (symmetrical)	Yes
• Absolute encoder (SSI)	Yes
• 2-wire sensor	Yes
- permissible quiescent current (2-wire sensor), max.	2 mA
Encoder signals, incremental encoder (symmetrical)	
• Trace mark signals	A, notA, B, notB
• Zero mark signal	N, notN
• Input voltage	5 V difference signal (phys. RS 422)
• Input frequency, max.	1 MHz
• Cable length, shielded, max.	35 m; 35 m at max. 500 kHz; 10 m at max. 1 MHz
Encoder signals, absolute encoder (SSI)	
• Input signal	5 V difference signal (phys. RS 422)
• Data signal	DATA, notDATA
• Clock signal	CL, notCL
• Telegram length, parameterizable	13, 21, 24 bit
• Clock frequency, max.	1.5 MHz; 187.5 KHz 1.5 MHz (parameterizable)
• Binary code	Yes
• Gray code	Yes
• Cable length, shielded, max.	250 m; 250 m at 187.5 kHz, 10 m at 1.5 MHz
Isochronous mode	
Isochronous operation (application synchronized up to terminal)	Yes
shortest clock pulse	1.5 ms
Interrupts/diagnostics/ status information	
Alarms	
• Diagnostic alarm	Yes

Article number	**6ES7174-0AA10-0AA0** IM 174 for connecting analog drives
Drive interface	
Number of drive interfaces	4
Analog drive	
Setpoint signal	
- Short-circuit proof	Yes; max. 45 mA, min. 3.3 kOhm load impedance
- Rated voltage range	-10.5 V to +10.5 V
- Output current	-3 to +3 mA
Output controller enable	
- Number of relay contacts	4
- Switching voltage, max.	30 V
- Switching current, max.	1 A
- Switching capacity, max.	30 V·A
- Number of switching cycles, min.	50 000; at 30 V DC, 1 A
- Cable length, shielded, max.	35 m
Stepper drive	
• Differential output voltage, min.	2 V; R = 100 Ohm
• Differential output voltage for signal "0", max.	1 V; For I = -20 mA
• Differential output voltage for signal "1", min.	3.7 V; 3.7 V at I = -20 mA; 4.5 V at I = -100 µA,
• Load resistance, min.	55 Ω
• Output current, max.	60 mA
• Pulse frequency	750 kHz
• Cable length, shielded, max.	50 m; in hybrid operation with analog axes 35 m, in asymmetrical transmission 10 m
Potential separation	
Potential separation digital inputs	
• Potential separation digital inputs	Yes; to encoders, analog outputs, DP interface; no to other DI/DOs
Potential separation digital outputs	
• Potential separation digital outputs	Yes; to encoders, analog outputs, DP interface; no to other DI/DOs
Connection method	
required front connector	40-pin
Dimensions	
Width	160 mm
Height	125 mm
Depth	118 mm
Weights	
Weight, approx.	1 kg

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Ordering data

	Article No.
IM 174 PROFIBUS module PROFIBUS module for connecting analog drives and stepper drives to a controller	**6ES7174-0AA10-0AA0**

	Article No.
Setpoint cable for the connection between IM 174 and SIMODRIVE 611-A	**6FX2002-3AD01-** ■ ■ ■ ■
0 m	**1**
100 m	**2**
200 m	**3**
0 m	**A**
10 m	**B**
20 m	**C**
30 m	**D**
40 m	**E**
50 m	**F**
60 m	**G**
70 m	**H**
80 m	**J**
90 m	**K**
0 m	**A**
1 m	**B**
2 m	**C**
3 m	**D**
4 m	**E**
5 m	**F**
6 m	**G**
7 m	**H**
8 m	**J**
9 m	**K**
0.0 m	**0**
0.1 m	**1**
0.2 m	**2**
0.3 m	**3**
0.4 m	**4**
0.5 m	**5**
0.6 m	**6**
0.7 m	**7**
0.8 m	**8**

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SIWAREX U

Overview



SIWAREX U is a versatile weighing module for all simple weighing and force measuring tasks. The compact module can be integrated into SIMATIC automation systems without any problems. Complete data access is possible via the SIMATIC.

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Technical specifications

SIWAREX U	
Integration in automation systems	
• S7-300	Direct integration
• S7-1500	Through ET 200M
• S7-400 (H)	Through ET 200M
• PCS 7 (H)	Through ET 200M
• Automation systems from other vendors	Through ET 200M
• Stand-alone (without SIMATIC CPU)	Possible with IM 153-1
Communication interfaces	• SIMATIC S7 (P bus) • RS 232 • TTY
Connection of remote displays (through TTY serial interface)	Gross, channel 1, 2 or default value 1, 2
Scale adjustment	Through SIMATIC (P bus) or PC using SIWATOOL U (RS 232)
Measuring properties	
Error limit to DIN 1319-1 of full-scale value at 20 °C ± 10 K (68 °F ± 10 K)	0.05%
Internal resolution ADC Data format of weight values	65535 2 byte (fixed-point)
Number of measurements/second	50
Digital filter	0.05 ... 5 Hz (in 7 steps), mean value filter
Weighing functions	
Weight values	Gross
Limit values	2 (min./max.)
Zero-setting function	Per command
Load cells	Strain gauges in 4-wire or 6-wire system

SIWAREX U	
Load cell powering	
Supply voltage U_s (rated value)	6 V DC[1]
Max. supply current	≤ 150 mA per channel
Permissible load resistance	
• R_{Lmin}	> 40 Ω per channel
• R_{Lmax}	< 4 010 Ω
With Ex(i) interface	
• R_{Lmin}	> 87 Ω per channel
• R_{Lmax}	< 4 010 Ω
Permissible load cell characteristic	Up to 4 mV/V
Max. distance of load cells	500 m[2] 150/500 m for gas group IIC 500 m[2] for gas group IIB (see SIWAREX IS Manual)
Intrinsically-safe load cell powering	Optional (Ex interface) with SIWAREX IS
Auxiliary power supply	
Rated voltage	24 V DC
Max. power consumption	150 mA (single-channel) / 240 mA (dual-channel)
Current consumption on backplane bus	≤ 100 mA
Certification	ATEX 95, FM, cUL$_{US}$ Haz. Loc.
IP degree of protection to EN 60529; IEC 60529	IP20
Climatic requirements	
$T_{min\ (IND)}$ to $T_{max\ (IND)}$ (operating temperature)	
• Horizontal installation	0 ... +60 °C (32 ... 140 °F)
• Vertical installation	0 ... +40 °C (32 ... 104 °F)
EMC requirements according to	according to NAMUR NE21, Part 1; EN 61326
Dimensions	40 x 125 x 130 mm (1.58 x 4.92 x 5.12 in)

[1] Load cell supply changed to 6 V DC as compared to 7MH4601-1AA01 and ... 1BA01.

[2] Possible up to 1000 m under certain conditions when using the recommended cable (accessories).

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Ordering data	Article No.
SIWAREX U For SIMATIC S7 and ET 200M, incl. bus connector, weight 0.3 kg (0.661 lb)	
Single-channel version[1] for connecting one scale	**7MH4950-1AA01**
Two-channel version[2] for connecting two scales	**7MH4950-2AA01**
SIWATOOL V4 & V7 Service and commissioning software for SIWAREX weighing modules	**7MH4900-1AK01**
SIWAREX U configuration package for PCS7, version 8.0 Suitable for 7MH4950-xAA01 • Function block for CFC • Faceplate • Manual	**7MH4950-3AK62**
SIWAREX PCS7 AddOn Library for PCS7 V8.x and V9.0 • Supports PROFINET APL faceplates and function blocks for: • SIWAREX U • SIWAREX FTA • SIWAREX FTC_B (conveyor scales) • SIWAREX WP321 Classic faceplate and function block for: • SIWAREX FTC_L (loss in weight)	**7MH4900-1AK61**
SIWATOOL connection cable From SIWAREX U/CS with serial PC interface, for 9-pin PC interfaces (RS 232), length 3 m (9.84 ft)	**7MH4607-8CA**
Installation material (mandatory)	
20-pin front connector with screw contacts Required for each SIWAREX module	**6ES7392-1AJ00-0AA0**
Shield connection element Sufficient for two SIWAREX U modules	**6ES7390-5AA00-0AA0**
Shield connection clamp Contents: 2 units (suitable for cable with diameter 4 ... 13 mm) (0.16 ... 0.51 in) Note: one shield connection clamp each is required for: • Scale connection • RS 485 interface • RS 232 interface	**6ES7390-5CA00-0AA0**
S7 DIN rail	
• 160 mm (6.30 in)	**6ES7390-1AB60-0AA0**
• 480 mm (18.90 in)	**6ES7390-1AE80-0AA0**
• 530 mm (20.87 in)	**6ES7390-1AF30-0AA0**
• 830 mm (32.68 in)	**6ES7390-1AJ30-0AA0**
• 2000 mm (78.74 in)	**6ES7390-1BC00-0AA0**

	Article No.
Accessories (optional)	
Labeling strips (10 units, spare part)	**6ES7392-2XX00-0AA0**
Remote displays (option) The digital remote displays can be connected directly to SIWAREX U through a TTY interface. The following remote displays can be used: S102, S302 Siebert Industrieelektronik GmbH Postfach 1180 D-66565 Eppelborn, Germany Tel.: +49 6806/980-0 Fax: +49 6806/980-999 Internet: http://www.siebert.de Detailed information is available from the manufacturer.	
SIWAREX JB junction box, aluminum housing For connecting up to 4 load cells in parallel, and for connecting multiple junction boxes.	**7MH5001-0AA20**
SIWAREX JB junction box, stainless steel housing For connecting up to 4 load cells in parallel.	**7MH5001-0AA00**
SIWAREX JB junction box, stainless steel housing (ATEX) For parallel connection of up to 4 load cells (for zone allocation, see manual or type-examination certificate).	**7MH4710-1EA01**
Ex interface SIWAREX IS For intrinsically safe connection of load cells. With ATEX approval (not UL/FM). Suitable for SIWAREX electronic weighing system. Compatibility of load cells must be checked separately.	
• With short-circuit current < 199 mA DC	**7MH4710-5BA**
• With short-circuit current < 137 mA DC	**7MH4710-5CA**

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Ordering data	Article No.
Cable (optional)	
Cable Li2Y 1 x 2 x 0.75 ST + 2 x (2 x 0.34 ST) – CY For connecting SIWAREX electronic weighing systems to junction box (JB), extension box (EB) and Ex interface or between two EBs. For permanent installation. Occasional bending is possible. External diameter: approx. 10.8 mm (0.43 in) Permissible ambient temperature -40 ... +80 °C (-40 ... +176 °F). Sold by the meter.	
• Sheath color: orange	**7MH4702-8AG**
• For hazardous atmospheres. Sheath color: blue.	**7MH4702-8AF**

Commissioning	Article No.
Commissioning charge for one static scale with SIWAREX module (Travel and setup charge must be ordered separately) Scope: • Recording of data • Checking of mechanical installation of the scale • Checking of electrical wiring and function • Static adjustment of the scale Requirements: • Mechanical design functional • Modules electrically wired and tested • Calibration weights available • Free access to scale	**9LA1110-8SN50-0AA0**
Flat charge for travel and setup in Germany	**9LA1110-8RA10-0AA0**

1) Compatible with 7MH4601-1AA01; supply of load cells changed to 6 V DC.

2) Compatible with 7MH4601-1BA01; supply of load cells changed to 6 V DC.

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Overview



SIWAREX FTA (Flexible Technology, Automatic Weighing Instrument) is a versatile and flexible weighing module for industrial use. It can be used in both non-automatic and automatic weighing operation, for example the production of mixtures, and for filling, loading, monitoring and bag filling.

It has the corresponding scale approvals and is also suitable for legal-for-trade weighing systems.

The SIWAREX FTA function module is integrated in SIMATIC S7/PCS7, and uses the features of this modern automation system, such as integrated communication, diagnostics and configuration tools.

Technical specifications

SIWAREX FTA	
Use in automation systems	
S7-300	Directly or via ET 200M
S7-1500	Through ET 200M
S7-400 (H)	Through ET 200M
PCS 7 (H)	Through ET 200M
Communication interfaces	
S7	Through backplane bus
RS 232	For SIWATOOL or printer connection
RS 485	For remote display or digital load cell
Module parameterization	Using SIMATIC S7 Using SIWATOOL FTA software (RS 232)
Measuring properties	
EU type approval as non-automatic weighing instrument, trade class III	3 x 6 000 d ≥ 0.5 µV/e
Internal resolution	16 million parts
Internal/external updating rate	400/100 Hz
Several parameterizable digital filters	Critically dampened, Bessel, Butterworth (0.05 ... 20 Hz), mean-value filter
Weighing functions	
Non-automatic weighing machine	OIML R76
Automatic weighing machine	OIML R51, R61, R107
Load cells	Strain gages in 4-wire or 6-wire system
3 characteristic value ranges	1, 2 or 4 mV/V
Load cell powering	
Supply voltage U_S (rated value)	10.3 V DC
Max. supply current	184 mA
Permissible load cell resistance	
• R_{Lmin}	> 56 Ω > 87 Ω with Ex interface
• R_{Lmax}	≤ 4 010 Ω

SIWAREX FTA	
Max. distance of load cells	
When using the recommended cable:	
Standard	1 000 m (3 280 ft)
In hazardous area[1)]	
• For gases of group IIC	300 m (984 ft)
• For gases of group IIB	1000 m (3 280 ft)
Connection to load cells in Ex zone 1	Optionally via SIWAREX IS Ex interface
Ex approvals zone 2 and safety	ATEX 95, FM, cUL_{US} Haz. Loc.
Auxiliary power supply	
Rated voltage	24 V DC
Max. power consumption	500 mA
Current consumption on backplane bus	Typ. 55 mA
Inputs/outputs	
Digital inputs	7 DI electrically isolated
Digital outputs	8 DO electrically isolated
Counter input	Up to 10 kHz
Analog output	
• Current range	0/4 ... 20 mA
• Updating rate	100 Hz
Approvals	EU type approval (CE, OIML R76) EU prototype test to MID (OIML R51, R61, R107)
Degree of protection according to EN 60529; IEC 60529	IP20
Climatic requirements	
$T_{min\ (IND)}$ ... $T_{max\ (IND)}$ (operating temperature)	
• Horizontal installation	-10 ... 60 °C (14 ... 140 °F)
• Vertical installation	-10 ... 40 °C (14 ... 104 °F)
EMC requirements	EN 61326, EN 45501, NAMUR NE21, Part 1
Dimensions	80 x 125 x 130 mm (3.15 x 4.92 x 5.12 in)
Weight	600 g (0.44 lb)

1) For further details, see Ex interface, type SIWAREX IS

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SIWAREX FTA

Ordering data	Article No.
SIWAREX FTA Legal-for-trade weighing electronics for automatic scales for S7-300 and ET 200M. EU type approval 3 x 6000 d Applications: proportioning, filling, bagging, loading. Note: Observe approval conditions for applications requiring official calibration. We recommend using our calibration set and contacting our SIWAREX hotline.	**7MH4900-2AA01**
SIWAREX FTA Manual Available in a range of languages Free download on the Internet at: http://www.siemens.com/weighing-technology	
SIWAREX FTA "Getting started" Sample software shows beginners how to program the scales in STEP 7. Free download on the Internet at: http://www.siemens.com/weighing-technology	
SIWATOOL V4 & V7 Service and commissioning software for SIWAREX weighing modules	**7MH4900-1AK01**
Configuration package SIWAREX FTA for SIMATIC PCS 7, Version 8.0 on CD-ROM • HSP hardware support package for integrating SIWAREX FTA/FTC in STEP 7 • Function block for CFC • Faceplate • Manual	**7MH4900-2AK63**
SIWAREX PCS7 AddOn Library for PCS7 V8.x and V9.0 • Supports PROFINET APL faceplates and function blocks for: • SIWAREX U • SIWAREX FTA • SIWAREX FTC_B (belt scales) • SIWAREX WP321 Classic faceplate and function block for: • SIWAREX FTC_L (loss in weight)	**7MH4900-1AK61**
Calibration set for SIWAREX FTA For verification of up to 5 scales comprising: • 3 x inscription foil for label • 1 x protection film • Guidelines for verification, verification certificates and approvals, adaptable label, SIWAREX FTA Manual on CD-ROM	**7MH4900-2AY10**
SIWATOOL connection cable From SIWAREX FTA with serial PC interface, for 9-pin PC interfaces (RS 232) • 2 m long (6.56 ft) • 5 m long (16.40 ft)	 **7MH4702-8CA** **7MH4702-8CB**

	Article No.
Front connector, 40-pin Required for each SIWAREX module	
• With screw contacts	**6ES7392-1AM00-0AA0**
• With spring-loaded terminals	**6ES7392-1BM01-0AA0**
Shield connection element Sufficient for one SIWAREX FTA module	**6ES7390-5AA00-0AA0**
Shield connection clamp Contents: 2 units (suitable for cable with diameter 4 ... 13 mm) (0.16 ... 0.51 in) Note: one shield connection clamp each is required for: • Scale connection • RS 485 interface • RS 232 interface	**6ES7390-5CA00-0AA0**
S7 DIN rail	
• 160 mm (6.30 in)	**6ES7390-1AB60-0AA0**
• 480 mm (18.90 in)	**6ES7390-1AE80-0AA0**
• 530 mm (20.87 in)	**6ES7390-1AF30-0AA0**
• 830 mm (32.68 in)	**6ES7390-1AJ30-0AA0**
• 2 000 mm (78.74 in)	**6ES7390-1BC00-0AA0**
MMC memory For data recording up to 32 MB, only for legal-for-trade applications R76, R51 and R107	**7MH4900-2AY21**
Remote displays (option) The Siebert S102 and S302 remote digital displays can be directly connected to the SIWAREX FTA via an RS 485 interface. Siebert Industrieelektronik GmbH Postfach 1180 D-66565 Eppelborn, Germany Tel.: +49 6806/980-0 Fax: +49 6806/980-999 Internet: http://www.siebert.de Detailed information is available from the manufacturer.	
SIWAREX JB junction box, aluminum housing For connecting up to 4 load cells in parallel, and for connecting several junction boxes	**7MH5001-0AA20**
SIWAREX JB junction box, stainless steel housing For connecting up to 4 load cells in parallel.	**7MH5001-0AA00**
SIWAREX JB junction box, stainless steel housing (ATEX) For parallel connection of up to 4 load cells (for zone allocation, see manual or type-examination certificate).	**7MH4710-1EA01**
Ex interface SIWAREX IS For intrinsically safe connection of load cells. With ATEX approval (not UL/FM). Suitable for SIWAREX electronic weighing system. Compatibility of load cells must be checked separately.	
• With short-circuit current < 199 mA DC	**7MH4710-5BA**
• With short-circuit current < 137 mA DC	**7MH4710-5CA**

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Ordering data	Article No.
Cable (optional)	
Cable Li2Y 1 x 2 x 0.75 ST + 2 x (2 x 0.34 ST) – CY For connecting SIWAREX electronic weighing systems to junction box (JB), extension box (EB) and Ex interface or between two EBs. For permanent installation. Occasional bending is possible. External diameter: approx. 10.8 mm (0.43 in) Permissible ambient temperature -40 ... +80 °C (-40 ... +176 °F). Sold by the meter.	
• Sheath color: orange	**7MH4702-8AG**
• For hazardous atmospheres. Sheath color: blue.	**7MH4702-8AF**

	Article No.
Commissioning	
Commissioning charge for one static scale with SIWAREX module (Travel and setup charge must be ordered separately) Scope: • Recording of data • Checking of mechanical installation of the scale • Checking of electrical wiring and function • Static adjustment of the scale Requirements: • Mechanical design functional • Modules electrically wired and tested • Calibration weights available • Free access to scale	**9LA1110-8SN50-0AA0**
Flat charge for travel and setup in Germany	**9LA1110-8RA10-0AA0**

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SIWAREX FTC

Overview



The SIWAREX FTC (Flexible Technology for Continuous Weighing) is a versatile and flexible weighing module for belt scales, loss-in-weight feeders and solid flow meters. It can also be used to record weights and measure force. The SIWAREX FTC function module is integrated in SIMATIC S7/PCS7, and uses the features of this modern automation system, such as integral communication, diagnostics and configuration tools.

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Technical specifications

SIWAREX FTC	
Use in automation systems	
S7-300	Directly or via ET 200M
S7-1500	Through ET 200M
S7-400 (H)	Through ET 200M
PCS 7 (H)	Through ET 200M
Communication interfaces	
S7	Through backplane bus
RS 232	For SIWATOOL or printer connection
RS 485	For remote display or digital load cell
Module parameterization	
	Using SIMATIC S7
	Using SIWATOOL FTC software (RS 232)
Measuring properties	
Accuracy to EN 45501	3 x 6 000 d ≥ 0.5 µV/e
Internal resolution	+/- 8 million parts
Internal/external updating rate	400/100 Hz
Several parameterizable digital filters	Critically dampened, Bessel, Butterworth (0.05 ... 20 Hz), mean-value filter
Weighing functions	• Non-automatic weighing machine, force measurement
	• Belt scale
	• Loss-in-weight feeder
	• Solid flow meter
Load cells	Strain gages in 4-wire or 6-wire system
3 characteristic value ranges	1, 2 or 4 mV/V
Load cell powering	
Supply voltage U_S (rated value)	10.3 V DC
Max. supply current	184 mA
Permissible load cell resistance	
• R_{Lmin}	> 56 Ω > 87 Ω with Ex interface
• R_{Lmax}	≤ 4 010 Ω

SIWAREX FTC	
Max. distance of load cells	
When using the recommended cable:	
Standard	1 000 m (3 280 ft)
In hazardous area[1)]	
• For gases of group IIC	300 m (984 ft)
• For gases of group IIB	1 000 m (3 280 ft)
Connection to load cells in Ex zone 1	Optionally via SIWAREX IS Ex interface
Ex approvals zone 2 and safety	ATEX 95, FM, cUL_{US} Haz. Loc.
Auxiliary power supply	
Rated voltage	24 V DC
Max. power consumption	500 mA
Current consumption on backplane bus	Typ. 55 mA
Inputs/outputs	
Digital inputs	7, electrically isolated
Digital outputs	8, electrically isolated
Counter input	Up to 10 kHz
Analog output	
• Current range	0/4 ... 20 mA
• Updating rate	100 Hz
Degree of protection according to EN 60529; IEC 60529	IP20
Climatic requirements	
$T_{min\ (IND)}$ ... $T_{max\ (IND)}$ (operating temperature)	
• Horizontal installation	-10 ... 60 °C (14 ... 140 °F)
• Vertical installation	-10 ... 40 °C (14 ... 104 °F)
EMC requirements	EN 61326, EN 45501, NAMUR NE21, Part 1
Dimensions	80 x 125 x 130 mm (3.15 x 4.92 x 5.12 in)
Weight	600 g (0.44 lb)

1) For further details, see Ex interface, type SIWAREX IS

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Ordering data	Article No.
SIWAREX FTC Weighing electronics for S7-300 and ET 200M. Applications: Belt scales, force measurement, loss-in-weight feeders and solid flow meters	**7MH4900-3AA01**
SIWAREX FTC_B manual for belt scales Available in a range of languages Free download on the Internet at: http://www.siemens.com/weighing-technology	
SIWAREX FTC_L manual for solid flow meters and loss-in-weight feeders Available in a range of languages Free download on the Internet at: http://www.siemens.com/weighing-technology	
SIWAREX FTC "Getting started" for belt scales Sample software shows beginners how to program the scales in STEP 7 for belt scale mode Free download on the Internet at: http://www.siemens.com/weighing-technology	
SIWAREX FTC "Getting started" for solid flow meters Sample software shows beginners how to program the scales in STEP 7 for solid flow meter mode Free download on the Internet at: http://www.siemens.com/weighing-technology	
SIWAREX FTC "Getting started" for loss-in-weight feeders Sample software shows beginners how to program scales in STEP 7 for loss-in-weight feeder mode Free download on the Internet at: http://www.siemens.com/weighing-technology	
SIWATOOL V4 & V7 Service and commissioning software for SIWAREX weighing modules	**7MH4900-1AK01**
SIWAREX PCS7 AddOn Library for PCS7 V8.x and V9.0 • Supports PROFINET APL faceplates and function blocks for: • SIWAREX U • SIWAREX FTA • SIWAREX FTC_B (belt scales) • SIWAREX WP321 Classic faceplate and function block for: • SIWAREX FTC_L (loss in weight)	**7MH4900-1AK61**
SIWATOOL connection cable from SIWAREX FTC with serial PC interface, for 9-pin PC interfaces (RS 232)	
• 2 m long (6.56 ft)	**7MH4702-8CA**
• 5 m long (16.40 ft)	**7MH4702-8CB**

	Article No.
40-pin front connector with screw contacts Required for each SIWAREX module	
• With screw contacts	**6ES7392-1AM00-0AA0**
• With spring-loaded terminals	**6ES7392-1BM01-0AA0**
Shield connection element Sufficient for one SIWAREX FTC module	**6ES7390-5AA00-0AA0**
Shield connection clamp Contents: 2 units (suitable for cable with diameter 4 ... 13 mm) Note: one shield connection clamp each is required for: • Scale connection • RS 485 interface • RS 232 interface	**6ES7390-5CA00-0AA0**
S7 DIN rail	
• 160 mm (6.30 in)	**6ES7390-1AB60-0AA0**
• 480 mm (18.90 in)	**6ES7390-1AE80-0AA0**
• 530 mm (20.87 in)	**6ES7390-1AF30-0AA0**
• 830 mm (32.68 in)	**6ES7390-1AJ30-0AA0**
• 2 000 mm (78.74 in)	**6ES7390-1BC00-0AA0**
MMC memory For data recording up to 16 MB	**7MH4900-2AY20**
Remote display (optional) The Siebert S102 and S302 remote digital displays can be directly connected to the SIWAREX FTC via an RS 485 interface. (not suitable for belt scale mode) Siebert Industrieelektronik GmbH Postfach 1180 D-66565 Eppelborn, Germany Tel.: +49 6806/980-0 Fax: +49 6806/980-999 Internet: http://www.siebert.de Detailed information is available from the manufacturer.	
SIWAREX JB junction box, aluminum housing For connecting up to 4 load cells in parallel, and for connecting multiple junction boxes.	**7MH5001-0AA20**
SIWAREX JB junction box, stainless steel housing For connecting up to 4 load cells in parallel.	**7MH5001-0AA00**
SIWAREX JB junction box, stainless steel housing (ATEX) For parallel connection of up to 4 load cells (for zone allocation, see manual or type-examination certificate).	**7MH4710-1EA01**
Ex interface SIWAREX IS For intrinsically safe connection of load cells. With ATEX approval (not UL/FM). Suitable for SIWAREX electronic weighing system. Compatibility of load cells must be checked separately.	
• With short-circuit current < 199 mA DC	**7MH4710-5BA**
• With short-circuit current < 137 mA DC	**7MH4710-5CA**

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Ordering data	Article No.
Cable (optional)	
Cable Li2Y 1 x 2 x 0.75 ST + 2 x (2 x 0.34 ST) – CY For connecting SIWAREX electronic weighing systems to junction box (JB), extension box (EB) and Ex interface or between two EBs. For permanent installation. Occasional bending is possible. External diameter: approx. 10.8 mm (0.43 in) Permissible ambient temperature -40 ... +80 °C (-40 ... +176 °F). Sold by the meter.	
• Sheath color: orange	**7MH4702-8AG**
• For hazardous atmospheres. Sheath color: blue.	**7MH4702-8AF**

Commissioning	Article No.
Commissioning charge for one belt scale with SIWAREX module (Travel and setup charge must be ordered separately) Scope: • Recording of data • Checking of mechanical installation of the scale • Checking of electrical wiring and function • Dynamic adjustment of the scale Requirements: • Mechanical design functional • Modules electrically wired and tested • Calibration weights available • Free access to scale	**9LA1110-8SM50-0AA0**
Flat charge for travel and setup in Germany	**9LA1110-8RA10-0AA0**

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Overview



SIFLOW FC070 is based on the latest developments within the digital processing technology – engineered for high performance, fast flow step response, immunity against process generated noise, easy to install, commission and maintain.

SIFLOW FC070 is available in two versions:

- SIFLOW FC070 Standard
- SIFLOW FC070 Ex CT

The SIFLOW FC070 transmitter delivers true multi-parameter measurements i.e. mass flow, volume flow, density, temperature and fraction.

SIFLOW FC070 is designed for integration in a variety of automation systems, i.e.:

- Central mounted in S7-300, C7
- Decentralized in ET 200M for use with S7-300 and S7-400 as PROFIBUS DP/PROFINET masters
- Decentralized in ET 200M for use with any automation system using standardized PROFIBUS DP/PROFINET masters
- Stand-alone via a Modbus RTU master, i.e. SIMATIC PDM

The SIFLOW FC070 transmitter can be connected to all sensors of types MASS 2100, FCS200 and FC300.

Technical specifications

Measurement of	Mass flow, volume flow, density, sensor temperature, fraction A flow, fraction B flow, fraction A in %
Measurement functions	
• Totalizer 1	Totalization of mass flow, volume flow, fraction A, fraction B
• Totalizer 2	Totalization of mass flow, volume flow, fraction A, fraction B
• Single and 2-stage batch function	Batching function with the use of one or two outputs for dosing in high and low speed
• 4 programmable limits	4 programmable high/low limits for mass flow, volume flow, density, sensor temperature, fraction A flow, fraction B flow, fraction A in %. Limits will generate an alarm if reached.
Digital input	
Functions	Start batch, stop batch, start/stop batch, hold/continue batch, reset totalizer 1, reset totalizer 2, reset totalizer 1 and 2, zero adjust, force frequency output, freeze frequency output
High signal	• Nominal voltage: 24 V DC • Lower limit: 15 V DC • Upper limit: 30 V DC • Current: 2 … 15 mA
Low signal	• Nominal voltage: 0 V DC • Lower limit: -3 V DC • Upper limit: 5 V DC • Current: -15 … +15 mA
Input	Approx. 10 kΩ
Switching	Max. 100 Hz

Digital output 1 and 2	
Functions	• Output 1: Pulse, frequency, redundancy pulse, redundancy frequency 2-stage batch, batch • Output 2: Redundancy pulse, redundancy frequency, 2-stage batch
Voltage supply	3 … 30 V DC (passive output)
Switching current	Max. 30 mA at 30 V DC
Voltage drop	≤ 3 V DC at max. current
Leakage current	≤ 0.4 mA at max. voltage 30 V DC
Load resistance	1 … 10 kΩ
Switching frequency	0 … 12 kHz 50 % duty cycle
Functions	Pulse, frequency, redundancy pulse, redundancy frequency 2-stage batch, batch
Communication	
Modbus RS 232C	• Max. baud rate: 115 200 baud • Max. line length: 15 m at 115 200 baud • Signal level: according to EIA-RS 232C
Modbus RS 485	• Max. baud rate: 115 200 baud • Max. line length: 1200 m at 115 200 baud • Signal level: according to EIA-RS 485 • Bus termination: Integrated. Can be enabled by inserting wire jumpers.
Galvanic isolation	All inputs, outputs and communication interfaces are galvanically isolated. Isolation voltage: 500 V.

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Technical specifications (continued)

Power	
Supply	24 V DC nominal
Tolerance	20.4 V DC … 28.8 V DC
Consumption	Max. 7.2 W
Fuse	T1 A/125 V, not replaceable by operator
Environment	
Ambient temperature	• Storage -40 °C … +70 °C (-40 °F … +158 °F)
Operation conditions	Horizontally mounted rail. For SIFLOW FC070 Std.: 0 … 60 °C (32 … 140 °F) For SIFLOW FC070 Ex CT: -40 … +60 °C (-40 … +140 °F) Vertically mounted rail For SIFLOW FC070 Std.: 0 … 45 °C (32 … 113 °F) For SIFLOW FC070 Ex CT: -40 … +45 °C (-40 … +113 °F)
Altitude	• Operation: -1000 … 2000 m (pressure 795 … 1080 hPa)
Enclosure	
Material	Noryl, color: anthracite
Rating	IP20/NEMA 2 according to IEC 60529
Mechanical load	According to SIMATIC standards (S7-300 devices)
Ex approvals	
SIFLOW FC070 Standard	ATEX: II 3G Ex nA II T4
SIFLOW FC070 Ex CT	ATEX, IECEx, EAC Ex, FM, CSA, INMETRO: • Zone 2: Ex nA [ia] IIC T4 FM: • Class I, Div. 2: Grp. A, B, C, D (interface to Class I+II+III, Div. 1)

Custody transfer approvals	
SIFLOW FC070 Ex CT	Compressed gaseous fuel measuring systems for vehicles NTEP for USA and Canada, approval no: 97-111A3
EMC performance	
Emission	EN 55011/CISPR-11
Immunity	EN/IEC 61326-1
Certification	
CE mark	Low voltage directive RoHS
NAMUR	Within the limits according to "General recommendations" with error criteria A in accordance with NE 21
Programming tools	
SIMATIC S7	Configuration through backplane P-BUS, PLC program and WinCC flexible
SIMATIC PCS7	Configuration trough backplane P-BUS and PLC/WinCC faceplates, certified driver
SIMATIC PDM	Through Modbus port RS 232C and RS 485, certified driver

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Ordering data	Article No.
SIFLOW FC070 flow transmitter Remember to order 40 pin front connector.	**7ME4120-2DH20-0EA0**
40 pin front connector with screw contacts	**6ES7392-1AM00-0AA0**
40 pin front connector with spring contacts	**6ES7392-1BM01-0AA0**
SIFLOW FC070 Ex flow transmitter Remember to order 20 pin front front connector.	**7ME4120-2DH21-0EA0**
20 pin front connector with screw contacts	**6ES7392-1AJ00-0AA0**
20 pin front connector with spring contacts	**6ES7392-1BJ00-0AA0**
Operating instructions for SITRANS F C SIFLOW FC070	
SIFLOW FC070 System Manual	
• English	**A5E00924779**
• German	**A5E00924776**
SIFLOW FC070 with S7	
• English	**A5E02254228**
• German	**A5E02665536**
SIFLOW FC070 with PCS 7	
• English	**A5E03694109**
All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	

Accessories	Article No.
Cable with multiplug for connecting MASS 2100, FCS200 and FC300 sensors, 5 x 2 x 0.34 mm^2 twisted and screened in pairs. Temperature range -20 °C … +110 °C (-4 °F … +230 °F)	
• 5 m (16.4 ft)	**FDK:083H3015**
• 10 m (32.8 ft)	**FDK:083H3016**
• 25 m (82 ft)	**FDK:083H3017**
• 50 m (164 ft)	**FDK:083H3018**
• 75 m (246 ft)	**FDK:083H3054**
• 150 m (492 ft)	**FDK:083H3055**
Cable without multiplug for connecting MC2 sensors, 5 x 2 x 0.34 mm^2 twisted and screened in pairs. Temperature range -20 °C … +110 °C (-4 °F … +230 °F)	
• 10 m (32.8 ft)	**FDK:083H3001**
• 25 m (82 ft)	**FDK:083H3002**
• 75 m (246 ft)	**FDK:083H3003**
• 150 m (492 ft)	**FDK:083H3004**
SIMATIC S7-300 rail The mechanical mounting rack of the SIMATIC S7-300	
• 160 mm (6.3")	**6ES7390-1AB60-0AA0**
• 482 mm (18.9")	**6ES7390-1AE80-0AA0**
• 530 mm (20.8")	**6ES7390-1AF30-0AA0**
• 830 mm (32.7")	**6ES7390-1AJ30-0AA0**
• 2000 mm (78.7")	**6ES7390-1BC00-0AA0**
SIMATIC S7-300, stabilized power supply PS307 Input: 120/230 V AC Output: 24 V DC/2 A	**6ES7307-1BA01-0AA0**

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SIPLUS S7-300 FM 350-1

Overview



- Single-channel, intelligent counter module for simple counting tasks
- For direct connection of incremental encoders
- Comparison function with 2 definable comparison values
- Integrated digital outputs for output of the response on reaching the comparison value
- Operating modes:
  - Continuous counting
  - Single counting
  - Periodic counting
- Special functions:
  - Set counter
  - Latch counter
- Start/stop counter by gate function

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

Technical specifications

Article number	**6AG1350-1AH03-2AE0**	**6AG1350-1AH03-2AY0**
Based on	**6ES7350-1AH03-0AE0**	**6ES7350-1AH03-0AE0**
	SIPLUS S7-300 FM350-1	SIPLUS S7-300 FM350-1 EN50155
Ambient conditions		
Ambient temperature during operation		
• min.	-25 °C; = Tmin	-25 °C; = Tmin
• max.	60 °C; = Tmax	60 °C; = Tmax; the rated temperature range of -25 ... +55 °C (T1) applies for the use on railway vehicles according to EN50155
Altitude during operation relating to sea level		
• Installation altitude above sea level, max.	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity		
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance		
Use in stationary industrial systems		
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
Use on land craft, rail vehicles and special-purpose vehicles		
- to biologically active substances according to EN 60721-3-5		Yes; Class 5B2 mold, fungus and dry rot spores (with the exception of fauna); Class 5B3 on request
- to chemically active substances according to EN 60721-3-5		Yes; Class 5C3 (RH < 75 %) incl. salt spray acc. to EN 50155 (ST2); *
- to mechanically active substances according to EN 60721-3-5		Yes; Class 5S3 incl. sand, dust; *

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Technical specifications (continued)

Article number	**6AG1350-1AH03-2AE0**	**6AG1350-1AH03-2AY0**
Based on	**6ES7350-1AH03-0AE0**	**6ES7350-1AH03-0AE0**
	SIPLUS S7-300 FM350-1	SIPLUS S7-300 FM350-1 EN50155
Use on ships/at sea		
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	
Remark		
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!

Ordering data

	Article No.
SIPLUS S7-300 FM 350-1 counter module	
With 1 channel, max. 500 kHz; for incremental encoder	
For industrial applications with extended ambient conditions	
Extended temperature range and exposure to media	**6AG1350-1AH03-2AE0**
For rolling stock railway applications	
Conforms to EN 50155	**6AG1350-1AH03-2AY0**
Accessories	
Mandatory	
Front connector	
20-pin, with spring-loaded contacts	
• 1 unit	**6ES7392-1BJ00-0AA0**
• 100 units	**6ES7392-1BJ00-1AB0**
Consumables	
Bus connectors	**6ES7390-0AA00-0AA0**
1 unit (spare part)	
Shield connection element	**6ES7390-5AA00-0AA0**
80 mm wide, with 2 rows for 4 shield connection clamps each	
Shield connection clamps	
2 units	
For 1 cable, diameter 3 mm to 8 mm	**6ES7390-5BA00-0AA0**
For 1 cable, diameter 4 mm to 13 mm	**6ES7390-5CA00-0AA0**

	Article No.
Label cover	**6ES7392-2XY00-0AA0**
10 units (spare part), for modules with 20-pin front connector	
Labeling strips	**6ES7392-2XX00-0AA0**
10 units (spare part), for modules with 20-pin front connector	
Slot number plates	**6ES7912-0AA00-0AA0**
Documentation	
SIMATIC Manual Collection	**6ES7998-8XC01-8YE0**
Electronic manuals on DVD, multi-language: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC Distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	
SIMATIC Manual Collection update service for 1 year	**6ES7998-8XC01-8YE2**
Current "Manual Collection" DVD and the three subsequent updates	

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SIPLUS S7-300 FM 350-2

Overview



- 8-channel intelligent counter module for universal counting and measuring tasks
- For the direct connection of 24 V incremental encoders, directional encoders, initiators or NAMUR encoders
- Comparison function with predefined comparison values (number depending on operating mode)
- Integrated digital outputs for output of the response on reaching the comparison value
- Operating modes:
  - Continuous / single / periodic counting
  - Frequency and speed control
  - Period measurement
  - Dosing

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

Technical specifications

Article number	**6AG1350-2AH01-4AE0**
Based on	**6ES7350-2AH01-0AE0**
	SIPLUS S7-300 FM350-2
Ambient conditions	
Ambient temperature during operation	
• min.	0 °C; = Tmin
• max.	60 °C; = Tmax
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance	
Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
Remark	
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!

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Ordering data

	Article No.
SIPLUS S7-300 FM 350-2 counter module	
With 8 channels, max. 20 kHz; for 24 V incremental encoders and NAMUR encoders; includes configuration package and electronic documentation on CD	
Exposure to media	**6AG1350-2AH01-4AE0**
Accessories	
Mandatory	
Front connector	
40-pin, with spring-loaded contacts	
• 1 unit	**6ES7392-1BM01-0AA0**
• 100 units	**6ES7392-1BM01-1AB0**
Consumables	
Bus connectors	**6ES7390-0AA00-0AA0**
1 unit (spare part)	
Shield connection clamps	
2 units	
For 2 cables, diameter 2 mm to 6 mm	**6ES7390-5AB00-0AA0**
For 1 cable, diameter 3 mm to 8 mm	**6ES7390-5BA00-0AA0**
For 1 cable, diameter 4 mm to 13 mm	**6ES7390-5CA00-0AA0**

	Article No.
Label cover	**6ES7392-2XY10-0AA0**
10 units (spare part), for modules with 40-pin front connector	
Labeling strips	**6ES7392-2XX10-0AA0**
10 units (spare part), for modules with 40-pin front connector	
Slot number plates	**6ES7912-0AA00-0AA0**
Documentation	
SIMATIC Manual Collection	**6ES7998-8XC01-8YE0**
Electronic manuals on DVD, multi-language: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC Distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	
SIMATIC Manual Collection update service for 1 year	**6ES7998-8XC01-8YE2**
Current "Manual Collection" DVD and the three subsequent updates	

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SIPLUS SIWAREX U

Overview



SIPLUS SIWAREX U electronic weighing system	
Article No.	**6AG1 950-2AA01-4AA0**
Article No. based on	**7MH4 950-2AA01**
Range of ambient temperature	0 ... +60 °C
Conformal coating	Coating of the printed circuit boards and the electronic components
Technical data	The technical data of the standard product applies except for the ambient conditions.
Ambient conditions	
Relative humidity	100%, condensation/frost permissible. No commissioning in bedewed state.

For technical documentation on SIPLUS, see:

http://www.siemens.com/siplus-extreme

SIPLUS SIWAREX U electronic weighing system

SIPLUS SIWAREX U is a flexible weighing module for all simple weighing and force measuring tasks. The compact module can be integrated into SIPLUS automation systems without any problems.

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

Ordering data

	Article No.
SIPLUS SIWAREX U	
Electronic weighing system for SIPLUS S7 and ET 200M, incl. bus connector	
Exposure to media	**6AG1950-2AA01-4AA0**
Accessories	
Mandatory	
Front connector	
20-pin, with spring-loaded contacts	
• 1 unit	**6ES7392-1BJ00-0AA0**
• 100 units	**6ES7392-1BJ00-1AB0**
Consumables	
Bus connectors	**6ES7390-0AA00-0AA0**
1 unit (spare part)	
Shield connection clamps	
2 units	
For 2 cables, diameter 2 mm to 6 mm	**6ES7390-5AB00-0AA0**
For 1 cable, diameter 3 mm to 8 mm	**6ES7390-5BA00-0AA0**
For 1 cable, diameter 4 mm to 13 mm	**6ES7390-5CA00-0AA0**

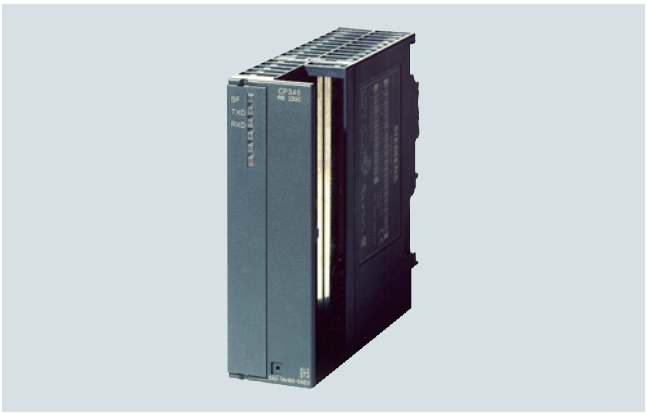
	Article No.
Labeling strips	**6ES7392-2XX00-0AA0**
10 units; spare part	
Label cover	**6ES7392-2XY00-0AA0**
10 units; spare part	
Slot number plates	**6ES7912-0AA00-0AA0**
SIWAREX JB junction box, aluminum housing	**7MH4710-1BA**
For connecting up to 4 load cells in parallel, and for connecting multiple junction boxes	
Ex interface, type SIWAREX IS	
With ATEX approval, but without UL and FM approvals, for intrinsically safe connection of load cells	
Incl. Equipment Manual	
Suitable for SIWAREX U, CS, MS, FTA, FTC and CF weighing modules	
Approved for use in the EU	
• With short-circuit current < 199 mA DC	**7MH4710-5BA**
• With short-circuit current < 137 mA DC	**7MH4710-5CA**

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Ordering data	Article No.
Cables (optional)	
Cable Li2Y 1 x 2 x 0.75 ST + 2 x (2 x 0.34 ST) – CY, orange sheath For connecting SIWAREX U, CS, MS, FTA, FTC and CF to the junction box (JB), extension box (EB) or Ex interface (Ex-I) or between two JBs; for fixed laying, occasional bending permitted, 10.8 mm (0.43 inch) outer diameter, for ambient temperature -40 ... +80 °C (-40 ... +176 °F)	**7MH4702-8AG**
Cable Li2Y 1 x 2 x 0.75 ST + 2 x (2 x 0.34 ST) – CY, blue sheath For connecting the junction box (JB) or extension box (EB) in a potentially explosive atmosphere to the Ex interface (Ex I), for fixed laying, occasional bending permitted, blue PVC insulating sheath, approx. 10.8 mm (0.43 inch) outer diameter, for ambient temperature -40 ... +80 °C (-40 ... +176 °F)	**7MH4702-8AF**
Configuration software	
SIWAREX U configuration package for PCS7 S7, version 7.0 and V7.1 Suitable for 7MH4950-1AA01 and 7MH4950-2AA01 On CD-ROM • Function block for the CFC • Faceplate • SIWATOOL U commissioning software • Manual	**7MH4950-3AK61**
SIWAREX U configuration package for PCS7, version 8.0 Suitable for 7MH4950-xAA01 • Function block for the CFC • Faceplate • SIWATOOL U commissioning software • Manual	**7MH4950-3AK62**
SIWAREX U APL configuration package for PCS7, version 8.0, Update 1 Suitable for 7MH4950-xAA01 • Function block for the CFC • APL-style faceplate • SIWATOOL U commissioning software • Manual	**7MH4950-3AK65**
Documentation	
SIMATIC Manual Collection Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC Distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	**6ES7998-8XC01-8YE0**
SIMATIC Manual Collection update service for 1 year Current "Manual Collection" DVD and the three subsequent updates	**6ES7998-8XC01-8YE2**

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Overview



- The economical complete solution for serial communication via point-to-point links.
- 3 versions with different transmission interfaces:
  - RS 232C (V.24)
  - 20 mA (TTY)
  - RS 422/RS 485 (X.27)
- Implemented protocols:
  - ASCII
  - 3964 (R) (not for RS 485)
  - Printer driver
- Simple parameterization via a parameterization tool integrated into STEP 7

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Technical specifications

Article number	**6ES7340-1AH02-0AE0**	**6ES7340-1BH02-0AE0**	**6ES7340-1CH02-0AE0**
	CP340 w. RS232C interface(V.24)	CP340 w. 20MA interface(TTY)	CP340 w. RS422/485 interface
General information			
Product type designation	CP 340	CP 340	CP 340
Supply voltage			
Rated value (DC)			
• 24 V DC	No; Power supply via backplane bus 5V	No; Power supply via backplane bus 5V	No; Power supply via backplane bus 5V
Input current			
from backplane bus 5 V DC, max.	165 mA	190 mA	165 mA
Power loss			
Power loss, typ.	0.6 W	0.85 W	0.6 W
Power loss, max.	0.85 W	0.95 W	0.85 W
Interfaces			
Number of interfaces	1; Isolated	1; Isolated	1; Isolated
Interface physics, 20 mA (TTY)		Yes	
Interface physics, RS 232C (V.24)	Yes		
Interface (physical) RS 422/485 (X.27)			Yes
Transmission rate, min.	2.4 kbit/s	2.4 kbit/s	2.4 kbit/s
Transmission rate, max.	19.2 kbit/s	19.2 kbit/s	19.2 kbit/s
Point-to-point connection			
• Cable length, max.	15 m	1 000 m; 100 m active, 1 000 m passive	1 200 m
• supported printers	HP-Deskjet, HP-Laserjet, IBM-Proprinter, user-defined	HP-Deskjet, HP-Laserjet, IBM-Proprinter, user-defined	HP-Deskjet, HP-Laserjet, IBM-Proprinter, user-defined
• Connector type	9-pin sub D connector	9-pin sub D socket	15-pin sub D socket
Integrated protocol driver			
- 3964 (R)	Yes	Yes	Yes
- ASCII	Yes	Yes	Yes
- RK512	No	No	No
- customer-specific drivers reloadable	No	No	No
Telegram length, max.			
- 3964 (R)	1 024 byte	1 024 byte	1 024 byte
- ASCII	1 024 byte	1 024 byte	1 024 byte
Transmission rate, 20 mA (TTY)			
- with 3964 (R) protocol, max.		19.2 kbit/s	
- with ASCII protocol, max.		9.6 kbit/s	
- with printer driver, max.		9.6 kbit/s	

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Technical specifications (continued)

Article number	**6ES7340-1AH02-0AE0** CP340 w. RS232C interface(V.24)	**6ES7340-1BH02-0AE0** CP340 w. 20MA interface(TTY)	**6ES7340-1CH02-0AE0** CP340 w. RS422/485 interface
Transmission rate, RS 422/485			
- with 3964 (R) protocol, max.			19.2 kbit/s
- with ASCII protocol, max.			9.6 kbit/s
- with printer driver, max.			9.6 kbit/s
Transmission speed, RS 232			
- with 3964 (R) protocol, max.	19.2 kbit/s		
- with ASCII protocol, max.	9.6 kbit/s		
- with printer driver, max.	9.6 kbit/s		
Ambient conditions			
Ambient temperature during operation			
• min.	0 °C	0 °C	0 °C
• max.	60 °C	60 °C	60 °C
Ambient temperature during storage/transportation			
• min.	-40 °C	-40 °C	-40 °C
• max.	70 °C	70 °C	70 °C
Software			
Block			
• FB length in RAM, max.	2 700 byte; Data communication, sending and receiving	2 700 byte; Data communication, sending and receiving	2 700 byte; Data communication, sending and receiving
Connection method			
Design of electrical connection for supply voltage	Over backplane bus	Over backplane bus	Over backplane bus
Dimensions			
Width	40 mm	40 mm	40 mm
Height	125 mm	125 mm	125 mm
Depth	120 mm	120 mm	120 mm
Weights			
Weight, approx.	300 g	300 g	300 g

Ordering data

	Article No.
CP 340 communications processor	**6ES7340-1AH02-0AE0**
With one RS 232 C (V.24) interface	
RS 232 connecting cable	
For linking to SIMATIC S7	
5 m	**6ES7902-1AB00-0AA0**
10 m	**6ES7902-1AC00-0AA0**
15 m	**6ES7902-1AD00-0AA0**
CP 340 communications processor	**6ES7340-1BH02-0AE0**
With one 20 mA (TTY) interface	
20 mA (TTY) connecting cable	
For linking to SIMATIC S7	
5 m	**6ES7902-2AB00-0AA0**
10 m	**6ES7902-2AC00-0AA0**
50 m	**6ES7902-2AG00-0AA0**

	Article No.
CP 340 communications processor	**6ES7340-1CH02-0AE0**
With one RS 422/485 (X.27) interface	
RS 422/485 connecting cable	
For linking to SIMATIC S7	
5 m	**6ES7902-3AB00-0AA0**
10 m	**6ES7902-3AC00-0AA0**
50 m	**6ES7902-3AG00-0AA0**

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CP 341

Overview



- For quick, high-performance serial data exchange via point-to-point coupling
- 3 versions with different transmission physics:
  - RS 232C (V.24),
  - 20 mA (TTY),
  - RS 422/RS 485 (X.27)
- Implemented protocols: ASCII, 3964 (R), RK 512
- The following protocols can also be loaded: Modbus RTU
- Easy configuration using a parameterizing tool integrated in STEP 7

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Technical specifications

Article number	**6ES7341-1AH02-0AE0**	**6ES7341-1BH02-0AE0**	**6ES7341-1CH02-0AE0**
	CP 341 RS232C (V.24)	CP341 20mA-Interface (TTY)	CP341 RS422/485-Interface
General information			
Product type designation	CP 341	CP 341	CP 341
Supply voltage			
Rated value (DC)			
• 24 V DC	Yes	Yes	Yes
Input current			
from supply voltage L+, max.	100 mA	100 mA	100 mA
from backplane bus 5 V DC, max.	70 mA	70 mA	70 mA
Power loss			
Power loss, typ.	1.6 W	1.6 W	1.6 W
Power loss, max.	2.4 W	2.4 W	2.4 W
Interfaces			
Number of interfaces	1; Isolated	1; Isolated	1; Isolated
Interface physics, 20 mA (TTY)		Yes	
Interface physics, RS 232C (V.24)	Yes		
Interface (physical) RS 422/485 (X.27)			Yes
Transmission rate, min.	0.3 kbit/s	0.3 kbit/s	0.3 kbit/s
Transmission rate, max.	115.2 kbit/s	19.2 kbit/s	115.2 kbit/s
Point-to-point connection			
• Cable length, max.	15 m	1 000 m	1 200 m
• supported printers	Serial printers	Serial printers	Serial printers
• Connector type	9-pin sub D connector	9-pin sub D socket	15-pin sub D socket
Integrated protocol driver			
- 3964 (R)	Yes	Yes	Yes; not with RS 485
- ASCII	Yes	Yes	Yes
- RK512	Yes	Yes	Yes; not with RS 485
Telegram length, max.			
- 3964 (R)	4 096 byte	4 096 byte	4 096 byte
- ASCII	4 096 byte	4 096 byte	4 096 byte
- RK 512	4 096 byte	4 096 byte	4 096 byte
Transmission rate, 20 mA (TTY)			
- with 3964 (R) protocol, max.		19.2 kbit/s	
- with ASCII protocol, max.		19.2 kbit/s	
- with printer driver, max.		19.2 kbit/s	
- with RK 512 protocol, max.		19.2 kbit/s	

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Technical specifications (continued)

Article number	6ES7341-1AH02-0AE0 CP 341 RS232C (V.24)	6ES7341-1BH02-0AE0 CP341 20mA-Interface (TTY)	6ES7341-1CH02-0AE0 CP341 RS422/485-Interface
Transmission rate, RS 422/485			
- with 3964 (R) protocol, max.			115.2 kbit/s
- with ASCII protocol, max.			115.2 kbit/s
- with printer driver, max.			115.2 kbit/s
- with RK 512 protocol, max.			115.2 kbit/s
Transmission speed, RS 232			
- with 3964 (R) protocol, max.	115.2 kbit/s		
- with ASCII protocol, max.	115.2 kbit/s		
- with printer driver, max.	115.2 kbit/s		
- with RK 512 protocol, max.	115.2 kbit/s		
Ambient conditions			
Ambient temperature during operation			
• min.	0 °C	0 °C	0 °C
• max.	60 °C	60 °C	60 °C
Ambient temperature during storage/transportation			
• min.	-40 °C	-40 °C	-40 °C
• max.	70 °C	70 °C	70 °C
Software			
Block			
• FB length in RAM, max.	6 100 byte; Data communication, sending and receiving	6 100 byte; Data communication, sending and receiving	6 100 byte; Data communication, sending and receiving
Connection method			
Design of electrical connection for supply voltage	3 screw-type terminals: L+, M, GND	3 screw-type terminals: L+, M, GND	3 screw-type terminals: L+, M, GND
Dimensions			
Width	40 mm	40 mm	40 mm
Height	125 mm	125 mm	125 mm
Depth	120 mm	120 mm	120 mm
Weights			
Weight, approx.	300 g	300 g	300 g

Ordering data

	Article No.
CP 341 communications processor	**6ES7341-1AH02-0AE0**
With one RS 232 C (V.24) interface	
RS 232 connecting cable	
For linking to SIMATIC S7	
5 m	**6ES7902-1AB00-0AA0**
10 m	**6ES7902-1AC00-0AA0**
15 m	**6ES7902-1AD00-0AA0**
CP 341 communications processor	**6ES7341-1BH02-0AE0**
With one 20 mA (TTY) interface	
20 mA (TTY) connecting cable	
For linking to SIMATIC S7	
5 m	**6ES7902-2AB00-0AA0**
10 m	**6ES7902-2AC00-0AA0**
50 m	**6ES7902-2AG00-0AA0**

	Article No.
CP 341 communications processor	**6ES7341-1CH02-0AE0**
With one RS 422/485 (X.27) interface	
RS 422/485 connecting cable	
For linking to SIMATIC S7	
5 m	**6ES7902-3AB00-0AA0**
10 m	**6ES7902-3AC00-0AA0**
50 m	**6ES7902-3AG00-0AA0**
Loadable drivers for CP 341	
Modbus master (RTU format)	
• Single license	**6ES7870-1AA01-0YA0**
• Single license, without software or documentation	**6ES7870-1AA01-0YA1**
Modbus slave (RTU format)	
• Single license	**6ES7870-1AB01-0YA0**
• Single license, without software or documentation	**6ES7870-1AB01-0YA1**

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Loadable drivers for CP 441-2 and CP 341

Overview

- Drivers for Modbus protocol with RTU message format; communication as master or slave
- Downloadable onto CP 341 and CP 441-2 (6ES7 441-2AA05-0AE0)

Technical specifications

Parameterization software	**Loadable drivers for CP 441-2 and CP 341**
Type of license	Simple license, copy license
Target system	SIMATIC CP 341, SIMATIC CP 441-2

Technical specifications	**Modbus Master**
	• Modbus protocol with RTU format • Master/slave coupling: SIMATIC S7 is master • Function codes implemented: 01, 02, 03, 04, 05, 06, 07, 08, 11, 12, 15, 16 • No V.24 control and signal lines • CRC polynomial: $x^{16} + x^{15} + x^2 + 1$ • Interfaces: TTY (20 mA); V.24 (RS 232 C); X.27 (RS 422/485) 2-wire or 4-wire • Receive mailbox specified on BRCV • Character delay time 3.5 characters or multiple thereof • Broadcast message possible
Adjustable parameters	• Transmission rate 300 bit/s up to 76800 bit/s (TTY up to 19200 bit/s) • Character frame • With/without RS 485 operation for 2-wire connections • With/without modem operation (ignore smudge characters) • Response monitoring time 100 ms to 25.5 s in steps of 100 ms • Factor for the character delay time 1-10 • Default setting of receive line when using the X.27 interface module

	Modbus slave
	• Modbus protocol with RTU format • Master/slave coupling: SIMATIC S7 is slave • Function codes implemented: 01, 02, 03, 04, 05, 06, 08, 15, 16 • No V.24 control and signal line • CRC polynomial: $x^{16} + x^{15} + x^2 + 1$ • Interfaces: TTY (20 mA), V.24 (RS 232C), X.27 (RS 422/485) 2-wire or 4-wire • Communications FB 180, instance DB 180 (use of a multi-instance) • Conversion of the Modbus data address to S7 data areas. Data areas which can be processed: DB, bit memories, outputs, inputs, timers, counters • Character delay time 3.5 characters or multiple thereof
Adjustable parameters	• Transmission rate 300 bit/s up to 76800 bit/s (TTY up to 19200 bit/s) • Character frame • Slave address of CP (1 to 255) • With/without RS 485 operation for 2-wire connection • With/without modem operation (ignore smudge characters) • Factor for the character delay time 1-10 • Number of work DB (for FB processing) • Enabling of memory areas for writing by the master • Default setting of receive line when using the X.27 interface module • Conversion of Modbus addresses to S7 data areas

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Ordering data

	Article No.
Modbus Master V3.1	
Task: Communication via Modbus protocol with RTU format, SIMATIC S7 as master Requirement: CP 341 or CP 441-2; STEP 7 V4.02 and higher Delivery package: Driver program/documentation, English, German, French	
Single license	**6ES7870-1AA01-0YA0**
Single license, without software and documentation	**6ES7870-1AA01-0YA1**
Modbus Slave V3.1	
Task: Communication via Modbus protocol with RTU format, SIMATIC S7 as slave Requirement: CP 341 or CP 441-2; STEP 7 V4.02 and higher Delivery package: Driver program/documentation, English, German, French	
Single license	**6ES7870-1AB01-0YA0**
Single license, without software and documentation	**6ES7870-1AB01-0YA1**

	Article No.
SIMATIC Manual Collection	**6ES7998-8XC01-8YE0**
Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC Distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	
SIMATIC Manual Collection update service for 1 year	**6ES7998-8XC01-8YE2**
Current "Manual Collection" DVD and the three subsequent updates	

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Overview



The CP 343-2P communications processor is the AS-Interface master for the SIMATIC S7-300 and the ET 200M distributed I/O station, with user-friendly parameterizing options.

The CP 343-2 is the basic version of the module.

The CP 343-2P / CP 343-2 has the following characteristics:

- As many as 62 AS-Interface slaves can be connected
- Integrated analog value transmission
- Supports all AS-Interface master functions according to the AS-Interface Specification V3.0
- Status displays of operating states and indication of the readiness for operation of connected slaves by means of LEDs in the front panel
- Fault indications (including AS-Interface voltage fault, configuration fault) by means of LEDs in the front panel.
- Compact enclosure in the design of the SIMATIC S7-300
- Suitable for AS-Interface with 30-V voltage and AS-i Power24V (from product version 2/firmware version 3.1)
- Additionally for CP 343-2P: Supports the configuration of the AS-Interface-network with STEP 7 V5.2 and higher

Design

The CP 343-2P / CP 343-2 is connected like an I/O module to the S7-300. It has:

- Two terminal connections for connecting the AS-Interface cable directly.
- LEDs in the front panel for indicating the operating state and functional readiness of all connected and active slaves
- Pushbuttons for switching over the master operating state and for adopting the existing ACTUAL configuration of the AS-i slave as the TARGET configuration

Function

The CP 343-2P / CP 343-2 supports all specified functions of the extended AS-Interface Specification V3.0.

The CP 343-2P / CP 343-2 each occupy 16 bytes in the I/O address area of the SIMATIC S7-300. The digital I/O data of the standard slaves and A slaves is saved in this area.
The digital I/O data of the B slaves and the analog I/O data can be accessed with the S7 system functions for read/write data records.

If required, master calls can be performed with the command interface, e.g. read/write parameters, read/write configuration.

For more information, see https://support.industry.siemens.com/cs/ww/en/view/51678777.

Notes on security

In order to protect plants, systems, machines and networks against cyber threats, it is necessary to implement – and continuously maintain – a holistic, state-of-the-art industrial security concept. Siemens products and solutions only represent one component of such a concept.

For more information on Industrial Security, see http://www.siemens.com/industrialsecurity.

Configuration

All connected AS-Interface slaves are configured at the press of a button. No further configuration of the CP is required.

Additionally for CP 343-2P

The CP 343-2P also supports configuring of the AS-Interface network with STEP 7 V5.2 and higher. Specifying the AS-i configuration in HW-Config facilitates the setting of slave parameters and documentation of the plant. Uploading the ACTUAL configuration of an already configured AS-Interface network is also supported. The saved configuration cannot be overwritten at the press of a button and is therefore tamper-proof.

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Benefits

- Shorter start-up times through simple configuration at the press of a button
- Design of flexible machine-related structures using the ET 200M distributed I/O system
- Enables diagnostics of the AS-Interface network
- Well suited also for complex applications thanks to connection options for 62 slaves and integral analog value processing
- Reduction of standstill and servicing times in the event of a fault thanks to the LED indicators:
  - Status of the AS-Interface network
  - Slaves connected and their readiness for operation
  - Monitoring of the AS-Interface voltage
- Lower costs for stock keeping and spare parts inventory because the CP can be used for the SIMATIC S7-300 and also for the ET 200M
- Additionally for CP 343-2P: Improved plant documentation and support for service assignments thanks to a description of the AS-Interface configuration in the STEP 7 project
- Simple operation with AS-Interface power supply unit (see https://mall.industry.siemens.com/mall/en/WW/Catalog/Products/8200165?tree=CatalogTree) possible without restrictions
- Alternatively: No need for the AS-i power supply unit with AS-i Power24V. The AS-Interface cable is powered through an existing 24 V DC PELV power supply unit. An S22.5 AS-i data decoupling module (e.g. 3RK1901-1DE12-1AA0) is required for the decoupling, see https://mall.industry.siemens.com/mall/en/WW/Catalog/Products/10057533?tree=CatalogTree.

Application

The CP 343-2P / CP 343-2 is the AS-Interface master connection for the SIMATIC S7-300 and the ET 200M.

Through connection to AS-Interface it is possible to access max. 248 DI / 248 DQ per CP, using 62 A/B slaves with 4 DI / 4 DQ each.

With the integrated analog value processing, it is easy to transmit analog signals. Up to 62 analog slaves with an A/B address (each with up to two channels) or up to 31 analog slaves with a standard address (each with up to four channels) are possible per CP.

The CP 343-2P is the further development of the CP 343-2 and contains its entire functionality. An existing STEP 7 user program for a CP 343-2 can thus be used without restrictions with a CP 343-2P. It is only in STEP 7 HW-Config that the two modules are configured differently, with the CP 343-2P offering additional options. This is why the CP 343-2P is recommended.

Ordering data

Ordering data	Article No.
CP 343-2P communications processor • Device version with expanded configuration options for connection of SIMATIC S7-300 and ET 200M to AS-Interface • Configuration of the AS-i network using the SET key or STEP 7 (V5.2 and higher) • Without front connector • Corresponds to AS-Interface Specification V3.0 • Dimensions (W x H x D / mm): 40 x 125 x 120	**6GK7343-2AH11-0XA0**
CP 343-2 communications processor • Basic version for connection of SIMATIC S7-300 and ET 200M to AS-Interface • Configuration of the AS-i network using the SET key • Without front connector • Corresponds to AS-Interface Specification V3.0 • Dimensions (W x H x D / mm): 40 x 125 x 120	**6GK7343-2AH01-0XA0**
Accessories	
Front connector, 20-pin • With screw-type terminals • With spring-loaded terminals	 **6ES7392-1AJ00-0AA0** **6ES7392-1BJ00-0AA0**

AS-Interface addressing unit V3.0
• For AS-Interface modules and sensors and actuators with integrated AS-Interface according to AS-i Specification V3.0
• For setting the AS-i address of standard slaves, and slaves with extended addressing mode (A/B slaves)
• With input/output test function and many other commissioning functions
• Battery operation with four type AA batteries (IEC LR6, NEDA 15)
• Degree of protection IP40
• Dimensions (W × H × D / mm): 84 × 195 × 35
• Scope of supply:
  - Addressing unit with four batteries
  - Addressing cable, with M12 plug to addressing plug (hollow plug), length 1.5 m
	3RK1904-2AB02

More information

More information
Manuals, see https://support.industry.siemens.com/cs/ww/en/ps/15754/man
For diagnostics during ongoing operation, diagnostics blocks with clearly arranged visualization on the SIMATIC HMI panel are available or can be downloaded free of charge via a web browser, see https://support.industry.siemens.com/cs/ww/en/view/61892138.
AS-Interface function block library for SIMATIC PCS 7 for easy connection of AS-Interface to PCS 7, see https://mall.industry.siemens.com/mall/en/ww/Catalog/Products/10046725?tree=CatalogTree.

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Overview



- PROFIBUS DP master or slave with electrical interface for connecting the SIMATIC S7-300 to PROFIBUS at up to 12 Mbps (including 45.45 Kbps)
- Communication services:
  - PROFIBUS DP
  - PG/OP communication (OP multiplexing)
  - S7 communication (client, server)
  - Open communication (SEND/RECEIVE)
- Easy configuration and programming over PROFIBUS
- Cross-network programming device communication through S7 routing
- Modules can be replaced without the need for a PG

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Technical specifications

Article number	**6GK7342-5DA03-0XE0**
Product type designation	CP 342-5
Transmission rate	
Transfer rate	
• at the 1st interface acc. to PROFIBUS	9.6 kbit/s ... 12 Mbit/s
Interfaces	
Number of interfaces acc. to Industrial Ethernet	0
Number of electrical connections	
• at the 1st interface acc. to PROFIBUS	1
• for power supply	1
Type of electrical connection	
• at the 1st interface acc. to PROFIBUS	9-pin Sub-D socket (RS485)
• for power supply	4-pole terminal block
Supply voltage, current consumption, power loss	
Type of voltage of the supply voltage	DC
Supply voltage 1 from backplane bus	5 V
Supply voltage external	24 V
Supply voltage external at DC Rated value	24 V
Relative positive tolerance at DC at 24 V	20 %
Relative negative tolerance at DC at 24 V	15 %
Consumed current	
• from backplane bus at DC at 5 V typical	0.15 A
• from external supply voltage at DC at 24 V typical	0.25 A
Power loss [W]	6.75 W

Article number	**6GK7342-5DA03-0XE0**
Product type designation	CP 342-5
Permitted ambient conditions	
Ambient temperature	
• during operation	0 ... 60 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
Relative humidity at 25 °C without condensation during operation maximum	95 %
Protection class IP	IP20
Design, dimensions and weight	
Module format	Compact module S7-300 single width
Width	40 mm
Height	125 mm
Depth	120 mm
Net weight	0.3 kg
Product properties, functions, components general	
Number of units	
• per CPU maximum	4
Performance data open communication	
Number of possible connections for open communication by means of SEND/RECEIVE blocks maximum	16
Amount of data	
• as user data per connection for open communication by means of SEND/RECEIVE blocks maximum	240 byte

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Technical specifications (continued)

Article number	6GK7342-5DA03-0XE0
Product type designation	CP 342-5
Performance data PROFIBUS DP	
Service as DP master	
• DPV0	Yes
Number of DP slaves on DP master usable	124
Amount of data	
• of the address area of the inputs as DP master total	2 160 byte
• of the address area of the outputs as DP master total	2 160 byte
• of the address area of the inputs per DP slave	244 byte
• of the address area of the outputs per DP slave	244 byte
• of the address area of the diagnostic data per DP slave	240 byte
Service as DP slave	
• DPV0	Yes
Amount of data	
• of the address area of the inputs as DP slave total	240 byte
• of the address area of the outputs as DP slave total	240 byte

Article number	6GK7342-5DA03-0XE0
Product type designation	CP 342-5
Performance data S7 communication	
Number of possible connections for S7 communication	
• maximum	16
Performance data multi-protocol mode	
Number of active connections with multi-protocol mode	
• without DP maximum	32
• with DP maximum	28
Performance data telecontrol	
Protocol is supported	
• TCP/IP	No
Product functions management, configuration	
Configuration software	
• required	STEP 7 V5.1 SP2 or higher / STEP 7 Professional V12 (TIA Portal) or higher

Ordering data

	Article No.
CP 342-5 communications processor	**6GK7342-5DA03-0XE0**
Communications processor for electrical connection of SIMATIC S7-300 to PROFIBUS at up to 12 Mbps, with electronic manual on CD-ROM	
Accessories	
PROFIBUS FastConnect RS 485 connection plug	
With 90° cable outlet; insulation displacement technology, max. transmission rate 12 Mbps	
• Without PG interface	**6ES7972-0BA52-0XA0**
• With PG interface	**6ES7972-0BB52-0XA0**
PROFIBUS bus connector IP20	
With connection to PPI, MPI, PROFIBUS	
• Without PG interface	**6ES7972-0BA12-0XA0**
• With PG interface	**6ES7972-0BB12-0XA0**

	Article No.
PROFIBUS FC Standard Cable	
2-wire bus cable, shielded, special design for fast mounting, delivery unit: max. 1000 m, minimum order quantity 20 m, sold by the meter	**6XV1830-0EH10**
PROFIBUS bus terminal 12M	
Bus terminal for connection of PROFIBUS nodes at up to 12 Mbps with connecting cable	**6GK1500-0AA10**
SIMATIC S7-300 DM 370	**6ES7370-0AA01-0AA0**
Dummy module; used for module replacement	

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CP 342-5 FO

Overview



DP-M	DP-S	FMS	PG/OP	S7/S5	
●	●		●	●	

- PROFIBUS DP master or slave with optical interface for connecting the SIMATIC S7-300 to PROFIBUS at up to 12 Mbps (including 45.45 Kbps)
- Direct connection to the optical PROFIBUS network via the integrated fiber-optic interface for plastic and PCF fiber-optic cables
- Communication services:
  - PROFIBUS DP
  - PG/OP communication (OP multiplexing)
  - S7 communication (client, server)
  - Open communication (SEND/RECEIVE)
- Easy configuration and programming over PROFIBUS
- Cross-network programming device communication through S7 routing
- Modules can be replaced without the need for a PG

Technical specifications

Article number	**6GK7342-5DF00-0XE0**
Product type designation	CP 342-5 FO
Transmission rate	
Transfer rate	
• at the 1st interface acc. to PROFIBUS	9.6 kbit/s ... 12 Mbit/s
Interfaces	
Number of interfaces acc. to Industrial Ethernet	0
Number of electrical connections	
• for power supply	1
Number of optical interfaces at the 1st interface acc. to PROFIBUS	2
Design of the optical interface at the 1st interface acc. to PROFIBUS	Duplex socket
Type of electrical connection	
• for power supply	4-pole terminal block
Supply voltage, current consumption, power loss	
Type of voltage of the supply voltage	DC
Supply voltage 1 from backplane bus	5 V
Supply voltage	24 V
Supply voltage external	24 V
Supply voltage external at DC Rated value	24 V
Relative positive tolerance at DC at 24 V	20 %
Relative negative tolerance at DC at 24 V	15 %
Consumed current	
• from backplane bus at DC at 5 V typical	0.15 A
• from external supply voltage at DC at 24 V typical	0.25 A
Power loss [W]	6 W

Article number	**6GK7342-5DF00-0XE0**
Product type designation	CP 342-5 FO
Permitted ambient conditions	
Ambient temperature	
• during operation	0 ... 60 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
Relative humidity at 25 °C without condensation during operation maximum	95 %
Protection class IP	IP20
Design, dimensions and weight	
Module format	Compact module
Width	40 mm
Height	125 mm
Depth	120 mm
Net weight	0.3 kg
Mounting type	
• S7-300 rail mounting	Yes
Product properties, functions, components general	
Number of units	
• per CPU maximum	4
Wire length	
• for PCF FOC maximum	300 m
• for POF FOC maximum	50 m
Performance data open communication	
Number of possible connections for open communication by means of SEND/RECEIVE blocks maximum	16
Amount of data	
• as user data per connection for open communication by means of SEND/RECEIVE blocks maximum	240 byte

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Technical specifications (continued)

Article number	6GK7342-5DF00-0XE0
Product type designation	CP 342-5 FO
Performance data PROFIBUS DP	
Service as DP master	
• DPV0	Yes
Number of DP slaves on DP master usable	124
Amount of data	
• of the address area of the inputs as DP master total	2 160 byte
• of the address area of the outputs as DP master total	2 160 byte
• of the address area of the inputs per DP slave	244 byte
• of the address area of the outputs per DP slave	244 byte
• of the address area of the diagnostic data per DP slave	240 byte
Service as DP slave	
• DPV0	Yes
Amount of data	
• of the address area of the inputs as DP slave total	240 byte
• of the address area of the outputs as DP slave total	240 byte

Article number	6GK7342-5DF00-0XE0
Product type designation	CP 342-5 FO
Performance data S7 communication	
Number of possible connections for S7 communication	
• maximum	16
Performance data multi-protocol mode	
Number of active connections with multi-protocol mode	
• without DP maximum	32
• with DP maximum	28
Performance data telecontrol	
Protocol is supported	
• TCP/IP	No
Product functions management, configuration	
Configuration software	
• required	STEP 7 V5.1 SP2 or higher / STEP 7 Professional V12 (TIA Portal) or higher

Ordering data

	Article No.
CP 342-5 FO communications processor Communication processor for optical connection of SIMATIC S7-300 to PROFIBUS to 12 Mbps with electronic manual on CD-ROM	**6GK7342-5DF00-0XE0**

	Article No.
Accessories	
PROFIBUS Plastic Fiber Optic, Simplex Connector/Polishing Set 100 simplex connectors and 5 polishing sets for assembling PROFIBUS plastic fiber optic cables for the optical PROFIBUS DP	**6GK1901-0FB00-0AA0**
PROFIBUS Plastic Fiber Optic, stripping tool set Tools for removing the outer sheath or core sheath of plastic fiber optic cables	**6GK1905-6PA10**

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CP 343-5

Overview



DP-M	DP-S	FMS	PG/OP	S7/S5	
		●	●	●	

Connection of SIMATIC S7-300 to PROFIBUS at up to 12 Mbps (including 45.45 Kbps)

- Communication services:
  - PG/OP communication
  - S7 communication
  - Open communication (SEND/RECEIVE)
  - PROFIBUS FMS
- Easy configuration and programming over PROFIBUS
- Can be easily integrated into the S7-300 system
- Cross-network programming device communication through S7 routing
- Modules can be replaced without the need for a PG

Technical specifications

Article number	**6GK7343-5FA01-0XE0**
Product type designation	CP 343-5
Transmission rate	
Transfer rate	
• at the 1st interface acc. to PROFIBUS	9.6 kbit/s ... 12 Mbit/s
Interfaces	
Number of interfaces acc. to Industrial Ethernet	0
Number of electrical connections	
• at the 1st interface acc. to PROFIBUS	1
• for power supply	1
Type of electrical connection	
• at the 1st interface acc. to PROFIBUS	9-pin Sub-D socket (RS485)
• for power supply	4-pole terminal block
Supply voltage, current consumption, power loss	
Type of voltage of the supply voltage	DC
Supply voltage 1 from backplane bus	5 V
Supply voltage	24 V
Supply voltage external	24 V
Supply voltage external at DC Rated value	24 V
Relative positive tolerance at DC at 24 V	20 %
Relative negative tolerance at DC at 24 V	15 %
Consumed current	
• from backplane bus at DC at 5 V typical	0.15 A
• from external supply voltage at DC at 24 V typical	0.25 A
Power loss [W]	5 W

Article number	**6GK7343-5FA01-0XE0**
Product type designation	CP 343-5
Permitted ambient conditions	
Ambient temperature	
• during operation	0 ... 60 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
Relative humidity at 25 °C without condensation during operation maximum	95 %
Protection class IP	IP20
Design, dimensions and weight	
Module format	Compact module S7-300 single width
Width	40 mm
Height	125 mm
Depth	120 mm
Net weight	0.3 kg
Mounting type	
• S7-300 rail mounting	Yes
Product properties, functions, components general	
Number of units	
• per CPU maximum	4
Performance data open communication	
Number of possible connections for open communication by means of SEND/RECEIVE blocks maximum	16
Amount of data	
• as user data per connection for open communication by means of SEND/RECEIVE blocks maximum	240 byte

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Technical specifications (continued)

Article number	6GK7343-5FA01-0XE0
Product type designation	CP 343-5
Performance data FMS functions	
Number of possible connections for FMS connection maximum	16
Amount of data of the variables	
• for READ job maximum	237 byte
• for WRITE and REPORT job maximum	233 byte
Number of variables	
• Configurable from server to FMS partner	256
• Loadable from server to FMS partner	256

Article number	6GK7343-5FA01-0XE0
Product type designation	CP 343-5
Performance data S7 communication	
Number of possible connections for S7 communication	
• maximum	16
Performance data multi-protocol mode	
Number of active connections with multi-protocol mode	48
Performance data telecontrol	
Protocol is supported	
• TCP/IP	No
Product functions management, configuration	
Configuration software	
• required	STEP 7 V5.1 SP3 or higher and NCM S7 for PROFIBUS

Ordering data

	Article No.
CP 343-5 communications processor	**6GK7343-5FA01-0XE0**
Communications processor for connection of S7-300 to PROFIBUS, FMS, open communication, PG/OP and S7 communication; with electronic manual on CD-ROM	
Accessories	
STEP 7 Version 5.6	
Target system: SIMATIC S7-300/-400, SIMATIC C7, SIMATIC WinAC Requirements: Windows Server 2008 R2 SP1 Windows Server 2012 R2 Windows Server 2016 Windows 7 SP1 Windows 10 Professional Windows 10 Enterprise Type of delivery: English, German, French, Spanish, Italian Including license key on USB flash drive, with electronic documentation	
• Floating license on DVD	**6ES7810-4CC11-0YA5**
• Rental license for 50 hours	**6ES7810-4CC11-0YA6**
• Software Update Service on DVD (requires current software version)	**6ES7810-4BC01-0YX2**
• Floating license upgrade 3.x/4.x/5.x to V5.6; on DVD	**6ES7810-4CC11-0YE5**
• STEP 7 V5.6 trial license; on DVD, operational for 14 days	**6ES7810-4CC11-0YA7**

	Article No.
PROFIBUS FastConnect RS485 bus connection plug	
With 90° cable outlet; insulation displacement technology, max. transfer rate 12 Mbps (1 unit)	
• Without PG interface	**6ES7972-0BA52-0XA0**
• With PG interface	**6ES7972-0BB52-0XA0**
PROFIBUS bus connector IP20	
With connection to PPI, MPI, PROFIBUS	
• Without PG interface	**6ES7972-0BA12-0XA0**
• With PG interface	**6ES7972-0BB12-0XA0**
PROFIBUS bus terminal 12M	**6GK1500-0AA10**
Bus terminal for connection of PROFIBUS nodes at up to 12 Mbps with connecting cable	
SIMATIC S7-300 DM 370	**6ES7370-0AA01-0AA0**
Dummy module; used for module replacement	

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CP 343-1 Lean

Overview



ISO	TCP/ UDP	PN	MRP	IT	IP-R	PG/OP	S7/S5
	●	●	●			●	●

Communications processor for connecting a SIMATIC S7-300 to Industrial Ethernet networks, also as PROFINET IO Device.

The CP supports:

- PG/OP communication
- S7 communication
- Open communication (SEND/RECEIVE)
- PROFINET communication

Technical specifications

Article number	**6GK7343-1CX10-0XE0**
Product type designation	CP 343-1 Lean
Transmission rate	
Transfer rate	
• at the 1st interface	10 ... 100 Mbit/s
Interfaces	
Number of interfaces acc. to Industrial Ethernet	2
Number of electrical connections	
• at the 1st interface acc. to Industrial Ethernet	2
• for power supply	1
Type of electrical connection	
• at the 1st interface acc. to Industrial Ethernet	RJ45 port
• of Industrial Ethernet interface	RJ45 port
• for power supply	2-pole plugable terminal block
Supply voltage, current consumption, power loss	
Type of voltage of the supply voltage	DC
Supply voltage 1 from backplane bus	5 V
Supply voltage	24 V
Supply voltage external	24 V
Supply voltage external at DC Rated value	24 V
Relative positive tolerance at DC at 24 V	20 %
Relative negative tolerance at DC at 24 V	15 %
Consumed current	
• from backplane bus at DC at 5 V typical	0.2 A
• from external supply voltage at DC at 24 V typical	0.16 A
• from external supply voltage at DC at 24 V maximum	0.2 A
Power loss [W]	5.8 W

Article number	**6GK7343-1CX10-0XE0**
Product type designation	CP 343-1 Lean
Permitted ambient conditions	
Ambient temperature	
• for vertical installation during operation	0 ... 40 °C
• for horizontally arranged busbars during operation	0 ... 60 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
Relative humidity at 25 °C without condensation during operation maximum	95 %
Protection class IP	IP20
Design, dimensions and weight	
Module format	Compact module S7-300 single width
Width	40 mm
Height	125 mm
Depth	120 mm
Net weight	0.22 kg
Mounting type	
• S7-300 rail mounting	Yes

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Technical specifications (continued)

Article number	6GK7343-1CX10-0XE0
Product type designation	CP 343-1 Lean
Performance data open communication	
Number of possible connections for open communication by means of SEND/RECEIVE blocks maximum	8
Amount of data	
• as user data per ISO on TCP connection for open communication by means of SEND/RECEIVE blocks maximum	8 Kibyte
• as user data per TCP connection for open communication by means of SEND/RECEIVE blocks maximum	8 Kibyte
• as user data per UDP connection for open IE communication by means of SEND/RECEIVE blocks maximum	2 Kibyte
Number of Multicast stations	8
Performance data S7 communication	
Number of possible connections for S7 communication	
• maximum	4
Service	
• of SIMATIC communication as server	Yes
Performance data multi-protocol mode	
Number of active connections with multi-protocol mode	12
Performance data PROFINET communication as PN IO-Controller	
Product function PROFINET IO controller	No
Performance data PROFINET communication as PN IO-Device	
Product function PROFINET IO device	Yes
Amount of data	
• as user data for input variables as PROFINET IO device maximum	512 byte
• as user data for input variables as PROFINET IO device maximum	512 byte
• as user data for input variables for each sub-module as PROFINET IO device	240 byte
• as user data for input variables for each sub-module as PROFINET IO device	240 byte
• as user data for the consistency area for each sub-module	240 byte
Number of submodules per PROFINET IO-Device	32
Performance data telecontrol	
Protocol is supported	
• TCP/IP	Yes

Article number	6GK7343-1CX10-0XE0
Product type designation	CP 343-1 Lean
Product functions management, configuration	
Product function MIB support	Yes
Protocol is supported	
• SNMP v1	Yes
• DCP	Yes
• LLDP	Yes
Configuration software	
• required	STEP 7 V5.4 or higher / STEP 7 Professional V11 (TIA Portal) or higher
Identification & maintenance function	
• I&M0 - device-specific information	Yes
• I&M1 – higher-level designation/ location designation	Yes
Product functions Diagnosis	
Product function Web-based diagnostics	Yes
Product functions switch	
Product feature Switch	Yes
Product function	
• switch-managed	No
• with IRT PROFINET IO switch	No
• Configuration with STEP 7	Yes
Product functions Redundancy	
Product function	
• Ring redundancy	Yes
• Redundancy manager	No
Protocol is supported Media Redundancy Protocol (MRP)	Yes
Product functions Security	
Product function	
• password protection for Web applications	No
• ACL - IP-based	Yes
• ACL - IP-based for PLC/routing	No
• switch-off of non-required services	Yes
• Blocking of communication via physical ports	Yes
• log file for unauthorized access	No
Product functions Time	
Product function SICLOCK support	Yes
Product function pass on time synchronization	Yes
Protocol is supported	
• NTP	Yes

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Ordering data

	Article No.
CP 343-1 Lean communications processor For connecting SIMATIC S7-300 to Industrial Ethernet through TCP/IP and UDP, Multicast, S7 communication, open communication (SEND/RECEIVE), FETCH/WRITE, PROFINET IO Device, MRP, integrated 2-port switch ERTEC, comprehensive diagnostics facilities, module replacement without PG, SNMP, initial commissioning over LAN; with electronic manual on CD-ROM	**6GK7343-1CX10-0XE0**
Accessories	
IE FC RJ45 plug 145 RJ45 plug connector 2 x 2 for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 145° cable outlet	
• 1 pack = 1 unit	**6GK1901-1BB30-0AA0**
• 1 pack = 10 units	**6GK1901-1BB30-0AB0**
• 1 pack = 50 units	**6GK1901-1BB30-0AE0**
IE FC TP Standard Cable GP 2 x 2 (Type A) 4-wire, shielded TP installation cable for connecting to IE FC RJ45 outlet/IE FC RJ45 plug; PROFINET-compatible; with UL approval; sold by the meter; max. length 1000 m, minimum order quantity 20 m	**6XV1840-2AH10**
IE FC Stripping Tool Preadjusted stripping tool for fast stripping of the Industrial Ethernet FC cables	**6GK1901-1GA00**
Compact Switch Module CSM 377 Unmanaged switch for connection of a SIMATIC S7-300 CPU, ET 200M, and up to three further nodes to Industrial Ethernet operating at 10/100 Mbps; 4 x RJ45 ports; external 24 V DC power supply, LED diagnostics, S7-300 module including electronic manual on CD-ROM	**6GK7377-1AA00-0AA0**

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Overview



ISO	TCP/ UDP	PN	MRP	IT	IP-R	PG/OP	S7/S5
●	●	●	●			●	●

Communications processor for connecting a SIMATIC S7-300/ SINUMERIK 840D powerline to Industrial Ethernet networks, also as PROFINET IO controller or IO Device.

The CP supports:

- PG/OP communication
- S7 communication
- Open communication (SEND/RECEIVE)
- PROFINET communication

Technical specifications

Article number	**6GK7343-1EX30-0XE0**
Product type designation	CP 343-1
Transmission rate	
Transfer rate	
• at the 1st interface	10 ... 100 Mbit/s
Interfaces	
Number of interfaces acc. to Industrial Ethernet	2
Number of electrical connections	
• at the 1st interface acc. to Industrial Ethernet	2
• for power supply	1
Type of electrical connection	
• at the 1st interface acc. to Industrial Ethernet	RJ45 port
• of Industrial Ethernet interface	RJ45 port
• for power supply	2-pole plugable terminal block
Supply voltage, current consumption, power loss	
Type of voltage of the supply voltage	DC
Supply voltage 1 from backplane bus	5 V
Supply voltage	24 V
Supply voltage external	24 V
Supply voltage external at DC Rated value	24 V
Relative positive tolerance at DC at 24 V	20 %
Relative negative tolerance at DC at 24 V	15 %
Consumed current	
• from backplane bus at DC at 5 V typical	0.2 A
• from external supply voltage at DC at 24 V typical	0.16 A
• from external supply voltage at DC at 24 V maximum	0.2 A
Power loss [W]	5.8 W

Article number	**6GK7343-1EX30-0XE0**
Product type designation	CP 343-1
Permitted ambient conditions	
Ambient temperature	
• for vertical installation during operation	0 ... 40 °C
• for horizontally arranged busbars during operation	0 ... 60 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
Relative humidity at 25 °C without condensation during operation maximum	95 %
Protection class IP	IP20
Design, dimensions and weight	
Module format	Compact module S7-300 single width
Width	40 mm
Height	125 mm
Depth	120 mm
Net weight	0.22 kg
Mounting type	
• S7-300 rail mounting	Yes
Performance data open communication	
Number of possible connections for open communication by means of SEND/RECEIVE blocks maximum	16
Amount of data	
• as user data per ISO connection for open communication by means of SEND/RECEIVE blocks maximum	8 Kibyte
• as user data per ISO on TCP connection for open communication by means of SEND/RECEIVE blocks maximum	8 Kibyte
• as user data per TCP connection for open communication by means of SEND/RECEIVE blocks maximum	8 Kibyte
• as user data per UDP connection for open IE communication by means of SEND/RECEIVE blocks maximum	2 Kibyte
Number of Multicast stations	16

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Technical specifications (continued)

Article number	6GK7343-1EX30-0XE0
Product type designation	CP 343-1
Performance data S7 communication	
Number of possible connections for S7 communication	
• maximum	16
Performance data multi-protocol mode	
Number of active connections with multi-protocol mode	32
Performance data PROFINET communication as PN IO-Controller	
Number of PN IO devices on PROFINET IO controller usable total	32
Number of external PN IO lines with PROFINET per rack	1
Amount of data	
• as user data for input variables as PROFINET IO controller maximum	1 Kibyte
• as user data for input variables as PROFINET IO controller maximum	1 Kibyte
• as user data for input variables per PN IO device as PROFINET IO controller maximum	1 433 byte
• as user data for output variables per PN IO device as PROFINET IO controller maximum	1 433 byte
• as user data for input variables per PN IO device for each sub-module as PROFINET IO controller maximum	240 byte
• as user data for output variables per PN IO device for each sub-module as PROFINET IO controller maximum	240 byte
Performance data PROFINET communication as PN IO-Device	
Product function PROFINET IO device	Yes
Amount of data	
• as user data for input variables as PROFINET IO device maximum	512 byte
• as user data for input variables as PROFINET IO device maximum	512 byte
• as user data for input variables for each sub-module as PROFINET IO device	240 byte
• as user data for input variables for each sub-module as PROFINET IO device	240 byte
• as user data for the consistency area for each sub-module	240 byte
Number of submodules per PROFINET IO-Device	32
Performance data telecontrol	
Protocol is supported	
• TCP/IP	Yes

Article number	6GK7343-1EX30-0XE0
Product type designation	CP 343-1
Product functions management, configuration	
Product function MIB support	Yes
Protocol is supported	
• SNMP v1	Yes
• DCP	Yes
• LLDP	Yes
Configuration software	
• required	STEP 7 V5.4 SP2 or higher / STEP 7 Professional V11 (TIA Portal) or higher
Identification & maintenance function	
• I&M0 - device-specific information	Yes
• I&M1 – higher-level designation/ location designation	Yes
Product functions Diagnosis	
Product function Web-based diagnostics	Yes
Product functions switch	
Product feature Switch	Yes
Product function	
• switch-managed	No
• with IRT PROFINET IO switch	Yes
• Configuration with STEP 7	Yes
Product functions Redundancy	
Product function	
• Ring redundancy	Yes
• Redundancy manager	No
Protocol is supported Media Redundancy Protocol (MRP)	Yes
Product functions Security	
Product function	
• password protection for Web applications	No
• ACL - IP-based	Yes
• ACL - IP-based for PLC/routing	No
• switch-off of non-required services	Yes
• Blocking of communication via physical ports	Yes
• log file for unauthorized access	No
Product functions Time	
Product function SICLOCK support	Yes
Product function pass on time synchronization	Yes
Protocol is supported	
• NTP	Yes

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Ordering data	Article No.
CP 343-1 communications processor For connection of SIMATIC S7-300 to Industrial Ethernet over ISO and TCP/IP; PROFINET IO controller or PROFINET IO Device, MRP, integrated 2-port switch ERTEC; S7 communication, open communication (SEND/RECEIVE), FETCH/WRITE, with and without RFC 1006, multicast, DHCP, CPU clock synchronization via SIMATIC procedure and NTP, diagnostics, SNMP, access protection through IP access list, initialization over LAN 10/100 Mbps; with electronic manual on DVD	**6GK7343-1EX30-0XE0**
Accessories	
IE FC RJ45 plug 180 2 x 2 RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface	
• 1 pack = 1 unit	**6GK1901-1BB10-2AA0**
• 1 pack = 10 units	**6GK1901-1BB10-2AB0**
• 1 pack = 50 units	**6GK1901-1BB10-2AE0**
IE FC RJ45 plug 145 RJ45 plug connector 2 x 2 for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 145° cable outlet	
• 1 pack = 1 unit	**6GK1901-1BB30-0AA0**
• 1 pack = 10 units	**6GK1901-1BB30-0AB0**
• 1 pack = 50 units	**6GK1901-1BB30-0AE0**
IE FC TP Standard Cable GP 2 x 2 (Type A) 4-wire, shielded TP installation cable for connecting to IE FC RJ45 outlet/IE FC RJ45 plug; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	**6XV1840-2AH10**
IE FC Stripping Tool Pre-adjusted stripping tool for fast stripping of Industrial Ethernet FC cables	**6GK1901-1GA00**
Compact Switch Module CSM 377 Unmanaged switch for connection of a SIMATIC S7-300 CPU, ET 200M, and up to three additional nodes to Industrial Ethernet operating at 10/100 Mbps; 4 x RJ45 ports; external 24 V DC power supply, LED diagnostics, S7-300 module including electronic manual on CD-ROM	**6GK7377-1AA00-0AA0**

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CP 343-1 Advanced

Overview



ISO	TCP/ UDP	PN	MRP	IT	IP-R	PG/OP	S7/S5
●	●	●	●	●	●	●	●

Communications processor for connecting the SIMATIC S7-300/ SINUMERIK 840D powerline to Industrial Ethernet networks, also as PROFINET IO controller and IO device.

The CP supports:

- PG/OP communication
- S7 communication
- Open communication (SEND/RECEIVE)
- PROFINET communication
- IT communication
- Security functionality, firewall and VPN

In addition, the CP 343-1 Advanced provides email functions and allows users to create their own Web pages - ideal support for maintenance and quality assurance. The Internet functions such as FTP even allow connection to the most diverse PC-based systems. This CP is therefore the bridge between the field level and the management level for the S7-300. The CP 343-1 Advanced connects seamlessly to the security structures of the office and IT world.

Technical specifications

Article number	**6GK7343-1GX31-0XE0**
Product type designation	CP 343-1 Advanced
Transmission rate	
Transfer rate	
• at the 1st interface	10 ... 1 000 Mbit/s
• at the 2nd interface	10 ... 100 Mbit/s
Interfaces	
Number of interfaces acc. to Industrial Ethernet	3
Number of electrical connections	
• at the 1st interface acc. to Industrial Ethernet	1
• at the 2nd interface acc. to Industrial Ethernet	2
• for power supply	1
Type of electrical connection	
• at the 1st interface acc. to Industrial Ethernet	RJ45 port
• at the 2nd interface acc. to Industrial Ethernet	RJ45 port
• for power supply	2-pole plugable terminal block
design of the removable storage C-PLUG	Yes
Supply voltage, current consumption, power loss	
Type of voltage of the supply voltage	DC
Supply voltage 1 from backplane bus	5 V
Supply voltage external	24 V
Supply voltage external at DC Rated value	24 V
Relative positive tolerance at DC at 24 V	20 %
Relative negative tolerance at DC at 24 V	15 %
Consumed current	
• from backplane bus at DC at 5 V typical	0.14 A
• from external supply voltage at DC at 24 V typical	0.48 A
• from external supply voltage at DC at 24 V maximum	0.62 A
Power loss [W]	14.7 W

Article number	**6GK7343-1GX31-0XE0**
Product type designation	CP 343-1 Advanced
Permitted ambient conditions	
Ambient temperature	
• for vertical installation during operation	0 ... 40 °C
• for horizontally arranged busbars during operation	0 ... 60 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
Relative humidity at 25 °C without condensation during operation maximum	95 %
Protection class IP	IP20
Design, dimensions and weight	
Module format	Compact module
Width	80 mm
Height	125 mm
Depth	120 mm
Net weight	0.8 kg
Mounting type	
• S7-300 rail mounting	Yes
Performance data open communication	
Number of possible connections for open communication by means of SEND/RECEIVE blocks maximum	16
Amount of data	
• as user data per ISO connection for open communication by means of SEND/RECEIVE blocks maximum	8 Kibyte
• as user data per ISO on TCP connection for open communication by means of SEND/RECEIVE blocks maximum	8 Kibyte
• as user data per TCP connection for open communication by means of SEND/RECEIVE blocks maximum	8 Kibyte
• as user data per UDP connection for open IE communication by means of SEND/RECEIVE blocks maximum	2 Kibyte
Number of Multicast stations	16

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Technical specifications (continued)

Article number	6GK7343-1GX31-0XE0
Product type designation	CP 343-1 Advanced
Performance data S7 communication	
Number of possible connections for S7 communication	
• maximum	16
Performance data multi-protocol mode	
Number of active connections with multi-protocol mode	48
Performance data IT functions	
Number of possible connections	
• as client by means of FTP maximum	10
• as server by means of FTP maximum	2
Number of possible connections	
• as server by means of HTTP maximum	4
• as e-mail client maximum	1
Amount of data as user data for email maximum	8 Kibyte
Storage capacity of the user memory	
• as flash memory file system	28 Mibyte
• as RAM	30 Mibyte
Number of possible write cycles of the flash memory cells	100 000
Performance data PROFINET communication as PN IO-Controller	
Product function PROFINET IO controller	Yes
Number of PN IO devices on PROFINET IO controller usable total	128
Number of PN IO IRT devices on PROFINET IO controller usable	128
Number of external PN IO lines with PROFINET per rack	1
Amount of data	
• as user data for input variables as PROFINET IO controller maximum	4 Kibyte
• as user data for input variables as PROFINET IO controller maximum	4 Kibyte
• as user data for input variables per PN IO device as PROFINET IO controller maximum	1 433 byte
• as user data for output variables per PN IO device as PROFINET IO controller maximum	1 433 byte
• as user data for input variables per PN IO device for each sub-module as PROFINET IO controller maximum	240 byte
• as user data for output variables per PN IO device for each sub-module as PROFINET IO controller maximum	240 byte

Article number	6GK7343-1GX31-0XE0
Product type designation	CP 343-1 Advanced
Performance data PROFINET communication as PN IO-Device	
Product function PROFINET IO device	Yes
Amount of data	
• as user data for input variables as PROFINET IO device maximum	1 024 byte
• as user data for input variables as PROFINET IO device maximum	1 024 byte
• as user data for input variables for each sub-module as PROFINET IO device	240 byte
• as user data for input variables for each sub-module as PROFINET IO device	240 byte
• as user data for the consistency area for each sub-module	240 byte
Number of submodules per PROFINET IO-Device	32
Performance data PROFINET CBA	
Number of remote connection partners with PROFINET CBA	64
Number of connections with PROFINET CBA total	1 000
Amount of data	
• as user data for digital inputs with PROFINET CBA maximum	8 Kibyte
• as user data for digital outputs with PROFINET CBA maximum	8 Kibyte
• as user data for arrays and data types in the case of acyclic transmission with PROFINET CBA maximum	8 Kibyte
• as user data for arrays and data types with PROFINET CBA with cyclical transfer maximum	250 byte
• as user data for arrays and data types with PROFINET CBA in the case of local interconnection maximum	2 400 byte
Performance data PROFINET CBA remote connection with acyclic transmission	
Refresh time of the remote inter-connections in the case of acyclic transmission with PROFINET CBA	100 ms
Number of remote connections to input variables in the case of acyclic transmission with PROFINET CBA maximum	128
Number of remote connections to output variables in the case of acyclic transmission with PROFINET CBA maximum	128
Amount of data	
• as user data for remote inter-connections with input variables in the case of acyclic transmission with PROFINET CBA	8 Kibyte
• as user data for remote inter-connections with output variables in the case of acyclic transmission with PROFINET CBA	8 Kibyte

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Technical specifications (continued)

Article number	6GK7343-1GX31-0XE0
Product type designation	CP 343-1 Advanced
Performance data PROFINET CBA remote connection with cyclic transmission	
Refresh time of the remote inter-connections with PROFINET CBA with cyclical transfer	8 ms
Number of remote connections to input variables with PROFINET CBA with cyclical transfer maximum	200
Number of remote connections to output variables with PROFINET CBA with cyclical transfer maximum	200
Amount of data	
• as user data for remote inter-connections with input variables with PROFINET CBA with cyclical transfer maximum	2 000 byte
• as user data for remote inter-connections with output variables with PROFINET CBA with cyclical transfer maximum	2 000 byte
Performance data PROFINET CBA HMI variables via PROFINET acyclic	
Number of connectable HMI stations for HMI variables in the case of acyclic transmission with PROFINET CBA	3
Refresh time of the HMI variables in the case of acyclic transmission with PROFINET CBA	500 ms
Number of HMI variables in the case of acyclic transmission with PROFINET CBA maximum	200
Amount of data as user data for HMI variables in the case of acyclic transmission with PROFINET CBA maximum	8 Kibyte
Performance data PROFINET CBA device-internal connections	
Number of internal connections with PROFINET CBA maximum	256
Amount of data of the internal connections with PROFINET CBA maximum	2 400 byte
Performance data PROFINET CBA connections to constants	
Number of connections with constants with PROFINET CBA maximum	200
Amount of data as user data for interconnections with constants with PROFINET CBA maximum	4 096 byte
Performance data PROFINET CBA PROFIBUS proxy functionality	
Product function with PROFINET CBA PROFIBUS proxy functionality	No
Performance data telecontrol	
Protocol is supported	
• TCP/IP	Yes

Article number	6GK7343-1GX31-0XE0
Product type designation	CP 343-1 Advanced
Product functions management, configuration	
Product function MIB support	Yes
Protocol is supported	
• SNMP v1	Yes
• SNMP v3	Yes
• DCP	Yes
• LLDP	Yes
Configuration software	
• required	STEP7 V5.5 SP2 HF1 or higher / STEP 7 Professional V12 (TIA Portal) or higher
• for PROFINET CBA required	SIMATIC iMap V3.0 SP4 and higher
Identification & maintenance function	
• I&M0 - device-specific information	Yes
• I&M1 – higher-level designation/ location designation	Yes
Product functions Diagnosis	
Product function Web-based diagnostics	Yes
Product functions switch	
Product feature Switch	Yes
Product function	
• switch-managed	No
• with IRT PROFINET IO switch	Yes
• Configuration with STEP 7	Yes
Product functions Redundancy	
Product function	
• Ring redundancy	Yes
• Redundancy manager	Yes
Protocol is supported Media Redundancy Protocol (MRP)	Yes
Product functions Security	
Firewall version	stateful inspection
Product function with VPN connection	IPSec
Type of encryption algorithms with VPN connection	AES-256, AES-192, AES-128, 3DES-168, DES-56
Type of authentication procedure with VPN connection	Preshared key (PSK), X.509v3 certificates
Type of hashing algorithms with VPN connection	MD5, SHA-1
Number of possible connections with VPN connection	32
Product function	
• password protection for Web applications	Yes
• ACL - IP-based	Yes
• ACL - IP-based for PLC/routing	Yes
• switch-off of non-required services	Yes
• Blocking of communication via physical ports	Yes
• log file for unauthorized access	No
Product functions Time	
Product function SICLOCK support	Yes
Product function pass on time synchronization	Yes
Protocol is supported	
• NTP	Yes

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Ordering data	Article No.
CP 343-1 Advanced communications processor	
For connecting the SIMATIC S7-300 CPU to Industrial Ethernet; 1 x 10/100/1000 Mbps; 2 x 10/100 Mbps (IE SWITCH); RJ 45 ports; TCP; UDP; ISO; PROFINET IO-Controller and Device, S7 communication (client + server); open communication (SEND/RECEIVE); S7 routing; IP configuration via DHCP/block; extended web diagnostics; time synchronization; IP Access Control List; IP routing; FTP; email; PROFINET CBA; C-PLUG	
• With Security (Firewall + VPN) and PROFIenergy (Controller + Device)	**6GK7343-1GX31-0XE0**
Accessories	
IE FC RJ45 plug 180 2 x 2	
RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface	
• 1 pack = 1 unit	**6GK1901-1BB10-2AA0**
• 1 pack = 10 units	**6GK1901-1BB10-2AB0**
• 1 pack = 50 units	**6GK1901-1BB10-2AE0**
IE FC RJ45 plug 145	
RJ45 plug connector 2 x 2 for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 145° cable outlet	
• 1 pack = 1 unit	**6GK1901-1BB30-0AA0**
• 1 pack = 10 units	**6GK1901-1BB30-0AB0**
• 1 pack = 50 units	**6GK1901-1BB30-0AE0**
IE FC RJ45 plug 4 x 2	
RJ45 plug connector for Industrial Ethernet (10/100/1000 Mbps) with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; 180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface	
• 1 pack = 1 unit	**6GK1901-1BB11-2AA0**
• 1 pack = 10 units	**6GK1901-1BB11-2AB0**
• 1 pack = 50 units	**6GK1901-1BB11-2AE0**

	Article No.
IE FC TP Standard Cable GP 2 x 2 (Type A)	**6XV1840-2AH10**
4-wire, shielded TP installation cable for connecting to IE FC RJ45 outlet/IE FC RJ45 plug; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	
IE FC TP Standard Cable GP 4 x 2	
8-wire, shielded TP installation cable for connecting to IE FC RJ45 Modular Outlet for universal applications; with UL approval; sold by the meter; max. quantity 1000 m, minimum order quantity 20 m	
• AWG22, for connecting to IE FC RJ45 Modular Outlet	**6XV1870-2E**
• AWG24, for connecting to IE FC RJ45 plug 4 x 2	**6XV1878-2A**
IE FC Stripping Tool	**6GK1901-1GA00**
Pre-adjusted stripping tool for fast stripping of Industrial Ethernet FC cables	
Compact Switch Module CSM 377	
Unmanaged switch for connection of a SIMATIC S7-300 CPU, ET 200M, and up to three further nodes to Industrial Ethernet operating at 10/100 Mbps; 4 x RJ45 ports; external 24 V DC power supply, LED diagnostics, S7-300 module including electronic manual on CD-ROM	**6GK7377-1AA00-0AA0**

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CP 343-1 ERPC

Overview



ERPC	TCP/ UDP	PN	MRP	IT	IP-R	PG/OP	S7/S5
●	●					●	●

The CP 343-1 ERPC (Enterprise Connect) communications processor for connecting a SIMATIC S7-300 to Industrial Ethernet networks.

The CP supports:

- PG/OP communication
- S7 communication
- Open communication (SEND/RECEIVE)
- ERPC communication

Connection of the SIMATIC S7-300 to various database systems for vertical integration is supported by means of a firmware expansion to be ordered separately.

Technical specifications

Article number	**6GK7343-1FX00-0XE0**
Product type designation	CP 343-1 ERPC
Transmission rate	
Transfer rate	
• at the 1st interface	10 ... 1 000 Mbit/s
Interfaces	
Number of interfaces acc. to Industrial Ethernet	1
Number of electrical connections	
• at the 1st interface acc. to Industrial Ethernet	1
• for power supply	1
Type of electrical connection	
• at the 1st interface acc. to Industrial Ethernet	RJ45 port
• for power supply	2-pole plugable terminal block
design of the removable storage C-PLUG	Yes
Supply voltage, current consumption, power loss	
Type of voltage of the supply voltage	DC
Supply voltage 1 from backplane bus	5 V
Supply voltage external	24 V
Supply voltage external at DC Rated value	24 V
Relative positive tolerance at DC at 24 V	20 %
Relative negative tolerance at DC at 24 V	15 %
Consumed current	
• from backplane bus at DC at 5 V typical	0.3 A
• from external supply voltage at DC at 24 V typical	0.16 A
• from external supply voltage at DC at 24 V maximum	0.6 A
Power loss [W]	14.7 W

Article number	**6GK7343-1FX00-0XE0**
Product type designation	CP 343-1 ERPC
Permitted ambient conditions	
Ambient temperature	
• for vertical installation during operation	0 ... 40 °C
• for horizontally arranged busbars during operation	0 ... 60 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
Relative humidity at 25 °C without condensation during operation maximum	95 %
Protection class IP	IP20
Design, dimensions and weight	
Module format	Compact module S7-300 double width
Width	80 mm
Height	125 mm
Depth	120 mm
Net weight	0.8 kg
Mounting type	
• S7-300 rail mounting	Yes
Performance data open communication	
Number of possible connections for open communication by means of SEND/RECEIVE blocks maximum	8
Amount of data	
• as user data per ISO on TCP connection for open communication by means of SEND/RECEIVE blocks maximum	8 Kibyte
• as user data per TCP connection for open communication by means of SEND/RECEIVE blocks maximum	8 Kibyte
• as user data per UDP connection for open IE communication by means of SEND/RECEIVE blocks maximum	2 Kibyte
Number of Multicast stations	8

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Technical specifications (continued)

Article number	6GK7343-1FX00-0XE0
Product type designation	CP 343-1 ERPC
Performance data S7 communication	
Number of possible connections for S7 communication	
• maximum	8
• Note	also 2 PG/OP connections and 1 diagnostics connection
Performance data multi-protocol mode	
Number of active connections with multi-protocol mode	32
Performance data IT functions	
Number of possible connections	
• as server by means of HTTP maximum	4
Number of possible write cycles of the flash memory cells	100 000
Performance data ERPC functions	
Number of possible connections for communication with ERP or MES stations maximum	8
Number of possible logical triggers per CP maximum	8
Number of configurable ERPC symbols for database access	
• per CPU maximum	2 000
• per logical trigger maximum	255
Amount of data as user data and header information per logical trigger	8 Kibyte
Performance data telecontrol	
Protocol is supported	
• TCP/IP	Yes
Product functions management, configuration	
Product function MIB support	Yes
Protocol is supported	
• SNMP v1	Yes
• DCP	Yes
• LLDP	Yes
Configuration software	
• required	STEP 7 V5.4 SP5 + HSP or higher
Identification & maintenance function	
• I&M0 - device-specific information	Yes
• I&M1 – higher-level designation/ location designation	Yes

Article number	6GK7343-1FX00-0XE0
Product type designation	CP 343-1 ERPC
Product functions Diagnosis	
Product function Web-based diagnostics	Yes
Product functions switch	
Product feature Switch	No
Product functions Redundancy	
Product function	
• Ring redundancy	No
Product functions Security	
Product function	
• password protection for Web applications	No
• ACL - IP-based	Yes
• ACL - IP-based for PLC/routing	No
• switch-off of non-required services	Yes
• Blocking of communication via physical ports	Yes
• log file for unauthorized access	No
Product functions Time	
Product function SICLOCK support	Yes
Product function pass on time synchronization	Yes
Protocol is supported	
• NTP	Yes

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Ordering data	Article No.
CP 343-1 ERPC (Enterprise Connect) communications processor For the connection of SIMATIC S7-300 to Industrial Ethernet and for the support of the database connection of the SIMATIC S7-300 to various databases; TCP/UDP, S7 communication, open communication (SEND/RECEIVE), with and without RFC 1006, multicast, web server, setting of CPU's clock using SIMATIC procedures and NTP, access protection via IP access list, SNMP, DHCP, initialization over LAN 10/100/1000 Mbps; with electronic manual on DVD, C-PLUG included in scope of supply	**6GK7343-1FX00-0XE0**
deviceWISE Embedded Edition for SIMATIC S7 Firmware expansion for database connection of the SIMATIC S7-300 complete with CP 343-1 ERPC to various ERP or MES systems	See Catalog IK PI 2015, Partner solutions/deviceWISE Embedded Edition for SIMATIC S7

Accessories	Article No.
IE FC RJ45 plug 4 x 2 RJ45 plug connector for Industrial Ethernet (10/100/1000 Mbps) with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; 180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface	
• 1 pack = 1 unit	**6GK1901-1BB11-2AA0**
• 1 pack = 10 units	**6GK1901-1BB11-2AB0**
• 1 pack = 50 units	**6GK1901-1BB11-2AE0**
IE FC TP Standard Cable GP 4 x 2 8-wire, shielded TP installation cable for connecting to IE FC RJ45 Modular Outlet for universal applications; with UL approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	
• AWG22, for connecting to IE FC RJ45 Modular Outlet	**6XV1870-2E**
• AWG24, for connecting to IE FC RJ45 plug 4 x 2	**6XV1878-2A**
IE FC Stripping Tool Pre-adjusted stripping tool for fast stripping of Industrial Ethernet FC cables	**6GK1901-1GA00**

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Overview



- Unmanaged switch for connecting a SIMATIC S7-300 with integral PROFINET interface or an Industrial Ethernet CP or SIMATIC ET 200M to an Industrial Ethernet in an electrical line, tree or star structure
- As many as three additional nodes can be connected
- As an unmanaged switch, the CSM 377 is used for integrating small machines into existing automation networks or for the stand-alone operation of the machines
- Simple, space-saving attachment to SIMATIC S7-300 DIN rail due to design as single-width module in SIMATIC S7-300 format
- Low-cost solution for implementing small, local Ethernet networks
- Rugged, industry-standard node connections with PROFINET-compliant RJ45 plug connectors that latch onto the enclosure to offer additional strain and bending relief

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Technical specifications

Article number	**6GK7377-1AA00-0AA0**
Product type designation	SCALANCE CSM 377
Transmission rate	
Transfer rate	10 Mbit/s, 100 Mbit/s
Interfaces for communication integrated	
Number of electrical connections	
• for network components or terminal equipment	4
Number of 100 Mbit/s SC ports	
• for multimode	0
Number of 1000 Mbit/s LC ports	
• for multimode	0
• for single mode (LD)	0
Interfaces others	
Number of electrical connections	
• for power supply	1
Type of electrical connection	
• for power supply	2-pole terminal block
Supply voltage, current consumption, power loss	
Type of voltage of the supply voltage	DC
Supply voltage	
• external	24 V
• external minimum	19.2 V
• external maximum	28.8 V
Product component fusing at power supply input	Yes
Fuse protection type at input for supply voltage	0.5 A / 60 V
Consumed current maximum	0.07 A
Power loss [W]	
• at DC at 24 V	1.6 W
Permitted ambient conditions	
Ambient temperature	
• during operation	0 ... 60 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
Relative humidity	
• at 25 °C without condensation during operation maximum	95 %
Protection class IP	IP20

Article number	**6GK7377-1AA00-0AA0**
Product type designation	SCALANCE CSM 377
Design, dimensions and weight	
Design	SIMATIC S7-300 device design
Width	40 mm
Height	125 mm
Depth	118 mm
Net weight	0.2 kg
Mounting type	
• 35 mm DIN rail mounting	No
• wall mounting	No
• S7-300 rail mounting	Yes
• S7-1500 rail mounting	No
Product functions management, configuration	
Product function	
• multiport mirroring	No
Product function switch-managed	No
Product functions Redundancy	
Product function	
• Parallel Redundancy Protocol (PRP)/ operation in the PRP-network	Yes
• Parallel Redundancy Protocol (PRP)/ Redundant Network Access (RNA)	No
Standards, specifications, approvals	
Standard	
• for FM	FM3611: Class 1, Divison 2, Group A, B, C, D / T.., CL.1, Zone 2, GP. IIC, T.. Ta
• for hazardous zone	EN 60079-15, II 3 G Ex nA II T.., KEMA 06 ATEX 0021 X
• for safety from CSA and UL	UL 508, CSA C22.2 No. 142
• for hazardous zone from CSA and UL	UL 1604 and UL 2279-15 (Hazardous Location)
• for emitted interference	EN 61000-6-4:2001
• for interference immunity	EN 61000-6-2:2001
Standards, specifications, approvals CE	
Certificate of suitability CE marking	Yes

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Technical specifications (continued)

Article number	**6GK7377-1AA00-0AA0**
Product type designation	SCALANCE CSM 377
Standards, specifications, approvals miscellaneous	
Certificate of suitability	EN 61000-6-2:2001, EN 61000-6-4:2001
• C-Tick	Yes
• KC approval	No
Standards, specifications, approvals ship classification	
Marine classification association	
• American Bureau of Shipping Europe Ltd. (ABS)	Yes
• Bureau Veritas (BV)	Yes
• Det Norske Veritas (DNV)	Yes
• Germanische Lloyd (GL)	No
• Lloyds Register of Shipping (LRS)	Yes
• Nippon Kaiji Kyokai (NK)	Yes
• Polski Rejestr Statkow (PRS)	No
• Royal Institution of Naval Architects (RINA)	No
Standards, specifications, approvals product conformity	
MTBF	144 y

Ordering data

	Article No.
Compact Switch Module CSM 377	
Unmanaged switch for connecting a SIMATIC S7-300, ET200 M and up to three further nodes to Industrial Ethernet with 10/100 Mbps; 4 x RJ45 ports; external 24 V DC power supply, diagnostics on LEDs, S7-300 module including electronic manual on CD-ROM	**6GK7377-1AA00-0AA0**
Accessories	
IE FC TP Standard Cable GP 2 x 2 (Type A)	
4-wire, shielded TP installation cable for connecting to IE FC RJ45 outlet/IE FC RJ45 plug; PROFINET-compliant; with UL approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	**6XV1840-2AH10**
IE FC RJ45 plug 180 2 x 2	
RJ45 plug connector for Industrial Ethernet with a rugged metal housing and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; 180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface	
• 1 pack = 1 unit	**6GK1901-1BB10-2AA0**
• 1 pack = 10 units	**6GK1901-1BB10-2AB0**
• 1 pack = 50 units	**6GK1901-1BB10-2AE0**
IE FC Stripping Tool	**6GK1901-1GA00**
Pre-adjusted stripping tool for fast stripping of Industrial Ethernet FC cables	

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Overview



- SINAUT communications module TIM for SIMATIC S7-300 for use in a wide area network (WAN)
- IP communication via secure VPN (virtual private network) using the Internet
- Wireless communication via GPRS router, GPRS modem, or radio devices
- Wired communication via Ethernet, DSL, dialup modems or dedicated line modem
- Complete migration of existing wireless, dedicated line and dial-up technology to IP-based network
- Message frame memory for seamless recording of data
- Simple configuration and operation without specialist IT knowledge

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Technical specifications

Article number	**6NH7800-3BA00**
Product type designation	TIM 3V-IE
Transmission rate	
Transfer rate	
• for Industrial Ethernet	10 ... 100 Mbit/s
• acc. to RS 232	50 ... 38 400 bit/s
Interfaces	
Number of interfaces acc. to Industrial Ethernet	1
Number of electrical connections	
• for external data transmission acc. to RS 232	1
• for power supply	1
Type of electrical connection	
• of Industrial Ethernet interface	RJ45 port
• at interface 1 for external data transmission	9 pin Sub-D-connector (RS232)
• for power supply	2-pole plugable terminal block
design of the removable storage C-PLUG	No
Supply voltage, current consumption, power loss	
Type of voltage of the supply voltage	DC
Supply voltage	24 V
Supply voltage	20.4 ... 28.8 V
Supply voltage external at DC Rated value	24 V
Supply voltage external at DC rated value	20.4 ... 28.8 V
Relative symmetrical tolerance at DC	
• at 5 V	5 %
Relative positive tolerance at DC at 24 V	5 %
Relative negative tolerance at DC at 24 V	5 %
Consumed current	
• from backplane bus at DC at 24 V maximum	0.2 A
• from external supply voltage at DC at 24 V maximum	0.2 A
Power loss [W]	5.8 W
Product extension optional Backup battery	No

Article number	**6NH7800-3BA00**
Product type designation	TIM 3V-IE
Permitted ambient conditions	
Ambient temperature	
• during operation	0 ... 60 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
Relative humidity at 25 °C without condensation during operation maximum	95 %
Protection class IP	IP20
Design, dimensions and weight	
Module format	Compact module S7-300 single width
Width	40 mm
Height	125 mm
Depth	120 mm
Net weight	0.25 kg
Product properties, functions, components general	
Number of units	
• per CPU maximum	1
• Note	Number of TIM per S7-300
Wire length	
• with RS 232 interface maximum	6 m
Performance data S7 communication	
Number of possible connections for S7 communication	
• maximum	8
• with PG connections maximum	2
• with OP connections maximum	8
Service	
• SINAUT ST7 via S7 communication	Yes
• PG/OP communication	Yes
Performance data multi-protocol mode	
Number of active connections with multi-protocol mode	12

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Technical specifications (continued)

Article number	6NH7800-3BA00
Product type designation	TIM 3V-IE
Performance data telecontrol	
Suitability for use	
• Node station	No
• substation	Yes
• TIM control center	No
• Note	RS232 and Industrial Ethernet can not be operated in parallel
Protocol is supported	
• DNP3	No
• SINAUT ST1 protocol	Yes
• SINAUT ST7 protocol	Yes
Product function data buffering if connection is aborted	Yes; 16,000 data messages
Storage capacity	
• of S7 CPU RAM for TD7onCPU mode data blocks on CPU required	20 Kibyte
• of S7 CPU RAM for TD7onTIM mode data blocks on TIM required	0 Kibyte
• Note	TD7onCPU: at least 20 KB, actual requirement determined by data volume and functional scope TD7onTIM: 0 bytes in most favorable case
Product feature Buffered message frame memory	No
Transmission format	
• for SINAUT ST1 protocol with polling 11 bit	Yes
• for SINAUT ST1 protocol with spontaneous 10-bit or 11-bit	Yes
• for SINAUT ST7 protocol with multi-master polling 10-bit	Yes
• for SINAUT ST7 protocol with polling or spontaneous 10-bit or 11-bit	Yes
Operating mode for scanning of data transmission	
• with dedicated line/radio link with SINAUT ST1 protocol	Polling, polling with time slot procedure
• with dedicated line/radio link with SINAUT ST7 protocol	Polling, polling with time slot procedure, multi-master polling with time slot procedure
• with dial-up network with SINAUT ST1 protocol	spontaneous
• with dial-up network with SINAUT ST7 protocol	spontaneous
Hamming distance	
• for SINAUT ST1 protocol	4
• for SINAUT ST7 protocol	4

Article number	6NH7800-3BA00
Product type designation	TIM 3V-IE
Product functions management, configuration	
Configuration software	
• required	SINAUT ST7 ES
• for CPU configuring required SINAUT TD7 block library for CPU	Yes
• for PG configuring required SINAUT ST7 configuration software for PG	Yes
Storage location of TIM configuration data	on the TIM
Product functions Security	
Suitability for operation Virtual Private Network	Yes
Operating mode Virtual Private Network note	VPN operation as MSC client with MSC protocol and password protection only possible in conjunction with GPRS modem with MSC capability
Type of authentication with Virtual Private Network PSK	Yes
Product function	
• password protection for VPN	Yes
• MSC client via GPRS modem with MSC capability	Yes
Protocol	
• is supported MSC protocol	No
Key length for MSC with Virtual Private Network	128 bit
Number of possible connections	
• as MSC client with VPN connection	1
• as MSC server with VPN connection	0

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Ordering data

	Article No.
TIM 3V-IE communications module With an RS 232 interface for SINAUT communication via a conventional WAN or an IP-based network (WAN or LAN)	**6NH7800-3BA00**
SINAUT Engineering Software V5.5 + SP3 On DVD, comprising • SINAUT Engineering Software V5.5 for the PG • SINAUT TD7 block library • Electronic manual in German and English	**6NH7997-0CA55-0AA0**
Accessories	
IE FC TP Standard Cable GP 2 x 2 (Type A) 4-wire, shielded TP installation cable for connecting to IE FC RJ45 outlet/IE FC RJ45 plug; PROFINET-compatible; with UL approval Sold by the meter; Max. delivery unit 1 000 m, minimum order quantity 20 m	**6XV1840-2AH10**
IE FC RJ45 plug 180 RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface	
• 1 pack = 1 unit	**6GK1901-1BB10-2AA0**
• 1 pack = 10 units	**6GK1901-1BB10-2AB0**
• 1 pack = 50 units	**6GK1901-1BB10-2AE0**
IE FC Stripping Tool Pre-adjusted stripping tool for fast stripping of Industrial Ethernet FC cables	**6GK1901-1GA00**
Connecting cable For connecting a TIM (RS 232) with a SINAUT ST7 MD2, MD3 or MD4 (RS 232) modem Cable length 1.5 m	**6NH7701-4AL**
Connecting cable For connecting a TIM (RS 232) with the GSM modem MD720-3; also suitable for third-party modems or radio unit with standard RS 232 interface; cable length 2.5 m	**6NH7701-5AN**
Connecting cable With one end open for connecting a TIM (RS 232) to a third-party modem or radio unit (RS 232) Cable length 2.5 m	**6NH7701-4BN**
Connecting cable For connecting two TIM modules via their RS 232 interface without modems ("null modem"); cable length 6 m	**6NH7701-0AR**

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TIM 3V-IE Advanced (for S7-300)

Overview



- SINAUT communications module TIM for SIMATIC S7-300 for use in wide area network (WAN) as station, node station, and control center
- IP communication via secure VPN (virtual private network) using the Internet
- Wireless communication via GPRS router, GPRS modem or radio devices
- Wired communication via Ethernet, DSL, dialup modems or dedicated line modem
- Complete migration of existing wireless, dedicated line and dial-up technology to IP-based network
- Message frame memory for complete recording of data and support of redundant communication paths
- Simple configuration and operation without specialist IT knowledge

Technical specifications

Article number	**6NH7800-3CA00**
Product type designation	TIM 3V-IE Advanced
Transmission rate	
Transfer rate	
• for Industrial Ethernet	10 ... 100 Mbit/s
• acc. to RS 232	50 ... 38 400 bit/s
Interfaces	
Number of interfaces acc. to Industrial Ethernet	1
Number of electrical connections	
• for external data transmission acc. to RS 232	1
• for power supply	1
Type of electrical connection	
• of Industrial Ethernet interface	RJ45 port
• at interface 1 for external data transmission	9 pin Sub-D-connector (RS232)
• for power supply	2-pole plugable terminal block
design of the removable storage C-PLUG	No
Supply voltage, current consumption, power loss	
Type of voltage of the supply voltage	DC
Supply voltage	24 V
Supply voltage	20.4 ... 28.8 V
Supply voltage external at DC Rated value	24 V
Supply voltage external at DC rated value	20.4 ... 28.8 V
Relative symmetrical tolerance at DC	
• at 5 V	5 %
Relative positive tolerance at DC at 24 V	5 %
Relative negative tolerance at DC at 24 V	5 %
Consumed current	
• from backplane bus at DC at 24 V maximum	0.2 A
• from external supply voltage at DC at 24 V maximum	0.2 A
Power loss [W]	5.8 W
Product extension optional Backup battery	No

Article number	**6NH7800-3CA00**
Product type designation	TIM 3V-IE Advanced
Permitted ambient conditions	
Ambient temperature	
• during operation	0 ... 60 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
Relative humidity at 25 °C without condensation during operation maximum	95 %
Protection class IP	IP20
Design, dimensions and weight	
Module format	Compact module S7-300 single width
Width	40 mm
Height	125 mm
Depth	120 mm
Net weight	0.25 kg
Product properties, functions, components general	
Number of units	
• Note	Number of TIMs per S7-300: multiple, number depends on the connection resources of the S7-300 CPU
Wire length	
• with RS 232 interface maximum	6 m
Performance data S7 communication	
Number of possible connections for S7 communication	
• maximum	24
• with PG connections maximum	4
• with OP connections maximum	20
Service	
• SINAUT ST7 via S7 communication	Yes
• PG/OP communication	Yes
Performance data multi-protocol mode	
Number of active connections with multi-protocol mode	24

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Technical specifications (continued)

Article number	6NH7800-3CA00
Product type designation	TIM 3V-IE Advanced
Performance data telecontrol	
Suitability for use	
• Node station	Yes
• substation	Yes
• TIM control center	Yes
• Note	RS232 and Industrial Ethernet can be operated in parallel
Protocol is supported	
• DNP3	No
• SINAUT ST1 protocol	Yes
• SINAUT ST7 protocol	Yes
Product function data buffering if connection is aborted	Yes; 32,000 data messages
Storage capacity	
• of S7 CPU RAM for TD7onCPU mode data blocks on CPU required	20 Kibyte
• of S7 CPU RAM for TD7onTIM mode data blocks on TIM required	0 Kibyte
• Note	TD7onCPU: at least 20 KB, actual requirement determined by data volume and functional scope TD7onTIM: 0 bytes in most favorable case
Product feature Buffered message frame memory	No
Transmission format	
• for SINAUT ST1 protocol with polling 11 bit	Yes
• for SINAUT ST1 protocol with spontaneous 10-bit or 11-bit	Yes
• for SINAUT ST7 protocol with multi-master polling 10-bit	Yes
• for SINAUT ST7 protocol with polling or spontaneous 10-bit or 11-bit	Yes
Operating mode for scanning of data transmission	
• with dedicated line/radio link with SINAUT ST1 protocol	Polling, polling with time slot procedure
• with dedicated line/radio link with SINAUT ST7 protocol	Polling, polling with time slot procedure, multi-master polling with time slot procedure
• with dial-up network with SINAUT ST1 protocol	spontaneous
• with dial-up network with SINAUT ST7 protocol	spontaneous
Hamming distance	
• for SINAUT ST1 protocol	4
• for SINAUT ST7 protocol	4

Article number	6NH7800-3CA00
Product type designation	TIM 3V-IE Advanced
Product functions management, configuration	
Configuration software	
• required	SINAUT ST7 ES
• for CPU configuring required SINAUT TD7 block library for CPU	Yes
• for PG configuring required SINAUT ST7 configuration software for PG	Yes
Storage location of TIM configuration data	on the TIM
Product functions Security	
Suitability for operation Virtual Private Network	Yes
Type of authentication with Virtual Private Network PSK	Yes
Product function	
• password protection for VPN	Yes
• MSC client via GPRS modem with MSC capability	Yes
Protocol	
• is supported MSC protocol	Yes
• with Virtual Private Network MSC is supported	TCP/IP
Key length for MSC with Virtual Private Network	128 bit
Number of possible connections	
• as MSC client with VPN connection	1
• as MSC server with VPN connection	0

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TIM 3V-IE Advanced (for S7-300)

Ordering data	Article No.
TIM 3V-IE Advanced communications module With an RS 232 interface and an RJ45 interface for SINAUT communication via a conventional WAN and an IP-based network (WAN or LAN)	**6NH7800-3CA00**
Accessories	
SINAUT Engineering Software V5.5 + SP3 On DVD, comprising • SINAUT ST7 Engineering Software V5.5 + SP3 for the PG • SINAUT TD7 block library • Electronic manual in German and English	**6NH7997-0CA55-0AA0**
SINAUT ST7 Engineering Software Update from Version V5.0x to V5.5 SINAUT Engineering Software V5.5 upgrade; for owners of SINAUT Engineering Software Version V5.0 or higher	**6NH7997-0CA55-0GA0**
IE FC TP Standard Cable GP 2 x 2 (Type A) 4-wire, shielded TP installation cable for connecting to IE FC RJ45 outlet/IE FC RJ45 plug; PROFINET-compatible; with UL approval Sold by the meter; Max. delivery unit 1 000 m, minimum order quantity 20 m	**6XV1840-2AH10**
IE FC RJ45 plug 180 RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 180° cable outlet; for network components and CPs/ CPUs with Industrial Ethernet interface	
• 1 pack = 1 unit	**6GK1901-1BB10-2AA0**
• 1 pack = 10 units	**6GK1901-1BB10-2AB0**
• 1 pack = 50 units	**6GK1901-1BB10-2AE0**

	Article No.
IE FC Stripping Tool Pre-adjusted stripping tool for fast stripping of Industrial Ethernet FC cables	**6GK1901-1GA00**
Connecting cable For connecting a TIM (RS 232) with a SINAUT ST7 MD2, MD3 or MD4 (RS 232) modem Cable length 1.5 m	**6NH7701-4AL**
Connecting cable For connecting a TIM (RS 232) with the GSM modem MD720-3; also suitable for third-party modems or radio units with standard RS 232 interface Cable length 2.5 m	**6NH7701-5AN**
Connecting cable With one end open for connecting a TIM (RS 232) to a third-party modem or radio unit (RS 232) Cable length 2.5 m	**6NH7701-4BN**
Connecting cable For connecting two TIM modules via their RS 232 interface without modems ("null modem") Cable length 6 m	**6NH7701-0AR**

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Overview



- SINAUT communications module TIM with four interfaces for SIMATIC S7-300 or as self-contained unit for the S7-400 for use in the wide area network (WAN)
- For universal use in a SINAUT station, node station and control center
- Internet communication via integrated MSC-VPN tunnel with direct connection to DSL router or operation via IPsec VPN with additional SIMATIC NET components
- Wireless communication via GPRS router, GPRS modem, or radio devices
- Wired communication via Ethernet, DSL, dialup modems or dedicated line modem
- Complete migration of existing wireless, dedicated line and dial-up technology to IP-based network
- Message frame memory for complete recording of data and support of redundant communication paths
- Simple configuration and operation without specialist IT knowledge

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Technical specifications

Article number	**6NH7800-4BA00**
Product type designation	TIM 4R-IE
Transmission rate	
Transfer rate	
• for Industrial Ethernet	10 ... 100 Mbit/s
• acc. to RS 232	50 ... 38 400 bit/s
Interfaces	
Number of interfaces acc. to Industrial Ethernet	2
Number of electrical connections	
• for external data transmission acc. to RS 232	2
• for power supply	1
Type of electrical connection	
• of Industrial Ethernet interface	RJ45 port
• at interface 1 for external data transmission	9 pin Sub-D-connector, RS232 switchable to RS485
• at interface 2 for external data transmission	9-pole D-sub connector, RS232 can be switched to RS485
• for power supply	2-pole plugable terminal block
design of the removable storage C-PLUG	Yes
Supply voltage, current consumption, power loss	
Type of voltage of the supply voltage	DC
Supply voltage	24 V
Supply voltage	20.4 ... 28.8 V
Supply voltage external at DC Rated value	24 V
Supply voltage external at DC rated value	20.4 ... 28.8 V
Consumed current	
• from backplane bus at DC at 24 V maximum	0.2 A
• from external supply voltage at DC at 24 V maximum	0.17 A
Power loss [W]	4.6 W
Product extension optional Backup battery	Yes
Type of battery	Lithium AA / 3.6 V / 2.3 Ah
Backup current	
• typical	100 µA
• maximum	160 µA

Article number	**6NH7800-4BA00**
Product type designation	TIM 4R-IE
Permitted ambient conditions	
Ambient temperature	
• during operation	0 ... 60 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
Relative humidity at 25 °C without condensation during operation maximum	95 %
Protection class IP	IP20
Design, dimensions and weight	
Module format	Compact module S7-300 double width
Width	80 mm
Height	125 mm
Depth	120 mm
Net weight	0.4 kg
Product properties, functions, components general	
Number of units	
• Note	Number of TIM 4R-IE per S7-300/S7-400: multiple, number depends on the connection resources of the CPU
Wire length	
• with RS 232 interface maximum	6 m
• with RS 485 interface maximum	30 m
Performance data S7 communication	
Number of possible connections for S7 communication	
• maximum	64
• with PG connections maximum	2
• with OP connections maximum	62
Service	
• SINAUT ST7 via S7 communication	Yes
• PG/OP communication	Yes

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Technical specifications (continued)

Article number	6NH7800-4BA00
Product type designation	TIM 4R-IE
Performance data multi-protocol mode	
Number of active connections with multi-protocol mode	128
Performance data telecontrol	
Suitability for use	
• Node station	Yes
• substation	Yes
• TIM control center	Yes
Protocol is supported	
• DNP3	No
• SINAUT ST1 protocol	Yes
• SINAUT ST7 protocol	Yes
Product function data buffering if connection is aborted	Yes; 56,000 data messages
Storage capacity	
• of S7 CPU RAM for TD7onCPU mode data blocks on CPU required	20 Kibyte
• of S7 CPU RAM for TD7onTIM mode data blocks on TIM required	0 Kibyte
• Note	TD7onCPU: at least 20 KB, actual requirement determined by data volume and functional scope TD7onTIM: 0 bytes in most favorable case
Product feature Buffered message frame memory	Yes
Transmission format	
• for SINAUT ST1 protocol with polling 11 bit	Yes
• for SINAUT ST1 protocol with spontaneous 10-bit or 11-bit	Yes
• for SINAUT ST7 protocol with multi-master polling 10-bit	Yes
• for SINAUT ST7 protocol with polling or spontaneous 10-bit or 11-bit	Yes
Operating mode for scanning of data transmission	
• with dedicated line/radio link with SINAUT ST1 protocol	Polling, polling with time slot procedure
• with dedicated line/radio link with SINAUT ST7 protocol	Polling, polling with time slot procedure, multi-master polling with time slot procedure
• with dial-up network with SINAUT ST1 protocol	spontaneous
• with dial-up network with SINAUT ST7 protocol	spontaneous
Hamming distance	
• for SINAUT ST1 protocol	4
• for SINAUT ST7 protocol	4

Article number	6NH7800-4BA00
Product type designation	TIM 4R-IE
Product functions management, configuration	
Configuration software	
• required	SINAUT ST7 ES
• for CPU configuring required SINAUT TD7 block library for CPU	Yes
• for PG configuring required SINAUT ST7 configuration software for PG	Yes
Storage location of TIM configuration data	on internal TIM flash memory, or on TIM in optional C-PLUG, or on MMC of the S7-300 CPU if TIM installed in S7-300 controller
Product functions Security	
Suitability for operation Virtual Private Network	Yes
Type of authentication with Virtual Private Network PSK	Yes
Product function	
• password protection for VPN	Yes
• MSC client via GPRS modem with MSC capability	Yes
Protocol	
• is supported MSC protocol	Yes
• with Virtual Private Network MSC is supported	TCP/IP
Key length for MSC with Virtual Private Network	128 bit
Number of possible connections	
• as MSC client with VPN connection	1
• as MSC server with VPN connection	128
Product functions Time	
Product component Hardware real-time clock	Yes
Product feature Hardware real-time clock w. battery backup	Yes
Accuracy of the hardware real-time clock per day maximum	4 s
time synchronization	
• from NTP-server	Yes

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Ordering data

	Article No.
TIM 4R-IE communications module With two combined RS 232/RS 485 interfaces for SINAUT communication via conventional WANs and two RJ45 interfaces for SINAUT communication via IP-based networks (WAN or LAN)	**6NH7800-4BA00**
Accessories	
SINAUT Engineering Software V5.5 + SP3 On DVD, comprising • SINAUT ST7 Engineering Software V5.5 + SP3 for the PG • SINAUT TD7 block library • Electronic manual in German and English	**6NH7997-0CA55-0AA0**
SINAUT ST7 Engineering Software Update from Version V5.0x to V5.5 SINAUT Engineering Software V5.5 upgrade; for owners of SINAUT Engineering Software Version V5.0 or higher	**6NH7997-0CA55-0GA0**
Backup battery 3.6 V/2.3 Ah for TIM 4R-IE	**6ES7971-0BA00**
IE FC TP Standard Cable GP 2 x 2 (Type A) 4-wire, shielded TP installation cable for connecting to IE FC RJ45 outlet/IE FC RJ45 plug; PROFINET-compatible; with UL approval Sold by the meter; Max. delivery unit 1 000 m, minimum order quantity 20 m	**6XV1840-2AH10**
IE FC RJ45 plug 180 RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface	
• 1 pack = 1 unit	**6GK1901-1BB10-2AA0**
• 1 pack = 10 units	**6GK1901-1BB10-2AB0**
• 1 pack = 50 units	**6GK1901-1BB10-2AE0**

	Article No.
IE FC Stripping Tool Pre-adjusted stripping tool for fast stripping of Industrial Ethernet FC cables	**6GK1901-1GA00**
Connecting cable For connecting a TIM (RS 232) with a SINAUT ST7 MD2, MD3 or MD4 (RS 232) modem; cable length 1.5 m	**6NH7701-4AL**
Connecting cable For connecting a TIM (RS 232) with the GSM modem MD720-3; also suitable for third-party modems or radio units with standard RS 232 interface Cable length 2.5 m	**6NH7701-5AN**
Connecting cable With one end open for connecting a TIM (RS 232) to a third-party modem or radio unit (RS 232); cable length 2.5 m	**6NH7701-4BN**
Connecting cable For connecting two TIM modules via their RS 232 interface without modems ("null modem") Cable length 6 m	**6NH7701-0AR**
SITOP compact 24 V/0.6 A 1-phase power supply with wide-range input 85 … 264 V AC/110 … 300 V DC, stabilized output voltage 24 V, rated output current value 0.6 A, slim design	**6EP1331-5BA00**

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TIM 3V-IE DNP3 (for S7-300)

Overview



In a station for the S7-CPU, the new communication module TIM 3V-IE DNP3 V3.0 (TeleControl Interface Module) handles the data exchange with the assigned master system SIMATIC PCS 7 TeleControl V8.0 using the open DNP3 protocol. In addition, the V3.0 module now also supports master and node functionality.

- With the S7-300 housing, the module can be fully integrated into the S7-300 system
- The module has an RS232 interface for the connection of an external modem for data transmission via a conventional WAN or the connection of a Modbus RTU slave to an S7-300 system
- The RJ45 port is used for data transmission via IP-based networks

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Technical specifications

Article number	**6NH7803-3BA00-0AA0**
Product type designation	TIM 3V-IE DNP3
Transmission rate	
Transfer rate	
• for Industrial Ethernet	10 ... 100 Mbit/s
• acc. to RS 232	9 600 ... 38 400 bit/s
Interfaces	
Number of interfaces acc. to Industrial Ethernet	1
Number of electrical connections	
• for external data transmission acc. to RS 232	1
• for power supply	1
Type of electrical connection	
• of Industrial Ethernet interface	RJ45 port
• at interface 1 for external data transmission	9 pin Sub-D-connector (RS232)
• for power supply	2-pole plugable terminal block
design of the removable storage C-PLUG	No
Supply voltage, current consumption, power loss	
Type of voltage of the supply voltage	DC
Supply voltage	24 V
Supply voltage	20.4 ... 28.8 V
Supply voltage external at DC Rated value	24 V
Supply voltage external at DC rated value	20.4 ... 28.8 V
Consumed current	
• from backplane bus at DC at 24 V maximum	0.2 A
• from external supply voltage at DC at 24 V maximum	0.2 A
Power loss [W]	5.8 W
Product extension optional Backup battery	No

Article number	**6NH7803-3BA00-0AA0**
Product type designation	TIM 3V-IE DNP3
Permitted ambient conditions	
Ambient temperature	
• during operation	0 ... 60 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
Relative humidity at 25 °C without condensation during operation maximum	95 %
Protection class IP	IP20
Design, dimensions and weight	
Module format	Compact module S7-300 single width
Width	40 mm
Height	125 mm
Depth	120 mm
Net weight	0.25 kg
Product properties, functions, components general	
Number of units	
• Note	Number of TIMs per S7-300: 1
Wire length	
• with RS 232 interface maximum	6 m
Performance data S7 communication	
Number of possible connections for S7 communication	
• maximum	3
• with PG connections maximum	2
• with OP connections maximum	1
• Note	only via LAN
Service	
• PG/OP communication	Yes

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Technical specifications (continued)

Article number	**6NH7803-3BA00-0AA0**
Product type designation	TIM 3V-IE DNP3
Performance data telecontrol	
Suitability for use	
• Node station	Yes
• substation	Yes
• TIM control center	Yes
Protocol is supported	
• DNP3	Yes
• SINAUT ST1 protocol	No
• SINAUT ST7 protocol	No
• Modbus RTU	Yes
Product function data buffering if connection is aborted	Yes; 64,000 data points with one master
Number of DNP3 masters	
• for Ethernet maximum	8
• with RS 232 interface maximum	1
Number of Modbus RTU slaves maximum	1

Article number	**6NH7803-3BA00-0AA0**
Product type designation	TIM 3V-IE DNP3
Product functions management, configuration	
Configuration software	
• required	SINAUT ST7 ES
Storage location of TIM configuration data	on the CPU or TIM

Ordering data

	Article No.
TIM 3V-IE DNP3 communications module With an RS 232 interface for SINAUT communication via a conventional WAN and an IP-based network (WAN or LAN)	**6NH7803-3BA00-0AA0**
SINAUT Engineering Software V5.5 + SP3 On DVD, comprising • SINAUT ST7 Engineering Software V5.5 for the PG • SINAUT TD7 block library • Electronic manual in German and English	**6NH7997-0CA55-0AA0**
SINAUT ST7 Engineering Software Update from Version V5.0x to V5.5 SINAUT Engineering Software V5.5 upgrade; for owners of SINAUT Engineering Software Version V5.0 or higher	**6NH7997-0CA55-0GA0**
Accessories	
IE FC TP Standard Cable GP 2 x 2 (Type A) 4-wire, shielded TP installation cable for connecting to IE FC RJ45 outlet/IE FC RJ45 plug; PROFINET-compatible; with UL approval Sold by the meter; Max. delivery unit 1 000 m, minimum order quantity 20 m	**6XV1840-2AH10**

	Article No.
IE FC RJ45 plug 180 RJ45 plug connector for Industrial Ethernet with a rugged metal housing and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface	
• 1 pack = 1 unit	**6GK1901-1BB10-2AA0**
• 1 pack = 10 units	**6GK1901-1BB10-2AB0**
• 1 pack = 50 units	**6GK1901-1BB10-2AE0**
IE FC Stripping Tool Pre-adjusted stripping tool for fast stripping of Industrial Ethernet FC cables	**6GK1901-1GA00**
Connecting cable For connecting a TIM (RS 232) with a SINAUT ST7 MD2, MD3 or MD4 (RS 232) modem Cable length 1.5 m	**6NH7701-4AL**
Connecting cable For connecting a TIM (RS 232) with the GSM modem MD720-3; also suitable for third-party modems or radio units with standard RS 232 interface Cable length 2.5 m	**6NH7701-5AN**
Connecting cable With one end open for connecting a TIM (RS 232) to a third-party modem or radio unit (RS 232) Cable length 2.5 m	**6NH7701-4BN**
Connecting cable For connecting two TIM modules via their RS 232 interface without modems ("null modem") Cable length 6 m	**6NH7701-0AR**

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TIM 4R-IE DNP3 (for S7-300/-400)

Overview



In a station for the S7-CPU, the communication module TIM 4R-IE DNP3 (TeleControl Interface Modul) handles the data exchange with the assigned SIMATIC PCS7 TeleControl V8.0 master system using the open DNP3 protocol. In addition, the V3.0 module now also supports master and node functionality.

- With the double-width S7-300 housing, the module can be fully integrated into the S7-300 system
- Can be connected as a stand-alone module to a SIMATIC S7-400 and SIMATIC S7-400 H System
- Two RS 232/RS 485 interfaces support connection of an external modem for data transmission via a conventional WAN or of a Modbus RTU slave to an S7-300 system
- The module has two RJ45 interfaces for data transmission via IP-based networks
- By using physically separate connection paths, the module permits media redundancy without loss of data during the switchover

Technical specifications

Article number	**6NH7803-4BA00-0AA0**
Product type designation	TIM 4R-IE DNP3
Transmission rate	
Transfer rate	
• for Industrial Ethernet	10 ... 100 Mbit/s
• acc. to RS 232	9 600 ... 115 200 bit/s
Interfaces	
Number of interfaces acc. to Industrial Ethernet	2
Number of electrical connections	
• for external data transmission acc. to RS 232	2
• for power supply	1
Type of electrical connection	
• of Industrial Ethernet interface	RJ45 port
• at interface 1 for external data transmission	9 pin Sub-D-connector, RS232 switchable to RS485
• at interface 2 for external data transmission	9-pole D-sub connector, RS232 can be switched to RS485
• for power supply	2-pole plugable terminal block
design of the removable storage C-PLUG	Yes
Supply voltage, current consumption, power loss	
Type of voltage of the supply voltage	DC
Supply voltage	24 V
Supply voltage	20.4 ... 28.8 V
Supply voltage external at DC Rated value	24 V
Supply voltage external at DC rated value	20.4 ... 28.8 V
Consumed current	
• from backplane bus at DC at 24 V maximum	0.2 A
• from external supply voltage at DC at 24 V maximum	0.17 A
Power loss [W]	4.6 W
Product extension optional Backup battery	Yes
Type of battery	Lithium AA / 3.6 V / 2.3 Ah
Backup current	
• typical	100 µA
• maximum	160 µA

Article number	**6NH7803-4BA00-0AA0**
Product type designation	TIM 4R-IE DNP3
Permitted ambient conditions	
Ambient temperature	
• during operation	0 ... 60 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
Relative humidity at 25 °C without condensation during operation maximum	95 %
Protection class IP	IP20
Design, dimensions and weight	
Module format	Compact module S7-300 double width
Width	80 mm
Height	125 mm
Depth	120 mm
Net weight	0.4 kg
Product properties, functions, components general	
Number of units	
• Note	Number of TIMs per S7-300 / S7-400: 1
Wire length	
• with RS 232 interface maximum	6 m
• with RS 485 interface maximum	30 m
Performance data S7 communication	
Number of possible connections for S7 communication	
• maximum	5
• with PG connections maximum	2
• with OP connections maximum	1
• Note	only via LAN
Service	
• PG/OP communication	Yes

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Technical specifications (continued)

Article number	6NH7803-4BA00-0AA0
Product type designation	TIM 4R-IE DNP3
Performance data telecontrol	
Suitability for use	
• Node station	Yes
• substation	Yes
• TIM control center	Yes
Protocol is supported	
• DNP3	Yes
• SINAUT ST1 protocol	No
• SINAUT ST7 protocol	No
• Modbus RTU	Yes
Product function data buffering if connection is aborted	Yes; 200,000 data points with one master
Number of DNP3 masters	
• for Ethernet maximum	8
• with RS 232 interface maximum	1
Number of Modbus RTU slaves maximum	1

Article number	6NH7803-4BA00-0AA0
Product type designation	TIM 4R-IE DNP3
Product functions management, configuration	
Configuration software	
• required	SINAUT ST7 ES
Storage location of TIM configuration data	on the CPU or TIM
Product functions Time	
Product component Hardware real-time clock	Yes
Product feature Hardware real-time clock w. battery backup	Yes
Accuracy of the hardware real-time clock per day maximum	4 s
time synchronization	
• from NTP-server	Yes

Ordering data

	Article No.
TIM 4R-IE DNP3 communications module With two combined RS 232/RS 485 interfaces for SINAUT communication via conventional WANs and two RJ45 interfaces for SINAUT communication via IP-based networks (WAN or LAN)	**6NH7803-4BA00-0AA0**
Accessories	
SINAUT Engineering Software V5.5 + SP3 On DVD, comprising • SINAUT ST7 Engineering Software V5.5 + SP3 for the PG • SINAUT TD7 block library • Electronic manual in German and English	**6NH7997-0CA55-0AA0**
SINAUT ST7 Engineering Software Update from Version V5.0x to V5.5 SINAUT Engineering Software V5.5 upgrade; for owners of SINAUT Engineering Software Version V5.0 or higher	**6NH7997-0CA55-0GA0**
Backup battery 3.6 V/2.3 Ah for TIM 4R-IE DNP3	**6ES7971-0BA00**
IE FC TP Standard Cable GP 2 x 2 (Type A) 4-wire, shielded TP installation cable for connecting to IE FC RJ45 outlet/IE FC RJ45 plug; PROFINET-compatible; with UL approval; sold by the meter; Max. delivery unit 1 000 m, minimum order quantity 20 m	**6XV1840-2AH10**
IE FC RJ45 plug 180 RJ45 plug connector for Industrial Ethernet with a rugged metal housing and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface	
• 1 pack = 1 unit	**6GK1901-1BB10-2AA0**
• 1 pack = 10 units	**6GK1901-1BB10-2AB0**
• 1 pack = 50 units	**6GK1901-1BB10-2AE0**

	Article No.
IE FC Stripping Tool Pre-adjusted stripping tool for fast stripping of Industrial Ethernet FC cables	**6GK1901-1GA00**
Connecting cable For connecting a TIM (RS 232) with a SINAUT ST7 MD2, MD3 or MD4 (RS 232) modem Cable length 1.5 m	**6NH7701-4AL**
Connecting cable For connecting a TIM (RS 232) with the GSM modem MD720-3; also suitable for third-party modems or radio units with standard RS 232 interface Cable length 2.5 m	**6NH7701-5AN**
Connecting cable With one end open for connecting a TIM (RS 232) to a third-party modem or radio unit (RS 232) Cable length 2.5 m	**6NH7701-4BN**
Connecting cable For connecting two TIM modules via their RS 232 interface without modems ("null modem") Cable length 6 m	**6NH7701-0AR**
SITOP compact 24 V/0.6 A 1-phase power supply with wide-range input 85 to 264 V AC/ 110 to 300 V DC, stabilized output voltage 24 V, rated output current value 0.6 A, slim design	**6EP1331-5BA00**

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ASM 475

Overview



The ASM 475 is a powerful communication module for connecting the SIMATIC RF200, RF300, SIMATIC MV400 and SIMATIC MV500 identifications systems to the S7-300 und ET 200M.

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Technical specifications

Article number	**6GT2002-0GA10**
Product type designation	ASM 475 communication module
Suitability for operation	SIMATIC S7-300, ET200M together with RF200/300/600, MV400, MOBY D/E/I/U
Transmission rate	
Transfer rate at the point-to-point connection serial maximum	115.2 kbit/s
Interfaces	
Design of the interface for point-to-point connection	RS422
Number of readers connectable	2
Type of electrical connection	
• of the backplane bus	S7-300 backplane bus
• of the PROFIBUS interface	(according to the head module)
• of Industrial Ethernet interface	(according to the head module)
• for supply voltage	Screw-type or spring-loaded terminals
Design of the interface to the reader for communication	Screw-type or spring-loaded terminals
Mechanical data	
Material	Noryl
Color	anthracite
Supply voltage, current consumption, power loss	
Supply voltage	
• at DC Rated value	24 V
• at DC	20 ... 30 V
Consumed current at DC at 24 V	
• without connected devices typical	0.1 A
• with connected devices maximum	1 A

Article number	**6GT2002-0GA10**
Product type designation	ASM 475 communication module
Permitted ambient conditions	
Ambient temperature	
• during operation	0 ... 60 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
Protection class IP	IP20
Shock resistance	According to IEC 61131-2
Shock acceleration	150 m/s²
Vibrational acceleration	10 m/s²
Design, dimensions and weight	
Width	40 mm
Height	125 mm
Depth	120 mm
Net weight	0.2 kg
Mounting type	S7-300 rack
Wire length for RS 422 interface maximum	1 000 m
Product properties, functions, components general	
Display version	4 LEDs per reader connection, 2 LEDs for device status
Product function transponder file handler can be addressed	Yes
Protocol is supported	
• S7 communication	Yes
Type of parameterization	Object manager, GSD
Type of programming	FB 45, FB 55, FC 56 (FC 45/55 with limited functionality)
Type of computer-mediated communication	acyclic communication
Standards, specifications, approvals	
Certificate of suitability	CE, FCC, UL/CSA
Accessories	
accessories	Front connector with screw-type or spring-loaded terminals

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Ordering data

	Article No.
ASM 475 communication module For SIMATIC S7-300 and ET 200M, parameterizable	**6GT2002-0GA10**
Accessories	
Front connector (1 x per ASM 475)	
• with screw terminals	**6ES7392-1AJ00-0AA0**
• with spring-loaded terminals	**6ES7392-1BJ00-0AA0**
Shield connecting element (80 mm wide for 2 x ASM 475)	**6ES7390-5AA00-0AA0**
Shield connection clamp (1 x per reader cable)	**6ES7390-5BA00-0AA0**

	Article No.
Extension cable SIMATIC RF200 / RF300 / RF600 / MV400, PUR material, suitable for cable carriers, straight connector	
2 m	**6GT2891-4FH20**
5 m	**6GT2891-4FH50**
10 m	**6GT2891-4FN10**
20 m	**6GT2891-4FN20**
50 m	**6GT2891-4FN50**
SIMATIC RF200 / RF300 / RF600 / MV400 connecting cable Pre-assembled, between the ASM 475 and RF200 / RF300 / RF600 / MV400, IP65, straight connector, PUR material, suitable for cable carriers, in the following lengths[1]:	
2 m	**6GT2891-4EH20**
5 m	**6GT2891-4EH50**
DVD "RFID Systems Software & Documentation"	**6GT2080-2AA20**

[1] The connecting cables can be extended using RF300 connecting cables of type 6GT2891-4Fxxx. These connecting cables are available in the lengths 2 m, 5 m, 10 m, 20 m and 50 m.

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SIPLUS S7-300 CP 340

Overview



- The low-cost, complete solution for serial communication over a point-to-point connection
- RS 232C (V.24) and RS 422/485 (X.27)
- Implemented protocols:
  - ASCII
  - 3964 (R) (not for RS 485)
  - Printer driver
- Simple parameterization using tool integrated in STEP 7

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

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Technical specifications

Article number	**6AG1340-1AH02-2AE0**	**6AG1340-1AH02-2AY0**	**6AG1340-1CH02-2AE0**
Based on	**6ES7340-1AH02-0AE0**	**6ES7340-1AH02-0AE0**	**6ES7340-1CH02-0AE0**
	SIPLUS S7-300 CP340 RS232	SIPLUS S7-300 CP340 RS232 EN50155	SIPLUS S7-300 CP340 RS422/485
Ambient conditions			
Ambient temperature during operation			
• min.	-25 °C; = Tmin	-25 °C; = Tmin	-25 °C; = Tmin
• max.	70 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use	60 °C; = Tmax; the rated temperature range of -25 ... +55 °C (T1) applies for the use on railway vehicles according to EN50155	60 °C; = Tmax
Ambient temperature during storage/transportation			
• min.	-40 °C	-40 °C	-40 °C
• max.	70 °C	70 °C	70 °C
Altitude during operation relating to sea level			
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m

• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at
	1 140 hPa ... 795 hPa
	(-1 000 m ... +2 000 m) //
	Tmin ... (Tmax - 10 K) at
	795 hPa ... 658 hPa
	(+2 000 m ... +3 500 m) //
	Tmin ... (Tmax -20 K) at
	658 hPa ... 540 hPa
	(+3 500 m ... +5 000 m)
		Tmin ... Tmax at
		1 140 hPa ... 795 hPa
		(-1 000 m ... +2 000 m) //
		Tmin ... (Tmax - 10 K) at
		795 hPa ... 658 hPa
		(+2 000 m ... +3 500 m) //
		Tmin ... (Tmax -20 K) at
		658 hPa ... 540 hPa
		(+3 500 m ... +5 000 m)
			Tmin ... Tmax at
			1 140 hPa ... 795 hPa
			(-1 000 m ... +2 000 m) //
			Tmin ... (Tmax - 10 K) at
			795 hPa ... 658 hPa
			(+2 000 m ... +3 500 m) //
			Tmin ... (Tmax -20 K) at
			658 hPa ... 540 hPa
			(+3 500 m ... +5 000 m)

Relative humidity			
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance			
Use in stationary industrial systems			
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *

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Technical specifications (continued)

Article number	**6AG1340-1AH02-2AE0**	**6AG1340-1AH02-2AY0**	**6AG1340-1CH02-2AE0**
Based on	**6ES7340-1AH02-0AE0**	**6ES7340-1AH02-0AE0**	**6ES7340-1CH02-0AE0**
	SIPLUS S7-300 CP340 RS232	SIPLUS S7-300 CP340 RS232 EN50155	SIPLUS S7-300 CP340 RS422/485
Use on land craft, rail vehicles and special-purpose vehicles			
- to biologically active substances according to EN 60721-3-5		Yes; Class 5B2 mold, fungus and dry rot spores (with the exception of fauna); Class 5B3 on request	
- to chemically active substances according to EN 60721-3-5		Yes; Class 5C3 (RH < 75 %) incl. salt spray acc. to EN 50155 (ST2); *	
- to mechanically active substances according to EN 60721-3-5		Yes; Class 5S3 incl. sand, dust; *	
Use on ships/at sea			
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request		Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *		Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *		Yes; Class 6S3 incl. sand, dust; *
Remark			
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!

Ordering data

	Article No.
SIPLUS S7-300 CP 340 communications processor	
For industrial applications with extended ambient conditions	
Extended temperature range and exposure to media	
with 1 RS 232C interface (V.24)	**6AG1340-1AH02-2AE0**
with 1 RS 422/485 (X.27) interface	**6AG1340-1CH02-2AE0**
For rolling stock railway applications	
Conforms to EN 50155	
with 1 RS 232C interface (V.24)	**6AG1340-1AH02-2AY0**

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SIPLUS S7-300 CP 341

Overview



- For fast, high-performance serial data exchange via point-to-point coupling
- Two versions with different physical transmission characteristics:
  - RS 232C (V.24),
  - RS 422/RS 485 (X.27)
- Implemented protocols: ASCII, 3964 (R), RK 512, customized protocols (can be reloaded)
- Simple parameter assignment using tool integrated in STEP 7

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

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Technical specifications

Article number	**6AG1341-1AH02-7AE0**	**6AG1341-1CH02-7AE0**
Based on	**6ES7341-1AH02-0AE0**	**6ES7341-1CH02-0AE0**
	SIPLUS S7-300 CP341 RS232C	SIPLUS S7-300 CP341 RS422/485
Ambient conditions		
Ambient temperature during operation		
• min.	-25 °C; = Tmin	-25 °C; = Tmin
• max.	70 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use	70 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use
Ambient temperature during storage/transportation		
• min.	-40 °C	-40 °C
• max.	70 °C	70 °C
Altitude during operation relating to sea level		
• Installation altitude above sea level, max.	5 000 m	5 000 m

• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at
	1 140 hPa ... 795 hPa
	(-1 000 m ... +2 000 m) //
	Tmin ... (Tmax - 10 K) at
	795 hPa ... 658 hPa
	(+2 000 m ... +3 500 m) //
	Tmin ... (Tmax -20 K) at
	658 hPa ... 540 hPa
	(+3 500 m ... +5 000 m)
		Tmin ... Tmax at
		1 140 hPa ... 795 hPa
		(-1 000 m ... +2 000 m) //
		Tmin ... (Tmax - 10 K) at
		795 hPa ... 658 hPa
		(+2 000 m ... +3 500 m) //
		Tmin ... (Tmax -20 K) at
		658 hPa ... 540 hPa
		(+3 500 m ... +5 000 m)

Relative humidity		
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance		
Use in stationary industrial systems		
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
Use on ships/at sea		
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Remark		
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!

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Ordering data

	Article No.
SIPLUS S7-300 CP 341 communications processor	
For industrial applications with extended ambient conditions	
Extended temperature range and exposure to media	
with RS 232C interface (V.24)	**6AG1341-1AH02-7AE0**
with RS 422/485 (X.27) interface	**6AG1341-1CH02-7AE0**
Accessories	
Modbus Master V3.1	
Task: Communication via Modbus protocol with RTU format, SIMATIC S7 as master Requirement: CP 341 or CP 441-2; STEP 7 V4.02 and higher Delivery package: Driver program/documentation, English, German, French	
Single license	**6ES7870-1AA01-0YA0**
Single license, without software and documentation	**6ES7870-1AA01-0YA1**

	Article No.
Modbus Slave V3.1	
Task: Communication via Modbus protocol with RTU format, SIMATIC S7 as slave Requirement: CP 341 or CP 441-2; STEP 7 V4.02 and higher Delivery package: Driver program/documentation, English, German, French	
Single license	**6ES7870-1AB01-0YA0**
Single license, without software and documentation	**6ES7870-1AB01-0YA1**

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SIPLUS S7-300 CP 343-1 Lean

Overview



ISO	TCP/ UDP	PN	MRP	IT	IP-R	PG/OP	S7/S5
	●	●	●			●	●

- Connection for the SIMATIC S7-300 to Industrial Ethernet (not for SINUMERIK)
  - 2 x RJ45 interface for 10/100 Mbps full/half duplex connection (with autosensing for automatic switchover and autocrossover function)
  - Integral 2-port real-time switch ERTEC
  - Multi-protocol operation with TCP and UDP transport protocol and PROFINET IO
  - Keep Alive function
- Communications services:
  - Open communication (TCP/IP and UDP)
  - PG/OP communication
  - S7 communication (server)
  - PROFINET IO device
- Multicast for UDP
- Remote programming and initial commissioning is possible over Industrial Ethernet
- IT communication
  - Web function
- Integration into network management through SNMP
- Configuration with STEP 7
- Cross-network PG/OP communication by means of S7 routing
- Diagnostics possibilities in STEP 7 and via web browser

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

SIPLUS S7-300 CP 343-1 Lean		
Article No.	**6AG1343-1CX10-2XE0**	**6AG1343-1CX10-4XE0**
BasedOn article no.	**6GK7343-1CX10-0XE0**	**6GK7343-1CX10-0XE0**
Ambient temperature range	-25 ... +60 °C	0 ... +60 °C
Conformal coating	Coating of the printed circuit boards and the electronic components	
Technical data	The technical data of the standard product applies except for the ambient conditions.	
Ambient conditions		
Relative humidity	100%, condensation/frost permissible. No commissioning if condensation present.	
Biologically active substances, compliance with EN 60721-3-3	Class 3B2 mold and fungal spores (excluding fauna). The supplied plug covers must remain in place over the unused interfaces during operation!	
Chemically active substances, compliance with EN 60721-3-3	Class 3C4 incl. salt spray in accordance with EN60068-2-52 (degree of severity 3). The supplied plug covers must remain in place over the unused interfaces during operation!	
Mechanically active substances, compliance with EN 60721-3-3	Class 3S4 incl. sand, dust. The supplied plug covers must remain in place over the unused interfaces during operation!	
Air pressure (depending on the highest positive temperature range specified)	1 080 ... 795 hPa (-1 000 ... +2 000 m) see ambient temperature range 795 ... 658 hPa (+2 000 ... +3 500 m) derating 10 K 658 ... 540 hPa (+3 500 ... +5 000 m) derating 20 K	

For technical documentation on SIPLUS, see:

http://www.siemens.com/siplus-extreme

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Ordering data

	Article No.
SIPLUS CP 343-1 Lean communications processor	
For connecting SIMATIC S7-300 to Industrial Ethernet through TCP/IP and UDP, Multicast, S7 communication, open communication (SEND/RECEIVE), FETCH/WRITE, PROFINET IO device, integral 2-port switch ERTEC, comprehensive diagnostics facilities, module replacement without PG, SNMP, initial commissioning over LAN; with electronic manual on CD-ROM	
For industrial applications with extended ambient conditions	
Extended temperature range and exposure to environmental substances	**6AG1343-1CX10-2XE0**
Accessories	
Consumables	
IE FC RJ45 plug 180	
(Extended temperature range and exposure to environmental substances)	
180° cable outlet	
• 1 unit	**6AG1901-1BB10-7AA0**
IE FC TP Standard Cable GP 2 x 2 (Type A)	**6XV1840-2AH10**
4-wire, shielded TP installation cable for connecting to IE FC RJ45 outlet/IE FC RJ45 plug; PROFINET-compliant; with UL approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	
IE FC stripping tool	**6GK1901-1GA00**
Preadjusted stripping tool for fast stripping of Industrial Ethernet FC cables	
Programming tools	
STEP 7 Version 5.6	See Chapter 11
STEP 7 Professional V15	See Chapter 11
SOFTNET S7 for Industrial Ethernet	See Catalog IK PI
Software for S7 and open communication, incl. OPC server, PG/OP communication, and NCM PC/STEP 7 Professional V12, runtime software, software and electronic manual on CD-ROM, license key on USB flash drive, Class A	

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SIPLUS S7-300 CP 343-1

Overview



ISO	TCP/ UDP	PN	MRP	IT	IP-R	PG/OP	S7/S5
●	●	●	●			●	●

- The connection of SIMATIC S7-300/SINUMERIK 840D powerline to Industrial Ethernet
  - 2 x RJ45 interface for 10/100 Mbps full/half-duplex connection with autosensing/autonegotiation and autocrossover function
  - Integrated 2-port real-time switch ERTEC
  - Multi-protocol operation with ISO, TCP, UDP transport protocol and PROFINET IO
  - Adjustable keep-alive function
- Communications services:
  - Open communication (ISO, TCP/IP, and UDP)
  - PROFINET IO controller or PROFINET IO device
  - PG/OP communication: Cross-network by means of S7 routing
  - S7 communication (client, server, multiplexing)
- Media redundancy (MRP);
  within an Ethernet network with ring topology, the CP supports the media redundancy procedure MRP (V2.2 or higher).
- Multicast for UDP
- IP address assignment via DHCP, simple PC tool or via the user program (e.g. HMI)
- Access protection via configurable access list
- Remote programming and commissioning via Industrial Ethernet
- Configuration with STEP 7
- Automatic setting of CPU clock setting over Ethernet with NTP or SIMATIC procedure
- Web diagnostics
- Integration in network management systems via SNMP (MIB2 diagnostics information)
- Diagnostics possibilities in STEP 7 and via web browser

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

SIPLUS CP 343-1	
Article No.	**6AG1343-1EX30-7XE0**
BasedOn Article No.	**6GK7343-1EX30-0XE0**
Ambient temperature range	-25 ... +70 °C; 60 °C @ UL/cUL, ATEX and FM use
Conformal coating	Coating of the printed circuit boards and the electronic components
Technical data	The technical data of the standard product applies except for the ambient conditions.
Ambient conditions	
Relative humidity	100%, condensation/frost permissible. No commissioning if condensation present.
Biologically active substances, compliance with EN 60721-3-3	Class 3B2 mold and fungal spores (excluding fauna). The supplied plug covers must remain in place over the unused interfaces during operation!
Chemically active substances, compliance with EN 60721-3-3	Class 3C4 incl. salt spray in accordance with EN60068-2-52 (degree of severity 3). The supplied plug covers must remain in place over the unused interfaces during operation!
Mechanically active substances, compliance with EN 60721-3-3	Class 3S4 incl. sand, dust. The supplied plug covers must remain in place over the unused interfaces during operation!
Air pressure (depending on the highest positive temperature range specified)	1 080 ... 795 hPa (-1 000 ... +2 000 m) see ambient temperature range 795 ... 658 hPa (+2 000 ... +3 500 m) derating 10 K 658 ... 540 hPa (+3 500 ... +5 000 m) derating 20 K

For further technical documentation on SIPLUS, see:

http://www.siemens.com/siplus-extreme

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Ordering data	Article No.
SIPLUS S7-300 CP 343-1 communications processor For connection of SIMATIC S7-300 to Industrial Ethernet over ISO and TCP/IP; PROFINET IO controller or PROFINET IO device, MRP, integrated 2-port switch ERTEC; S7 communication, open communication (SEND/RECEIVE), FETCH/WRITE, with and without RFC 1006, multicast, DHCP, CPU clock synchronization via SIMATIC procedure and NTP, diagnostics, SNMP, access protection through IP access list, initialization over LAN 10/100 Mbps; with electronic manual on DVD	
For industrial applications with extended ambient conditions	
Extended temperature range and exposure to environmental substances	**6AG1343-1EX30-7XE0**
Accessories	
Consumables	
IE FC RJ45 plug 180 (Extended temperature range and exposure to environmental substances) 180° cable outlet	
• 1 unit	**6AG1901-1BB10-7AA0**
C-PLUG Swap medium for simple replacement of devices in the event of a fault; for storing configuration or engineering and application data; can be used for SIMATIC NET products with C-PLUG slot, -40 ... +70 °C, medial exposure	**6AG1900-0AB00-7AA0**
IE FC TP Standard Cable GP 2 x 2 (Type A) 4-wire, shielded TP installation cable for connecting to IE FC RJ45 outlet/IE FC RJ45 plug; PROFINET-compliant; with UL approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	**6XV1840-2AH10**
IE FC stripping tool Preadjusted stripping tool for fast stripping of Industrial Ethernet FC cables	**6GK1901-1GA00**

	Article No.
Communication within the application	
SIPLUS SCALANCE X-200 Industrial Ethernet Switches Industrial Ethernet switches with integral SNMP access, online diagnostics, copper cable diagnostics and PROFINET diagnostics for configuring line, star and ring topologies; with integrated redundancy manager (exception: SCALANCE X208PRO); incl. operating instructions, Industrial Ethernet network manual and configuration software on CD-ROM	
• With electrical and optical ports for glass multimode FOC up to 3 km • Extended temperature range and exposure to media • **SIPLUS SCALANCE X204-2** with four 10/100 Mbps RJ45 ports and two FO ports	**6AG1204-2BB10-4AA3**
Programming tools	
STEP 7 Version 5.6	See Chapter 11
STEP 7 Professional V15.1	See Chapter 11
SOFTNET S7 for Industrial Ethernet Software for S7 and open communication, incl. OPC server, PG/OP communication, and NCM PC/STEP 7 Professional V12, runtime software, software and electronic manual on CD-ROM, license key on USB flash drive, Class A	See Catalog IK PI

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SIPLUS S7-300 CP 343-1 Advanced

Overview



ISO	TCP/ UDP	PN	MRP	IT	IP-R	PG/OP	S7/S5
●	●	●	●	●	●	●	●

- The connection of SIMATIC S7-300/SINUMERIK 840D powerline to Industrial Ethernet
  - Multi-protocol operation with TCP and UDP transport protocol
  - Adjustable keep-alive function
- Two separate interfaces (integrated network separation):
  - Gigabit interface with one RJ45 port with 10/100/1 000 Mbps, full/half-duplex with auto-sensing capability
  - PROFINET interface with two RJ45 ports with 10/100 Mbps full/half-duplex with auto-sensing and auto-crossover functionality via integrated 2-port switch
- Communications services via both interfaces:
  - Open communication (TCP/IP and UDP): Multicast with UDP, including routing between both interfaces
  - PG/OP communication:
    Cross-network by means of S7 routing
  - S7 communication (client, server, multiplexing) including routing between both interfaces
  - IT communication:
    HTTP communication supports access to process data via own web pages;
    e-mail client function, sending of e-mails directly from user program;
    FTP communication supports program-controlled FTP client communication;
    access to data blocks through FTP server
- Communications services via PROFINET interfaces:
  - PROFINET IO controller and IO device with real-time properties (RT and IRT)[1)]
  - PROFINET CBA
  - IP address assignment via DHCP, simple PC tool or via program block (e.g. for HMI)
  - Configuration with STEP 7
- Media redundancy (MRP);
  within an Ethernet network with ring topology, the CP supports the media redundancy procedure MRP (V2.2 or higher).
- Access protection by means of configurable IP access list
- Module replacement without programming device;
  all information is stored on the C-PLUG (also file system for IT functions)
- Extensive diagnostic functions for all modules in the rack
- IT communication
  - Web function
  - E-mail function
  - FTP
- Integration into network management systems through the support of SNMP V1 MIB-II

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

SIPLUS S7-300 CP 343-1 Advanced	
Article No.	**6AG1343-1GX31-4XE0**
BasedOn Article No.	**6GK7343-1GX31-0XE0**
Ambient temperature range	0 ... +60 °C
Conformal coating	Coating of the printed circuit boards and the electronic components
Technical data	The technical data of the standard product applies, except for the ambient conditions.
Ambient conditions	
Relative humidity	100%, condensation/frost permissible. No commissioning if condensation present.
Biologically active substances, compliance with EN 60721-3-3	Class 3B2 mold and fungal spores (excluding fauna). The supplied plug covers must remain in place over the unused interfaces during operation!
Chemically active substances, compliance with EN 60721-3-3	Class 3C4 incl. salt spray in accordance with EN60068-2-52 (degree of severity 3). The supplied plug covers must remain in place over the unused interfaces during operation!
Mechanically active substances, compliance with EN 60721-3-3	Class 3S4 incl. sand, dust. The supplied plug covers must remain in place over the unused interfaces during operation!
Air pressure (depending on the highest positive temperature range specified)	1080 ... 795 hPa (-1 000 ... +2 000 m) see ambient temperature range 795 ... 658 hPa (+2 000 ... +3 500 m) derating 10 K 658 ... 540 hPa (+3 500 ... +5 000 m) derating 20 K

For technical documentation on SIPLUS, see:

http://www.siemens.com/siplus-extreme

[1)] Possible combinations in parallel operation:
- IO controller with IRT and IO device with RT
- IO controller with RT and IO device with IRT

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Ordering data

	Article No.
SIPLUS S7-300 CP 343-1 Advanced communications processor for connecting the SIMATIC S7-300 to Industrial Ethernet, PROFINET IO controller and IO device with RT and IRT, MRP, PROFINET CBA, TCP/IP and UDP, S7 communication, open communication (SEND/RECEIVE), FETCH/WRITE with or without RFC 1006, diagnostics extensions, multicast, Web server, HTML diagnostics, FTP server, FTP client, e-mail client, CPU clock set via SIMATIC procedure and NTP, access control via IP access list, SNMP, DHCP, initialization over LAN 10/100 Mbps; with electronic manual on DVD; C-PLUG included	
For industrial applications with extended ambient conditions	
Exposure to media	**6AG1343-1GX31-4XE0**
Accessories	
Consumables	
IE FC RJ45 plug 180 (Extended temperature range and exposure to environmental substances) 180° cable outlet	
• 1 unit	**6AG1901-1BB10-7AA0**
C-PLUG Swap medium for simple replacement of devices in the event of a fault; for storing configuration or engineering and application data; can be used for SIMATIC NET products with C-PLUG slot, -40 ... +70 °C, medial exposure	**6AG1900-0AB00-7AA0**
IE FC TP Standard Cable GP 2 x 2 (Type A) 4-wire, shielded TP installation cable for connecting to IE FC RJ45 outlet/IE FC RJ45 plug; PROFINET-compliant; with UL approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	**6XV1840-2AH10**
IE FC TP Standard Cable GP 4 x 2 8-wire, shielded TP installation cable for universal applications; with UL approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	
• AWG22, for connecting to IE FC RJ45 Modular Outlet	**6XV1870-2E**
• AWG24, for connecting to IE FC RJ45 plug 4 x 2, IE FC M12 plug PRO 4 x 2	**6XV1878-2A**
IE FC stripping tool Preadjusted stripping tool for fast stripping of Industrial Ethernet FC cables	**6GK1901-1GA00**
Communication within the application	
SIPLUS SCALANCE X-200 Industrial Ethernet Switches Industrial Ethernet switches with integral SNMP access, online diagnostics, copper cable diagnostics and PROFINET diagnostics for configuring line, star and ring topologies; with integrated redundancy manager (exception: SCALANCE X208PRO); incl. operating instructions, Industrial Ethernet network manual and configuration software on CD-ROM	
• With electrical and optical ports for glass multimode FOC up to 3 km • Extended temperature range and exposure to media	
• SIPLUS SCALANCE X204-2 with four 10/100 Mbps RJ45 ports and two FO ports	**6AG1204-2BB10-4AA3**
Programming tools	
STEP 7 Version 5.6	See Chapter 11
STEP 7 Professional V15.1	See Chapter 11
SOFTNET S7 for Industrial Ethernet Software for S7 and open communication, incl. OPC server, PG/OP communication, and NCM PC/STEP 7 Professional V12, runtime software, software and electronic manual on CD-ROM, license key on USB flash drive, Class A	See Catalog IK PI
SIMATIC iMap	See Chapter 11

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SIPLUS TIM 3V-IE for WAN and Ethernet

Overview



- SINAUT communication module SIPLUS TIM for SIMATIC S7-300 for use in a wide area network (WAN)
- IP communication via secure VPN (virtual private network) using the Internet
- Wireless communication via GPRS router, GPRS modem, or radio devices
- Wired communication via Ethernet, DSL, dialup modems or dedicated line modem
- Complete migration of existing wireless, dedicated line and dial-up technology to IP-based network
- Message frame memory for seamless recording of data
- Simple configuration and operation without specialist IT knowledge

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were adopted from the respective standard products. SIPLUS extreme specific information was added.

SIPLUS TIM 3V-IE	
Article No.	**6AG1800-3BA00-7AA0**
Article No. based on	**6NH7800-3BA00**
Ambient temperature range	-25 … +70 °C; 60 °C @ UL/cUL, ATEX and FM use
Conformal coating	Coating of the printed circuit boards and the electronic components
Technical specifications	The technical data of the standard product applies except for the ambient conditions.
Ambient conditions	
Relative humidity	100%, condensation/frost permissible. No commissioning if condensation present.
Biologically active substances, compliance with EN 60721-3-3	Class 3B2 mold and fungal spores (excluding fauna). The supplied plug covers must remain in place over the unused interfaces during operation!
Chemically active substances, compliance with EN 60721-3-3	Class 3C4 incl. salt spray in accordance with EN60068-2-52 (degree of severity 3). The supplied plug covers must remain in place over the unused interfaces during operation!
Mechanically active substances, compliance with EN 60721-3-3	Class 3S4 incl. sand, dust. The supplied plug covers must remain in place over the unused interfaces during operation!
Air pressure (depending on the highest positive temperature range specified)	1080 ... 795 hPa (-1000 ... +2000 m) see ambient temperature range 795 ... 658 hPa (+2000 ... +3500 m) derating 10 K 658 ... 540 hPa (+3500 ... +5000 m) derating 20 K

Technical documentation on SIPLUS can be found here:
http://www.siemens.com/siplus-extreme

Ordering data

	Article No.
SIPLUS ST7 TIM 3V-IE communication module With an RS 232 interface for SINAUT communication via a conventional WAN or an IP-based network (WAN or LAN)	**6AG1800-3BA00-7AA0**
Accessories	
Consumables	
IE FC TP Standard Cable GP 2 x 2 (Type A) 4-wire, shielded TP installation cable for connecting to IE FC RJ45 outlet/IE FC RJ45 plug; PROFINET-compliant; with UL approval; sold by the meter; max. length 1000 m, minimum order quantity 20 m	**6XV1840-2AH10**
IE FC RJ45 plug 180 RJ45 plug connector for Industrial Ethernet with a rugged metal housing and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface	
• 1 pack = 1 unit, -40 ... +70 °C, exposure to media	**6AG1901-1BB10-7AA0**
IE FC Stripping Tool Preadjusted stripping tool for fast stripping of the Industrial Ethernet FC cables	**6GK1901-1GA00**

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Overview



- SINAUT communication module SIPLUS TIM with four interfaces for SIMATIC S7-300 or as a self-contained device for S7-400 for use in a wide area network (WAN)
- For universal use in a SINAUT station, node station and control center
- Internet communication via integrated MSC-VPN tunnel with direct connection to DSL router or operation via IPsec VPN with additional SIMATIC NET components
- Wireless communication via GPRS router, GPRS modem, or radio devices
- Wired communication via Ethernet, DSL, dialup modems or dedicated line modem
- Complete migration of existing wireless, dedicated line and dial-up technology to IP-based network
- Message frame memory for seamless recording of data and support of redundant communication paths
- Simple configuration and operation without specialist IT knowledge

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

SIPLUS TIM 4R-IE	
Article No.	**6AG1800-4BA00-7AA0**
Article No. based on	**6NH7800-4BA00**
Ambient temperature range	-25 ... +70 °C; 60 °C @ UL/cUL, ATEX and FM use
Conformal coating	Coating of the printed circuit boards and the electronic components
Technical specifications	The technical data of the standard product applies except for the ambient conditions.
Ambient conditions	
Relative humidity	100%, condensation/frost permissible. No commissioning if condensation present.
Biologically active substances, compliance with EN 60721-3-3	Class 3B2 mold and fungal spores (excluding fauna). The supplied plug covers must remain in place over the unused interfaces during operation!
Chemically active substances, compliance with EN 60721-3-3	Class 3C4 incl. salt spray in accordance with EN60068-2-52 (degree of severity 3). The supplied plug covers must remain in place over the unused interfaces during operation!
Mechanically active substances, compliance with EN 60721-3-3	Class 3S4 incl. sand, dust. The supplied plug covers must remain in place over the unused interfaces during operation!
Air pressure (depending on the highest positive temperature range specified)	1080 ... 795 hPa (-1000 ... +2000 m) see ambient temperature range 795 ... 658 hPa (+2000 ... +3500 m) derating 10 K 658 ... 540 hPa (+3500 ... +5000 m) derating 20 K

For technical documentation on SIPLUS, see:
http://www.siemens.com/siplus-extreme

Ordering data

	Article No.
SIPLUS ST7 TIM 4R-IE communication module With two combined RS 232/RS 485 interfaces for SINAUT communication via conventional WANs and two RJ45 interfaces for SINAUT communication via IP-based networks (WAN or LAN)	**6AG1800-4BA00-7AA0**
Accessories	
Consumables	
IE FC TP Standard Cable GP 2 x 2 (Type A) 4-wire, shielded TP installation cable for connecting to IE FC RJ45 outlet/IE FC RJ45 plug; PROFINET-compliant; with UL approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	**6XV1840-2AH10**
IE FC RJ45 plug 180 RJ45 plug connector for Industrial Ethernet with a rugged metal housing and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface	
• 1 pack = 1 unit; -40 ... +70 °C, exposure to media	**6AG1901-1BB10-7AA0**
IE FC Stripping Tool Preadjusted stripping tool for fast stripping of the Industrial Ethernet FC cables	**6GK1901-1GA00**

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SIPLUS TIM 3V-IE DNP3

Overview



In a station for the S7-CPU, the new SIPLUS communication module TIM 3V-IE DNP3 V3.0 (TeleControl Interface Module) handles the data exchange with the assigned master system SIMATIC PCS 7 TeleControl V8.0 using the open DNP3 protocol. In addition, the V3.0 module now also supports master and node functionality.

- With the S7-300 housing, the module can be fully integrated into the S7-300 system
- The module has an RS232 interface for the connection of an external modem for data transmission via a conventional WAN or the connection of a Modbus RTU slave to an S7-300 system
- The RJ45 port is used for data transmission via IP-based networks

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were adopted from the respective standard products. SIPLUS extreme specific information was added.

SIPLUS TIM 3V-IE	
Article No.	**6AG1803-3BA00-7AA0**
Article No. based on	**6NH7803-3BA00**
Ambient temperature range	-25 … +70 °C
Conformal coating	Coating of the printed circuit boards and the electronic components
Technical specifications	The technical specifications of the standard product apply except for the ambient conditions.
Ambient conditions	
Relative humidity	100%, condensation/frost permissible. No commissioning if condensation present.
Biologically active substances, compliance with EN 60721-3-3	Class 3B2 mold and fungal spores (excluding fauna). The supplied plug covers must remain in place over the unused interfaces during operation.
Chemically active substances, compliance with EN 60721-3-3	Class 3C4 incl. salt spray in accordance with EN60068-2-52 (degree of severity 3). The supplied plug covers must remain in place over the unused interfaces during operation.
Mechanically active substances, compliance with EN 60721-3-3	Class 3S4 incl. sand, dust. The supplied plug covers must remain in place over the unused interfaces during operation.
Air pressure (depending on the highest positive temperature range specified)	1 080 ... 795 hPa (-1 000 ... +2 000 m) see ambient temperature range 795 ... 658 hPa (+2 000 ... +3 500 m) derating 10 K 658 ... 540 hPa (+3 500 ... +5 000 m) derating 20 K

Technical documentation on SIPLUS can be found here:
http://www.siemens.com/siplus-extreme

Ordering data

	Article No.
SIPLUS TIM 3V-IE DNP3 communication module With an RS232 interface for SINAUT communication via a conventional WAN and an IP-based network (WAN or LAN)	**6AG1803-3BA00-7AA0**
Accessories	
Consumables	
IE FC TP Standard Cable GP 2 x 2 (Type A) 4-wire, shielded TP installation cable for connecting to IE FC RJ45 outlet/IE FC RJ45 plug; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	**6XV1840-2AH10**
IE FC RJ45 plug 180 RJ45 plug-in connector for Industrial Ethernet with a rugged metal housing and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface	
• 1 pack = 1 unit -40 ... +70 °C, medial exposure	**6AG1901-1BB10-7AA0**
IE FC Stripping Tool Preadjusted stripping tool for fast stripping of the Industrial Ethernet FC cables	**6GK1901-1GA00**

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Overview



In a station for the S7-CPU, the SIPLUS communication module TIM 4R-IE DNP3 (TeleControl Interface Module) handles the data exchange with the assigned SIMATIC PCS7 TeleControl V8.0 master system using the open DNP3 protocol. In addition, the V3.0 module now also supports master and node functionality.

- With the double-width S7-300 housing, the module can be fully integrated into the S7-300 system
- Can be connected as a stand-alone module to a SIMATIC S7-400 and SIMATIC S7-400 H System
- Two RS232/RS485 interfaces support connection of an external modem for data transmission via a conventional WAN or of a Modbus RTU slave to an S7-300 system
- The module has two RJ45 interfaces for data transmission via IP-based networks
- By using physically separate connection paths, the module permits media redundancy without loss of data during the switchover

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were adopted from the respective standard products. SIPLUS extreme specific information was added.

SIPLUS TIM 4R-IE DNP3	
Article No.	**6AG1803-4BA00-7AA0**
Article No. based on	**6NH7803-4BA00-0AA0**
Ambient temperature range	-25 … +70 °C
Conformal coating	Coating of the printed circuit boards and the electronic components
Technical specifications	The technical specifications of the standard product apply except for the ambient conditions.
Ambient conditions	
Relative humidity	100%, condensation/frost permissible. No commissioning if condensation present.
Biologically active substances, compliance with EN 60721-3-3	Class 3B2 mold and fungal spores (excluding fauna). The supplied plug covers must remain in place over the unused interfaces during operation.
Chemically active substances, compliance with EN 60721-3-3	Class 3C4 incl. salt spray in accordance with EN60068-2-52 (degree of severity 3). The supplied plug covers must remain in place over the unused interfaces during operation.
Mechanically active substances, compliance with EN 60721-3-3	Class 3S4 incl. sand, dust. The supplied plug covers must remain in place over the unused interfaces during operation.
Air pressure (depending on the highest positive temperature range specified)	1 080 ... 795 hPa (-1 000 ... +2 000 m) see ambient temperature range 795 ... 658 hPa (+2 000 ... +3 500 m) derating 10 K 658 ... 540 hPa (+3 500 ... +5 000 m) derating 20 K

Technical documentation on SIPLUS can be found here:
http://www.siemens.com/siplus-extreme

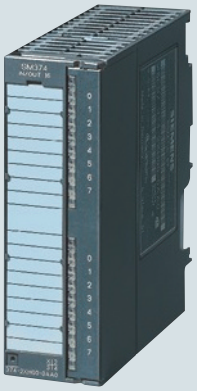
Ordering data

	Article No.
SIPLUS TIM 4R-IE DNP3 communication module With two combined RS 232/RS 485 interfaces for SINAUT communication via conventional WANs and two RJ45 interfaces for SINAUT communication via IP-based networks (WAN or LAN)	**6AG1803-4BA00-7AA0**
Accessories	
Consumables	
IE FC TP Standard Cable GP 2 x 2 (Type A) 4-wire, shielded TP installation cable for connecting to IE FC RJ45 outlet/IE FC RJ45 plug; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	**6XV1840-2AH10**
IE FC RJ45 plug 180 RJ45 plug-in connector for Industrial Ethernet with a rugged metal housing and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface	
• 1 pack = 1 unit -40 ... +70 °C, medial exposure	**6AG1901-1BB10-7AA0**
IE FC Stripping Tool Preadjusted stripping tool for fast stripping of the Industrial Ethernet FC cables	**6GK1901-1GA00**

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SM 374 simulator

Overview



- Simulator module for program testing during commissioning and ongoing operation
- For the simulation of sensor signals using switches
- For display of signal conditions on the outputs using LED
- Simulation of
  - 16 inputs or
  - 16 outputs or
  - 8 inputs and 8 outputs
- Function can be directly adjusted on the module using a screwdriver

5

Technical specifications

Article number	**6ES7374-2XH01-0AA0**
	SM 374 Simulation unit 16I/16O
General information	
Product type designation	SM 374
Input current	
from backplane bus 5 V DC, max.	80 mA
Power loss	
Power loss, typ.	0.35 W
Digital inputs	
Number of digital inputs	16; Switch
Digital outputs	
Number of digital outputs	16; LEDs

Article number	**6ES7374-2XH01-0AA0**
	SM 374 Simulation unit 16I/16O
Potential separation	
Potential separation digital inputs	
• between the channels and backplane bus	No
Potential separation digital outputs	
• between the channels and backplane bus	No
Dimensions	
Width	40 mm
Height	125 mm
Depth	120 mm
Weights	
Weight, approx.	190 g

Ordering data

	Article No.
SM 374 simulator module incl. bus connectors, labeling strips	**6ES7374-2XH01-0AA0**
Bus connectors 1 unit, spare part	**6ES7390-0AA00-0AA0**
Labeling strips 10 units (spare part)	**6ES7392-2XX00-0AA0**
Label cover 10 units (spare part)	**6ES7392-2XY00-0AA0**

	Article No.
Labeling sheets for machine inscription for modules with 20-pin front connector, DIN A4, for printing with laser printer; 10 units	
Petrol	**6ES7392-2AX00-0AA0**
Light beige	**6ES7392-2BX00-0AA0**
Yellow	**6ES7392-2CX00-0AA0**
Red	**6ES7392-2DX00-0AA0**

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Overview



- Dummy module for reserving slots for non-parameterized signal modules
- Structure and address allocation is retained when replaced with a signal module

Technical specifications

Article number	**6ES7370-0AA01-0AA0** DM 370 DUMMY module
General information	
Product type designation	DM 370
Input current	
from backplane bus 5 V DC, max.	5 mA
Power loss	
Power loss, max.	0.03 W

Article number	**6ES7370-0AA01-0AA0** DM 370 DUMMY module
Digital inputs	
Number of digital inputs	0
Digital outputs	
Number of digital outputs	0
Dimensions	
Width	40 mm
Height	125 mm
Depth	120 mm
Weights	
Weight, approx.	180 g

Ordering data

	Article No.
DM 370 dummy module incl. bus connectors, labeling strips	**6ES7370-0AA01-0AA0**
Bus connectors 1 unit, spare part	**6ES7390-0AA00-0AA0**
Labeling strips 10 units (spare part)	**6ES7392-2XX00-0AA0**
Label cover 10 units (spare part)	**6ES7392-2XY00-0AA0**

	Article No.
Labeling sheets for machine inscription for modules with 20-pin front connector, DIN A4, for printing with laser printer; 10 units	
Petrol	**6ES7392-2AX00-0AA0**
Light beige	**6ES7392-2BX00-0AA0**
Yellow	**6ES7392-2CX00-0AA0**
Red	**6ES7392-2DX00-0AA0**

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SIPLUS S7-300 DM 370

Overview



- Dummy module for reserving slots for unconfigured signal modules
- Retention of design and address assignment when replacing with a signal module

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

5

Technical specifications

Article number	**6AG1370-0AA01-7AA0**
Based on	**6ES7370-0AA01-0AA0**
	SIPLUS S7-300 Dummy-BG
Ambient conditions	
Ambient temperature during operation	
• min.	-40 °C; = Tmin
• max.	70 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m

• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at
	1 140 hPa ... 795 hPa
	(-1 000 m ... +2 000 m) //
	Tmin ... (Tmax - 10 K) at
	795 hPa ... 658 hPa
	(+2 000 m ... +3 500 m) //
	Tmin ... (Tmax -20 K) at
	658 hPa ... 540 hPa
	(+3 500 m ... +5 000 m)

Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)

Article number	**6AG1370-0AA01-7AA0**
Based on	**6ES7370-0AA01-0AA0**
	SIPLUS S7-300 Dummy-BG
Resistance	
Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
Remark	
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!

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Ordering data

	Article No.
SIMATIC S7-300 DM 370 dummy module	
for use when replacing modules	
Extended temperature range and exposure to media	**6AG1370-0AA01-7AA0**
Accessories	
Consumables	
Bus connectors	**6ES7390-0AA00-0AA0**
1 unit (spare part)	
Labeling strips	
10 units (spare part)	
For modules with 20-pin front connector	**6ES7392-2XX00-0AA0**

	Article No.
Label cover	
10 units (spare part)	
For modules with 20-pin front connector	**6ES7392-2XY00-0AA0**
Labeling sheets for machine printing	
For modules with 20-pin front connector, DIN A4, for printing with laser printer; 10 units	
Petrol	**6ES7392-2AX00-0AA0**
Light beige	**6ES7392-2BX00-0AA0**
Yellow	**6ES7392-2CX00-0AA0**
Red	**6ES7392-2DX00-0AA0**

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Front connectors

Overview



- For the simple and user-friendly connection of sensors and actuators to the S7-300 I/O modules
- For maintaining the wiring when replacing modules ("permanent wiring")
- With mechanical coding to avoid errors when replacing modules

Ordering data

	Article No.
Front connectors	
20-pin, with screw contacts	
• 1 unit	**6ES7392-1AJ00-0AA0**
• 100 units	**6ES7392-1AJ00-1AB0**
20-pin, with spring-loaded contacts	
• 1 unit	**6ES7392-1BJ00-0AA0**
• 100 units	**6ES7392-1BJ00-1AB0**
40-pin, with screw contacts	
• 1 unit	**6ES7392-1AM00-0AA0**
• 100 units	**6ES7392-1AM00-1AB0**
40-pin, with spring-loaded contacts	
• 1 unit	**6ES7392-1BM01-0AA0**
• 100 units	**6ES7392-1BM01-1AB0**
Front door, elevated design	**6ES7328-0AA00-7AA0**
e.g. for 32 channel modules; enables connection of 1.3 mm^2/16 AWG wires	
Front door, higher version, for F-modules	**6ES7328-7AA10-0AA0**
For F-modules; for connecting 1.3 mm^2/16 AWG wires; wiring diagram and labels in yellow	

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Overview



Wiring of SIMATIC S7 I/O modules with the sensors/actuators is a significant factor with respect to time/cost overhead, configuring, control cabinet installation, procurement and ease of service.

With SIMATIC TOP connect system cabling, it is simple and quick to establish a reliable connection for your SIMATIC S7-300 or ET 200M.

With the TIA Selection Tool, a mouse click is all that is required to configure the connection from the SIMATIC S7 module to the I/O. The program automatically checks for plausibility and generates a parts list for the selected connection components that can then be ordered in the Industry Mall.

More information can be found on the Internet at

http://www.siemens.com/tia-selection-tool

Design

Two cabling variants are available for a wide range of control cabinet concepts:

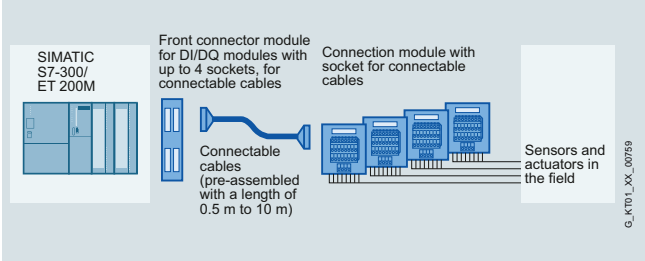
Fully modular connection

Each component is individually inserted.

The system consists of:

- Front connector module
- Connecting cable
- Terminal modules in the following versions: Basic module, signal module and function module

Connection errors are thus practically excluded and installation overhead is minimized. Systematic connection of the SIMATIC system. The assembly overhead for the connecting cables is drastically reduced thanks to the use of pre-assembled or easily assembled cables sold by the meter.



SIMATIC TOP connect for S7-300/ ET200M, fully modular connection

Flexible connection

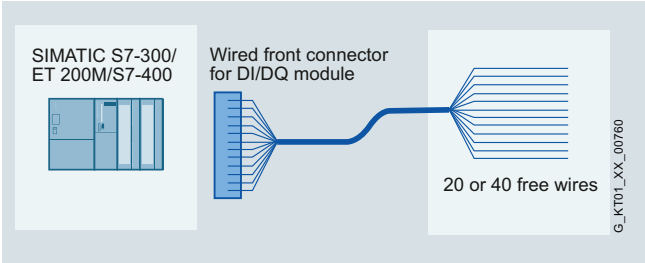
Consisting of:

- Front connector with screw-type or crimp connection
- Front connector with fixed single cores
- Single cores also available with UL/CSA-certified cores

The blue wires are numbered sequentially and can be routed direct to each element in the control cabinet. The numbering of the single cores corresponds to the coding of the front connector contacts.

In comparison to conventional single wiring, there is a cost saving of 50% for assembly, since the single cores that have already been checked on the connector are fixed.

Thus no complex pre-assembly of up to two times 46 single cores per module is necessary.



SIMATIC TOP connect for S7-300/ET200M, flexible connection

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Overview



The fully modular connection for connecting to the digital I/O modules of the SIMATIC S7-300 or ET 200M consists of modified front connectors, called front connector modules, preassembled connecting cables of various lengths, and terminal modules. Suitable components can be selected for the application in question and joined by means of simple plug-in connections. The terminal modules are used instead of conventional terminal blocks and act as the interface to the sensors and actuators.

Benefits

- Front connector module, connecting cable and terminal module are easy to plug in
- Fast, low-cost wiring
- For digital and analog signals, supply voltage can be connected to the front plug-in module or terminal module
- Reduction in wiring errors, clear control cabinet wiring
- Distribution of digital signals by byte or quadruple byte
- Each component can be replaced individually
- Cable lengths can be configured without cutting losses, or pre-assembled cables can be used

Design

Front connector module

Modified front connectors, called front connector modules, are available for connecting to the module. These are plugged into the module to be wired instead of the front connector.
Many different front connector module versions, for digital I/O modules, 24 V 2-ampère modules or analog I/O modules. The connecting cables are plugged into these front connector modules.

Connecting cable

The connecting cable is available in two different versions.

As a pre-assembled 16-pin or 50-pin round cable (shielded or unshielded) up to a length of 10 m, or as a 16-pin round-sheath ribbon cable (with or without shield), which can be easily assembled by the user; or as 2 x 16-pin round-sheath ribbon cable (without shield).

When assembled, there are one or two insulation displacement connectors (female ribbon connectors) at both ends of the cable.

The round-sheath ribbon cable is assembled by the user with the aid of pliers (can be ordered separately). The cable transmits 8 or 2 x 8 channels over a distance of up to 30 m.

The connecting cable connects the front connector module with the terminal module.

Terminal module

The system has both digital and analog terminal modules for connecting the I/O signals. These are snapped onto the DIN rail. The terminal modules with basic or signal functionality are available in 1-byte or 4-byte versions.

Terminal modules are available for two different connection methods: with push-in or screw-type terminals. The potential can be fed in at the terminal module or at the front connector module.

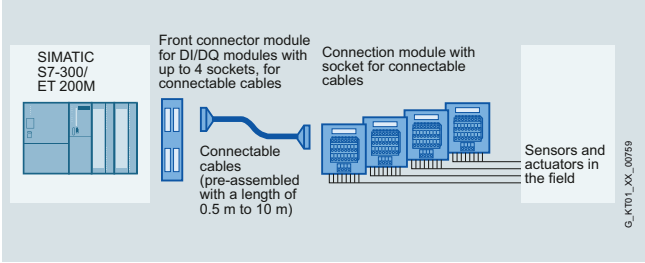
If other voltage or power levels are required in the field, the terminal module for TPRo or TPOo output signals is used. For the TPRo terminal module, relays are used for the implementation. For the TPOo terminal module, optocouplers are used for the implementation. This converts the 24 V DC output signal simply and reliably to another voltage or power level. If 230 V AC or 110 V AC input signals have to be transmitted to the controller in the field, a terminal module with relay TPRi is available that simply converts the 230/110 V AC signal to 24 V DC. This means that there is always the same voltage level on the module side.

Use with optocouplers for the TPRo relay modules

If higher switching frequencies of the relay terminal module are required for the output signals, the relay can simply be replaced with an optocoupler (note technical specifications) in order to increase the switching frequency.

Shield plate

The shield plate is latched onto the terminal module for 3-wire-wire initiators or optionally onto the terminal module for analog signals and then snapped onto the DIN rail with the terminal module. With the shield connection clamps, optimal shield connection is achieved between the shielded round-sheath ribbon cable or the shielded field cables and the grounded DIN rail.



SIMATIC TOP connect for S7-300/ ET200 M, fully modular connection

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Technical specifications front connector module

Technical data of front connector module	
Rated operating voltage	24 VDC
Max. permissible operating voltage	60 V DC
Max. permissible continuous current • per connector pin	1 A
Max. permissible summation current	4 A/byte
Permissible ambient temperature	0 to + 60°C
Test voltage	0.5 kV, 50 Hz, 60 sec.
Air gaps and creepage distances	IEC 664 (1980), IEC 664 A (1981), in accordance with DIN VDE 0110 (01.89), overvoltage class II, pollution degree 2

Wiring rules for front connector modules

	Front connector module SIMATIC TOP connect, connection for potential infeed	
	Spring connection	Screw connection
	Modules up to 4 connections	
Connectable cable cross-sections		
• solid cables • flexible cables with/without wire end ferrule	No 0.25 to 1.5 mm^2	
Number of wires per connection	1 or a combination of 2 conductors up to 1.5 mm^2 (total) in a common wire end ferrule	
Max. diameter of the cable insulation	3.1 mm	
Stripping length of the cables		
• without insulating collar • with insulating collar	6 mm -	
Wire-end ferrules in acc. with DIN 46228		
• without insulating collar • with insulating collar 0.25 to 1.0 mm^2 • with insulating collar 1.5 mm^2	Form A; 5 to 7 mm long - -	
Blade width of the screwdriver	3.5 mm (cylindrical shape)	
Tightening torque for connecting the cables	-	0.4 to 0.7 Nm

	Front connector module SIMATIC TOP connect, connection for potential infeed	
	Spring connection	Screw connection
	Modules up to 8 connections	
Connectable cable cross-sections		
• solid cables • flexible cables with/without wire end ferrule	No 0.25 to 0.75 mm^2	
Number of cables per connection	1 or a combination of 2 wires up to 0.75 mm^2 (total) in a common wire end ferrule	
Max. diameter of the cable insulation	2.0 mm	
Stripping length of the cables		
• without insulating collar • with insulating collar	6 mm -	
Wire-end ferrules in acc. with DIN 46228		
• without insulating collar • with insulating collar 0.25 to 1.0 mm^2 • with insulating collar 1.5 mm^2	Form A; 5 to 7 mm long - -	
Blade width of the screwdriver	3.5 mm (cylindrical shape)	
Tightening torque for connecting the cables	-	0.4 to 0.7 Nm

Technical specifications connecting cable

Technical specifications of connecting cable from SIMATIC S7 to connection module	
Operating voltage	60 V DC
Continuous current per signal conductor	1 A
Max. total current	4 A/byte
Operating temperature	0 to +60 °C
Outer diameter of pre-assembled round cable in mm unshielded/ shielded (16-pole)	Approx. 6.5/7.0

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Ordering data

Front connector modules

	Article No.
Front connector module (compact CPU 312C)	
Power supply via	
• Screw terminals	**6ES7921-3AK20-0AA0**
Front connector module (compact CPU 313C/ 314C-2PtP/314C-2DP), slot X1	
Power supply via	
• Screw terminals	**6ES7921-3AM20-0AA0**
Front connector module (digital 2 x 8 I/O)	
Power supply via	
• Spring-loaded terminals	**6ES7921-3AA00-0AA0**
• Screw terminals	**6ES7921-3AB00-0AA0**
Front connector module (digital 4 x 8 I/O)	
Power supply via	
• Spring-loaded terminals	**6ES7921-3AA20-0AA0**
• Screw terminals	**6ES7921-3AB20-0AA0**

	Article No.
Front connector module (1 x 8 outputs) for 2-ampere digital outputs	
Power supply via	
• Spring-loaded terminals	**6ES7921-3AC00-0AA0**
• Screw terminals	**6ES7921-3AD00-0AA0**
Front connector module 20-pin (analog)	
Power supply via	
• Spring-loaded terminals	**6ES7921-3AF00-0AA0**
• Screw terminals	**6ES7921-3AG00-0AA0**
Front connector module 40-pin (analog)	
Power supply via	
• Spring-loaded terminals	**6ES7921-3AF20-0AA0**
• Screw terminals	**6ES7921-3AG20-0AA0**

Connecting cables

	Article No.
Connecting cables for SIMATIC S7-300	
Pre-assembled round cable	
16-pin, 0.14 mm^2	
Unshielded	
• 0.5 m	**6ES7923-0BA50-0CB0**
• 1.0 m	**6ES7923-0BB00-0CB0**
• 1.5 m	**6ES7923-0BB50-0CB0**
• 2.0 m	**6ES7923-0BC00-0CB0**
• 2.5 m	**6ES7923-0BC50-0CB0**
• 3.0 m	**6ES7923-0BD00-0CB0**
• 4.0 m	**6ES7923-0BE00-0CB0**
• 5.0 m	**6ES7923-0BF00-0CB0**
• 6.5 m	**6ES7923-0BG50-0CB0**
• 8.0 m	**6ES7923-0BJ00-0CB0**
• 10.0 m	**6ES7923-0CB00-0CB0**
Shielded	
• 1.0 m	**6ES7923-0BB00-0DB0**
• 2.0 m	**6ES7923-0BC00-0DB0**
• 2.5 m	**6ES7923-0BC50-0DB0**
• 3.0 m	**6ES7923-0BD00-0DB0**
• 4.0 m	**6ES7923-0BE00-0DB0**
• 5.0 m	**6ES7923-0BF00-0DB0**
• 6.5 m	**6ES7923-0BG50-0DB0**
• 8.0 m	**6ES7923-0BJ00-0DB0**
• 10.0 m	**6ES7923-0CB00-0DB0**

	Article No.
Version 4 x 16 to 1 x 50-pin, 0.14 mm^2	
Unshielded	
• 0.5 m	**6ES7923-5BA50-0EB0**
• 1.0 m	**6ES7923-5BB00-0EB0**
• 1.5 m	**6ES7923-5BB50-0EB0**
• 2.0 m	**6ES7923-5BC00-0EB0**
• 2.5 m	**6ES7923-5BC50-0EB0**
• 3.0 m	**6ES7923-5BD00-0EB0**
• 4.0 m	**6ES7923-5BE00-0EB0**
• 5.0 m	**6ES7923-5BF00-0EB0**
• 6.5 m	**6ES7923-5BG50-0EB0**
• 8.0 m	**6ES7923-5BJ00-0EB0**
• 10.0 m	**6ES7923-5CB00-0EB0**

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Ordering data

Terminal modules

	Article No.
Terminal module TP1	
For 1-wire connection, for 16-pin connecting cables	
• Push-in terminals without LEDs	**6ES7924-0AA20-0AC0**
• Screw-type terminals without LEDs	**6ES7924-0AA20-0AA0**
• Push-in terminals with LEDs	**6ES7924-0AA20-0BC0**
• Screw-type terminals with LEDs	**6ES7924-0AA20-0BA0**
For 1-wire connection, for 50-pin connecting cables	
• Push-in terminals without LEDs	**6ES7924-2AA20-0AC0**
• Screw-type terminals without LEDs	**6ES7924-2AA20-0AA0**
• Push-in terminals with LEDs	**6ES7924-2AA20-0BC0**
• Screw-type terminals with LEDs	**6ES7924-2AA20-0BA0**
Terminal module TP3	
For 3-wire connection, for 16-pin connecting cables	
• Push-in terminals without LEDs	**6ES7924-0CA20-0AC0**
• Screw-type terminals without LEDs	**6ES7924-0CA20-0AA0**
• Push-in terminals with LEDs	**6ES7924-0CA20-0BC0**
• Screw-type terminals with LEDs	**6ES7924-0CA20-0BA0**
• Push-in terminals with LEDs and one isolating terminal per channel	**6ES7924-0CH20-0BC0**
• Screw-type terminals with LEDs and one isolating terminal per channel	**6ES7924-0CH20-0BA0**
• Push-in terminals with LEDs and one fuse per channel	**6ES7924-0CL20-0BC0**
• Screw-type terminals with LEDs and one fuse per channel	**6ES7924-0CL20-0BA0**
For 3-wire connection, for 50-pin connecting cables	
• Push-in terminals without LEDs	**6ES7924-2CA20-0AC0**
• Screw-type terminals without LEDs	**6ES7924-2CA20-0AA0**
• Push-in terminals with LEDs	**6ES7924-2CA20-0BC0**
• Screw-type terminals with LEDs	**6ES7924-2CA20-0BA0**
Terminal module TPRo	
Relay module for 8 outputs, relay as normally open contact	
• Push-in terminals with LEDs	**6ES7924-0BD20-0BC0**
• Screw-type terminals with LEDs	**6ES7924-0BD20-0BA0**

	Article No.
Terminal module TPRi	
Relay module for 8 outputs (110 V AC), relay as normally open contact	
• Push-in terminals with LEDs	**6ES7924-0BG20-0BC0**
• Screw-type terminals with LEDs	**6ES7924-0BG20-0BA0**
Terminal module TPRi	
Relay module for 8 outputs (230 V AC), relay as normally open contact	
• Push-in terminals with LEDs	**6ES7924-0BE20-0BC0**
• Screw-type terminals with LEDs	**6ES7924-0BE20-0BA0**
Terminal module TPOo	
Optocoupler module for 8 outputs (max. 24 V DC/4 A)	
• Push-in terminals with LEDs	**6ES7924-0BF20-0BC0**
• Screw-type terminals with LEDs	**6ES7924-0BF20-0BA0**
Terminal module for digital output modules 2 A	
Terminal module TP2	
• Push-in terminals without LEDs	**6ES7924-0BB20-0AC0**
• Screw-type terminals without LEDs	**6ES7924-0BB20-0AA0**
Terminal module for analog modules	
Terminal module TPA	
• Push-in terminals without LEDs	**6ES7924-0CC21-0AC0**
• Screw-type terminals without LEDs	**6ES7924-0CC21-0AA0**
Accessories	
ID labels for terminal modules in S7-1500 design	
ID labels, insertable P. unit = 340 units	**3RT1900-1SB20**
Shield plate for analog terminal module	
P. unit = 4 units (for connection of 15-pin connecting cable)	**6ES7928-1AA20-4AA0**
Shield connection clamp	
For shield plate at SIMATIC end, P. unit = 10 units	**6ES7590-5BA00-0AA0**
For shield plate at field end, 2 x 2 ... 6 mm	**6ES7390-5AB00-0AA0**
For shield plate at field end, 3 ... 8 mm	**6ES7390-5BA00-0AA0**
For shield plate at field end, 4 ... 13 mm	**6ES7390-5CA00-0AA0**

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Overview



Flexible connection enables fast, direct connection of the SIMATIC S7-300/ET 200 M input/output modules to the individual elements in the control cabinet.

Attached single cores reduce the wiring outlay.

Wire cross-sections of 0.5 mm^2 allow higher currents, too.

Technical specifications

Front connector with single cores for 16 channels	
Rated operating voltage	24 V DC
Permissible continuous current with simultaneous load of all wires, max.	1.5 A
Permissible ambient temperature	0 to 60 °C
Core type	H05V-K or with UL 1007/1569; CSA TR64
Number of single cores	20
Core cross-section	0.5 mm^2; Cu
Bundle diameter in mm	approx. 15
Core color	Blue, RAL 5010
Designation of cores	Numbered from 1 to 20 (front connector contact = core number)
Assembly	Screw-type or crimp contacts

Front connector with single cores for 32 channels	
Rated operating voltage	24 V DC
Permissible continuous current with simultaneous load of all wires, max.	1.5 A
Permissible ambient temperature	0 to 60 °C
Core type	H05V-K or with UL 1007/1569; CSA TR64
Number of single cores	40
Core cross-section	0.5 mm^2; Cu
Bundle diameter in mm	approx. 17
Core color	Blue, RAL 5010
Designation of cores	Numbered from 1 to 40 (front connector contact = core number)
Assembly	Screw-type or crimp contacts

Ordering data

	Article No.
Front connector with single cores for 16-channel digital modules SIMATIC S7-300, 20 x 0.5 mm^2	
Core type H05V-K	
Screw-type version	
Packaging unit: 1 unit Length:	
• 2.5 m	**6ES7922-3BC50-0AB0**
• 3.2 m	**6ES7922-3BD20-0AB0**
• 5 m	**6ES7922-3BF00-0AB0**
• Custom lengths	On request
Packaging unit: 5 units Length:	
• 2.5 m	**6ES7922-3BC50-5AB0**
• 3.2 m	**6ES7922-3BD20-5AB0**
• 5.0 m	**6ES7922-3BF00-5AB0**
Crimp version	
Packaging unit: 1 unit Length:	
• 2.5 m	**6ES7922-3BC50-0AF0**
• 3.2 m	**6ES7922-3BD20-0AF0**
• 5.0 m	**6ES7922-3BF00-0AF0**
• Custom lengths	On request
Core type UL/CSA-certified	
Screw-type version	
Packaging unit: 1 unit Length:	
• 3.2 m	**6ES7922-3BD20-0UB0**
• 5.0 m	**6ES7922-3BF00-0UB0**
Front connector with single cores for 32-channel digital modules SIMATIC S7-300, 40 x 0.5 mm^2	
Core type H05V-K	
Screw-type version	
Packaging unit: 1 unit Length:	
• 2.5 m	**6ES7922-3BC50-0AC0**
• 3.2 m	**6ES7922-3BD20-0AC0**
• 5.0 m	**6ES7922-3BF00-0AC0**
• Custom lengths	On request
Packaging unit: 5 units Length:	
• 2.5 m	**6ES7922-3BC50-5AC0**
• 3.2 m	**6ES7922-3BD20-5AC0**
• 5.0 m	**6ES7922-3BF00-5AC0**
Crimp version	
Packaging unit: 1 unit Length:	
• 2.5 m	**6ES7922-3BC50-0AG0**
• 3.2 m	**6ES7922-3BD20-0AG0**
• 5.0 m	**6ES7922-3BF00-0AG0**
• Custom lengths	On request
Core type UL/CSA-certified	
Screw version	
Packaging unit: 1 unit Length:	
• 3.2 m	**6ES7922-3BD20-0UC0**
• 5.0 m	**6ES7922-3BF00-0UC0**

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Design

The front connector is available in two designs

The 20-pin front connector contains:

- 20 connections for crimp contacts for connecting the wiring
- Strain relief for the cables
- Unlatching key; for unlatching the front connector when replacing the module
- Holder for coding element attachment; there are two coding elements with attachments on the modules. The attachments latch in when inserting into the front connector for the first time.

The 40-pin front connector contains:

- 40 connections for crimp contacts for connecting the wiring
- Strain relief for the cables
- Locking screw; for fixing and detaching the front connector when the module is replaced
- Holder for coding element attachment; there is a coding element with an attachment on the modules. The attachment latches in when inserting into the front connector for the first time.

Integration

Use of the 20-pin front connector with

- 16-channel signal modules
- Function modules
- CPU 312 IFM

Use of the 40-pin front connector with

- 32-channel signal modules
- Compact CPUs

Ordering data

	Article No.
Front connector 20-pin, crimp version without crimp contacts	
Packing unit 100 units	**6ES7921-3AH00-1AA0**
Front connector 40-pin, crimp version without crimp contacts	
Packing unit 100 units	**6ES7921-3AH20-1AA0**
Accessories	
Crimp contacts for front connectors	**6XX3070**
Packing unit 250 units	
Crimping tool	**6XX3071**
For crimping the crimp contacts	
Unlocking tool for crimp contacts	**6ES5497-4UC11**

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1-phase, 24 V DC (for S7-300 and ET200M)

Overview



The design and functionality of the SIMATIC PS 307 single-phase load power supply (system and load current supply) with automatic range switchover of the input voltage is an optimal match to the SIMATIC S7-300 PLC. By means of the connecting comb that is supplied with the system and load current supply, the supply to the CPU is quickly established. It is also possible to provide a 24 V supply to other S7-300 system components, input/output circuits of the input/output modules and, if necessary, the sensors and actuators. Comprehensive certifications, such as UL, ATEX or GL facilitate universal use (does not apply to outdoor use).

Technical specifications

Article number	**6ES7307-1BA01-0AA0**	**6ES7305-1BA80-0AA0**	**6ES7307-1EA01-0AA0**	**6ES7307-1EA80-0AA0**	**6ES7307-1KA02-0AA0**
Product	PS 307	PS 305 Outdoor	PS 307	PS 307 Outdoor	PS 307
Power supply, type	24 V/2 A	24 V/2 A	24 V/5 A	24 V/5 A	24 V/10 A
Input					
Input	1-phase AC	DC voltage	1-phase AC	1-phase AC	1-phase AC
• Note	Automatic range selection		Automatic range selection	Set by means of selector switch on the device	Automatic range selection
Supply voltage					
• 1 at AC Rated value	120 V		120 V	120 V	120 V
• 2 at AC Rated value	230 V		230 V	230 V	230 V
• at DC		24 ... 110 V			
Input voltage					
• 1 at AC	85 ... 132 V		85 ... 132 V	93 ... 132 V	85 ... 132 V
• 2 at AC	170 ... 264 V		170 ... 264 V	187 ... 264 V	170 ... 264 V
• at DC		16.8 ... 138 V			
Wide-range input	No	Yes	No	No	No
Overvoltage resistance	2.3 × $V_{in\ rated}$, 1.3 ms	154 V; 0.1 s	2.3 × $V_{in\ rated}$, 1.3 ms	2.3 × $V_{in\ rated}$, 1.3 ms	2.3 × $V_{in\ rated}$, 1.3 ms
Mains buffering at $I_{out\ rated}$, min.	20 ms; at V_{in} = 93/187 V	10 ms; at $V_{in\ rated}$	20 ms; at V_{in} = 93/187 V	20 ms; at V_{in} = 93/187 V	20 ms; at V_{in} = 93/187 V
Rated line frequency 1	50 Hz		50 Hz	50 Hz	50 Hz
Rated line frequency 2	60 Hz		60 Hz	60 Hz	60 Hz
Rated line range	47 ... 63 Hz		47 ... 63 Hz	47 ... 63 Hz	47 ... 63 Hz
Input current					
• at rated input voltage 120 V	0.9 A		2.3 A	2.1 A	4.2 A
• at rated input voltage 230 V	0.5 A		1.2 A	1.2 A	1.9 A
• at rated input voltage 24 V		2.4 A			
• at rated input voltage 110 V		0.6 A			
Switch-on current limiting (+25 °C), max.	22 A	20 A	20 A	45 A	55 A
Duration of inrush current limiting at 25 °C					
• maximum	3 ms	10 ms	3 ms	3 ms	3 ms
I^2t, max.	1 $A^2 \cdot s$	5 $A^2 \cdot s$	1.2 $A^2 \cdot s$	1.8 $A^2 \cdot s$	3.3 $A^2 \cdot s$
Built-in incoming fuse	T 1.6 A/250 V (not accessible)	T 6.3 A/250 V (not accessible)	T 3,15 A/250 V (not accessible)	T 3,15 A/250 V (not accessible)	T 6.3 A/250 V (not accessible)
Protection in the mains power input (IEC 898)	Recommended miniature circuit breaker: 3 A characteristic C	Recommended miniature circuit breaker: from 10 A characteristic C, suitable for DC	Recommended miniature circuit breaker: from 6 A characteristic C	Recommended miniature circuit breaker: from 10 A characteristic C or from 6 A characteristic D	Recommended miniature circuit breaker: from 10 A characteristic C

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Technical specifications (continued)

Article number	6ES7307-1BA01-0AA0	6ES7305-1BA80-0AA0	6ES7307-1EA01-0AA0	6ES7307-1EA80-0AA0	6ES7307-1KA02-0AA0
Product	PS 307	PS 305 Outdoor	PS 307	PS 307 Outdoor	PS 307
Power supply, type	24 V/2 A	24 V/2 A	24 V/5 A	24 V/5 A	24 V/10 A
Output					
Output	Controlled, isolated DC voltage	Controlled, isolated DC voltage	Controlled, isolated DC voltage	Controlled, isolated DC voltage	Controlled, isolated DC voltage
Rated voltage V_{out} DC	24 V	24 V	24 V	24 V	24 V
Total tolerance, static ±	3 %	3 %	3 %	3 %	3 %
Static mains compensation, approx.	0.1 %	0.2 %	0.1 %	0.2 %	0.1 %
Static load balancing, approx.	0.2 %	0.4 %	0.5 %	0.4 %	0.5 %
Residual ripple peak-peak, max.	50 mV	150 mV	50 mV	150 mV	50 mV
Residual ripple peak-peak, typ.	5 mV	30 mV	10 mV	40 mV	15 mV
Spikes peak-peak, max. (bandwidth: 20 MHz)	150 mV	240 mV	150 mV	240 mV	150 mV
Spikes peak-peak, typ. (bandwidth: 20 MHz)	20 mV	150 mV	20 mV	90 mV	60 mV
Product function Output voltage adjustable	No	No	No	No	No
Output voltage setting	-	-	-	-	-
Status display	Green LED for 24 V OK	Green LED for 24 V OK	Green LED for 24 V OK	Green LED for 24 V OK	Green LED for 24 V OK
On/off behavior	No overshoot of V_{out} (soft start)	No overshoot of V_{out} (soft start)	No overshoot of V_{out} (soft start)	No overshoot of V_{out} (soft start)	No overshoot of V_{out} (soft start)
Startup delay, max.	2 s	3 s	2 s	3 s	2 s
Voltage rise, typ.	10 ms	5 ms	10 ms	100 ms	10 ms
Rated current value $I_{out\ rated}$	2 A	2 A	5 A	5 A	10 A
Current range	0 ... 2 A	0 ... 3 A	0 ... 5 A	0 ... 5 A	0 ... 10 A
• Note		3 A up to +60°C at V_{in} > 24 V			
Supplied active power typical	48 W	48 W	120 W	120 W	240 W
Short-term overload current					
• on short-circuiting during the start-up typical	9 A	9 A	20 A	20 A	38 A
• at short-circuit during operation typical	9 A	9 A	20 A	20 A	38 A
Duration of overloading capability for excess current					
• on short-circuiting during the start-up	90 ms	270 ms	100 ms	180 ms	80 ms
• at short-circuit during operation	90 ms	270 ms	100 ms	80 ms	80 ms
Parallel switching for enhanced performance	Yes	Yes	Yes	No	Yes
Numbers of parallel switchable units for enhanced performance	2	2			
Efficiency					
Efficiency at $V_{out\ rated}$, $I_{out\ rated}$, approx.	84 %	75 %	87 %	84 %	90 %
Power loss at $V_{out\ rated}$, $I_{out\ rated}$, approx.	9 W	16 W	18 W	23 W	27 W
Closed-loop control					
Dynamic mains compensation ($V_{in\ rated}$ ±15 %), max.	0.1 %	0.3 %	0.1 %	0.3 %	0.1 %
Dynamic load smoothing (I_{out}: 50/100/50 %), U_{out} ± typ.	0.8 %	2.5 %	1 %	3 %	2 %
Load step setting time 50 to 100%, typ.	0.5 ms	2.5 ms	0.3 ms	0.2 ms	
Load step setting time 100 to 50%, typ.	0.5 ms	2.5 ms	0.3 ms	0.2 ms	
Setting time maximum	1 ms	5 ms		5 ms	0.1 ms

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1-phase, 24 V DC (for S7-300 and ET200M)

Technical specifications (continued)

Article number	6ES7307-1BA01-0AA0	6ES7305-1BA80-0AA0	6ES7307-1EA01-0AA0	6ES7307-1EA80-0AA0	6ES7307-1KA02-0AA0
Product	PS 307	PS 305 Outdoor	PS 307	PS 307 Outdoor	PS 307
Power supply, type	24 V/2 A	24 V/2 A	24 V/5 A	24 V/5 A	24 V/10 A
Protection and monitoring					
Output overvoltage protection	Additional control loop, shutdown at < 28.8 V, automatic restart	Additional control loop, shutdown at approx. 30 V, automatic restart	Additional control loop, shutdown at < 28.8 V, automatic restart	Additional control loop, shutdown at approx. 30 V, automatic restart	Additional control loop, shutdown at < 28.8 V, automatic restart
Current limitation	2.2 ... 2.6 A	3.3 ... 3.9 A	5.5 ... 6.5 A	5.5 ... 6.5 A	11 ... 12 A
Property of the output Short-circuit proof	Yes	Yes	Yes	Yes	Yes
Short-circuit protection	Electronic shutdown, automatic restart	Electronic shutdown, automatic restart	Electronic shutdown, automatic restart	Electronic shutdown, automatic restart	Electronic shutdown, automatic restart
Enduring short circuit current RMS value					
• maximum	2 A	2 A	7 A	5 A	12 A
Overload/short-circuit indicator	-	-			-
Safety					
Primary/secondary isolation	Yes	Yes	Yes	Yes	Yes
Galvanic isolation	Safety extra-low output voltage U_{out} acc. to EN 60950-1 and EN 50178	Safety extra low output voltage V_{out} according to EN 60950-1 and EN 50178, creepage distances and clearances > 5 mm	Safety extra-low output voltage U_{out} acc. to EN 60950-1 and EN 50178	Safety extra low output voltage V_{out} according to EN 60950-1 and EN 50178, creepage distances and clearances > 5 mm	Safety extra-low output voltage U_{out} acc. to EN 60950-1 and EN 50178
Protection class	Class I	Class I	Class I	Class I	Class I
Leakage current					
• maximum	3.5 mA		3.5 mA	3.5 mA	3.5 mA
• typical	0.5 mA		0.5 mA	0.3 mA	0.6 mA
CE mark	Yes	Yes	Yes	Yes	Yes
UL/cUL (CSA) approval	cULus-Listed (UL 508, CSA C22.2 No. 142), File E143289	UL-Listed (UL 508), File E143289, CSA (CSA C22.2 No. 142)	cULus-Listed (UL 508, CSA C22.2 No. 142), File E143289	UL-Listed (UL 508), File E143289, CSA (CSA C22.2 No. 142)	cULus-Listed (UL 508, CSA C22.2 No. 142), File E143289
Explosion protection	ATEX (EX) II 3G Ex nA II T4; cULus (ANSI/ISA 12.12.01, CSA C22.2 No.213) Class I, Div. 2, Group ABCD, T4, File E330455	-	ATEX (EX) II 3G Ex nA II T4; cULus (ANSI/ISA 12.12.01, CSA C22.2 No.213) Class I, Div. 2, Group ABCD, T4, File E330455	-	ATEX (EX) II 3G Ex nA II T4; cULus (ANSI/ISA 12.12.01, CSA C22.2 No.213) Class I, Div. 2, Group ABCD, T4, File E330455
FM approval	Class I, Div. 2, Group ABCD, T4	-	Class I, Div. 2, Group ABCD, T4	-	Class I, Div. 2, Group ABCD, T4
CB approval	No	No	No	No	No
Marine approval	In S7-300 system	-	In S7-300 system	-	In S7-300 system
Degree of protection (EN 60529)	IP20	IP20	IP20	IP20	IP20
EMC					
Emitted interference	EN 55022 Class B	EN 55011 Class A	EN 55022 Class B	EN 55011 Class A	EN 55022 Class B
Supply harmonics limitation	not applicable	not applicable	EN 61000-3-2	-	EN 61000-3-2
Noise immunity	EN 61000-6-2	EN 61000-6-2	EN 61000-6-2	EN 61000-6-2	EN 61000-6-2
Operating data					
Ambient temperature					
• during operation	0 ... 60 °C	-25 ... +70 °C	0 ... 60 °C	-25 ... +70 °C	0 ... 60 °C
- Note	with natural convection	with natural convection	with natural convection	with natural convection	with natural convection
• during transport	-40 ... +85 °C	-40 ... +85 °C	-40 ... +85 °C	-40 ... +85 °C	-40 ... +85 °C
• during storage	-40 ... +85 °C	-40 ... +85 °C	-40 ... +85 °C	-40 ... +85 °C	-40 ... +85 °C
Humidity class according to EN 60721	Climate class 3K3, no condensation	Climate class 3K5, transient condensation permitted	Climate class 3K3, no condensation	Climate class 3K5, transient condensation permitted	Climate class 3K3, no condensation

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Technical specifications (continued)

Article number	6ES7307-1BA01-0AA0	6ES7305-1BA80-0AA0	6ES7307-1EA01-0AA0	6ES7307-1EA80-0AA0	6ES7307-1KA02-0AA0
Product	PS 307	PS 305 Outdoor	PS 307	PS 307 Outdoor	PS 307
Power supply, type	24 V/2 A	24 V/2 A	24 V/5 A	24 V/5 A	24 V/10 A
Mechanics					
Connection technology	screw-type terminals	screw-type terminals	screw-type terminals	screw-type terminals	screw-type terminals
Connections					
• Supply input	L, N, PE: 1 screw terminal each for 0.5 ... 2.5 mm^2 single-core/finely stranded	L+1, M1, PE: 1 screw terminal each for 0.5 ... 2.5 mm^2 single-core/finely stranded	L, N, PE: 1 screw terminal each for 0.5 ... 2.5 mm^2 single-core/finely stranded	L, N, PE: 1 screw terminal each for 0.5 ... 2.5 mm^2 single-core/finely stranded	L, N, PE: 1 screw terminal each for 0.5 ... 2.5 mm^2 single-core/finely stranded
• Output	L+, M: 2 screw terminals each for 0.5 ... 2.5 mm^2	L+, M: 3 screw terminals each for 0.5 ... 2.5 mm^2	L+, M: 3 screw terminals each for 0.5 ... 2.5 mm^2	L+, M: 3 screw terminals each for 0.5 ... 2.5 mm^2	L+, M: 4 screw terminals each for 0.5 ... 2.5 mm^2
• Auxiliary	-	-	-	-	-
Width of the enclosure	40 mm	80 mm	60 mm	80 mm	80 mm
Height of the enclosure	125 mm	125 mm	125 mm	125 mm	125 mm
Depth of the enclosure	120 mm	120 mm	120 mm	120 mm	120 mm
Required spacing					
• top	40 mm	50 mm	40 mm	50 mm	40 mm
• bottom	40 mm	50 mm	40 mm	50 mm	40 mm
• left	0 mm	0 mm	0 mm	0 mm	0 mm
• right	0 mm	0 mm	0 mm	0 mm	0 mm
Weight, approx.	0.4 kg	0.57 kg	0.6 kg	0.57 kg	0.8 kg
Product feature of the enclosure housing for side-by-side mounting	Yes	Yes	Yes	Yes	Yes
Installation	Can be mounted onto S7 rail	Can be mounted onto S7 rail	Can be mounted onto S7 rail	Can be mounted onto S7 rail	Can be mounted onto S7 rail
Mechanical accessories	Mounting adapter for standard mounting rail (6EP1971-1BA00)	Mounting adapter for standard mounting rail (6ES7390-6BA00-0AA0)	Mounting adapter for standard mounting rail (6EP1971-1BA00)	Mounting adapter for standard mounting rail (6ES7390-6BA00-0AA0)	Mounting adapter for standard mounting rail (6EP1971-1BA00)
MTBF at 40 °C	2 320 078 h	964 506 h	2 480 589 h	2 231 610 h	1 504 280 h
Other information	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)

Ordering data

	Article No.
Load current supply PS 307, 2A incl. connecting comb Input: 120/230 V AC Output: 24 V DC/2 A	**6ES7307-1BA01-0AA0**
SIMATIC S7-300 Outdoor, 2A Stabilized power supply PS305 Input: 24 … 110 V DC Output: 24 V DC/2 A	**6ES7305-1BA80-0AA0**
PS 307 load power supply, 5 A incl. connecting comb Input: 120/230 V AC Output: 24 V DC/5 A	**6ES7307-1EA01-0AA0**
SIMATIC S7-300 Outdoor, 5A Stabilized power supply PS307 Input: 120/230 V AC Output: 24 V DC/5 A	**6ES7307-1EA80-0AA0**
PS 307 load power supply, 10 A Input: 120/230 V AC Output: 24 V DC/10 A	**6ES7307-1KA02-0AA0**

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1-phase, 24 V DC (for S7-300 and ET200M)

Overview



The design and functionality of the SIMATIC PS 305 and 307 1-phase load power supplies (system and load current supply) with automatic range switchover of the input voltage are an optimal match for the SIMATIC S7-300 PLC. By means of the connecting comb that is supplied with the system and load current supply, the supply to the CPU is quickly established. It is also possible to provide a 24 V supply to other S7-300 system components, input/output circuits of the input/output modules and, if necessary, the sensors and actuators. Comprehensive certifications, such as UL, ATEX or GL facilitate universal use (does not apply to outdoor use).

Note:

SIPLUS extreme products are based on Siemens standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

Technical specifications

Article number	**6AG1305-1BA80-2AA0**	**6AG1307-1EA01-7AA0**	**6AG1307-1KA02-7AA0**
Based on	**6ES7305-1BA80-0AA0**	**6ES7307-1EA01-0AA0**	**6ES7307-1KA02-0AA0**
	SIPLUS PS S7-300 PS305 (EN50155)	SIPLUS PS307 AC 120/230V / DC 24 V/5 A	SIPLUS_PS307_10A
Ambient conditions			
Ambient temperature during operation			
• min.	-25 °C; = Tmin	-25 °C; = Tmin	-25 °C; = Tmin
• max.	70 °C; = Tmax; for use on railway vehicles according to EN 50155, the rated temperature range -25 ... +55 °C (T1) or 60 °C @ UL/UL hazardous use applies	70 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use	70 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use
Altitude during operation relating to sea level			
• Installation altitude above sea level, max.	2 000 m	2 000 m	2 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m); above 2 000 m max. 75 V DC	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m); above 2 000 m max. 75 V DC	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m); above 2 000 m max. 75 V DC
Relative humidity			
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance			
Use in stationary industrial systems			
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *

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Technical specifications (continued)

Article number	**6AG1305-1BA80-2AA0**	**6AG1307-1EA01-7AA0**	**6AG1307-1KA02-7AA0**
Based on	**6ES7305-1BA80-0AA0**	**6ES7307-1EA01-0AA0**	**6ES7307-1KA02-0AA0**
	SIPLUS PS S7-300 PS305 (EN50155)	SIPLUS PS307 AC 120/230V / DC 24 V/5 A	SIPLUS_PS307_10A
Use on land craft, rail vehicles and special-purpose vehicles			
- to biologically active substances according to EN 60721-3-5	Yes; Class 5B2 mold, fungus and dry rot spores (with the exception of fauna); Class 5B3 on request		
- to chemically active substances according to EN 60721-3-5	Yes; Class 5C3 (RH < 75 %) incl. salt spray acc. to EN 50155 (ST2); *		
- to mechanically active substances according to EN 60721-3-5	Yes; Class 5S3 incl. sand, dust; *		
Use on ships/at sea			
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Remark			
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!

Ordering data

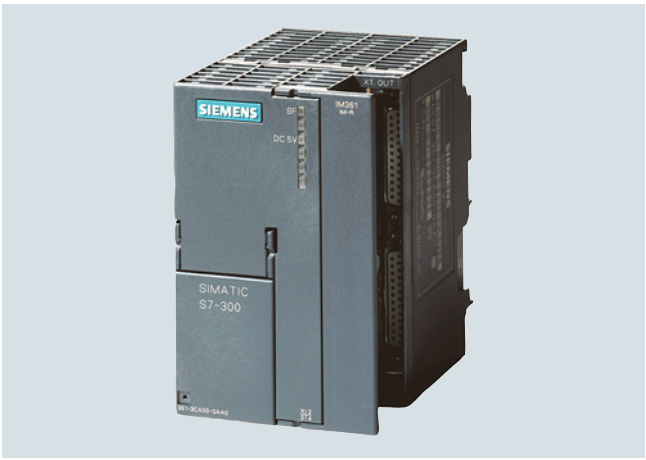
	Article No.
SIPLUS power supplies	
For industrial applications with extended ambient conditions	
SIPLUS S7-300 PS 305 (Extended temperature range and exposure to media) Input: 24 … 110 V DC Output: 24 V DC/2 A	**6AG1305-1BA80-2AA0**
SIPLUS S7-300 PS 307 5 A (Extended temperature range and exposure to media) Incl. connection bracket 120/230 V AC; 24 V DC Output current 5 A (dimensions 60 x 125 x 120)	**6AG1307-1EA01-7AA0**
SIPLUS S7-300 PS 307 10 A (Extended temperature range and exposure to media) Incl. connection bracket 120/230 V AC; 24 V DC Output current 10 A (dimensions 80 x 125 x 120)	**6AG1307-1KA02-7AA0**
For rolling stock railway applications	
SIPLUS S7-300 PS 305 (Extended temperature range and exposure to media) Conforms to EN 50155 Input: 24 … 110 V DC Output: 24 V DC/2 A	**6AG1305-1BA80-2AA0**

	Article No.
Accessories	
SIMATIC S7-300 mounting adapter For snapping the PS 307 onto a 35 mm DIN rail (EN 60715)	**6EP1971-1BA00**
Spare part	
SIMATIC S7-300 mounting adapter; for snapping the PS 307 onto 35 mm standard rails	**6ES7390-6BA00-0AA0**

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IM 360/361/365 interface modules

Overview



- For connection of the SIMATIC S7-300 rack in multi-tier configurations
- IM 365: For configuring central controllers and max. 1 expansion unit.
  Limited use of modules in the expansion unit (e.g. no CPs and FMs)
- IM 360/IM 361: For configuring central controllers and max. 3 expansion units.
  Unlimited selection of modules in the expansion unit

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Technical specifications

Article number	**6ES7360-3AA01-0AA0** IM360 interface module in CC, with K-BUS	**6ES7361-3CA01-0AA0** IM361 interface module in EU, with K-Bus	**6ES7365-0BA01-0AA0** IM365 interface module, w/o K-BUS
Supply voltage			
Rated value (DC)			
• 24 V DC		Yes	
Input current			
from supply voltage L+, max.		500 mA	
from backplane bus 5 V DC, max.	350 mA		100 mA
Power loss			
Power loss, typ.	2 W	5 W	0.5 W
Hardware configuration			
Number of interfaces per CPU, max.	1	3	1; 1 pair
Dimensions			
Width	40 mm	80 mm	40 mm
Height	125 mm	125 mm	125 mm
Depth	120 mm	120 mm	120 mm
Weights			
Weight, approx.	225 g	505 g	580 g

Ordering data

	Article No.
IM 360 interface module For expanding the S7-300 with max. 3 EUs; can be plugged into the CC	**6ES7360-3AA01-0AA0**
IM 361 interface module For expanding the S7-300 with max. 3 EUs; can be plugged into the EU	**6ES7361-3CA01-0AA0**
Connecting cable Between IM 360 and IM 361 or IM 361 and IM 361	
1 m	**6ES7368-3BB01-0AA0**
2.5 m	**6ES7368-3BC51-0AA0**
5 m	**6ES7368-3BF01-0AA0**
10 m	**6ES7368-3CB01-0AA0**
IM 365 interface module For expanding the S7-300 with max. 1 EU; 2 modules with permanent connecting cable (1 m)	**6ES7365-0BA01-0AA0**

	Article No.
SIMATIC Manual Collection Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC Distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	**6ES7998-8XC01-8YE0**
SIMATIC Manual Collection update service for 1 year Current "Manual Collection" DVD and the three subsequent updates	**6ES7998-8XC01-8YE2**

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Overview



- SIPLUS IM 365: For configuration of 1 central controller and max. 1 expansion unit

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

Technical specifications

Article number	**6AG1365-0BA01-2AA0**
Based on	**6ES7365-0BA01-0AA0**
	SIPLUS S7-300 IM365
Ambient conditions	
Ambient temperature during operation	
• min.	-25 °C; = Tmin
• max.	60 °C; = Tmax
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)

Article number	**6AG1365-0BA01-2AA0**
Based on	**6ES7365-0BA01-0AA0**
	SIPLUS S7-300 IM365
Resistance	
Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
Use on land craft, rail vehicles and special-purpose vehicles	
- to biologically active substances according to EN 60721-3-5	Yes; Class 5B2 mold, fungus and dry rot spores (with the exception of fauna); Class 5B3 on request
- to chemically active substances according to EN 60721-3-5	Yes; Class 5C3 (RH < 75 %) incl. salt spray acc. to EN 50155 (ST2); *
- to mechanically active substances according to EN 60721-3-5	Yes; Class 5S3 incl. sand, dust; *
Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
Remark	
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!

Ordering data

	Article No.
SIPLUS S7-300 IM 365 interface module	
For expansion of S7-300 with max. 1 EU; 2 modules with permanent connecting cable (1 m)	
Extended temperature range and exposure to media	**6AG1365-0BA01-2AA0**

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Overview DIN rail



- The mechanical rack for SIMATIC S7-300
- For accommodating the modules
- Can be attached to walls

Ordering data	Article No.
DIN rail	
160 mm	**6ES7390-1AB60-0AA0**
482 mm	**6ES7390-1AE80-0AA0**
530 mm	**6ES7390-1AF30-0AA0**
830 mm	**6ES7390-1AJ30-0AA0**
2000 mm	**6ES7390-1BC00-0AA0**

Overview Labeling sheets

Labeling sheets

- Film sheets for the application-specific labeling of SIMATIC S7-300 I/O modules using standard laser printers
- Plain color films, tear-resistant, dirt-repellent
- Simple handling:
  - perforated label sheets in DIN A4 format for easy separation of the labeling strips.
  - the separated strips can be attached directly onto the I/O modules.
- Different colors to distinguish between different module types or preferred applications:
  The labeling sheets are available in the following colors: petrol, light beige, red, and yellow. Yellow is reserved for fail-safe systems.

Label cover

- Petrol-colored film
- For sealing and fixing of custom labeling strips on normal paper
- Accessories, 10 units

Technical specifications

Labeling sheets for S7-300	
Dimensions	DIN A4
Labeling strips per sheet, pre-perforated	10
Weight, approx.	0.1 kg

Ordering data	Article No.
Label sheets	
for modules with 20-pin front connector, DIN A4, for printing with laser printer; 10 units	
Petrol	**6ES7392-2AX00-0AA0**
Light beige	**6ES7392-2BX00-0AA0**
Yellow	**6ES7392-2CX00-0AA0**
Red	**6ES7392-2DX00-0AA0**
for modules with 40-pin front connector, DIN A4, for printing with laser printer; 10 units	
Petrol	**6ES7392-2AX10-0AA0**
Light beige	**6ES7392-2BX10-0AA0**
Yellow	**6ES7392-2CX10-0AA0**
Red	**6ES7392-2DX10-0AA0**

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6/2 **Overview**
6/2 SIMATIC S7-400
6/4 I/O modules

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Overview

SIMATIC S7-400:
The powerful controller for system solutions in the manufacturing and process industries

Within the controller family, the SIMATIC S7-400 is designed for system solutions in the manufacturing and process automation industry.

- The S7-400 is especially suitable for data-intensive tasks in the process industry. High processing speeds and deterministic response times guarantee short machine cycle times on high-speed machines in the manufacturing industry. The high-speed backplane bus of S7-400 ensures efficient linking of central I/O modules.
- The S7-400 is used preferably to coordinate complete plants and to control lower-level devices/stations; this is guaranteed by the high communication power and the integral interfaces.
- The performance is scalable thanks to a graded range of CPUs; the I/O capacity is almost unlimited.
- The power reserves of the CPUs enable new functions to be integrated without further hardware investment, e.g. processing of quality data, user-friendly diagnostics, integration into higher-level MES solutions or high-speed communication via bus systems.



SIMATIC S7-400, CPU	412-1 / 412-2	412-2 PN[4]	414-2 / 414-3	414-3 PN/DP[4]	416-2 / 416-3[4]	416-3 PN/DP[4]	417-4[4]
Work memory	512KB/ 1[1] MB	1 MB	2/4[2] MB	4 MB	8/16[3] MB	16 MB	32 MB
Processing times (ns)							
Bit/word/ fixed point/floating point	31.25/31.25/ 31.25/62.5	31.25/31.25/ 31.25/62.5	18.75/18.75/ 18.75/37.5	18.75/18.75/ 18.75/37.5	12.5/12.5/ 12.5/25	12.5/12.5/ 12.5/25	7.5/7.5/ 7.5/15
Timers/counters	2048/2048	2048/2048	2048/2048	2048/2048	2048/2048	2048/2048	2048/2048
Address range							
Digital inputs/outputs	32768 each	32768 each	65536 each	65536 each	131072 each	131072 each	131072 each
Analog inputs/outputs	2048 each	2048 each	4096 each	4096 each	8192 each	8192 each	8192 each
DP interfaces							
Number of MPI/DP interfaces	1	1	1	1	1	1	1
Number of DP interfaces	— / 1[1]	—	1	—	1	1	1
Number of DP slaves per MPI/DP	32	32	32	32	32	32	32
Number of DP slaves per DP	64	—	96 each	125 each	125 each	125 each	125 each
Plug-in interface modules	—	—	— / 1 x DP[2]	1 x DP	— / 1 x DP[3]	1 x DP	2 x DP
Data set gateway	●	●	●	●	●	●	●
PN interfaces							
Number of PN interfaces	—	1 (2 ports)	—	1 (2 ports)	—	1 (2 ports)	—
PROFINET IO	—	●	—	●	—	●	—
PROFINET with IRT	—	●	—	●	—	●	—
PROFINET CBA	—	●	—	●	—	●	—
TCP/IP	—	●	—	●	—	●	—
UDP	—	●	—	●	—	●	—
Web server	—	●	—	●	—	●	—
ISO-on-TCP (RFC 1006)	—	●	—	●	—	●	—
Mounting dimensions W x H x D (mm)	25 x 290 x 219	25 x 290 x 219	25 x 290 x 219 50 x 290 x 219[2]	50 x 290 x 219	25 x 290 x 219 50 x 290 x 219[3]	50 x 290 x 219	50 x 290 x 219

— = cannot be used/not available
● = can be used/available

[1] CPU 412-2
[2] CPU 414-3
[3] CPU 416-3
[4] also as SIPLUS extreme component for corrosive atmosphere/condensation

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Overview (continued)

- The S7-400 can be structured in a modular way without any slot rules; there is a wide range of modules available both for centralized configurations and distributed structures.
- The configuration of the distributed I/O of the S7-400 can be modified during operation. In addition signal modules can be removed and inserted while live (hot swapping). This makes it very easy to expand the system or replace modules in the event of a fault.
- Storage of the entire project data, including symbols and comments, on the CPU simplifies service and maintenance calls.
- Safety engineering and standard automation can be integrated into a single S7-400; plant availability can be increased through the redundant structure of the S7-400.
- Many S7-400 components are also available in a SIPLUS extreme version for extreme environmental conditions, e.g. for use where there is a corrosive atmosphere/condensation. For more detailed information, visit www.siemens.com/siplus-extreme



For more information, refer to:

www.siemens.com/simatic-s7-400

Detailed information on SIMATIC S7-400, see ***Catalog ST 400*** in the Siemens Industry Online Support:

www.siemens.com/industry-catalogs

SIMATIC S7-400, CPU	412-5H[4)]	414-5H[4)]	416-5H[4)]	417-5H[4)]	414F-3 PN/DP	416F-2	416F-3 PN/DP
Work memory	1 MB	4 MB	16 MB	32 MB	4 MB	8 MB	16 MB
Processing times (ns)							
Bit/word/ fixed point/floating point	31.25/31.25/ 31.25/62.5	18.75/18.75/ 18.75/37.5	12.5/12.5/ 12.5/25	7.5/7.5/ 7.5/15	18.75/18.75/ 18.75/37.5	12.5/12.5/ 12.5/25	12.5/12.5/ 12.5/25
Timers/counters	2048/2048	2048/2048	2048/2048	2048/2048	2048/2048	2048/2048	2048/2048
Address ranges							
Digital inputs/outputs	65536 each	65536 each	131072 each	131072 each	65536 each	131072 each	131072 each
Analog inputs/outputs	4096 each	4096 each	8192 each	8192 each	4096 each	8192 each	8192 each
DP interfaces							
Number of MPI/DP interfaces	1	1	1	1	1	1	1
Number of DP interfaces	1	1	1	1	1	1	1
Number of DP slaves per MPI/DP	32	32	32	32	32	32	32
Number of DP slaves per DP	64	96	125	125	125 each	125	125 each
Plug-in interface modules	—	—	—	—	1 x DP	—	1 x DP
Data set gateway	●	●	●	●	●	●	●
PN interfaces							
Number of PN interfaces	1 (2 ports)	1 (2 ports)	1 (2 ports)	1 (2 ports)	1 (2 ports)	—	1 (2 ports)
PROFINET IO	●	●	●	●	●	—	●
PROFINET with IRT	—	—	—	—	●	—	●
PROFINET CBA	—	—	—	—	●	—	●
TCP/IP	●	●	●	●	●	—	●
UDP	●	●	●	●	●	—	●
Web server	—	—	—	—	●	—	●
ISO-on-TCP (RFC 1006)	●	●	●	●	●	—	●
Mounting dimensions W x H x D (mm)	50 x 290 x 219	50 x 290 x 219	50 x 290 x 219	50 x 290 x 219	50 x 290 x 219	25 x 290 x 219	50 x 290 x 219

— = cannot be used/not available
● = can be used/available

[4)] also as SIPLUS extreme component for corrosive atmosphere/condensation

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Overview

Digital modules

SM 421 digital input module



- Digital inputs for the SIMATIC S7-400
- For connecting switches and 2-wire proximity switches (BEROs)

Detailed information on SIMATIC S7-400, see **Catalog ST 400** in Siemens Industry Online Support:
www.siemens.com/industry-catalogs

	Article No.
16 inputs, 24 V DC, with hardware/ diagnostics interrupt	**6ES7421-7BH01-0AB0**
32 inputs, 24 V DC	**6ES7421-1BL01-0AA0**
32 inputs, 120 V UC	**6ES7421-1EL00-0AA0**
16 inputs, 120/230 V UC, inputs according to IEC 1131-2 Type 2	**6ES7421-1FH20-0AA0**
16 inputs, 24 to 60 V UC, with hardware/ diagnostics interrupt	**6ES7421-7DH00-0AB0**

SM 422 digital output module



- Digital outputs for the SIMATIC S7-400
- For connecting solenoid valves, contactors, small-power motors, lamps and motor starters

Detailed information on SIMATIC S7-400, see **Catalog ST 400** in Siemens Industry Online Support:
www.siemens.com/industry-catalogs

	Article No.
16 outputs, 120/230 V AC, 2 A	**6ES7422-1FH00-0AA0**
6 outputs, relay contacts	**6ES7422-1HH00-0AA0**
16 outputs, 24 V DC, 2 A	**6ES7422-1BH11-0AA0**
32 outputs, 24 V DC, 0.5 A	**6ES7422-1BL00-0AA0**
32 outputs; 24 V DC, 0.5 A; with diagnostics	**6ES7422-7BL00-0AB0**

Analog modules

SM 431 analog input module



- Analog inputs for the SIMATIC S7-400
- For connecting voltage sensors and current sensors, thermocouples, resistors and resistance thermometers
- Resolution 13 to 16 bit

Detailed information on SIMATIC S7-400, see **Catalog ST 400** in Siemens Industry Online Support:
www.siemens.com/industry-catalogs

	Article No.
16 inputs, non-floating, 13 bit	**6ES7431-0HH00-0AB0**
8 inputs, floating, 14 bit	**6ES7431-1KF20-0AB0**
8 inputs, floating, 13 bit	**6ES7431-1KF00-0AB0**
8 inputs, floating, 14 bit, with linearization	**6ES7431-1KF10-0AB0**
16 inputs, floating, 16 bit, hardware interrupt capability	**6ES7431-7QH00-0AB0**
8 inputs, floating, 16 bit, hardware interrupt capability, for thermocouples (I, U)	**6ES7431-7KF00-0AB0**
8 inputs, floating, 16 bit, hardware interrupt capability, for thermal resistors	**6ES7431-7KF10-0AB0**

SM 432 analog output module



- Analog outputs for the SIMATIC S7-400
- For connecting analog actuators

Detailed information on SIMATIC S7-400, see **Catalog ST 400** in Siemens Industry Online Support:
www.siemens.com/industry-catalogs

	Article No.
8 outputs, floating, 13 bit	**6ES7432-1HF00-0AB0**

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Overview (continued)

Function modules

FM 450-1 counter module			Article No.
	• Two-channel, intelligent counter module for simple counting tasks • For direct connection of incremental encoders • Comparison function with 2 definable comparison values • Integrated digital outputs for outputting the reaction on reaching the comparison values Detailed information on SIMATIC S7-400, see **Catalog ST 400** in Siemens Industry Online Support: www.siemens.com/industry-catalogs	With 2 channels, max. 500 kHz; for incremental encoders	**6ES7450-1AP01-0AE0**

FM 451 positioning module			Article No.
	The three-channel FM 451 positioning module takes over the adjustment of mechanical axes for rapid traverse/creep speed drives. The module is designed for positioning adjusting and tooling axes, preferably with standard motors, controlled via contactors or frequency converters. • Three-channel positioning module for rapid traverse/creep speed drives • 4 digital outputs per channel for motor control • Incremental or synchronous-serial position feedback Detailed information on SIMATIC S7-400, see **Catalog ST 400** in Siemens Industry Online Support: www.siemens.com/industry-catalogs	For rapid traverse and creep speed drives	**6ES7451-3AL00-0AE0**

FM 452 cam controller			Article No.
	• Very high-speed electronic cam controller • Low-cost alternative to mechanical cam controllers • 32 cam tracks, 16 onboard digital outputs for direct output of actions • Incremental or synchronous-serial position feedback Detailed information on SIMATIC S7-400, see **Catalog ST 400** in Siemens Industry Online Support: www.siemens.com/industry-catalogs		**6ES7452-1AH00-0AE0**

FM 453 positioning module			Article No.
	The FM 453 is an intelligent, three-channel module designed for a wide range of positioning tasks using servo and/or stepper motors. • It can be used for simple point-to-point positioning tasks as well as for complex traverse profiles with the most stringent demands for dynamic response, accuracy, and velocity. • It is the ideal solution for positioning tasks in machines with high clock rates and for multi-axis machines. • Up to 3 independent motors can be controlled Detailed information on SIMATIC S7-400, see **Catalog ST 400** in Siemens Industry Online Support: www.siemens.com/industry-catalogs	with 3 channels/axes	**6ES7453-3AH00-0AE0**

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Overview (continued)

Function modules			
FM 455 controller module			Article No.
	The FM 455 controller module is the intelligent 16-channel controller module for universal control tasks. It can be used, for example, for temperature control, pressure control, flow control or level control. • Convenient online self-optimization for temperature controls • Ready-to-use controller structures • 2 control algorithms • 2 versions: - FM 455 C as continuous controller - FM 455 S as step or pulse controller • With 16 analog outputs (FM 455 C) or 32 digital outputs (FM 455 S) for actuators Detailed information on SIMATIC S7-400, see **Catalog ST 400** in Siemens Industry Online Support: www.siemens.com/industry-catalogs	With 16 analog outputs for 16 continuous controllers	**6ES7455-0VS00-0AE0**
		With 32 digital outputs for 16 step or pulse controllers	**6ES7455-1VS00-0AE0**

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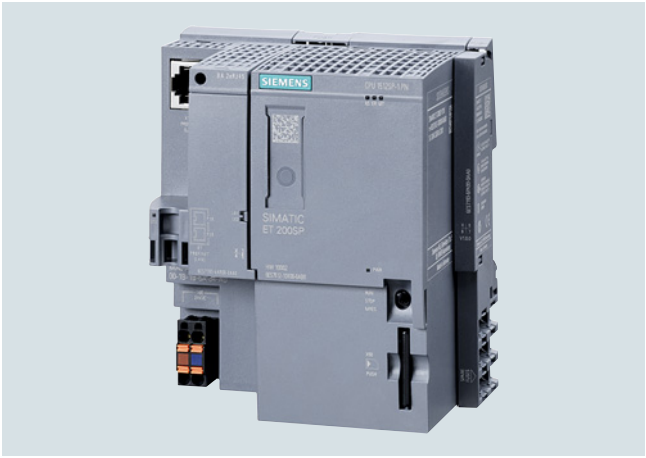
7/2 based on ET 200SP
7/2 Standard CPUs
7/2 CPU 1510SP-1 PN
7/6 CPU 1512SP-1 PN
7/10 SIPLUS standard CPUs
7/10 SIPLUS CPU 1510SP-1 PN
7/12 SIPLUS CPU 1512SP-1 PN
7/14 Fail-safe CPUs
7/14 CPU 1510SP F-1 PN
7/19 CPU 1512SP F-1 PN
7/24 SIPLUS fail-safe CPUs
7/24 SIPLUS CPU 1510SP F-1 PN
7/26 SIPLUS CPU 1512SP F-1 PN
7/28 ET 200SP Open Controllers
7/28 Standard CPUs
7/28 - CPU 1515SP PC
7/34 - CPU 1515SP PC2
7/38 Fail-safe CPUs
7/38 - CPU 1515SP PC F
7/44 - CPU 1515SP PC2 F
7/48 Technology CPUs
7/48 - CPU 1515SP PC2 T
7/52 - CPU 1515SP PC2 TF
7/56 SIPLUS ET 200SP Open Controller
7/56 SIPLUS CPU 1515SP PC

7/58 based on ET 200Pro
7/58 Standard CPUs
7/58 IM 154-8 PN/DP CPU
7/62 CPU 1516pro-2 PN
7/67 Fail-safe CPUs
7/67 IM 154-8 F PN/DP CPU
7/73 CPU 1516pro F-2 PN

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CPU 1510SP-1 PN

Overview



- CPU 1510SP-1 PN for SIMATIC ET 200SP based on S7-1500 CPU 1511-1 PN
- For high-performance control solutions using ET 200SP
- Increase in availability of systems and machines
- PROFINET IO controller for up to 64 IO devices
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or non-Siemens PROFINET IO controller
- PROFINET shared I-Device for 4 controllers
- PROFINET IO IRT interface with integrated 3-port switch
- Isochronous mode on PROFINET
- With multiple communication options: PG/OP communication, PROFINET IO, open IE communication (TCP, ISO-on-TCP and UDP), web server and S7 communication (with loadable FBs)
- OPC UA server and client (data access) as runtime option for easy connection of the SIMATIC ET 200SP to third-party devices/systems
- Optional PROFIBUS DP master for 125 PROFIBUS DP slaves (with CM DP module 6ES7545-5DA00-0AB0)
- Optional PROFIBUS DP slave (with CM DP module 6ES7545-5DA00-0AB0)
- Configuration control (option handling)
- Integrated motion control functionalities for controlling speed-controlled and positioning axes, support for external encoders, output cams/cam tracks and probes

Note:

SIMATIC memory card required for operation of the CPU.
The BusAdapter is not included in scope of supply and is to be ordered separately.

Technical specifications

Article number	**6ES7510-1DJ01-0AB0** CPU 1510SP-1 PN, 100KB Prog./750KB Data
General information	
Product type designation	CPU 1510SP-1 PN
Engineering with	
• STEP 7 TIA Portal configurable/ integrated as of version	V15.1 (FW V2.6)/V13 SP1 Update 4 (FW V1.8) or higher
Supply voltage	
Type of supply voltage	24 V DC
Memory	
Work memory	
• integrated (for program)	100 kbyte
• integrated (for data)	750 kbyte
Load memory	
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte
CPU processing times	
for bit operations, typ.	72 ns
for word operations, typ.	86 ns
for fixed point arithmetic, typ.	115 ns
for floating point arithmetic, typ.	461 ns
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
IEC counter	
• Number	Any (only limited by the main memory)
S7 times	
• Number	2 048
IEC timer	
• Number	Any (only limited by the main memory)
Data areas and their retentivity	
Flag	
• Number, max.	16 kbyte
Address area	
I/O address area	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
Address space per module	
• Address space per module, max.	288 byte; For input and output data respectively
Address space per station	
• Address space per station, max.	2 560 byte; for central inputs and outputs; depending on configuration; 2 048 bytes for ET 200SP modules + 512 bytes for ET 200AL modules
Time of day	
Clock	
• Type	Hardware clock

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Technical specifications (continued)

Article number	**6ES7510-1DJ01-0AB0** CPU 1510SP-1 PN, 100KB Prog./750KB Data
1. Interface	
Interface types	
• Number of ports	3; 1. integr. + 2. via BusAdapter
• integrated switch	Yes
• RJ 45 (Ethernet)	Yes; X1 P3; opt. X1 P1 and X1 P2 via BusAdapter BA 2x RJ45
• BusAdapter (PROFINET)	Yes; Applicable BusAdapter: BA 2x RJ45, BA 2x FC
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes
• Web server	Yes
• Media redundancy	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0
PROFINET IO controller	
Services	
- PG/OP communication	Yes
- S7 routing	Yes
- Isochronous mode	Yes
- Open IE communication	Yes
- IRT	Yes
- MRP	Yes; As MRP redundancy manager and/or MRP client; max. number of devices in the ring: 50
- MRPD	Yes; Requirement: IRT
- PROFIenergy	Yes
- Prioritized startup	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	64; In total, up to 256 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64
- Number of connectable IO Devices for RT, max.	64
- of which in line, max.	64
- Number of IO Devices that can be simultaneously activated/ deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communi-cation share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
Update time for IRT	
- for send cycle of 250 µs	250 µs to 4 ms; Note: In the case of IRT with isochronous mode, the minimum update time of 625 µs of the isochronous OB is decisive
- for send cycle of 500 µs	500 µs to 8 ms; Note: In the case of IRT with isochronous mode, the minimum update time of 625 µs of the isochronous OB is decisive
- for send cycle of 1 ms	1 ms to 16 ms
- for send cycle of 2 ms	2 ms to 32 ms
- for send cycle of 4 ms	4 ms to 64 ms
- With IRT and parameterization of "odd" send cycles	Update time = set "odd" send clock (any multiple of 125 µs: 375 µs, 625 µs ... 3 875 µs)

Article number	**6ES7510-1DJ01-0AB0** CPU 1510SP-1 PN, 100KB Prog./750KB Data
Update time for RT	
- for send cycle of 250 µs	250 µs to 128 ms
- for send cycle of 500 µs	500 µs to 256 ms
- for send cycle of 1 ms	1 ms to 512 ms
- for send cycle of 2 ms	2 ms to 512 ms
- for send cycle of 4 ms	4 ms to 512 ms
PROFINET IO Device	
Services	
- PG/OP communication	Yes
- S7 routing	Yes
- Isochronous mode	No
- Open IE communication	Yes
- IRT	Yes
- MRP	Yes; As MRP redundancy manager and/or MRP client; max. number of devices in the ring: 50
- MRPD	Yes; Requirement: IRT
- PROFIenergy	Yes
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- Asset management record	Yes; Per user program
2. Interface	
Interface types	
• Number of ports	1
• RS 485	Yes; Via CM DP module
Protocols	
• PROFIBUS DP master	Yes
• PROFIBUS DP slave	Yes
• SIMATIC communication	Yes
Protocols	
Number of connections	
• Number of connections, max.	96; via integrated interfaces of the CPU and connected CPs / CMs
PROFIBUS DP master	
Services	
- Number of DP slaves	125; In total, up to 256 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
OPC UA	
• OPC UA client	Yes
• OPC UA server	Yes; Data access (read, write, subscribe), method call, custom address space
Isochronous mode	
Isochronous operation (application synchronized up to terminal)	Yes; Only with PROFINET; with minimum OB 6x cycle of 625 µs

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CPU 1510SP-1 PN

Technical specifications (continued)

Article number	**6ES7510-1DJ01-0AB0** CPU 1510SP-1 PN, 100KB Prog./750KB Data
Supported technology objects	
Motion Control	Yes; Note: The number of axes affects the cycle time of the PLC program; selection guide via the TIA Selection Tool or SIZER
• Number of available Motion Control resources for technology objects (except cam disks)	800
• Required Motion Control resources	
- per speed-controlled axis	40
- per positioning axis	80
- per synchronous axis	160
- per external encoder	80
- per output cam	20
- per cam track	160
- per probe	40
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-25 °C; No condensation
• horizontal installation, max.	60 °C
• vertical installation, min.	-25 °C; No condensation
• vertical installation, max.	50 °C
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
Configuration	
Programming	
Programming language	
- LAD	Yes
- FBD	Yes
- STL	Yes
- SCL	Yes
- GRAPH	Yes
Know-how protection	
• User program protection/password protection	Yes
• Copy protection	Yes
• Block protection	Yes
Access protection	
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Complete protection	Yes
Dimensions	
Width	100 mm
Height	117 mm
Depth	75 mm
Weights	
Weight, approx.	310 g

Ordering data

	Article No.
CPU 1510SP-1 PN Work memory 100 KB for program, 750 KB for data, PROFINET IO IRT interface; SIMATIC memory card required	**6ES7510-1DJ01-0AB0**
Accessories	
CM DP for ET 200SP CPU PROFIBUS DP master/slave with electrical interface for connecting the ET 200SP CPUs to PROFIBUS at up to 12 Mbps	**6ES7545-5DA00-0AB0**
SIMATIC memory card	
4 MB	**6ES7954-8LC03-0AA0**
12 MB	**6ES7954-8LE03-0AA0**
24 MB	**6ES7954-8LF03-0AA0**
256 MB	**6ES7954-8LL03-0AA0**
2 GB	**6ES7954-8LP02-0AA0**
32 GB	**6ES7954-8LT03-0AA0**
DIN rail 35 mm	
• Length: 483 mm for 19" cabinets	**6ES5710-8MA11**
• Length: 530 mm for 600 mm cabinets	**6ES5710-8MA21**
• Length: 830 mm for 900 mm cabinets	**6ES5710-8MA31**
• Length: 2 m	**6ES5710-8MA41**
PE connection element for DIN rail 2 000 mm	**6ES7590-5AA00-0AA0**
BusAdapter BA 2xRJ45	**6ES7193-6AR00-0AA0**
BusAdapter BA 2xFC for increased vibration and EMC loads	**6ES7193-6AF00-0AA0**
BusAdapter BA 2xSCRJ	**6ES7193-6AP00-0AA0**
BusAdapter BA SCRJ/RJ45	**6ES7193-6AP20-0AA0**
BusAdapter BA SCRJ/FC	**6ES7193-6AP40-0AA0**
Equipment labeling plates 10 sheets of 16 plates	**6ES7193-6LF30-0AW0**
Labeling strips	
500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer	**6ES7193-6LR10-0AA0**
500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer	**6ES7193-6LR10-0AG0**
1 000 labeling strips DIN A4, light gray, card, for inscription with laser printer	**6ES7193-6LA10-0AA0**
1 000 labeling strips DIN A4, yellow, card, for inscription with laser printer	**6ES7193-6LA10-0AG0**

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Ordering data	Article No.
IE FC RJ45 plugs RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables	
IE FC RJ45 plug 90 90° cable outlet	
1 unit	**6GK1901-1BB20-2AA0**
10 units	**6GK1901-1BB20-2AB0**
50 units	**6GK1901-1BB20-2AE0**
IE FC RJ45 plug 180 180° cable outlet	
1 unit	**6GK1901-1BB10-2AA0**
10 units	**6GK1901-1BB10-2AB0**
50 units	**6GK1901-1BB10-2AE0**
IE FC TP standard cable GP 2x2 4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/ IE FC RJ45 plug; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	**6XV1840-2AH10**
IE FC TP trailing cable 2 x 2 (Type C) 4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/ IE FC RJ45 plug 180/90 for use as trailing cable; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	**6XV1840-3AH10**
IE FC TP marine cable 2 x 2 (Type B) 4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/IE FC RJ45 plug 180/90 with marine approval, sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	**6XV1840-4AH10**
IE FC stripping tool Preadjusted stripping tool for fast stripping of Industrial Ethernet FC cables	**6GK1901-1GA00**
Manuals for ET 200SP distributed I/O system ET 200SP library: ET 200SP Manual Collection, comprising system manual, product information, and device manuals Manuals can be downloaded from the Internet as PDF files: http://www.siemens.com/simatic-docu	
SIMATIC Manual Collection Electronic manuals on DVD, multi-language: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC Distributed I/O, SIMATIC HMI, SIMATIC sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	**6ES7998-8XC01-8YE0**
SIMATIC Manual Collection update service for 1 year Current "Manual Collection" DVD and the three subsequent updates	**6ES7998-8XC01-8YE2**
STEP 7 Professional V15.1 Target system: SIMATIC S7-1200, S7-1500, S7-300, S7-400, WinAC Requirement: Windows 7 Home Premium SP1 (64-bit) Windows 7 Professional SP1 (64-bit) Windows 7 Enterprise SP1 (64-bit) Windows 7 Ultimate SP1 (64-bit) Windows 10 Home Version 1709, 1803 Windows 10 Professional Version 1709, 1803 Windows 10 Enterprise Version 1709, 1803 Windows 10 Enterprise 2016 LTSB Windows 10 IoT Enterprise 2015 LTSB Windows 10 IoT Enterprise 2016 LTSB Windows Server 2012 R2 StdE (full installation) Windows Server 2016 Standard (full installation) Type of delivery: en, de, fr, it, es, zh	
STEP 7 Professional V15.1, floating license	**6ES7822-1AA05-0YA5**
STEP 7 Professional V15.1, floating license software download incl. license key [1] Email address required for delivery	**6ES7822-1AE05-0YA5**
Spare parts	
Power supply connector Spare part; for connecting the 24 V DC supply voltage • With push-in terminals; 10 units	**6ES7193-4JB00-0AA0**
Cover for bus adapter interface 5 units	**6ES7591-3AA00-0AA0**
Server module	**6ES7193-6PA00-0AA0**

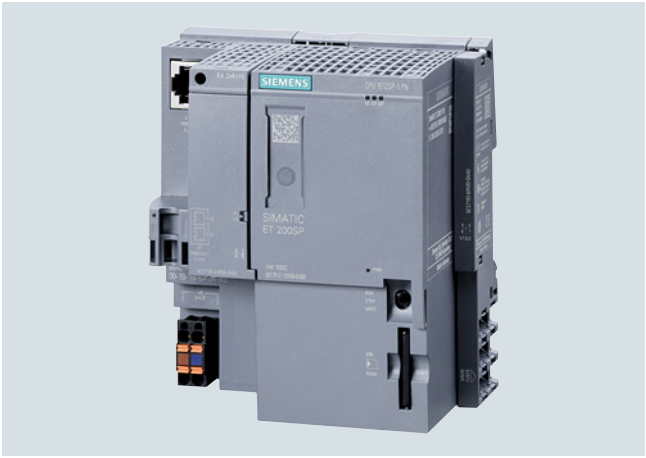
[1] For up-to-date information and download availability, see: http://www.siemens.com/tia-online-software-delivery

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CPU 1512SP-1 PN

Overview



- CPU 1512SP-1 PN for SIMATIC ET 200SP based on S7-1500 CPU 1513-1 PN
- For applications with medium requirements in terms of program scope and processing speed, for distributed configurations via PROFINET IO or PROFIBUS DP.
- Increase in availability of systems and machines
- PROFINET IO controller for up to 128 IO devices
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or non-Siemens PROFINET IO controller
- PROFINET shared I-Device for 4 controllers
- PROFINET IO IRT interface with integrated 3-port switch
- Isochronous mode on PROFINET
- With multiple communication options: PG/OP communication, PROFINET IO, open IE communication (TCP, ISO-on-TCP and UDP), web server and S7 communication (with loadable FBs)
- OPC UA server and client (data access) as runtime option for easy connection of the SIMATIC ET 200SP to third-party devices/systems
- Optional PROFIBUS DP master for 125 PROFIBUS DP slaves (with CM DP module 6ES7545-5DA00-0AB0)
- Optional PROFIBUS DP slave (with CM DP module 6ES7545-5DA00-0AB0)
- Configuration control (option handling)
- Integrated motion control functionalities for controlling speed-controlled and positioning axes, support for external encoders, output cams/cam tracks and probes

Note:

SIMATIC memory card required for operation of the CPU. BusAdapter is not included in scope of supply and is to be ordered separately.

Technical specifications

Article number	**6ES7512-1DK01-0AB0** CPU 1512SP-1 PN, 200KB Prog./1MB Data
General information	
Product type designation	CPU 1512SP-1 PN
Engineering with	
• STEP 7 TIA Portal configurable/ integrated as of version	V15.1 (FW V2.6)/V13 SP1 Update 4 (FW V1.8) or higher
Supply voltage	
Type of supply voltage	24 V DC
Memory	
Work memory	
• integrated (for program)	200 kbyte
• integrated (for data)	1 Mbyte
Load memory	
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte
CPU processing times	
for bit operations, typ.	48 ns
for word operations, typ.	58 ns
for fixed point arithmetic, typ.	77 ns
for floating point arithmetic, typ.	307 ns
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
IEC counter	
• Number	Any (only limited by the main memory)
S7 times	
• Number	2 048
IEC timer	
• Number	Any (only limited by the main memory)
Data areas and their retentivity	
Flag	
• Number, max.	16 kbyte
Address area	
I/O address area	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
Address space per module	
• Address space per module, max.	288 byte; For input and output data respectively
Address space per station	
• Address space per station, max.	2 560 byte; for central inputs and outputs; depending on configuration; 2 048 bytes for ET 200SP modules + 512 bytes for ET 200AL modules
Time of day	
Clock	
• Type	Hardware clock

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Technical specifications (continued)

Article number	**6ES7512-1DK01-0AB0** CPU 1512SP-1 PN, 200KB Prog./1MB Data
1. Interface	
Interface types	
• Number of ports	3; 1. integr. + 2. via BusAdapter
• integrated switch	Yes
• RJ 45 (Ethernet)	Yes; X1 P3; opt. X1 P1 and X1 P2 via BusAdapter BA 2x RJ45
• BusAdapter (PROFINET)	Yes; Compatible BusAdapter: BA 2x RJ45, BA 2x FC, BA 2x SCRJ, BA SCRJ / RJ45, BA SCRJ / FC, BA 2x LC, BA LC / RJ45, BA LC / FC
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes
• Web server	Yes
• Media redundancy	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0
PROFINET IO controller	
Services	
- PG/OP communication	Yes
- S7 routing	Yes
- Isochronous mode	Yes
- Open IE communication	Yes
- IRT	Yes
- MRP	Yes; As MRP redundancy manager and/or MRP client; max. number of devices in the ring: 50
- MRPD	Yes; Requirement: IRT
- PROFIenergy	Yes
- Prioritized startup	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	128; In total, up to 512 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64
- Number of connectable IO Devices for RT, max.	128
- of which in line, max.	128
- Number of IO Devices that can be simultaneously activated/ deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
Update time for IRT	
- for send cycle of 250 µs	250 µs to 4 ms; Note: In the case of IRT with isochronous mode, the minimum update time of 500 µs of the isochronous OB is decisive
- for send cycle of 500 µs	500 µs to 8 ms
- for send cycle of 1 ms	1 ms to 16 ms
- for send cycle of 2 ms	2 ms to 32 ms
- for send cycle of 4 ms	4 ms to 64 ms
- With IRT and parameterization of "odd" send cycles	Update time = set "odd" send clock (any multiple of 125 µs: 375 µs, 625 µs ... 3 875 µs)

Article number	**6ES7512-1DK01-0AB0** CPU 1512SP-1 PN, 200KB Prog./1MB Data
Update time for RT	
- for send cycle of 250 µs	250 µs to 128 ms
- for send cycle of 500 µs	500 µs to 256 ms
- for send cycle of 1 ms	1 ms to 512 ms
- for send cycle of 2 ms	2 ms to 512 ms
- for send cycle of 4 ms	4 ms to 512 ms
PROFINET IO Device	
Services	
- PG/OP communication	Yes
- S7 routing	Yes
- Isochronous mode	No
- Open IE communication	Yes
- IRT	Yes
- MRP	Yes; As MRP redundancy manager and/or MRP client; max. number of devices in the ring: 50
- MRPD	Yes; Requirement: IRT
- PROFIenergy	Yes
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- Asset management record	Yes; Per user program
2. Interface	
Interface types	
• Number of ports	1
• RS 485	Yes; Via CM DP module
Protocols	
• PROFIBUS DP master	Yes
• PROFIBUS DP slave	Yes
• SIMATIC communication	Yes
Protocols	
Number of connections	
• Number of connections, max.	128; via integrated interfaces of the CPU and connected CPs / CMs
PROFIBUS DP master	
Services	
- Number of DP slaves	125; In total, up to 512 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
OPC UA	
• OPC UA client	Yes
• OPC UA server	Yes; Data access (read, write, subscribe), method call, custom address space
Isochronous mode	
Isochronous operation (application synchronized up to terminal)	Yes; Only with PROFINET; with minimum OB 6x cycle of 625 µs

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CPU 1512SP-1 PN

Technical specifications (continued)

Article number	**6ES7512-1DK01-0AB0** CPU 1512SP-1 PN, 200KB Prog./1MB Data
Supported technology objects	
Motion Control	Yes; Note: The number of axes affects the cycle time of the PLC program; selection guide via the TIA Selection Tool or SIZER
• Number of available Motion Control resources for technology objects (except cam disks)	800
• Required Motion Control resources	
- per speed-controlled axis	40
- per positioning axis	80
- per synchronous axis	160
- per external encoder	80
- per output cam	20
- per cam track	160
- per probe	40
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-25 °C; No condensation
• horizontal installation, max.	60 °C
• vertical installation, min.	-25 °C; No condensation
• vertical installation, max.	50 °C
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
Configuration	
Programming	
Programming language	
- LAD	Yes
- FBD	Yes
- STL	Yes
- SCL	Yes
- GRAPH	Yes
Know-how protection	
• User program protection/password protection	Yes
• Copy protection	Yes
• Block protection	Yes
Access protection	
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Complete protection	Yes
Dimensions	
Width	100 mm
Height	117 mm
Depth	75 mm
Weights	
Weight, approx.	310 g

Ordering data

	Article No.
CPU 1512SP-1 PN Work memory 200 KB for program, 1 MB for data, PROFINET IO IRT interface; SIMATIC memory card required	**6ES7512-1DK01-0AB0**
Accessories	
CM DP for ET 200SP CPU PROFIBUS DP master/slave with electrical interface for connecting the ET 200SP CPUs to PROFIBUS at up to 12 Mbps	**6ES7545-5DA00-0AB0**
SIMATIC memory card	
4 MB	**6ES7954-8LC03-0AA0**
12 MB	**6ES7954-8LE03-0AA0**
24 MB	**6ES7954-8LF03-0AA0**
256 MB	**6ES7954-8LL03-0AA0**
2 GB	**6ES7954-8LP02-0AA0**
32 GB	**6ES7954-8LT03-0AA0**
DIN rail 35 mm	
• Length: 483 mm for 19" cabinets	**6ES5710-8MA11**
• Length: 530 mm for 600 mm cabinets	**6ES5710-8MA21**
• Length: 830 mm for 900 mm cabinets	**6ES5710-8MA31**
• Length: 2 m	**6ES5710-8MA41**
PE connection element for DIN rail 2 000 mm	**6ES7590-5AA00-0AA0**
BusAdapter BA 2xRJ45	**6ES7193-6AR00-0AA0**
BusAdapter BA 2xFC for increased vibration and EMC loads	**6ES7193-6AF00-0AA0**
BusAdapter BA 2xSCRJ	**6ES7193-6AP00-0AA0**
BusAdapter BA SCRJ/RJ45	**6ES7193-6AP20-0AA0**
BusAdapter BA SCRJ/FC	**6ES7193-6AP40-0AA0**
BusAdapter BA 2xLC	**6ES7193-6AG00-0AA0**
BusAdapter BA LC/RJ45	**6ES7193-6AG20-0AA0**
BusAdapter BA LC/FC	**6ES7193-6AG40-0AA0**
Equipment labeling plates 10 sheets of 16 plates	**6ES7193-6LF30-0AW0**
Labeling strips	
500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer	**6ES7193-6LR10-0AA0**
500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer	**6ES7193-6LR10-0AG0**
1 000 labeling strips DIN A4, light gray, card, for inscription with laser printer	**6ES7193-6LA10-0AA0**
1 000 labeling strips DIN A4, yellow, card, for inscription with laser printer	**6ES7193-6LA10-0AG0**

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Ordering data	Article No.
IE FC RJ45 plugs RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables	
IE FC RJ45 plug 90 90° cable outlet	
1 unit	**6GK1901-1BB20-2AA0**
10 units	**6GK1901-1BB20-2AB0**
50 units	**6GK1901-1BB20-2AE0**
IE FC RJ45 plug 180 180° cable outlet	
1 unit	**6GK1901-1BB10-2AA0**
10 units	**6GK1901-1BB10-2AB0**
50 units	**6GK1901-1BB10-2AE0**
IE FC TP standard cable GP 2x2 4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/ IE FC RJ45 plug; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	**6XV1840-2AH10**
IE FC TP trailing cable 2 x 2 (Type C) 4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/ IE FC RJ45 plug 180/90 for use as trailing cable; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	**6XV1840-3AH10**
IE FC TP marine cable 2 x 2 (Type B) 4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/IE FC RJ45 plug 180/90 with marine approval, sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	**6XV1840-4AH10**
IE FC stripping tool Preadjusted stripping tool for fast stripping of Industrial Ethernet FC cables	**6GK1901-1GA00**
Manuals for ET 200SP distributed I/O system ET 200SP library: ET 200SP Manual Collection, comprising system manual, product information, and device manuals Manuals can be downloaded from the Internet as PDF files: http://www.siemens.com/simatic-docu	
SIMATIC Manual Collection Electronic manuals on DVD, multi-language: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC Distributed I/O, SIMATIC HMI, SIMATIC sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	**6ES7998-8XC01-8YE0**
SIMATIC Manual Collection update service for 1 year Current "Manual Collection" DVD and the three subsequent updates	**6ES7998-8XC01-8YE2**
STEP 7 Professional V15.1 Target system: SIMATIC S7-1200, S7-1500, S7-300, S7-400, WinAC Requirement: Windows 7 Home Premium SP1 (64-bit) Windows 7 Professional SP1 (64-bit) Windows 7 Enterprise SP1 (64-bit) Windows 7 Ultimate SP1 (64-bit) Windows 10 Home Version 1709, 1803 Windows 10 Professional Version 1709, 1803 Windows 10 Enterprise Version 1709, 1803 Windows 10 Enterprise 2016 LTSB Windows 10 IoT Enterprise 2015 LTSB Windows 10 IoT Enterprise 2016 LTSB Windows Server 2012 R2 StdE (full installation) Windows Server 2016 Standard (full installation) Type of delivery: en, de, fr, it, es, zh	
STEP 7 Professional V15.1, floating license	**6ES7822-1AA05-0YA5**
STEP 7 Professional V15.1, floating license software download incl. license key [1] Email address required for delivery	**6ES7822-1AE05-0YA5**
Spare parts	
Power supply connector Spare part; for connecting the 24 V DC supply voltage • With push-in terminals; 10 units	**6ES7193-4JB00-0AA0**
Cover for bus adapter interface 5 units	**6ES7591-3AA00-0AA0**
Server module	**6ES7193-6PA00-0AA0**

[1] For up-to-date information and download availability, see: http://www.siemens.com/tia-online-software-delivery

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SIPLUS CPU 1510SP-1 PN

Overview



- SIPLUS CPU 1510SP-1 PN for SIPLUS ET 200SP based on SIPLUS-S7-1500 CPU 1511-1 PN
- For high-performance control solutions using ET 200SP
- Increase in availability of systems and machines
- PROFINET IO controller for up to 64 IO devices
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or non-Siemens PROFINET IO controller
- PROFINET shared I-Device for 4 controllers
- PROFINET IO IRT interface with integrated 3-port switch
- Isochronous mode on PROFINET
- With multiple communication options: PG/OP communication, PROFINET IO, open IE communication (TCP, ISO-on-TCP and UDP), web server and S7 communication (with loadable FBs)
- Optional PROFIBUS DP master for 125 PROFIBUS DP slaves (with CM DP module 6ES7545-5DA00-0AB0)
- Optional PROFIBUS DP slave (with CM DP module 6ES7545-5DA00-0AB0)
- Configuration control (option handling)
- Integrated motion control functionalities for controlling speed-controlled and positioning axes, support for external encoders

Note:

SIMATIC memory card required for operation of the CPU. The bus adapter is not included in scope of supply and is to be ordered separately.

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

Technical specifications

Article number	**6AG1510-1DJ01-2AB0**
Based on	**6ES7510-1DJ01-0AB0**
	SIPLUS ET 200SP CPU 1510SP-1 PN
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	60 °C; = Tmax
• vertical installation, min.	-40 °C; = Tmin
• vertical installation, max.	50 °C; = Tmax
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance	
Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!
Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
Remark	
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A

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Ordering data

	Article No.
SIPLUS CPU 1510SP-1 PN (Extended temperature range and exposure to environmental substances) Work memory 100 KB for program, 750 KB for data, PROFINET IO IRT interface; SIMATIC memory card required	**6AG1510-1DJ01-2AB0**

	Article No.
Accessories	
BA 2xRJ45 BusAdapter (Extended temperature range and exposure to environmental substances)	**6AG1193-6AR00-7AA0**
BA 2xFC BusAdapter for increased vibration and EMC loads (Extended temperature range and exposure to environmental substances)	**6AG1193-6AF00-7AA0**
IE FC RJ45 plugs RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables	
IE FC RJ45 plug 180 (Extended temperature range and exposure to environmental substances) 180° cable outlet 1 unit	**6AG1901-1BB10-7AA0**
Additional accessories	See SIMATIC ET 200SP CPU 1510SP-1 PN, page 7/4

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SIPLUS CPU 1512SP-1 PN

Overview



- SIPLUS CPU 1512SP-1 PN for SIPLUS ET 200SP based on SIPLUS S7-1500 CPU 1513-1 PN
- For applications with medium requirements regarding the program scope and processing speed, for distributed setup via PROFINET IO or PROFIBUS DP.
- Increase in availability of systems and machines
- PROFINET IO controller for up to 128 IO devices
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or non-Siemens PROFINET IO controller
- PROFINET shared I-Device for 4 controllers
- PROFINET IO IRT interface with integrated 3-port switch
- Isochronous mode on PROFINET
- With multiple communication options: PG/OP communication, PROFINET IO, open IE communication (TCP, ISO-on-TCP and UDP), web server and S7 communication (with loadable FBs)
- Optional PROFIBUS DP master for 125 PROFIBUS DP slaves (with CM DP module 6ES7545-5DA00-0AB0)
- Optional PROFIBUS DP slave (with CM DP module 6ES7545-5DA00-0AB0)
- Configuration control (option handling)
- Integrated motion control functionalities for controlling speed-controlled and positioning axes, support for external encoders

Note:

SIMATIC memory card required for operation of the CPU. BusAdapter is not included in scope of supply and is to be ordered separately.

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

Technical specifications

Article number	**6AG1512-1DK01-2AB0**
Based on	**6ES7512-1DK01-0AB0**
	SIPLUS ET 200SP CPU 1512SP-1 PN
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	60 °C; = Tmax
• vertical installation, min.	-40 °C; = Tmin
• vertical installation, max.	50 °C; = Tmax
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance	
Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75%) incl. salt spray according to EN 60068-2-52 (degree of severity 3). The supplied connector covers must remain on the unused interfaces during operation!
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust. The supplied connector covers must remain on the unused interfaces during operation!
Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
Remark	
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A

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Ordering data

	Article No.
SIPLUS CPU 1512SP-1 PN (Extended temperature range and exposure to environmental substances) Work memory 200 KB for program, 1 MB for data, PROFINET IO IRT interface; SIMATIC memory card required	**6AG1512-1DK01-2AB0**

	Article No.
Accessories	
BusAdapter BA 2xRJ45 (Extended temperature range and exposure to environmental substances)	**6AG1193-6AR00-7AA0**
BusAdapter BA 2xFC for increased vibration and EMC loads (Extended temperature range and exposure to environmental substances)	**6AG1193-6AF00-7AA0**
IE FC RJ45 plugs RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables	
IE FC RJ45 plug 180 180° cable outlet 1 unit	**6AG1901-1BB10-7AA0**
Additional accessories	see SIMATIC ET 200SP, CPU 1512SP-1 PN, page 7/8

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CPU 1510SP F-1 PN

Overview



- CPU 1510SP F-1 PN for SIMATIC ET 200SP based on S7-1500 CPU 1511F-1 PN
- For high-performance control solutions using ET 200SP
- Increase in availability of systems and machines
- Supports PROFIsafe in centralized and distributed configurations
- PROFINET IO controller for up to 64 IO devices
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or non-Siemens PROFINET IO controller
- PROFINET shared I-Device for 4 controllers
- PROFINET IO IRT interface with integrated 3-port switch
- Isochronous mode on PROFINET
- With multiple communication options: PG/OP communication, PROFINET IO, open IE communication (TCP, ISO-on-TCP and UDP), web server and S7 communication (with loadable FBs)
- OPC UA server and client (data access) as runtime option for easy connection of the SIMATIC ET 200SP to third-party devices/systems
- Optional PROFIBUS master for 125 PROFIBUS DP slaves (with CM DP module 6ES7545-5DA00-0AB0)
- Configuration control (option handling)
- Integrated motion control functionalities for controlling speed-controlled and positioning axes, support for external encoders

Note:

SIMATIC memory card required for operation of the CPU.

The BusAdapter is not included in the scope of supply and must be ordered separately.

Technical specifications

Article number	**6ES7510-1SJ01-0AB0** CPU1510SP F-1 PN, 150KB Prog./750KB Data
General information	
Product type designation	CPU 1510SP F-1 PN
Engineering with	
• STEP 7 TIA Portal configurable/ integrated as of version	V15.1 (FW V2.6)/V13 SP1 Update 4 (FW V1.8) or higher
Supply voltage	
Type of supply voltage	24 V DC
Memory	
Work memory	
• integrated (for program)	150 kbyte
• integrated (for data)	750 kbyte
Load memory	
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte
CPU processing times	
for bit operations, typ.	72 ns
for word operations, typ.	86 ns
for fixed point arithmetic, typ.	115 ns
for floating point arithmetic, typ.	461 ns
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
IEC counter	
• Number	Any (only limited by the main memory)
S7 times	
• Number	2 048
IEC timer	
• Number	Any (only limited by the main memory)
Data areas and their retentivity	
Flag	
• Number, max.	16 kbyte
Address area	
I/O address area	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
Address space per module	
• Address space per module, max.	288 byte; For input and output data respectively
Address space per station	
• Address space per station, max.	2 560 byte; for central inputs and outputs; depending on configuration; 2 048 bytes for ET 200SP modules + 512 bytes for ET 200AL modules
Time of day	
Clock	
• Type	Hardware clock

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Technical specifications (continued)

Article number	**6ES7510-1SJ01-0AB0** CPU1510SP F-1 PN, 150KB Prog./750KB Data
1. Interface	
Interface types	
• Number of ports	3; 1. integr. + 2. via BusAdapter
• integrated switch	Yes
• RJ 45 (Ethernet)	Yes; X1 P3; opt. X1 P1 and X1 P2 via BusAdapter BA 2x RJ45
• BusAdapter (PROFINET)	Yes; Applicable BusAdapter: BA 2x RJ45, BA 2x FC
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes
• Web server	Yes
• Media redundancy	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0
PROFINET IO controller	
Services	
- PG/OP communication	Yes
- S7 routing	Yes
- Isochronous mode	Yes
- Open IE communication	Yes
- IRT	Yes
- MRP	Yes; As MRP redundancy manager and/or MRP client; max. number of devices in the ring: 50
- MRPD	Yes; Requirement: IRT
- PROFIenergy	Yes
- Prioritized startup	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	64; In total, up to 256 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64
- Number of connectable IO Devices for RT, max.	64
- of which in line, max.	64
- Number of IO Devices that can be simultaneously activated/ deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communi-cation share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
Update time for IRT	
- for send cycle of 250 µs	250 µs to 4 ms; Note: In the case of IRT with isochronous mode, the minimum update time of 625 µs of the isochronous OB is decisive
- for send cycle of 500 µs	500 µs to 8 ms; Note: In the case of IRT with isochronous mode, the minimum update time of 625 µs of the isochronous OB is decisive
- for send cycle of 1 ms	1 ms to 16 ms
- for send cycle of 2 ms	2 ms to 32 ms
- for send cycle of 4 ms	4 ms to 64 ms
- With IRT and parameterization of "odd" send cycles	Update time = set "odd" send clock (any multiple of 125 µs: 375 µs, 625 µs ... 3 875 µs)

Article number	**6ES7510-1SJ01-0AB0** CPU1510SP F-1 PN, 150KB Prog./750KB Data
Update time for RT	
- for send cycle of 250 µs	250 µs to 128 ms
- for send cycle of 500 µs	500 µs to 256 ms
- for send cycle of 1 ms	1 ms to 512 ms
- for send cycle of 2 ms	2 ms to 512 ms
- for send cycle of 4 ms	4 ms to 512 ms
PROFINET IO Device	
Services	
- PG/OP communication	Yes
- S7 routing	Yes
- Isochronous mode	No
- Open IE communication	Yes
- IRT	Yes
- MRP	Yes; As MRP redundancy manager and/or MRP client; max. number of devices in the ring: 50
- MRPD	Yes; Requirement: IRT
- PROFIenergy	Yes
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- Asset management record	Yes; Per user program
2. Interface	
Interface types	
• Number of ports	1
• RS 485	Yes; Via CM DP module
Protocols	
• PROFIBUS DP master	Yes
• PROFIBUS DP slave	Yes
• SIMATIC communication	Yes
Protocols	
Number of connections	
• Number of connections, max.	96; via integrated interfaces of the CPU and connected CPs / CMs
PROFIBUS DP master	
Services	
- Number of DP slaves	125; In total, up to 256 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
OPC UA	
• OPC UA client	Yes
• OPC UA server	Yes; Data access (read, write, subscribe), method call, custom address space
Isochronous mode	
Isochronous operation (application synchronized up to terminal)	Yes; Only with PROFINET; with minimum OB 6x cycle of 625 µs

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Technical specifications (continued)

Article number	6ES7510-1SJ01-0AB0 CPU1510SP F-1 PN, 150KB Prog./750KB Data
Supported technology objects	
Motion Control	Yes; Note: The number of axes affects the cycle time of the PLC program; selection guide via the TIA Selection Tool or SIZER
• Number of available Motion Control resources for technology objects (except cam disks)	800
• Required Motion Control resources	
- per speed-controlled axis	40
- per positioning axis	80
- per synchronous axis	160
- per external encoder	80
- per output cam	20
- per cam track	160
- per probe	40
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes
Standards, approvals, certificates	
Highest safety class achievable in safety mode	
Probability of failure (for service life of 20 years and repair time of 10047,131 mmhours)	
- Low demand mode: PFDavg in accordance with SIL3	< 2.00E-05
- High demand/continuous mode: PFH in accordance with SIL3	< 1.00E-09

Article number	6ES7510-1SJ01-0AB0 CPU1510SP F-1 PN, 150KB Prog./750KB Data
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-25 °C; No condensation
• horizontal installation, max.	60 °C
• vertical installation, min.	-25 °C; No condensation
• vertical installation, max.	50 °C
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
Configuration	
Programming	
Programming language	
- LAD	Yes; incl. failsafe
- FBD	Yes; incl. failsafe
- STL	Yes
- SCL	Yes
- GRAPH	Yes
Know-how protection	
• User program protection/password protection	Yes
• Copy protection	Yes
• Block protection	Yes
Access protection	
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Complete protection	Yes
Dimensions	
Width	100 mm
Height	117 mm
Depth	75 mm
Weights	
Weight, approx.	310 g

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Ordering data	Article No.
CPU 1510SP F-1 PN Work memory 150 KB for program, 750 KB for data, PROFINET IO IRT interface; SIMATIC memory card required	**6ES7510-1SJ01-0AB0**
Accessories	
CM DP for ET 200SP CPU PROFIBUS DP master/slave with electrical interface for connecting the ET 200SP CPUs to PROFIBUS at up to 12 Mbps	**6ES7545-5DA00-0AB0**
SIMATIC memory card	
4 MB	**6ES7954-8LC03-0AA0**
12 MB	**6ES7954-8LE03-0AA0**
24 MB	**6ES7954-8LF03-0AA0**
256 MB	**6ES7954-8LL03-0AA0**
2 GB	**6ES7954-8LP02-0AA0**
32 GB	**6ES7954-8LT03-0AA0**
DIN rail 35 mm	
• Length: 483 mm for 19" cabinets	**6ES5710-8MA11**
• Length: 530 mm for 600 mm cabinets	**6ES5710-8MA21**
• Length: 830 mm for 900 mm cabinets	**6ES5710-8MA31**
• Length: 2 m	**6ES5710-8MA41**
PE connection element for DIN rail 2 000 mm	**6ES7590-5AA00-0AA0**
BusAdapter BA 2xRJ45	**6ES7193-6AR00-0AA0**
BusAdapter BA 2xFC for increased vibration and EMC loads	**6ES7193-6AF00-0AA0**
BusAdapter BA 2xSCRJ	**6ES7193-6AP00-0AA0**
BusAdapter BA SCRJ/RJ45	**6ES7193-6AP20-0AA0**
BusAdapter BA SCRJ/FC	**6ES7193-6AP40-0AA0**
Equipment labeling plates 10 sheets of 16 plates	**6ES7193-6LF30-0AW0**
Labeling strips	
500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer	**6ES7193-6LR10-0AA0**
500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer	**6ES7193-6LR10-0AG0**
1 000 labeling strips DIN A4, light gray, card, for inscription with laser printer	**6ES7193-6LA10-0AA0**
1000 labeling strips DIN A4, yellow, card, for inscription with laser printer	**6ES7193-6LA10-0AG0**

	Article No.
IE FC RJ45 plugs RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables	
IE FC RJ45 plug 90 90° cable outlet	
1 unit	**6GK1901-1BB20-2AA0**
10 units	**6GK1901-1BB20-2AB0**
50 units	**6GK1901-1BB20-2AE0**
IE FC RJ45 plug 180 180° cable outlet	
1 unit	**6GK1901-1BB10-2AA0**
10 units	**6GK1901-1BB10-2AB0**
50 units	**6GK1901-1BB10-2AE0**
IE FC TP standard cable GP 2x2 4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/ IE FC RJ45 plug; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	**6XV1840-2AH10**
IE FC TP trailing cable 2 x 2 (Type C) 4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/ IE FC RJ45 plug 180/90 for use as trailing cable; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	**6XV1840-3AH10**
IE FC TP marine cable 2 x 2 (Type B) 4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/IE FC RJ45 plug 180/90 with marine approval, sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	**6XV1840-4AH10**
IE FC stripping tool Preadjusted stripping tool for fast stripping of Industrial Ethernet FC cables	**6GK1901-1GA00**

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CPU 1510SP F-1 PN

Ordering data	Article No.
Manuals for ET 200SP distributed I/O system ET 200SP library: ET 200SP Manual Collection, comprising system manual, product information, and device manuals Manuals can be downloaded from the Internet as PDF files: http://www.siemens.com/simatic-docu	
SIMATIC Manual Collection Electronic manuals on DVD, multi-language: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC Distributed I/O, SIMATIC HMI, SIMATIC sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	**6ES7998-8XC01-8YE0**
SIMATIC Manual Collection update service for 1 year Current "Manual Collection" DVD and the three subsequent updates	**6ES7998-8XC01-8YE2**
STEP 7 Professional V15.1 Target system: SIMATIC S7-1200, S7-1500, S7-300, S7-400, WinAC Requirement: Windows 7 Home Premium SP1 (64-bit) Windows 7 Professional SP1 (64-bit) Windows 7 Enterprise SP1 (64-bit) Windows 7 Ultimate SP1 (64-bit) Windows 10 Home Version 1709, 1803 Windows 10 Professional Version 1709, 1803 Windows 10 Enterprise Version 1709, 1803 Windows 10 Enterprise 2016 LTSB Windows 10 IoT Enterprise 2015 LTSB Windows 10 IoT Enterprise 2016 LTSB Windows Server 2012 R2 StdE (full installation) Windows Server 2016 Standard (full installation) Type of delivery: en, de, fr, it, es, zh	
STEP 7 Professional V15.1, floating license	**6ES7822-1AA05-0YA5**
STEP 7 Professional V15.1, floating license software download incl. license key [1] Email address required for delivery	**6ES7822-1AE05-0YA5**
STEP 7 Safety Advanced V15.1 Task: Engineering tool for configuring and programming fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-1500F Software Controller, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller and the fail-safe ET 200SP, ET 200MP, ET 200S, ET 200M, ET 200iSP, ET 200pro and ET 200eco I/O Requirement: STEP 7 Professional V15.1	
Floating license for 1 user, software and documentation on DVD, license key on USB flash drive	**6ES7833-1FA15-0YA5**
Floating license for 1 user, software, documentation and license key for download [2]; email address required for delivery	**6ES7833-1FA15-0YH5**
Spare parts	
Power supply connector Spare part; for connecting the 24 V DC supply voltage • With push-in terminals; 10 units	**6ES7193-4JB00-0AA0**
Cover for bus adapter interface 5 units	**6ES7591-3AA00-0AA0**
Server module	**6ES7193-6PA00-0AA0**

[1] For up-to-date information and download availability, see: http://www.siemens.com/tia-online-software-delivery

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Overview



- CPU 1512SP F-1 PN for SIMATIC ET 200SP based on S7-1500 CPU 1513F-1 PN
- For applications with medium requirements in terms of program scope and processing speed, for distributed configurations via PROFINET IO or PROFIBUS DP.
- Increase in availability of systems and machines
- Supports PROFIsafe in centralized and distributed configurations
- PROFINET IO controller for up to 128 IO devices
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or non-Siemens PROFINET IO controller
- PROFINET shared I-Device for 4 controllers
- PROFINET IO IRT interface with integrated 3-port switch
- Isochronous mode on PROFINET
- With multiple communication options: PG/OP communication, PROFINET IO, open IE communication (TCP, ISO-on-TCP and UDP), web server and S7 communication (with loadable FBs)
- OPC UA server and client (data access) as runtime option for easy connection of the SIMATIC ET 200SP to third-party devices/systems
- Optional PROFIBUS master for 125 PROFIBUS DP slaves (with CM DP module 6ES7545-5DA00-0AB0)
- Configuration control (option handling)
- Integrated motion control functionalities for controlling speed-controlled and positioning axes, support for external encoders

Note:

SIMATIC memory card required for operation of the CPU.

The BusAdapter is not included in the scope of supply and must be ordered separately.

Technical specifications

Article number	**6ES7512-1SK01-0AB0** CPU 1512SP F-1 PN, 300KB Prog./1MB Data
General information	
Product type designation	CPU 1512SP F-1 PN
Engineering with	
• STEP 7 TIA Portal configurable/ integrated as of version	V15.1 (FW V2.6)/V13 SP1 Update 4 (FW V1.8) or higher
Supply voltage	
Type of supply voltage	24 V DC
Memory	
Work memory	
• integrated (for program)	300 kbyte
• integrated (for data)	1 Mbyte
Load memory	
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte
CPU processing times	
for bit operations, typ.	48 ns
for word operations, typ.	58 ns
for fixed point arithmetic, typ.	77 ns
for floating point arithmetic, typ.	307 ns
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
IEC counter	
• Number	Any (only limited by the main memory)
S7 times	
• Number	2 048
IEC timer	
• Number	Any (only limited by the main memory)
Data areas and their retentivity	
Flag	
• Number, max.	16 kbyte
Address area	
I/O address area	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
Address space per module	
• Address space per module, max.	288 byte; For input and output data respectively
Address space per station	
• Address space per station, max.	2 560 byte; for central inputs and outputs; depending on configuration; 2 048 bytes for ET 200SP modules + 512 bytes for ET 200AL modules
Time of day	
Clock	
• Type	Hardware clock

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Technical specifications (continued)

Article number	6ES7512-1SK01-0AB0 CPU 1512SP F-1 PN, 300KB Prog./1MB Data
1. Interface	
Interface types	
• Number of ports	3; 1. integr. + 2. via BusAdapter
• integrated switch	Yes
• RJ 45 (Ethernet)	Yes; X1 P3; opt. X1 P1 and X1 P2 via BusAdapter BA 2x RJ45
• BusAdapter (PROFINET)	Yes; Compatible BusAdapter: BA 2x RJ45, BA 2x FC, BA 2x SCRJ, BA SCRJ / RJ45, BA SCRJ / FC, BA 2x LC, BA LC / RJ45, BA LC / FC
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes
• Web server	Yes
• Media redundancy	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0
PROFINET IO controller	
Services	
- PG/OP communication	Yes
- S7 routing	Yes
- Isochronous mode	Yes
- Open IE communication	Yes
- IRT	Yes
- MRP	Yes; As MRP redundancy manager and/or MRP client; max. number of devices in the ring: 50
- MRPD	Yes; Requirement: IRT
- PROFIenergy	Yes
- Prioritized startup	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	128; In total, up to 512 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64
- Number of connectable IO Devices for RT, max.	128
- of which in line, max.	128
- Number of IO Devices that can be simultaneously activated/ deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communi-cation share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
Update time for IRT	
- for send cycle of 250 µs	250 µs to 4 ms; Note: In the case of IRT with isochronous mode, the minimum update time of 500 µs of the isochronous OB is decisive
- for send cycle of 500 µs	500 µs to 8 ms
- for send cycle of 1 ms	1 ms to 16 ms
- for send cycle of 2 ms	2 ms to 32 ms
- for send cycle of 4 ms	4 ms to 64 ms
- With IRT and parameterization of "odd" send cycles	Update time = set "odd" send clock (any multiple of 125 µs: 375 µs, 625 µs ... 3 875 µs)

Article number	6ES7512-1SK01-0AB0 CPU 1512SP F-1 PN, 300KB Prog./1MB Data
Update time for RT	
- for send cycle of 250 µs	250 µs to 128 ms
- for send cycle of 500 µs	500 µs to 256 ms
- for send cycle of 1 ms	1 ms to 512 ms
- for send cycle of 2 ms	2 ms to 512 ms
- for send cycle of 4 ms	4 ms to 512 ms
PROFINET IO Device	
Services	
- PG/OP communication	Yes
- S7 routing	Yes
- Isochronous mode	No
- Open IE communication	Yes
- IRT	Yes
- MRP	Yes; As MRP redundancy manager and/or MRP client; max. number of devices in the ring: 50
- MRPD	Yes; Requirement: IRT
- PROFIenergy	Yes
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- Asset management record	Yes; Per user program
2. Interface	
Interface types	
• Number of ports	1
• RS 485	Yes; Via CM DP module
Protocols	
• PROFIBUS DP master	Yes
• PROFIBUS DP slave	Yes
• SIMATIC communication	Yes
Protocols	
Number of connections	
• Number of connections, max.	128; via integrated interfaces of the CPU and connected CPs / CMs
PROFIBUS DP master	
Services	
- Number of DP slaves	125; In total, up to 512 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
OPC UA	
• OPC UA client	Yes
• OPC UA server	Yes; Data access (read, write, subscribe), method call, custom address space
Isochronous mode	
Isochronous operation (application synchronized up to terminal)	Yes; Only with PROFINET; with minimum OB 6x cycle of 625 µs

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Technical specifications (continued)

Article number	**6ES7512-1SK01-0AB0** CPU 1512SP F-1 PN, 300KB Prog./1MB Data
Supported technology objects	
Motion Control	Yes; Note: The number of axes affects the cycle time of the PLC program; selection guide via the TIA Selection Tool or SIZER
• Number of available Motion Control resources for technology objects (except cam disks)	800
• Required Motion Control resources	
- per speed-controlled axis	40
- per positioning axis	80
- per synchronous axis	160
- per external encoder	80
- per output cam	20
- per cam track	160
- per probe	40
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes
Standards, approvals, certificates	
Highest safety class achievable in safety mode	
Probability of failure (for service life of 20 years and repair time of 100 hours)	
- Low demand mode: PFDavg in accordance with SIL3	< 2.00E-05
- High demand/continuous mode: PFH in accordance with SIL3	< 1.00E-09

Article number	**6ES7512-1SK01-0AB0** CPU 1512SP F-1 PN, 300KB Prog./1MB Data
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-25 °C; No condensation
• horizontal installation, max.	60 °C
• vertical installation, min.	-25 °C; No condensation
• vertical installation, max.	50 °C
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
Configuration	
Programming	
Programming language	
- LAD	Yes; incl. failsafe
- FBD	Yes; incl. failsafe
- STL	Yes
- SCL	Yes
- GRAPH	Yes
Know-how protection	
• User program protection/password protection	Yes
• Copy protection	Yes
• Block protection	Yes
Access protection	
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Complete protection	Yes
Dimensions	
Width	100 mm
Height	117 mm
Depth	75 mm
Weights	
Weight, approx.	310 g

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CPU 1512SP F-1 PN

Ordering data	Article No.
CPU 1512SP F-1 PN Work memory 300 KB for program, 1 MB for data, PROFINET IO IRT interface, SIMATIC memory card required	**6ES7512-1SK01-0AB0**
Accessories	
CM DP for ET 200SP CPU PROFIBUS DP master/slave with electrical interface for connecting the ET 200SP CPUs to PROFIBUS at up to 12 Mbps	**6ES7545-5DA00-0AB0**
SIMATIC memory card	
4 MB	**6ES7954-8LC03-0AA0**
12 MB	**6ES7954-8LE03-0AA0**
24 MB	**6ES7954-8LF03-0AA0**
256 MB	**6ES7954-8LL03-0AA0**
2 GB	**6ES7954-8LP02-0AA0**
32 GB	**6ES7954-8LT03-0AA0**
DIN rail 35 mm	
• Length: 483 mm for 19" cabinets	**6ES5710-8MA11**
• Length: 530 mm for 600 mm cabinets	**6ES5710-8MA21**
• Length: 830 mm for 900 mm cabinets	**6ES5710-8MA31**
• Length: 2 m	**6ES5710-8MA41**
PE connection element for DIN rail 2 000 mm	**6ES7590-5AA00-0AA0**
BusAdapter BA 2xRJ45	**6ES7193-6AR00-0AA0**
BusAdapter BA 2xFC for increased vibration and EMC loads	**6ES7193-6AF00-0AA0**
BusAdapter BA 2xSCRJ	**6ES7193-6AP00-0AA0**
BusAdapter BA SCRJ/RJ45	**6ES7193-6AP20-0AA0**
BusAdapter BA SCRJ/FC	**6ES7193-6AP40-0AA0**
Equipment labeling plates 10 sheets of 16 plates	**6ES7193-6LF30-0AW0**
Labeling strips	
500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer	**6ES7193-6LR10-0AA0**
500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer	**6ES7193-6LR10-0AG0**
1 000 labeling strips DIN A4, light gray, card, for inscription with laser printer	**6ES7193-6LA10-0AA0**
1000 labeling strips DIN A4, yellow, card, for inscription with laser printer	**6ES7193-6LA10-0AG0**

	Article No.
IE FC RJ45 plugs RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables	
IE FC RJ45 plug 90 90° cable outlet	
1 unit	**6GK1901-1BB20-2AA0**
10 units	**6GK1901-1BB20-2AB0**
50 units	**6GK1901-1BB20-2AE0**
IE FC RJ45 plug 180 180° cable outlet	
1 unit	**6GK1901-1BB10-2AA0**
10 units	**6GK1901-1BB10-2AB0**
50 units	**6GK1901-1BB10-2AE0**
IE FC TP standard cable GP 2x2 4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/ IE FC RJ45 plug; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	**6XV1840-2AH10**
IE FC TP trailing cable 2 x 2 (Type C) 4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/ IE FC RJ45 plug 180/90 for use as trailing cable; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	**6XV1840-3AH10**
IE FC TP marine cable 2 x 2 (Type B) 4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/IE FC RJ45 plug 180/90 with marine approval, sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	**6XV1840-4AH10**
IE FC stripping tool Preadjusted stripping tool for fast stripping of Industrial Ethernet FC cables	**6GK1901-1GA00**

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Ordering data

	Article No.
Manuals for ET 200SP distributed I/O system ET 200SP library: ET 200SP Manual Collection, comprising system manual, product information, and device manuals Manuals can be downloaded from the Internet as PDF files: http://www.siemens.com/simatic-docu	
SIMATIC Manual Collection Electronic manuals on DVD, multi-language: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC Distributed I/O, SIMATIC HMI, SIMATIC sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	**6ES7998-8XC01-8YE0**
SIMATIC Manual Collection update service for 1 year Current "Manual Collection" DVD and the three subsequent updates	**6ES7998-8XC01-8YE2**
STEP 7 Professional V15.1 Target system: SIMATIC S7-1200, S7-1500, S7-300, S7-400, WinAC Requirement: Windows 7 Home Premium SP1 (64-bit) Windows 7 Professional SP1 (64-bit) Windows 7 Enterprise SP1 (64-bit) Windows 7 Ultimate SP1 (64-bit) Windows 10 Home Version 1709, 1803 Windows 10 Professional Version 1709, 1803 Windows 10 Enterprise Version 1709, 1803 Windows 10 Enterprise 2016 LTSB Windows 10 IoT Enterprise 2015 LTSB Windows 10 IoT Enterprise 2016 LTSB Windows Server 2012 R2 StdE (full installation) Windows Server 2016 Standard (full installation) Type of delivery: en, de, fr, it, es, zh	
STEP 7 Professional V15.1, floating license	**6ES7822-1AA05-0YA5**
STEP 7 Professional V15.1, floating license software download incl. license key [1] Email address required for delivery	**6ES7822-1AE05-0YA5**

	Article No.
STEP 7 Safety Advanced V15.1 Task: Engineering tool for configuring and programming fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-1500F Software Controller, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller and the fail-safe ET 200SP, ET 200MP, ET 200S, ET 200M, ET 200iSP, ET 200pro and ET 200eco I/O Requirement: STEP 7 Professional V15.1	
Floating license for 1 user, software and documentation on DVD, license key on USB flash drive	**6ES7833-1FA15-0YA5**
Floating license for 1 user, software, documentation and license key for download[1]; email address required for delivery	**6ES7833-1FA15-0YH5**
Spare parts	
Power supply connector Spare part; for connecting the 24 V DC supply voltage • With push-in terminals; 10 units	**6ES7193-4JB00-0AA0**
Cover for bus adapter interface 5 units	**6ES7591-3AA00-0AA0**
Server module	**6ES7193-6PA00-0AA0**

[1] For up-to-date information and download availability, see:
http://www.siemens.com/tia-online-software-delivery

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SIPLUS CPU 1510SP F-1 PN

Overview



- SIPLUS CPU 1510SP F-1 PN for SIPLUS ET 200SP based on S7-1500 CPU 1511F-1 PN
- For high-performance control solutions using ET 200SP
- Increase in availability of systems and machines
- Supports PROFIsafe in centralized and distributed configurations
- PROFINET IO controller for up to 64 IO devices
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or non-Siemens PROFINET IO controller
- PROFINET shared I-Device for 4 controllers
- PROFINET IO IRT interface with integrated 3-port switch
- Isochronous mode on PROFINET
- With multiple communication options: PG/OP communication, PROFINET IO, open IE communication (TCP, ISO-on-TCP and UDP), web server and S7 communication (with loadable FBs)
- Optional PROFIBUS master for 125 PROFIBUS DP slaves (with CM DP module 6ES7545-5DA00-0AB0)
- Configuration control (option handling)
- Integrated motion control functionalities for controlling speed-controlled and positioning axes, support for external encoders

Note:

SIMATIC memory card required for operation of the CPU.

The bus adapter is not included in the scope of supply and must be ordered separately.

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the corresponding standard products. SIPLUS extreme specific information was added.

Technical specifications

Article number	**6AG1510-1SJ01-2AB0**
Based on	**6ES7510-1SJ01-0AB0**
	SIPLUS ET 200SP CPU 1510SP F-1PN
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-25 °C; = Tmin
• horizontal installation, max.	60 °C; = Tmax
• vertical installation, min.	-25 °C; = Tmin
• vertical installation, max.	50 °C; = Tmax
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	2 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance	
Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
Remark	
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A

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Ordering data

	Article No.
SIPLUS CPU 1510SP F-1 PN (Extended temperature range and exposure to environmental substances) Work memory 150 KB for program, 750 KB for data, PROFINET IO IRT interface; SIMATIC memory card required	**6AG1510-1SJ01-2AB0**

	Article No.
Accessories	
SIPLUS BusAdapter BA 2xRJ45	**6AG1193-6AR00-7AA0**
IE FC RJ45 plugs RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables	
IE FC RJ45 plug 180 (Extended temperature range and exposure to environmental substances) 180° cable outlet	
1 unit	**6AG1901-1BB10-7AA0**
Other accessories	See SIMATIC ET 200SP, CPU 1510 F-1 PN, page 7/17

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SIPLUS CPU 1512SP F-1 PN

Overview



- SIPLUS CPU 1512SP F-1 PN for SIPLUS ET 200SP based on S7-1500 CPU 1513F-1 PN
- For applications with medium requirements in terms of program scope and processing speed, for distributed configurations via PROFINET IO or PROFIBUS DP.
- Increase in availability of systems and machines
- Supports PROFIsafe in centralized and distributed configurations
- PROFINET IO controller for up to 128 IO devices
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or non-Siemens PROFINET IO controller
- PROFINET shared I-Device for 4 controllers
- PROFINET IO IRT interface with integrated 3-port switch
- Isochronous mode on PROFINET
- With multiple communication options: PG/OP communication, PROFINET IO, open IE communication (TCP, ISO-on-TCP and UDP), web server and S7 communication (with loadable FBs)
- Optional PROFIBUS master for 125 PROFIBUS DP slaves (with CM DP module 6ES7545-5DA00-0AB0)
- Configuration control (option handling)
- Integrated motion control functionalities for controlling speed-controlled and positioning axes, support for external encoders

Note:

SIMATIC memory card required for operation of the CPU.

The bus adapter is not included in the scope of supply and must be ordered separately.

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the corresponding standard products. SIPLUS extreme specific information was added.

Technical specifications

Article number	**6AG1512-1SK01-2AB0**
Based on	**6ES7512-1SK01-0AB0**
	SIPLUS ET 200SP CPU 1512SP F-1PN
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-25 °C; = Tmin
• horizontal installation, max.	60 °C; = Tmax
• vertical installation, min.	-25 °C; = Tmin
• vertical installation, max.	50 °C; = Tmax
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	2 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance	
Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
Remark	
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A

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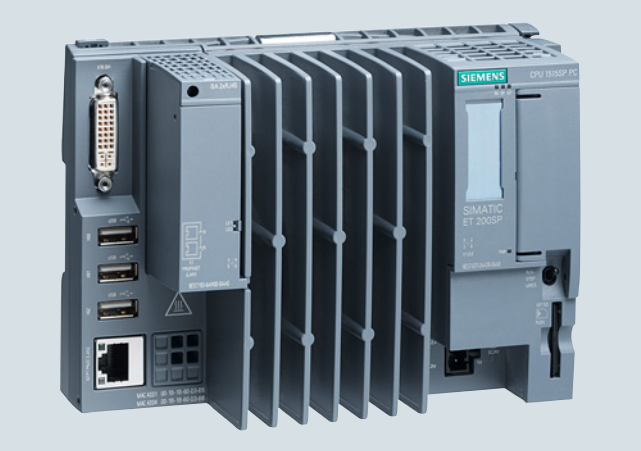
Ordering data

	Article No.
SIPLUS CPU 1512SP F-1 PN (Extended temperature range and exposure to environmental substances) Work memory 300 KB for program, 1 MB for data, PROFINET IO IRT interface, SIMATIC memory card required	**6AG1512-1SK01-2AB0**

	Article No.
Accessories	
SIPLUS BusAdapter BA 2xRJ45	**6AG1193-6AR00-7AA0**
IE FC RJ45 plugs RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables	
IE FC RJ45 plug 180 (Extended temperature range and exposure to environmental substances) 180° cable outlet 1 unit	**6AG1901-1BB10-7AA0**
Other accessories	See SIMATIC ET 200SP, CPU 1512 F-1 PN, page 7/22

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Overview



- Turnkey all-in-one solution with pre-installed SIMATIC S7-1500 Software Controller Standard control and optional pre-installed WinCC Runtime Advanced
- Central expansion via ET 200SP modules (station width up to 1 m or up to 64 modules)
- SIMATIC Hypervisor: for separating Windows systems from control functions
- Dual-core processor for optimal use of the hypervisor
- Swappable flash memory (CFast card) for operating system, runtime and project data
- Integrated DVI-I graphics connection; 3x USB 2.0 connection
- 2 PROFINET interfaces: X1 via PN-IO bus adapter (RJ45 or FC) with 2 ports; X2: GB Ethernet interface (RJ45)
- PROFINET IRT
- Open Ethernet communication (TCP/IP, UDP, ISO-on-TCP)
- Web server functionality for information, status, diagnostics and user-defined web pages
- PROFIBUS DP communication optionally via CM DP module as DP master
- Configuration control (option handling)
- Improved know-how and copy protection; Security Integrated
- Integrated system diagnostics
- Integrated motion control functionalities for controlling speed-controlled and positioning axes with support for external encoders
- Trace function
- Especially suitable for high data volumes and user-specific, open applications
- Integration of control functions and applications implemented in C/C++ (using SIMATIC ODK-1500S Open Development Kit)

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Technical specifications

Article number	**6ES7677-2AA31-0EB0** CPU 1515SP PC 4GB	**6ES7677-2AA41-0FB0** CPU 1515SP PC 4GB
General information		
Product type designation	CPU 1515SP PC	CPU 1515SP PC
Engineering with		
• STEP 7 TIA Portal configurable/ integrated as of version	V14 SP1	V14 SP1
Installed software		
• Visualization	No	No
• Control	S7-1500 Software Controller CPU 1505SP V2.1	S7-1500 Software Controller CPU 1505SP V2.1
Supply voltage		
Type of supply voltage	24 V DC	24 V DC
Processor		
Processor type	Dual-Core 1 GHz, AMD G Series APU T40E	Dual-Core 1 GHz, AMD G Series APU T40E
Memory		
Type of memory	DDR3-SDRAM	DDR3-SDRAM
Main memory	4 GB RAM	4 GB RAM
CFast memory card	Yes; 30 GB flash memory	Yes; 30 GB flash memory
Work memory		
• integrated (for program)	1 Mbyte	1 Mbyte
• integrated (for data)	5 Mbyte	5 Mbyte
• integrated (for CPU function library of CPU Runtime)	10 Mbyte	10 Mbyte
Load memory		
• integrated (on PC mass storage)	320 Mbyte	320 Mbyte
CPU processing times		
for bit operations, typ.	10 ns	10 ns
for word operations, typ.	12 ns	12 ns
for fixed point arithmetic, typ.	16 ns	16 ns
for floating point arithmetic, typ.	64 ns	64 ns

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Technical specifications (continued)

Article number	**6ES7677-2AA31-0EB0** CPU 1515SP PC 4GB	**6ES7677-2AA41-0FB0** CPU 1515SP PC 4GB
Counters, timers and their retentivity		
S7 counter		
• Number	2 048	2 048
IEC counter		
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)
S7 times		
• Number	2 048	2 048
IEC timer		
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)
Data areas and their retentivity		
Flag		
• Number, max.	16 kbyte	16 kbyte
Address area		
I/O address area		
• Inputs	32 kbyte; All inputs are in the process image	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image	32 kbyte; All outputs are in the process image
Hardware configuration		
Integrated power supply	Yes	Yes
Time of day		
Clock		
• Type	Hardware clock	Hardware clock
• Hardware clock (real-time)	Yes; Resolution: 1 s	Yes; Resolution: 1 s
Interfaces		
Number of industrial Ethernet interfaces	2	2
Number of RS 485 interfaces	1; Via CM DP module	1; Via CM DP module
Number of USB interfaces	3; 3x USB 2.0 on the front, 500 mA each – of which 2x 500 mA and 1x 100 mA simultaneously	3; 3x USB 2.0 on the front, 500 mA each – of which 2x 500 mA and 1x 100 mA simultaneously
Number of SD card slots	1	1
Video interfaces		
• Graphics interface	1x DVI-I	1x DVI-I
1. Interface		
Interface type	PROFINET	PROFINET
automatic detection of transmission rate	Yes	Yes
Autonegotiation	Yes	Yes
Autocrossing	Yes	Yes
Interface types		
• Number of ports	2	2
• integrated switch	Yes	Yes
• RJ 45 (Ethernet)	Yes; Via BusAdapter BA 2x RJ45	Yes; Via BusAdapter BA 2x RJ45
- Transmission rate, max.	100 Mbit/s	100 Mbit/s
- Industrial Ethernet status LED	Yes	Yes
• BusAdapter (PROFINET)	Yes; Applicable BusAdapter: BA 2x RJ45, BA 2x FC	Yes; Applicable BusAdapter: BA 2x RJ45, BA 2x FC
Protocols		
• Number of connections via this interface	88	88
• PROFINET IO controller	Yes	Yes
• PROFINET IO Device	Yes	Yes
• SIMATIC communication	Yes	Yes
• Open IE communication	Yes	Yes
• Web server	Yes	Yes

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Technical specifications (continued)

Article number	**6ES7677-2AA31-0EB0** CPU 1515SP PC 4GB	**6ES7677-2AA41-0FB0** CPU 1515SP PC 4GB
PROFINET IO controller		
Services		
- Isochronous mode	Yes	Yes
- shortest clock pulse	500 µs	500 µs
- IRT	Yes	Yes
- MRP	Yes	Yes
- MRPD	Yes	Yes
- Prioritized startup	Yes; Max. 32 PROFINET devices	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	128	128
- Of which IO devices with IRT, max.	64	64
- of which in line, max.	64	64
- Number of connectable IO Devices for RT, max.	128	128
- of which in line, max.	128	128
- Number of IO Devices that can be simultaneously activated/ deactivated, max.	8	8
- IO Devices changing during operation (partner ports), supported	Yes	Yes
- Number of IO Devices per tool, max.	8	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
Update time for IRT		
- for send cycle of 500 µs	500 µs to 8 ms	500 µs to 8 ms
- for send cycle of 1 ms	1 ms to 16 ms	1 ms to 16 ms
- for send cycle of 2 ms	2 ms to 32 ms	2 ms to 32 ms
- for send cycle of 4 ms	4 ms to 64 ms	4 ms to 64 ms
- With IRT and parameterization of "odd" send cycles	Update time = set "odd" send clock (any multiple of 125 µs: 375 µs, 625 µs ... 3 875 µs)	Update time = set "odd" send clock (any multiple of 125 µs: 375 µs, 625 µs ... 3 875 µs)
Update time for RT		
- for send cycle of 500 µs	500 µs to 256 ms	500 µs to 256 ms
- for send cycle of 1 ms	1 ms to 512 ms	1 ms to 512 ms
- for send cycle of 2 ms	2 ms to 512 ms	2 ms to 512 ms
- for send cycle of 4 ms	4 ms to 512 ms	4 ms to 512 ms
PROFINET IO Device		
Services		
- Isochronous mode	No	No
- IRT	Yes	Yes
- MRP	Yes	Yes
- MRPD	Yes	Yes
- Prioritized startup	Yes	Yes
- Shared device	Yes	Yes
- Number of IO Controllers with shared device, max.	4	4
2. Interface		
Interface type	Integrated Ethernet interface	Integrated Ethernet interface
automatic detection of transmission rate	Yes	Yes
Autonegotiation	Yes	Yes
Autocrossing	Yes	Yes
Interface types		
• Number of ports	1	1
• RJ 45 (Ethernet)	Yes; Integrated	Yes; Integrated
- Transmission rate, max.	1 000 Mbit/s	1 000 Mbit/s
- Industrial Ethernet status LED	No	No

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Technical specifications (continued)

Article number	**6ES7677-2AA31-0EB0** CPU 1515SP PC 4GB	**6ES7677-2AA41-0FB0** CPU 1515SP PC 4GB
3. Interface		
Interface type	PROFIBUS with CM DP	PROFIBUS with CM DP
Interface types		
• RS 485	Yes	Yes
Protocols		
• Number of connections via this interface	44	44
• PROFIBUS DP master	Yes	Yes
• PROFIBUS DP slave	Yes	Yes
• SIMATIC communication	Yes	Yes
PROFIBUS DP master		
• Number of DP slaves, max.	125	125
Services		
- Equidistance	No	No
- Isochronous mode	No	No
PROFIBUS DP slave		
Services		
- Equidistance	No	No
- Isochronous mode	No	No
Protocols		
Number of connections		
• Number of connections, max.	88	88
OPC UA		
• OPC UA server	Data access (read, write, subscribe), runtime license required	Yes; Data access (read, write, subscribe), runtime license required
Supported technology objects		
Motion Control	Yes	Yes
• Number of available Motion Control resources for technology objects (except cam disks)	2 400	2 400
• Required Motion Control resources		
- per speed-controlled axis	40; per axis	40; per axis
- per positioning axis	80; per axis	80; per axis
- per synchronous axis	160; per axis	160; per axis
- per external encoder	80; per external encoder	80; per external encoder
- per output cam	20; per cam	20; per cam
- per cam track	160; per cam track	160; per cam track
- per probe	40; per probe	40; per probe
Controller		
• PID_Compact	Yes; Universal PID controller with integrated optimization	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature	Yes; PID controller with integrated optimization for temperature
Counting and measuring		
• High-speed counter	Yes	Yes
Ambient conditions		
Ambient temperature during operation		
• min.	0 °C	0 °C
• max.	Up to 60 °C with max. 32 ET 200SP modules and 3x 100 mA USB load; up to 55 °C with max. 64 ET 200SP modules and 2x max. 500 mA and 1x max. 100 mA USB load	Up to 60 °C with max. 32 ET 200SP modules and 3x 100 mA USB load; up to 55 °C with max. 64 ET 200SP modules and 2x max. 500 mA and 1x max. 100 mA USB load
• horizontal installation, min.	0 °C	0 °C
• horizontal installation, max.	60 °C	60 °C
• vertical installation, min.	0 °C	0 °C
• vertical installation, max.	50 °C; With max. 32 ET 200SP modules and 3x 100 mA USB load	50 °C; With max. 32 ET 200SP modules and 3x 100 mA USB load
Operating systems		
pre-installed operating system	Windows Embedded Standard 7 E 32-bit	Windows Embedded Standard 7 P 64-bit

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Technical specifications (continued)

Article number	6ES7677-2AA31-0EB0 CPU 1515SP PC 4GB	6ES7677-2AA41-0FB0 CPU 1515SP PC 4GB
Configuration		
Programming		
Programming language		
- LAD	Yes	Yes
- FBD	Yes	Yes
- STL	Yes	Yes
- SCL	Yes	Yes
- CFC	No	No
- GRAPH	Yes	Yes
Know-how protection		
• User program protection/password protection	Yes	Yes
• Copy protection	Yes	Yes
• Block protection	Yes	Yes
Access protection		
• Protection level: Write protection	Yes	Yes
• Protection level: Read/write protection	Yes	Yes
• Protection level: Complete protection	Yes	Yes
Open Development interfaces		
• Size of ODK SO file, max.	3.8 Mbyte	3.8 Mbyte
Peripherals/Options		
Peripherals		
• SD card	Optionally for additional mass storage	Optionally for additional mass storage
Dimensions		
Width	160 mm	160 mm
Height	117 mm	117 mm
Depth	75 mm	75 mm
Weights		
Weight, approx.	0.83 kg	0.83 kg

Ordering data

SIMATIC ET 200SP Open Controller CPU 1515SP PC (+ HMI)

ET 200SP CPU with Windows Embedded Standard 7 and pre-installed SIMATIC S7-1500 Software Controller (with WinCC RT Advanced as option);

Type of delivery:
en, de, fr, it, es, zh

	Article No.
Windows Embedded Standard 7 E 32-bit, 8 GB CFast card	
• CPU 1515SP PC (4 GB RAM)	**6ES7677-2AA31-0EB0**
Windows Embedded Standard 7 P 64-bit (multi-touch), 16 GB CFast card	
• CPU 1515SP PC (4 GB RAM)	**6ES7677-2AA41-0FB0**
• CPU 1515SP PC + HMI 128PT (4 GB RAM)	**6ES7677-2AA41-0FK0**
• CPU 1515SP PC + HMI 512PT (4 GB RAM)	**6ES7677-2AA41-0FL0**
• CPU 1515SP PC + HMI 2048PT (4 GB RAM)	**6ES7677-2AA41-0FM0**

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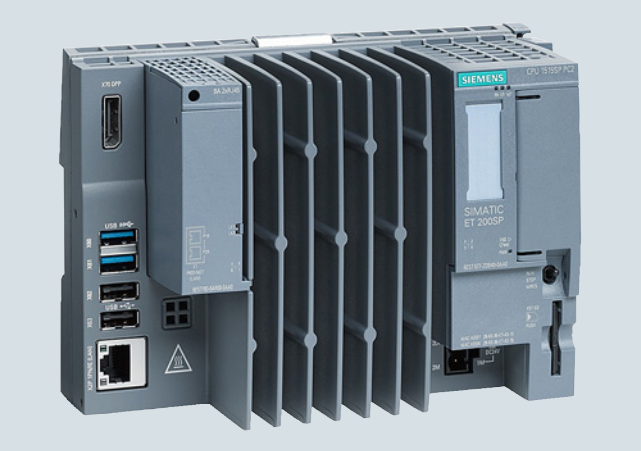
Ordering data	Article No.
Accessories	
Upgrade from SIMATIC S7-1500 Software Controller CPU 1505SP to SIMATIC Open Controller From V 1.x to V 2.0; software download incl. documentation and license key Email address required for delivery	**6ES7672-5DC01-0YK0**
BusAdapter BA 2xRJ45	**6ES7193-6AR00-0AA0**
BusAdapter BA 2xFC	**6ES7193-6AF00-0AA0**
BusAdapter BA 2xSCRJ	**6ES7193-6AP00-0AA0**
BusAdapter BA SCRJ/RJ45	**6ES7193-6AP20-0AA0**
BusAdapter BA SCRJ/FC For increased vibration and EMC loads	**6ES7193-6AP40-0AA0**
BusAdapter BA 2XLC	**6ES7193-6AG00-0AA0**
BusAdapter BA LC/RJ45	**6ES7193-6AG20-0AA0**
BusAdapter BA LC/FC	**6ES7193-6AG40-0AA0**
CM DP for ET 200SP CPU PROFIBUS DP master with electrical interface for connecting the ET 200SP CPUs to PROFIBUS at up to 12 Mbps	**6ES7545-5DA00-0AB0**
Server module Spare part	**6ES7193-6PA00-0AA0**
Power supply connector Spare part; for connecting the 24 V DC supply voltage; with push-in terminals (10 units)	**6ES7193-4JB00-0AA0**
Equipment labeling plates 10 sheets of 16 plates	**6ES7193-6LF30-0AW0**
Labeling strips	
500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer	**6ES7193-6LR10-0AA0**
1 000 labeling strips DIN A4, light gray, card, for inscription with laser printer	**6ES7193-6LA10-0AA0**

	Article No.
STEP 7 Professional V15.1 Target system: SIMATIC S7-1200, S7-1500, S7-300, S7-400, WinAC Requirement: Windows 7 Home Premium SP1 (64-bit) Windows 7 Professional SP1 (64-bit) Windows 7 Enterprise SP1 (64-bit) Windows 7 Ultimate SP1 (64-bit) Windows 10 Home Version 1709, 1803 Windows 10 Professional Version 1709, 1803 Windows 10 Enterprise Version 1709, 1803 Windows 10 Enterprise 2016 LTSB Windows 10 IoT Enterprise 2015 LTSB Windows 10 IoT Enterprise 2016 LTSB Windows Server 2012 R2 StdE (full installation) Windows Server 2016 Standard (full installation) Type of delivery: en, de, fr, it, es, zh	
STEP 7 Professional V15.1, floating license	**6ES7822-1AA05-0YA5**
STEP 7 Professional V15.1, floating license software download incl. license key [1] Email address required for delivery	**6ES7822-1AE05-0YA5**
SIMATIC ODK 1500S	
Open Development Kit for support in developing Windows and real-time library functions for S7-1500 Software Controllers; supplied on DVD	**6ES7806-2CD02-0YA0**
Open Development Kit for support in developing Windows and real-time library functions for S7-1500 Software Controllers; software download including license key [1] Email address required for delivery	**6ES7806-2CD02-0YG0**
SIMATIC WinCC Advanced V15.1 Engineering software in the TIA Portal; for engineering SIMATIC Panels, WinCC Runtime Advanced; runs with Windows 7 (64-bit), Windows 10 (64-bit), WinSrv 2012 R2/2016 (64-bit), Class A; 6 languages: en, de, fr, it, es, zh	
• Floating license; software and documentation on DVD; license key on USB flash drive	**6AV2102-0AA05-0AA5**
• Floating license; software, documentation and license key for download [1]: Email address required for delivery	**6AV2102-0AA05-0AH5**

[1] For up-to-date information and download availability, see: http://www.siemens.com/tia-online-software-delivery

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Overview



ET 200SP Open Controller, CPU 1515SP PC2, combines robustness and compact dimensions with the flexibility of centralized or decentralized communication in the highest industrial functionality. Furthermore, the CPU offers the entire value added of the ET 200SP system, the S7-1500 controller family and the TIA world together.

- Rugged, compact control system
- Combines the functions of a ET 200SP controller with those of a PC-based platform
- Turnkey all-in-one controller
- High performance automation tasks with the use of new generation Intel Quad Core processors
- Connects high-level language applications and processes high data volumes with support from SIMATIC ODK 1500S

Technical specifications

Article number	**6ES7677-2DB42-0GB0** CPU1515SP PC2
General information	
Product type designation	CPU 1515SP PC2
Engineering with	
• STEP 7 TIA Portal configurable/ integrated as of version	V15 with HSP 269
Installed software	
• Visualization	No
• Control	S7-1500 Software Controller CPU 1505SP
Supply voltage	
Type of supply voltage	24 V DC
Processor	
Processor type	Intel Atom E3940, 1.6 GHz, 4 cores
Memory	
Type of memory	DDR3L
Main memory	8 GB RAM
CFast memory card	Yes; 30 GB flash memory
Work memory	
• integrated (for program)	1 Mbyte
• integrated (for data)	5 Mbyte
• integrated (for CPU function library of CPU Runtime)	20 Mbyte
Load memory	
• integrated (on PC mass storage)	320 Mbyte
CPU processing times	
for bit operations, typ.	10 ns
for word operations, typ.	12 ns
for fixed point arithmetic, typ.	16 ns
for floating point arithmetic, typ.	64 ns

Article number	**6ES7677-2DB42-0GB0** CPU1515SP PC2
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
IEC counter	
• Number	Any (only limited by the main memory)
S7 times	
• Number	2 048
IEC timer	
• Number	Any (only limited by the main memory)
Data areas and their retentivity	
Flag	
• Number, max.	16 kbyte
Address area	
I/O address area	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
Hardware configuration	
Integrated power supply	Yes
Time of day	
Clock	
• Type	Hardware clock
• Hardware clock (real-time)	Yes; Resolution: 1 s
Interfaces	
Number of industrial Ethernet interfaces	2
Number of RS 485 interfaces	1; Via CM DP module
Number of USB interfaces	4; 2x USB 2.0, 2x USB 3.0 on front side
Number of SD card slots	1
Video interfaces	
• Graphics interface	1x DisplayPort

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Technical specifications (continued)

Article number	**6ES7677-2DB42-0GB0**
	CPU1515SP PC2
1. Interface	
Interface type	PROFINET
automatic detection of transmission rate	Yes
Autonegotiation	Yes
Autocrossing	Yes
Interface types	
• Number of ports	2
• integrated switch	Yes
• RJ 45 (Ethernet)	Yes; Via BusAdapter BA 2x RJ45
- Transmission rate, max.	100 Mbit/s
- Industrial Ethernet status LED	Yes
• BusAdapter (PROFINET)	Yes; Compatible BusAdapter: BA 2x RJ45, BA 2x FC, BA 2x SCRJ (from FS03, V2.2), BA SCRJ / RJ45 (from FS03, V3.1), BA SCRJ / FC (from FS03, V3.1), BA 2x LC (from FS03, V3.3), BA LC / RJ45 (from FS03, V3.3), BA LC / FC (from FS03, V3.3)
Protocols	
• Number of connections via this interface	88
• PROFINET IO controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes
• Web server	Yes
PROFINET IO controller	
Services	
- Isochronous mode	Yes
- shortest clock pulse	500 µs
- IRT	Yes
- MRP	Yes
- MRPD	Yes
- PROFIenergy	Yes
- Prioritized startup	Yes; Max. 32 PROFINET devices; if you want to use the "Prioritized startup" functionality in STEP 7 for the PROFINET interface of the CPU, the CPU and the device must be separated by means of a switch (e.g. SCALANCE X205)
- Number of connectable IO Devices, max.	128
- Of which IO devices with IRT, max.	64
- of which in line, max.	64
- Number of connectable IO Devices for RT, max.	128
- of which in line, max.	128
- Number of IO Devices that can be simultaneously activated/ deactivated, max.	8
- IO Devices changing during operation (partner ports), supported	Yes
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communi-cation share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data

Article number	**6ES7677-2DB42-0GB0**
	CPU1515SP PC2
Update time for IRT	
- for send cycle of 500 µs	500 µs to 8 ms
- for send cycle of 1 ms	1 ms to 16 ms
- for send cycle of 2 ms	2 ms to 32 ms
- for send cycle of 4 ms	4 ms to 64 ms
- With IRT and parameterization of "odd" send cycles	Update time = set "odd" send clock (any multiple of 125 µs: 375 µs, 625 µs ... 3 875 µs)
Update time for RT	
- for send cycle of 500 µs	500 µs to 256 ms
- for send cycle of 1 ms	1 ms to 512 ms
- for send cycle of 2 ms	2 ms to 512 ms
- for send cycle of 4 ms	4 ms to 512 ms
Address area	
- Inputs, max.	8 kbyte
- Outputs, max.	8 kbyte
PROFINET IO Device	
Services	
- Isochronous mode	No
- shortest clock pulse	500 µs
- IRT	Yes
- MRP	Yes
- MRPD	Yes
- PROFIenergy	Yes
- Prioritized startup	Yes
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- Asset management record	Yes
2. Interface	
Interface type	Integrated Ethernet interface
automatic detection of transmission rate	Yes
Autonegotiation	Yes
Autocrossing	Yes
Interface types	
• Number of ports	1
• RJ 45 (Ethernet)	Yes; Integrated
- Transmission rate, max.	1 000 Mbit/s
- Industrial Ethernet status LED	No

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Technical specifications (continued)

Article number	6ES7677-2DB42-0GB0 CPU1515SP PC2
3. Interface	
Interface type	PROFIBUS with CM DP
Interface types	
• RS 485	Yes
Protocols	
• Number of connections via this interface	44
• PROFIBUS DP master	Yes
• PROFIBUS DP slave	Yes
• SIMATIC communication	Yes
PROFIBUS DP master	
• Number of DP slaves, max.	125
Services	
- Equidistance	No
- Isochronous mode	No
Address area	
- Inputs, max.	8 kbyte
- Outputs, max.	8 kbyte
PROFIBUS DP slave	
Services	
- Equidistance	No
- Isochronous mode	No
Protocols	
Number of connections	
• Number of connections, max.	88
OPC UA	
• OPC UA client	Yes; From SW CPU 1505SP V2.6
• OPC UA server	Yes; Data access (read, write, subscribe), runtime license required
Supported technology objects	
Motion Control	Yes
• Number of available Motion Control resources for technology objects (except cam disks)	2 400
• Required Motion Control resources	
- per speed-controlled axis	40; per axis
- per positioning axis	80; per axis
- per synchronous axis	160; per axis
- per external encoder	80; per external encoder
- per output cam	20; per cam
- per cam track	160; per cam track
- per probe	40; per probe
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes

Article number	6ES7677-2DB42-0GB0 CPU1515SP PC2
Ambient conditions	
Ambient temperature during operation	
• min.	-20 °C
• max.	Up to 60 °C with max. 32 ET 200SP modules; up to 55 °C with max. 64 ET 200SP modules
• horizontal installation, min.	-20 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	-20 °C
• vertical installation, max.	50 °C; With max. 32 ET 200SP modules
Operating systems	
pre-installed operating system	Windows 10 IoT Enterprise 2016 LTSB, 64bit, MUI
Configuration	
Programming	
Programming language	
- LAD	Yes
- FBD	Yes
- STL	Yes
- SCL	Yes
- CFC	No
- GRAPH	Yes
Know-how protection	
• User program protection/password protection	Yes
• Copy protection	Yes
• Block protection	Yes
Access protection	
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Complete protection	Yes
Open Development interfaces	
• Size of ODK SO file, max.	5.8 Mbyte
Peripherals/Options	
Peripherals	
• SD card	Optionally for additional mass storage
Dimensions	
Width	160 mm
Height	117 mm
Depth	75 mm
Weights	
Weight, approx.	0.83 kg

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Ordering data

	Article No.
SIMATIC ET 200SP Open Controller CPU 1515SP PC2 (+ HMI)	
ET 200SP central module with Windows 10 IoT Enterprise 64-bit and pre-installed SIMATIC S7-1500 Software Controller (with WinCC RT Advanced option); 8 GB RAM, 30 GB CFast card	
Type of delivery: en, de, fr, it, es, zh	
• CPU 1515SP PC2	**6ES7677-2DB42-0GB0**
With pre-installed WinCC RT Advanced	
• CPU 1515SP PC2 + HMI 128PT	**6ES7677-2DB42-0GK0**
• CPU 1515SP PC2 + HMI 512PT	**6ES7677-2DB42-0GL0**
• CPU 1515SP PC2 + HMI 2048PT	**6ES7677-2DB42-0GM0**
Accessories	
Upgrade from SIMATIC S7-1500 Software Controller CPU 1505SP to SIMATIC Open Controller	**6ES7672-5DC01-0YK0**
From V 1.x to V 2.0; software download incl. documentation and license key	
Email address required for delivery	
BusAdapter BA 2xRJ45	**6ES7193-6AR00-0AA0**
BusAdapter BA 2xFC	**6ES7193-6AF00-0AA0**
BusAdapter BA 2xSCRJ	**6ES7193-6AP00-0AA0**
BusAdapter BA SCRJ/RJ45	**6ES7193-6AP20-0AA0**
BusAdapter BA SCRJ/FC	**6ES7193-6AP40-0AA0**
For increased vibration and EMC loads	
BusAdapter BA 2XLC	**6ES7193-6AG00-0AA0**
BusAdapter BA LC/RJ45	**6ES7193-6AG20-0AA0**
BusAdapter BA LC/FC	**6ES7193-6AG40-0AA0**
CM DP for ET 200SP CPU	**6ES7545-5DA00-0AB0**
PROFIBUS DP master with electrical interface for connecting the ET 200SP CPUs to PROFIBUS at up to 12 Mbps	
Server module	**6ES7193-6PA00-0AA0**
Spare part	
Power supply connector	**6ES7193-4JB00-0AA0**
Spare part; for connecting the 24 V DC supply voltage; with push-in terminals (10 units)	
Equipment labeling plates	**6ES7193-6LF30-0AW0**
10 sheets of 16 plates	
Labeling strips	
500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer	**6ES7193-6LR10-0AA0**
1 000 labeling strips DIN A4, light gray, card, for inscription with laser printer	**6ES7193-6LA10-0AA0**

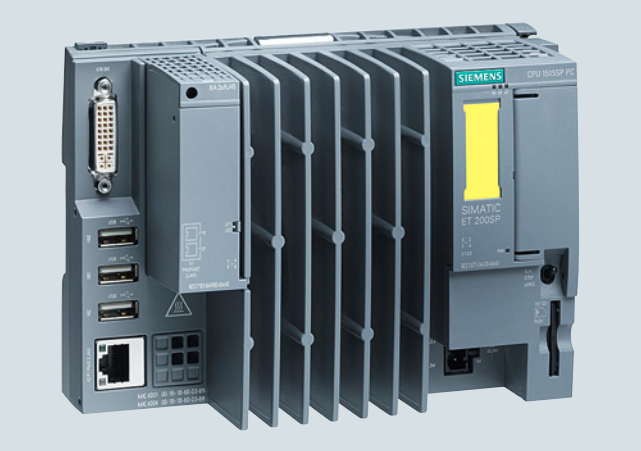
	Article No.
STEP 7 Professional V15.1	
Target system: SIMATIC S7-1200, S7-1500, S7-300, S7-400, WinAC Requirement: Windows 7 Home Premium SP1 (64-bit) Windows 7 Professional SP1 (64-bit) Windows 7 Enterprise SP1 (64-bit) Windows 7 Ultimate SP1 (64-bit) Windows 10 Home Version 1709, 1803 Windows 10 Professional Version 1709, 1803 Windows 10 Enterprise Version 1709, 1803 Windows 10 Enterprise 2016 LTSB Windows 10 IoT Enterprise 2015 LTSB Windows 10 IoT Enterprise 2016 LTSB Windows Server 2012 R2 StdE (full installation) Windows Server 2016 Standard (full installation) Type of delivery: en, de, fr, it, es, zh	
STEP 7 Professional V15.1, floating license	**6ES7822-1AA05-0YA5**
STEP 7 Professional V15.1, floating license software download incl. license key [1]	**6ES7822-1AE05-0YA5**
Email address required for delivery	
SIMATIC ODK 1500S	
Open Development Kit for support in developing Windows and real-time library functions for S7-1500 Software Controllers; supplied on DVD	**6ES7806-2CD03-0YA0**
Open Development Kit for support in developing Windows and real-time library functions for S7-1500 Software Controllers; software download including license key [1]	**6ES7806-2CD03-0YG0**
Email address required for delivery	
SIMATIC WinCC Advanced V15.1	
Engineering software in the TIA Portal; for engineering SIMATIC Panels, WinCC Runtime Advanced; runs with Windows 7 (64-bit), Windows 10 (64-bit), WinSrv 2012 R2/2016 (64-bit), Class A; 6 languages: en, de, fr, it, es, zh	
• Floating license; software and documentation on DVD; license key on USB flash drive	**6AV2102-0AA05-0AA5**
• Floating license; software, documentation and license key for download [1]: Email address required for delivery	**6AV2102-0AA05-0AH5**

[1] For up-to-date information and download availability, see: http://www.siemens.com/tia-online-software-delivery

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Overview



- Turnkey all-in-one solution with pre-installed fail-safe SIMATIC S7-1500 Software Controller and optional pre-installed WinCC Runtime Advanced
- Fail-safe versions make it possible to control machines or plants in a fail-safe environment. This makes it possible to address applications which require an SIL3 (Safety Integrity Level) safety class according to IEC 61508 2nd Edition or a PL e (Performance Level) according to ISO 13849.
- Central expansion via ET 200SP modules (station width up to 1 m or up to 64 modules)
- SIMATIC Hypervisor: for separating Windows systems from control functions
- Dual-core processor for optimal use of the hypervisor
- Swappable flash memory (CFast card) for operating system, runtime and project data
- Integrated DVI-I graphics connection; 3x USB 2.0 connection
- 2 PROFINET interfaces: X1 via PN-IO bus adapter (RJ45 or FC) with 2 ports; X2: GB Ethernet interface (RJ45)
- PROFINET IRT
- Open Ethernet communication (TCP/IP, UDP, ISO-on-TCP)
- Web server functionality for information, status, diagnostics and user-defined web pages
- PROFIBUS DP communication optionally via CM DP module as DP master
- Configuration control (option handling)
- Improved know-how and copy protection; Security Integrated
- Integrated system diagnostics
- Integrated motion control functionalities for controlling speed-controlled and positioning axes with support for external encoders
- Trace function
- Especially suitable for high data volumes and user-specific, open applications
- Integration of control functions and applications implemented in C/C++ (using SIMATIC ODK-1500S Open Development Kit)

Technical specifications

Article number	**6ES7677-2FA31-0EB0**	**6ES7677-2FA41-0FB0**
	CPU 1515SP PC F	CPU 1515SP PC F
General information		
Product type designation	CPU 1515SP PC F	CPU 1515SP PC F
Engineering with		
• STEP 7 TIA Portal configurable/ integrated as of version	V14 SP1	V14 SP1
Installed software		
• Visualization	No	No
• Control	S7-1500 Software Controller CPU 1505SP F	S7-1500 Software Controller CPU 1505SP F
Supply voltage		
Type of supply voltage	24 V DC	24 V DC
Processor		
Processor type	Dual-Core 1 GHz, AMD G Series APU T40E	Dual-Core 1 GHz, AMD G Series APU T40E
Memory		
Type of memory	DDR3-SDRAM	DDR3-SDRAM
Main memory	4 GB RAM	4 GB RAM
CFast memory card	Yes; 30 GB flash memory	Yes; 30 GB flash memory
Work memory		
• integrated (for program)	1.5 Mbyte	1.5 Mbyte
• integrated (for data)	5 Mbyte	5 Mbyte
• integrated (for CPU function library of CPU Runtime)	10 Mbyte	10 Mbyte
Load memory		
• integrated (on PC mass storage)	320 Mbyte	320 Mbyte

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Technical specifications (continued)

Article number	**6ES7677-2FA31-0EB0** CPU 1515SP PC F	**6ES7677-2FA41-0FB0** CPU 1515SP PC F
CPU processing times		
for bit operations, typ.	10 ns	10 ns
for word operations, typ.	12 ns	12 ns
for fixed point arithmetic, typ.	16 ns	16 ns
for floating point arithmetic, typ.	64 ns	64 ns
Counters, timers and their retentivity		
S7 counter		
• Number	2 048	2 048
IEC counter		
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)
S7 times		
• Number	2 048	2 048
IEC timer		
• Number	Any (only limited by the main memory)	Any (only limited by the main memory)
Data areas and their retentivity		
Flag		
• Number, max.	16 kbyte	16 kbyte
Address area		
I/O address area		
• Inputs	32 kbyte; All inputs are in the process image	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image	32 kbyte; All outputs are in the process image
Hardware configuration		
Integrated power supply	Yes	Yes
Time of day		
Clock		
• Type	Hardware clock	Hardware clock
• Hardware clock (real-time)	Yes; Resolution: 1 s	Yes; Resolution: 1 s
Interfaces		
Number of industrial Ethernet interfaces	2	2
Number of RS 485 interfaces	1; Via CM DP module	1; Via CM DP module
Number of USB interfaces	3; 3x USB 2.0 on the front, 500 mA each – of which 2x 500 mA and 1x 100 mA simultaneously	3; 3x USB 2.0 on the front, 500 mA each – of which 2x 500 mA and 1x 100 mA simultaneously
Number of SD card slots	1	1
Video interfaces		
• Graphics interface	1x DVI-I	1x DVI-I
1. Interface		
Interface type	PROFINET	PROFINET
automatic detection of transmission rate	Yes	Yes
Autonegotiation	Yes	Yes
Autocrossing	Yes	Yes
Interface types		
• Number of ports	2	2
• integrated switch	Yes	Yes
• RJ 45 (Ethernet)	Yes; Via BusAdapter BA 2x RJ45	Yes; Via BusAdapter BA 2x RJ45
- Transmission rate, max.	100 Mbit/s	100 Mbit/s
- Industrial Ethernet status LED	Yes	Yes
• BusAdapter (PROFINET)	Yes; Applicable BusAdapter: BA 2x RJ45, BA 2x FC	Yes; Applicable BusAdapter: BA 2x RJ45, BA 2x FC
Protocols		
• Number of connections via this interface	88	88
• PROFINET IO controller	Yes	Yes
• PROFINET IO Device	Yes	Yes
• SIMATIC communication	Yes	Yes
• Open IE communication	Yes	Yes
• Web server	Yes	Yes

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Technical specifications (continued)

Article number	6ES7677-2FA31-0EB0 CPU 1515SP PC F	6ES7677-2FA41-0FB0 CPU 1515SP PC F
PROFINET IO controller		
Services		
- Isochronous mode	Yes	Yes
- shortest clock pulse	500 µs	500 µs
- IRT	Yes	Yes
- MRP	Yes	Yes
- MRPD	Yes	Yes
- Prioritized startup	Yes; Max. 32 PROFINET devices	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	128	128
- Of which IO devices with IRT, max.	64	64
- of which in line, max.	64	64
- Number of connectable IO Devices for RT, max.	128	128
- of which in line, max.	128	128
- Number of IO Devices that can be simultaneously activated/ deactivated, max.	8	8
- IO Devices changing during operation (partner ports), supported	Yes	Yes
- Number of IO Devices per tool, max.	8	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
Update time for IRT		
- for send cycle of 500 µs	500 µs to 8 ms	500 µs to 8 ms
- for send cycle of 1 ms	1 ms to 16 ms	1 ms to 16 ms
- for send cycle of 2 ms	2 ms to 32 ms	2 ms to 32 ms
- for send cycle of 4 ms	4 ms to 64 ms	4 ms to 64 ms
- With IRT and parameterization of "odd" send cycles	Update time = set "odd" send clock (any multiple of 125 µs: 375 µs, 625 µs ... 3 875 µs)	Update time = set "odd" send clock (any multiple of 125 µs: 375 µs, 625 µs ... 3 875 µs)
Update time for RT		
- for send cycle of 500 µs	500 µs to 256 ms	500 µs to 256 ms
- for send cycle of 1 ms	1 ms to 512 ms	1 ms to 512 ms
- for send cycle of 2 ms	2 ms to 512 ms	2 ms to 512 ms
- for send cycle of 4 ms	4 ms to 512 ms	4 ms to 512 ms
PROFINET IO Device		
Services		
- Isochronous mode	No	No
- IRT	Yes	Yes
- MRP	Yes	Yes
- MRPD	Yes	Yes
- Prioritized startup	Yes	Yes
- Shared device	Yes	Yes
- Number of IO Controllers with shared device, max.	4	4
2. Interface		
Interface type	Integrated Ethernet interface	Integrated Ethernet interface
automatic detection of transmission rate	Yes	Yes
Autonegotiation	Yes	Yes
Autocrossing	Yes	Yes
Interface types		
• Number of ports	1	1
• RJ 45 (Ethernet)	Yes; Integrated	Yes; Integrated
- Transmission rate, max.	1 000 Mbit/s	1 000 Mbit/s
- Industrial Ethernet status LED	No	No

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Technical specifications (continued)

Article number	**6ES7677-2FA31-0EB0** CPU 1515SP PC F	**6ES7677-2FA41-0FB0** CPU 1515SP PC F
3. Interface		
Interface type	PROFIBUS with CM DP	PROFIBUS with CM DP
Interface types		
• RS 485	Yes	Yes
Protocols		
• Number of connections via this interface	44	44
• PROFIBUS DP master	Yes	Yes
• PROFIBUS DP slave	Yes	Yes
• SIMATIC communication	Yes	Yes
PROFIBUS DP master		
• Number of DP slaves, max.	125	125
Services		
- Equidistance	No	No
- Isochronous mode	No	No
PROFIBUS DP slave		
Services		
- Equidistance	No	No
- Isochronous mode	No	No
Protocols		
Number of connections		
• Number of connections, max.	88	88
OPC UA		
• OPC UA client		No
• OPC UA server	Data access (read, write, subscribe), runtime license required	Yes; Data access (read, write, subscribe), runtime license required
Supported technology objects		
Motion Control	Yes	Yes
• Number of available Motion Control resources for technology objects (except cam disks)	2 400	2 400
• Required Motion Control resources		
- per speed-controlled axis	40; per axis	40; per axis
- per positioning axis	80; per axis	80; per axis
- per synchronous axis	160; per axis	160; per axis
- per external encoder	80; per external encoder	80; per external encoder
- per output cam	20; per cam	20; per cam
- per cam track	160; per cam track	160; per cam track
- per probe	40; per probe	40; per probe
Controller		
• PID_Compact	Yes; Universal PID controller with integrated optimization	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature	Yes; PID controller with integrated optimization for temperature
Counting and measuring		
• High-speed counter	Yes	Yes
Standards, approvals, certificates		
Highest safety class achievable in safety mode		
Probability of failure (for service life of 20 years and repair time of 100 hours)		
- Low demand mode: PFDavg in accordance with SIL3	< 2.00E-05	< 2.00E-05
- High demand/continuous mode: PFH in accordance with SIL3	< 1.00E-09 1/h	< 1.00E-09 1/h

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Technical specifications (continued)

Article number	**6ES7677-2FA31-0EB0** CPU 1515SP PC F	**6ES7677-2FA41-0FB0** CPU 1515SP PC F
Ambient conditions		
Ambient temperature during operation		
• min.	0 °C	0 °C
• max.	Up to 60 °C with max. 32 ET 200SP modules and 3x 100 mA USB load; up to 55 °C with max. 64 ET 200SP modules and 2x max. 500 mA and 1x max. 100 mA USB load	Up to 60 °C with max. 32 ET 200SP modules and 3x 100 mA USB load; up to 55 °C with max. 64 ET 200SP modules and 2x max. 500 mA and 1x max. 100 mA USB load
• horizontal installation, min.	0 °C	0 °C
• horizontal installation, max.	60 °C	60 °C
• vertical installation, min.	0 °C	0 °C
• vertical installation, max.	50 °C; With max. 32 ET 200SP modules and 3x 100 mA USB load	50 °C; With max. 32 ET 200SP modules and 3x 100 mA USB load
Operating systems		
pre-installed operating system	Windows Embedded Standard 7 E 32-bit	Windows Embedded Standard 7 P 64-bit
Configuration		
Programming		
Programming language		
- LAD	Yes; incl. failsafe	Yes; incl. failsafe
- FBD	Yes; incl. failsafe	Yes; incl. failsafe
- STL	Yes	Yes
- SCL	Yes	Yes
- CFC	No	No
- GRAPH	Yes	Yes
Know-how protection		
• User program protection/password protection	Yes	Yes
• Copy protection	Yes	Yes
• Block protection	Yes	Yes
Access protection		
• Protection level: Write protection	Yes	Yes
• Protection level: Read/write protection	Yes	Yes
• Protection level: Complete protection	Yes	Yes
Open Development interfaces		
• Size of ODK SO file, max.	3.8 Mbyte	3.8 Mbyte
Peripherals/Options		
Peripherals		
• SD card	Optionally for additional mass storage	Optionally for additional mass storage
Dimensions		
Width	160 mm	160 mm
Height	117 mm	117 mm
Depth	75 mm	75 mm
Weights		
Weight, approx.	0.83 kg	0.83 kg

Ordering data

SIMATIC ET 200SP Open Controller CPU 1515SP PC F (+ HMI)

Fail-safe ET 200SP CPU with Windows Embedded Standard 7 and pre-installed fail-safe SIMATIC S7-1500 Software Controller (with WinCC RT Advanced option)

Type of delivery:
en, de, fr, it, es, zh

	Article No.
Windows Embedded Standard 7 E 32-bit, 8 GB CFast card	
• CPU 1515SP PC F (4 GB RAM)	**6ES7677-2FA31-0EB0**
Windows Embedded Standard 7 P 64-bit (multi-touch), 16 GB CFast card	
• CPU 1515SP PC F (4 GB RAM)	**6ES7677-2FA41-0FB0**
• CPU 1515SP PC F + HMI 128PT (4 GB RAM)	**6ES7677-2FA41-0FK0**
• CPU 1515SP PC F + HMI 512PT (4 GB RAM)	**6ES7677-2FA41-0FL0**
• CPU 1515SP PC F + HMI 2048PT (4 GB RAM)	**6ES7677-2FA41-0FM0**

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Ordering data	Article No.
Accessories	
Upgrade from SIMATIC S7-1500 Software Controller CPU 1505SP to SIMATIC Open Controller From V 1.x to V 2.0; software download incl. documentation and license key Email address required for delivery	**6ES7672-5DC01-0YK0**
BusAdapter BA 2xRJ45	**6ES7193-6AR00-0AA0**
BusAdapter BA 2xFC	**6ES7193-6AF00-0AA0**
BusAdapter BA 2xSCRJ	**6ES7193-6AP00-0AA0**
BusAdapter BA SCRJ/RJ45	**6ES7193-6AP20-0AA0**
BusAdapter BA SCRJ/FC For increased vibration and EMC loads	**6ES7193-6AP40-0AA0**
BusAdapter BA 2XLC	**6ES7193-6AG00-0AA0**
BusAdapter BA LC/RJ45	**6ES7193-6AG20-0AA0**
BusAdapter BA LC/FC	**6ES7193-6AG40-0AA0**
CM DP for ET 200SP CPU PROFIBUS DP master with electrical interface for connecting the ET 200SP CPUs to PROFIBUS at up to 12 Mbps	**6ES7545-5DA00-0AB0**
Server module Spare part	**6ES7193-6PA00-0AA0**
Power supply connector Spare part; for connecting the 24 V DC supply voltage; with push-in terminals (10 units)	**6ES7193-4JB00-0AA0**
Equipment labeling plates 10 sheets of 16 plates	**6ES7193-6LF30-0AW0**
Labeling strips	
500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer	**6ES7193-6LR10-0AA0**
1 000 labeling strips DIN A4, light gray, card, for inscription with laser printer	**6ES7193-6LA10-0AA0**

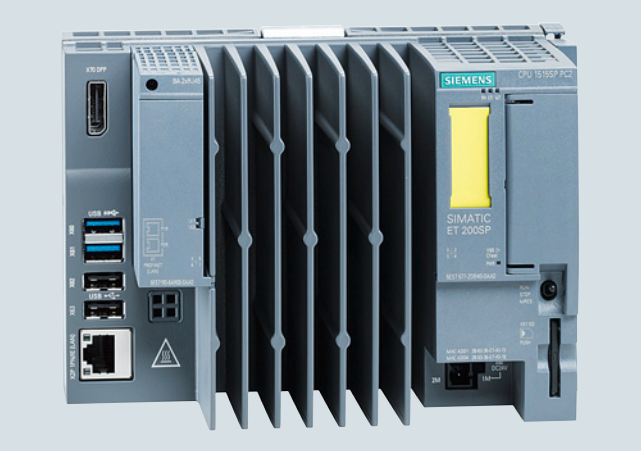
	Article No.
STEP 7 Professional V15.1 Target system: SIMATIC S7-1200, S7-1500, S7-300, S7-400, WinAC Requirement: Windows 7 Home Premium SP1 (64-bit) Windows 7 Professional SP1 (64-bit) Windows 7 Enterprise SP1 (64-bit) Windows 7 Ultimate SP1 (64-bit) Windows 10 Home Version 1709, 1803 Windows 10 Professional Version 1709, 1803 Windows 10 Enterprise Version 1709, 1803 Windows 10 Enterprise 2016 LTSB Windows 10 IoT Enterprise 2015 LTSB Windows 10 IoT Enterprise 2016 LTSB Windows Server 2012 R2 StdE (full installation) Windows Server 2016 Standard (full installation) Type of delivery: en, de, fr, es, it, zh	
STEP 7 Professional V15.1, floating license	**6ES7822-1AA05-0YA5**
STEP 7 Professional V15.1, floating license software download incl. license key [1] Email address required for delivery	**6ES7822-1AE05-0YA5**
SIMATIC ODK 1500S	
Open Development Kit for support in developing Windows and real-time library functions for S7-1500 Software Controllers; supplied on DVD	**6ES7806-2CD02-0YA0**
Open Development Kit for support in developing Windows and real-time library functions for S7-1500 Software Controllers; software download including license key [1] Email address required for delivery	**6ES7806-2CD02-0YG0**
SIMATIC WinCC Advanced V15.1 Engineering software in the TIA Portal; for engineering SIMATIC Panels, WinCC Runtime Advanced; runs with Windows 7 (64-bit), Windows 10 (64-bit), WinSrv 2012 R2/2016 (64-bit), Class A; 6 languages: en, de, fr, it, es, zh	
• Floating license; software and documentation on DVD; license key on USB flash drive	**6AV2102-0AA05-0AA5**
• Floating license; software, documentation and license key for download [1]: Email address required for delivery	**6AV2102-0AA05-0AH5**

[1] For up-to-date information and download availability, see: http://www.siemens.com/tia-online-software-delivery

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Overview



ET 200SP Open Controller, CPU 1515SP PC2 F, combines robustness and compact dimensions with the flexibility of centralized or decentralized communication in the highest industrial functionality. Furthermore, the CPU offers the entire value added of the ET 200SP system, the S7-1500 controller family and the TIA world together.

- Rugged, compact control system
- Combines the functions of an ET 200SP controller with those of a PC-based platform
- Turnkey all-in-one controller
- Can be used up to safety class SIL3 (Safety Integrity Level) according to IEC 61508 2nd Edition or PL e (Performance Level) according to ISO 13849
- High performance automation tasks with the use of new generation Intel Quad Core processors
- Connects high-level language applications and processes high data volumes with support from SIMATIC ODK 1500S

Technical specifications

Article number	**6ES7677-2SB42-0GB0** CPU1515SP PC2 F
General information	
Product type designation	CPU 1515SP PC2 F
Engineering with	
• STEP 7 TIA Portal configurable/ integrated as of version	V15 with HSP 269
Installed software	
• Visualization	No
• Control	S7-1500 Software Controller CPU 1505SP F
Supply voltage	
Type of supply voltage	24 V DC
Processor	
Processor type	Intel Atom E3940, 1.6 GHz, 4 cores
Memory	
Type of memory	DDR3L
Main memory	8 GB RAM
CFast memory card	Yes; 30 GB flash memory
Work memory	
• integrated (for program)	1.5 Mbyte
• integrated (for data)	5 Mbyte
• integrated (for CPU function library of CPU Runtime)	20 Mbyte
Load memory	
• integrated (on PC mass storage)	320 Mbyte
CPU processing times	
for bit operations, typ.	10 ns
for word operations, typ.	12 ns
for fixed point arithmetic, typ.	16 ns
for floating point arithmetic, typ.	64 ns

Article number	**6ES7677-2SB42-0GB0** CPU1515SP PC2 F
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
IEC counter	
• Number	Any (only limited by the main memory)
S7 times	
• Number	2 048
IEC timer	
• Number	Any (only limited by the main memory)
Data areas and their retentivity	
Flag	
• Number, max.	16 kbyte
Address area	
I/O address area	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
Hardware configuration	
Integrated power supply	Yes
Time of day	
Clock	
• Type	Hardware clock
• Hardware clock (real-time)	Yes; Resolution: 1 s
Interfaces	
Number of industrial Ethernet interfaces	2
Number of RS 485 interfaces	1; Via CM DP module
Number of USB interfaces	4; 2x USB 2.0, 2x USB 3.0 on front side
Number of SD card slots	1
Video interfaces	
• Graphics interface	1x DisplayPort

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Technical specifications (continued)

Article number	6ES7677-2SB42-0GB0 CPU1515SP PC2 F
1. Interface	
Interface type	PROFINET
automatic detection of transmission rate	Yes
Autonegotiation	Yes
Autocrossing	Yes
Interface types	
• Number of ports	2
• integrated switch	Yes
• RJ 45 (Ethernet)	Yes; Via BusAdapter BA 2x RJ45
- Transmission rate, max.	100 Mbit/s
- Industrial Ethernet status LED	Yes
• BusAdapter (PROFINET)	Yes; Compatible BusAdapter: BA 2x RJ45, BA 2x FC, BA 2x SCRJ (from FS03, V2.2), BA SCRJ / RJ45 (from FS03, V3.1), BA SCRJ / FC (from FS03, V3.1), BA 2x LC (from FS03, V3.3), BA LC / RJ45 (from FS03, V3.3), BA LC / FC (from FS03, V3.3)
Protocols	
• Number of connections via this interface	88
• PROFINET IO controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes
• Web server	Yes
PROFINET IO controller	
Services	
- Isochronous mode	Yes
- shortest clock pulse	500 µs
- IRT	Yes
- MRP	Yes
- MRPD	Yes
- PROFIenergy	Yes
- Prioritized startup	Yes; Max. 32 PROFINET devices; if you want to use the "Prioritized startup" functionality in STEP 7 for the PROFINET interface of the CPU, the CPU and the device must be separated by means of a switch (e.g. SCALANCE X205)
- Number of connectable IO Devices, max.	128
- Of which IO devices with IRT, max.	64
- of which in line, max.	64
- Number of connectable IO Devices for RT, max.	128
- of which in line, max.	128
- Number of IO Devices that can be simultaneously activated/ deactivated, max.	8
- IO Devices changing during operation (partner ports), supported	Yes
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communi-cation share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data

Article number	6ES7677-2SB42-0GB0 CPU1515SP PC2 F
Update time for IRT	
- for send cycle of 500 µs	500 µs to 8 ms
- for send cycle of 1 ms	1 ms to 16 ms
- for send cycle of 2 ms	2 ms to 32 ms
- for send cycle of 4 ms	4 ms to 64 ms
- With IRT and parameterization of "odd" send cycles	Update time = set "odd" send clock (any multiple of 125 µs: 375 µs, 625 µs ... 3 875 µs)
Update time for RT	
- for send cycle of 500 µs	500 µs to 256 ms
- for send cycle of 1 ms	1 ms to 512 ms
- for send cycle of 2 ms	2 ms to 512 ms
- for send cycle of 4 ms	4 ms to 512 ms
Address area	
- Inputs, max.	8 kbyte
- Outputs, max.	8 kbyte
PROFINET IO Device	
Services	
- Isochronous mode	No
- shortest clock pulse	500 µs
- IRT	Yes
- MRP	Yes
- MRPD	Yes
- PROFIenergy	Yes
- Prioritized startup	Yes
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- Asset management record	Yes
2. Interface	
Interface type	Integrated Ethernet interface
automatic detection of transmission rate	Yes
Autonegotiation	Yes
Autocrossing	Yes
Interface types	
• Number of ports	1
• RJ 45 (Ethernet)	Yes; Integrated
- Transmission rate, max.	1 000 Mbit/s
- Industrial Ethernet status LED	No
3. Interface	
Interface type	PROFIBUS with CM DP
Interface types	
• RS 485	Yes
Protocols	
• Number of connections via this interface	44
• PROFIBUS DP master	Yes
• PROFIBUS DP slave	Yes
• SIMATIC communication	Yes

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Technical specifications (continued)

Article number	6ES7677-2SB42-0GB0 CPU1515SP PC2 F
PROFIBUS DP master	
• Number of DP slaves, max.	125
Services	
- Equidistance	No
- Isochronous mode	No
Address area	
- Inputs, max.	8 kbyte
- Outputs, max.	8 kbyte
PROFIBUS DP slave	
Services	
- Equidistance	No
- Isochronous mode	No
Protocols	
Number of connections	
• Number of connections, max.	88
OPC UA	
• OPC UA client	Yes; From SW CPU 1505SP V2.6
• OPC UA server	Yes; Data access (read, write, subscribe), runtime license required
Supported technology objects	
Motion Control	Yes
• Number of available Motion Control resources for technology objects (except cam disks)	2 400
• Required Motion Control resources	
- per speed-controlled axis	40; per axis
- per positioning axis	80; per axis
- per synchronous axis	160; per axis
- per external encoder	80; per external encoder
- per output cam	20; per cam
- per cam track	160; per cam track
- per probe	40; per probe
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes
Standards, approvals, certificates	
Highest safety class achievable in safety mode	
Probability of failure (for service life of 20 years and repair time of 100 hours)	
- Low demand mode: PFDavg in accordance with SIL3	< 2.00E-05
- High demand/continuous mode: PFH in accordance with SIL3	< 1.00E-09 1/h

Article number	6ES7677-2SB42-0GB0 CPU1515SP PC2 F
Ambient conditions	
Ambient temperature during operation	
• min.	-20 °C
• max.	Up to 60 °C with max. 32 ET 200SP modules; up to 55 °C with max. 64 ET 200SP modules
• horizontal installation, min.	-20 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	-20 °C
• vertical installation, max.	50 °C; With max. 32 ET 200SP modules
Operating systems	
pre-installed operating system	Windows 10 IoT Enterprise 2016 LTSB, 64bit, MUI
Configuration	
Programming	
Programming language	
- LAD	Yes; incl. failsafe
- FBD	Yes; incl. failsafe
- STL	Yes
- SCL	Yes
- CFC	No
- GRAPH	Yes
Know-how protection	
• User program protection/password protection	Yes
• Copy protection	Yes
• Block protection	Yes
Access protection	
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Complete protection	Yes
Open Development interfaces	
• Size of ODK SO file, max.	5.8 Mbyte
Peripherals/Options	
Peripherals	
• SD card	Optionally for additional mass storage
Dimensions	
Width	160 mm
Height	117 mm
Depth	75 mm
Weights	
Weight, approx.	0.83 kg

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Ordering data

	Article No.
SIMATIC ET 200SP Open Controller CPU 1515SP PC2 F (+ HMI)	
Fail-safe ET 200SP CPU with Windows 10 IoT Enterprise 64-bit and pre-installed SIMATIC S7-1500 Failsafe Software Controller (with WinCC RT Advanced option); 8 GB RAM, 30 GB CFast card	
Type of delivery: en, de, fr, it, es, zh	
• CPU 1515SP PC2 F	**6ES7677-2SB42-0GB0**
With pre-installed WinCC RT Advanced	
• CPU 1515SP PC2 F + HMI 128PT	**6ES7677-2SB42-0GK0**
• CPU 1515SP PC2 F + HMI 512PT	**6ES7677-2SB42-0GL0**
• CPU 1515SP PC2 F + HMI 2048PT	**6ES7677-2SB42-0GM0**
Accessories	
Upgrade from SIMATIC S7-1500 Software Controller CPU 1505SP to SIMATIC Open Controller	**6ES7672-5DC01-0YK0**
From V 1.x to V 2.0; software download incl. documentation and license key	
Email address required for delivery	
BusAdapter BA 2xRJ45	**6ES7193-6AR00-0AA0**
BusAdapter BA 2xFC	**6ES7193-6AF00-0AA0**
BusAdapter BA 2xSCRJ	**6ES7193-6AP00-0AA0**
BusAdapter BA SCRJ/RJ45	**6ES7193-6AP20-0AA0**
BusAdapter BA SCRJ/FC	**6ES7193-6AP40-0AA0**
For increased vibration and EMC loads	
BusAdapter BA 2XLC	**6ES7193-6AG00-0AA0**
BusAdapter BA LC/RJ45	**6ES7193-6AG20-0AA0**
BusAdapter BA LC/FC	**6ES7193-6AG40-0AA0**
CM DP for ET 200SP CPU	**6ES7545-5DA00-0AB0**
PROFIBUS DP master with electrical interface for connecting the ET 200SP CPUs to PROFIBUS at up to 12 Mbps	
Server module	**6ES7193-6PA00-0AA0**
Spare part	
Power supply connector	**6ES7193-4JB00-0AA0**
Spare part; for connecting the 24 V DC supply voltage; with push-in terminals (10 units)	
Equipment labeling plates	**6ES7193-6LF30-0AW0**
10 sheets of 16 plates	
Labeling strips	
500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer	**6ES7193-6LR10-0AA0**
1 000 labeling strips DIN A4, light gray, card, for inscription with laser printer	**6ES7193-6LA10-0AA0**

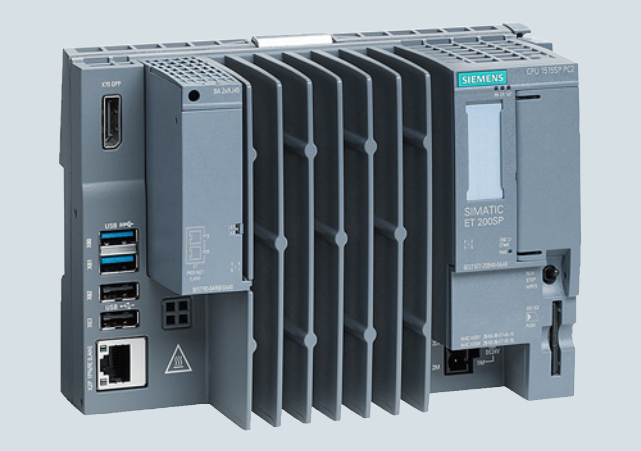
	Article No.
STEP 7 Professional V15.1	
Target system: SIMATIC S7-1200, S7-1500, S7-300, S7-400, WinAC Requirement: Windows 7 Home Premium SP1 (64-bit) Windows 7 Professional SP1 (64-bit) Windows 7 Enterprise SP1 (64-bit) Windows 7 Ultimate SP1 (64-bit) Windows 10 Home Version 1709, 1803 Windows 10 Professional Version 1709, 1803 Windows 10 Enterprise Version 1709, 1803 Windows 10 Enterprise 2016 LTSB Windows 10 IoT Enterprise 2015 LTSB Windows 10 IoT Enterprise 2016 LTSB Windows Server 2012 R2 StdE (full installation) Windows Server 2016 Standard (full installation) Type of delivery: en, de, fr, it, es, zh	
STEP 7 Professional V15.1, floating license	**6ES7822-1AA05-0YA5**
STEP 7 Professional V15.1, floating license software download incl. license key [1]	**6ES7822-1AE05-0YA5**
Email address required for delivery	
SIMATIC ODK 1500S	
Open Development Kit for support in developing Windows and real-time library functions for S7-1500 Software Controllers; supplied on DVD	**6ES7806-2CD03-0YA0**
Open Development Kit for support in developing Windows and real-time library functions for S7-1500 Software Controllers; software download including license key [1]	**6ES7806-2CD03-0YG0**
Email address required for delivery	
SIMATIC WinCC Advanced V15.1	
Engineering software in the TIA Portal; for engineering SIMATIC Panels, WinCC Runtime Advanced; runs with Windows 7 (64-bit), Windows 10 (64-bit), WinSrv 2012 R2/2016 (64-bit), Class A; 6 languages: en, de, fr, es, it, zh	
• Floating license; software and documentation on DVD; license key on USB flash drive	**6AV2102-0AA05-0AA5**
• Floating license; software, documentation and license key for download [1]: Email address required for delivery	**6AV2102-0AA05-0AH5**

[1] For up-to-date information and download availability, see: http://www.siemens.com/tia-online-software-delivery

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Overview



ET 200SP Open Controller CPU 1515SP PC2 T combines robustness and compact dimensions with the flexibility of centralized or decentralized communication in the highest industrial functionality. Furthermore, the CPU offers the entire value added of the ET 200SP system, the S7-1500 controller family and the TIA world together.

- Rugged, compact control system
- Combines the functions of an ET 200SP controller with those of a PC-based platform
- Turnkey all-in-one controller
- High performance automation tasks with the use of new generation Intel Quad Core processors
- Connects high-level language applications and processes high data volumes with support from SIMATIC ODK 1500S

Technical specifications

Article number	**6ES7677-2VB42-0GB0** CPU1515SP PC2 T
General information	
Product type designation	CPU 1515SP PC2 T
Engineering with	
• STEP 7 TIA Portal configurable/ integrated as of version	V15 (FW V2.5)
Installed software	
• Visualization	No
• Control	S7-1500 Software Controller CPU 1505SP T
Supply voltage	
Type of supply voltage	24 V DC
Processor	
Processor type	Intel Atom E3940, 1.6 GHz, 4 cores
Memory	
Type of memory	DDR3L
Main memory	8 GB RAM
CFast memory card	Yes; 30 GB flash memory
Work memory	
• integrated (for program)	1 Mbyte
• integrated (for data)	5 Mbyte
• integrated (for CPU function library of CPU Runtime)	20 Mbyte
Load memory	
• integrated (on PC mass storage)	320 Mbyte
CPU processing times	
for bit operations, typ.	10 ns
for word operations, typ.	12 ns
for fixed point arithmetic, typ.	16 ns
for floating point arithmetic, typ.	64 ns

Article number	**6ES7677-2VB42-0GB0** CPU1515SP PC2 T
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
IEC counter	
• Number	Any (only limited by the main memory)
S7 times	
• Number	2 048
IEC timer	
• Number	Any (only limited by the main memory)
Data areas and their retentivity	
Flag	
• Number, max.	16 kbyte
Address area	
I/O address area	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
Hardware configuration	
Integrated power supply	Yes
Time of day	
Clock	
• Type	Hardware clock
• Hardware clock (real-time)	Yes; Resolution: 1 s
Interfaces	
Number of industrial Ethernet interfaces	2
Number of RS 485 interfaces	1; Via CM DP module
Number of USB interfaces	4; 2x USB 2.0, 2x USB 3.0 on front side
Number of SD card slots	1
Video interfaces	
• Graphics interface	1x DisplayPort

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Technical specifications (continued)

Article number	**6ES7677-2VB42-0GB0**
	CPU1515SP PC2 T
1. Interface	
Interface type	PROFINET
automatic detection of transmission rate	Yes
Autonegotiation	Yes
Autocrossing	Yes
Interface types	
• Number of ports	2
• integrated switch	Yes
• RJ 45 (Ethernet)	Yes; Via BusAdapter BA 2x RJ45
- Transmission rate, max.	100 Mbit/s
- Industrial Ethernet status LED	Yes
• BusAdapter (PROFINET)	Yes; Compatible BusAdapter: BA 2x RJ45, BA 2x FC, BA 2x SCRJ (from FS03, V2.2), BA SCRJ / RJ45 (from FS03, V3.1), BA SCRJ / FC (from FS03, V3.1), BA 2x LC (from FS03, V3.3), BA LC / RJ45 (from FS03, V3.3), BA LC / FC (from FS03, V3.3)
Protocols	
• Number of connections via this interface	88
• PROFINET IO controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes
• Web server	Yes
PROFINET IO controller	
Services	
- Isochronous mode	Yes
- shortest clock pulse	500 µs
- IRT	Yes
- MRP	Yes
- MRPD	Yes
- PROFIenergy	Yes
- Prioritized startup	Yes; Max. 32 PROFINET devices; if you want to use the "Prioritized startup" functionality in STEP 7 for the PROFINET interface of the CPU, the CPU and the device must be separated by means of a switch (e.g. SCALANCE X205)
- Number of connectable IO Devices, max.	128
- Of which IO devices with IRT, max.	64
- of which in line, max.	64
- Number of connectable IO Devices for RT, max.	128
- of which in line, max.	128
- Number of IO Devices that can be simultaneously activated/ deactivated, max.	8
- IO Devices changing during operation (partner ports), supported	Yes
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communi-cation share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data

Article number	**6ES7677-2VB42-0GB0**
	CPU1515SP PC2 T
Update time for IRT	
- for send cycle of 500 µs	500 µs to 8 ms
- for send cycle of 1 ms	1 ms to 16 ms
- for send cycle of 2 ms	2 ms to 32 ms
- for send cycle of 4 ms	4 ms to 64 ms
- With IRT and parameterization of "odd" send cycles	Update time = set "odd" send clock (any multiple of 125 µs: 375 µs, 625 µs ... 3 875 µs)
Update time for RT	
- for send cycle of 500 µs	500 µs to 256 ms
- for send cycle of 1 ms	1 ms to 512 ms
- for send cycle of 2 ms	2 ms to 512 ms
- for send cycle of 4 ms	4 ms to 512 ms
Address area	
- Inputs, max.	8 kbyte
- Outputs, max.	8 kbyte
PROFINET IO Device	
Services	
- Isochronous mode	No
- shortest clock pulse	500 µs
- IRT	Yes
- MRP	Yes
- MRPD	Yes
- PROFIenergy	Yes
- Prioritized startup	Yes
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- Asset management record	Yes
2. Interface	
Interface type	Integrated Ethernet interface
automatic detection of transmission rate	Yes
Autonegotiation	Yes
Autocrossing	Yes
Interface types	
• Number of ports	1
• RJ 45 (Ethernet)	Yes; Integrated
- Transmission rate, max.	1 000 Mbit/s
- Industrial Ethernet status LED	No

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Technical specifications (continued)

Article number	6ES7677-2VB42-0GB0 CPU1515SP PC2 T
3. Interface	
Interface type	PROFIBUS with CM DP
Interface types	
• RS 485	Yes
Protocols	
• Number of connections via this interface	44
• PROFIBUS DP master	Yes
• PROFIBUS DP slave	Yes
• SIMATIC communication	Yes
PROFIBUS DP master	
• Number of DP slaves, max.	125
Services	
- Equidistance	No
- Isochronous mode	No
Address area	
- Inputs, max.	8 kbyte
- Outputs, max.	8 kbyte
PROFIBUS DP slave	
Services	
- Equidistance	No
- Isochronous mode	No
Protocols	
Number of connections	
• Number of connections, max.	88
OPC UA	
• OPC UA client	Yes; From SW CPU 1505SP V2.6
• OPC UA server	Yes; Data access (read, write, subscribe), runtime license required
Supported technology objects	
Motion Control	Yes
• Number of available Motion Control resources for technology objects (except cam disks)	2 400
• Required Motion Control resources	
- per speed-controlled axis	40; per axis
- per positioning axis	80; per axis
- per synchronous axis	160; per axis
- per external encoder	80; per external encoder
- per output cam	20; per cam
- per cam track	160; per cam track
- per probe	40; per probe
• Number of available Extended Motion Control resources for technology objects	120
• Required Extended Motion Control resources	
- for each cam	2
- for each set of kinematics	30
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes

Article number	6ES7677-2VB42-0GB0 CPU1515SP PC2 T
Ambient conditions	
Ambient temperature during operation	
• min.	-20 °C
• max.	Up to 60 °C with max. 32 ET 200SP modules; up to 55 °C with max. 64 ET 200SP modules
• horizontal installation, min.	-20 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	-20 °C
• vertical installation, max.	50 °C; With max. 32 ET 200SP modules
Operating systems	
pre-installed operating system	Windows 10 IoT Enterprise 2016 LTSB, 64bit, MUI
Configuration	
Programming	
Programming language	
- LAD	Yes
- FBD	Yes
- STL	Yes
- SCL	Yes
- CFC	No
- GRAPH	Yes
Know-how protection	
• User program protection/password protection	Yes
• Copy protection	Yes
• Block protection	Yes
Access protection	
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Complete protection	Yes
Open Development interfaces	
• Size of ODK SO file, max.	5.8 Mbyte
Peripherals/Options	
Peripherals	
• SD card	Optionally for additional mass storage
Dimensions	
Width	160 mm
Height	117 mm
Depth	75 mm
Weights	
Weight, approx.	0.83 kg

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Ordering data

	Article No.
SIMATIC ET 200SP Open Controller CPU 1515SP PC2 T ET 200SP CPU with Windows 10 IoT Enterprise 64-bit and pre-installed SIMATIC S7-1500 Software Controller; 8 GB RAM, 30 GB CFast card; with enhanced motion control functionality Type of delivery: en, de, fr, it, es, zh	
• CPU 1515SP PC2 T	**6ES7677-2VB42-0GB0**
Accessories	
Upgrade from SIMATIC S7-1500 Software Controller CPU 1505SP to SIMATIC Open Controller From V 1.x to V 2.0; software download incl. documentation and license key Email address required for delivery	**6ES7672-5DC01-0YK0**
BusAdapter BA 2xRJ45	**6ES7193-6AR00-0AA0**
BusAdapter BA 2xFC	**6ES7193-6AF00-0AA0**
BusAdapter BA 2xSCRJ	**6ES7193-6AP00-0AA0**
BusAdapter BA SCRJ/RJ45	**6ES7193-6AP20-0AA0**
BusAdapter BA SCRJ/FC For increased vibration and EMC loads	**6ES7193-6AP40-0AA0**
BusAdapter BA 2XLC	**6ES7193-6AG00-0AA0**
BusAdapter BA LC/RJ45	**6ES7193-6AG20-0AA0**
BusAdapter BA LC/FC	**6ES7193-6AG40-0AA0**
CM DP for ET 200SP CPU PROFIBUS DP master with electrical interface for connecting the ET 200SP CPUs to PROFIBUS at up to 12 Mbps	**6ES7545-5DA00-0AB0**
Server module Spare part	**6ES7193-6PA00-0AA0**
Power supply connector Spare part; for connecting the 24 V DC supply voltage; with push-in terminals (10 units)	**6ES7193-4JB00-0AA0**
Equipment labeling plates 10 sheets of 16 plates	**6ES7193-6LF30-0AW0**
Labeling strips	
500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer	**6ES7193-6LR10-0AA0**
1 000 labeling strips DIN A4, light gray, card, for inscription with laser printer	**6ES7193-6LA10-0AA0**

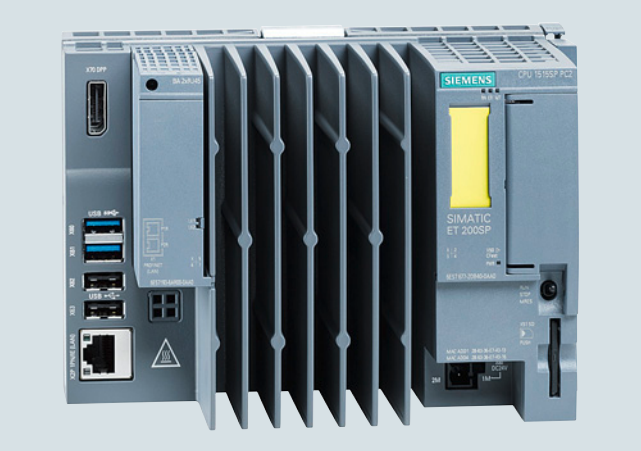
	Article No.
STEP 7 Professional V15.1 Target system: SIMATIC S7-1200, S7-1500, S7-300, S7-400, WinAC Requirement: Windows 7 Home Premium SP1 (64-bit) Windows 7 Professional SP1 (64-bit) Windows 7 Enterprise SP1 (64-bit) Windows 7 Ultimate SP1 (64-bit) Windows 10 Home Version 1709, 1803 Windows 10 Professional Version 1709, 1803 Windows 10 Enterprise Version 1709, 1803 Windows 10 Enterprise 2016 LTSB Windows 10 IoT Enterprise 2015 LTSB Windows 10 IoT Enterprise 2016 LTSB Windows Server 2012 R2 StdE (full installation) Windows Server 2016 Standard (full installation) Type of delivery: en, de, fr, it, es, zh	
STEP 7 Professional V15.1, floating license	**6ES7822-1AA05-0YA5**
STEP 7 Professional V15.1, floating license software download incl. license key [1] Email address required for delivery	**6ES7822-1AE05-0YA5**
SIMATIC ODK 1500S	
Open Development Kit for support in developing Windows and real-time library functions for S7-1500 Software Controllers; supplied on DVD	**6ES7806-2CD03-0YA0**
Open Development Kit for support in developing Windows and real-time library functions for S7-1500 Software Controllers; software download including license key [1] Email address required for delivery	**6ES7806-2CD03-0YG0**
SIMATIC WinCC Advanced V15.1 Engineering software in the TIA Portal; for engineering SIMATIC Panels, WinCC Runtime Advanced; runs with Windows 7 (64-bit), Windows 10 (64-bit), WinSrv 2012 R2/2016 (64-bit), Class A; 6 languages: en, de, fr, it, es, zh	
• Floating license; software and documentation on DVD; license key on USB flash drive	**6AV2102-0AA05-0AA5**
• Floating license; software, documentation and license key for download [1]: Email address required for delivery	**6AV2102-0AA05-0AH5**

[1] For up-to-date information and download availability, see:
http://www.siemens.com/tia-online-software-delivery

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Overview



ET 200SP Open Controller, CPU 1515SP PC2 TF, combines robustness and compact dimensions with the flexibility of centralized or decentralized communication in the highest industrial functionality. Furthermore, the CPU offers the entire value added of the ET 200SP system, the S7-1500 controller family and the TIA world together.

- Rugged, compact control system
- Combines the functions of a ET 200SP controller with those of a PC-based platform
- Turnkey all-in-one controller
- Can be used up to safety class SIL3 (Safety Integrity Level) according to IEC 61508 2nd Edition or PL e (Performance Level) according to ISO 13849
- High performance automation tasks with the use of new generation Intel Quad Core processors
- Connects high-level language applications and processes high data volumes with support from SIMATIC ODK 1500S

Technical specifications

Article number	**6ES7677-2WB42-0GB0** CPU1515SP PC2 TF
General information	
Product type designation	CPU 1515SP PC2 TF
Engineering with	
• STEP 7 TIA Portal configurable/ integrated as of version	V15 (FW V2.5)
Installed software	
• Visualization	No
• Control	S7-1500 Software Controller CPU 1505SP TF
Supply voltage	
Type of supply voltage	24 V DC
Processor	
Processor type	Intel Atom E3940, 1.6 GHz, 4 cores
Memory	
Type of memory	DDR3L
Main memory	8 GB RAM
CFast memory card	Yes; 30 GB flash memory
Work memory	
• integrated (for program)	1.5 Mbyte
• integrated (for data)	5 Mbyte
• integrated (for CPU function library of CPU Runtime)	20 Mbyte
Load memory	
• integrated (on PC mass storage)	320 Mbyte
CPU processing times	
for bit operations, typ.	10 ns
for word operations, typ.	12 ns
for fixed point arithmetic, typ.	16 ns
for floating point arithmetic, typ.	64 ns

Article number	**6ES7677-2WB42-0GB0** CPU1515SP PC2 TF
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
IEC counter	
• Number	Any (only limited by the main memory)
S7 times	
• Number	2 048
IEC timer	
• Number	Any (only limited by the main memory)
Data areas and their retentivity	
Flag	
• Number, max.	16 kbyte
Address area	
I/O address area	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
Hardware configuration	
Integrated power supply	Yes
Time of day	
Clock	
• Type	Hardware clock
• Hardware clock (real-time)	Yes; Resolution: 1 s
Interfaces	
Number of industrial Ethernet interfaces	2
Number of RS 485 interfaces	1; Via CM DP module
Number of USB interfaces	4; 2x USB 2.0, 2x USB 3.0 on front side
Number of SD card slots	1
Video interfaces	
• Graphics interface	1x DisplayPort

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Technical specifications (continued)

Article number	**6ES7677-2WB42-0GB0**
	CPU1515SP PC2 TF
1. Interface	
Interface type	PROFINET
automatic detection of transmission rate	Yes
Autonegotiation	Yes
Autocrossing	Yes
Interface types	
• Number of ports	2
• integrated switch	Yes
• RJ 45 (Ethernet)	Yes; Via BusAdapter BA 2x RJ45
- Transmission rate, max.	100 Mbit/s
- Industrial Ethernet status LED	Yes
• BusAdapter (PROFINET)	Yes; Compatible BusAdapter: BA 2x RJ45, BA 2x FC, BA 2x SCRJ (from FS03, V2.2), BA SCRJ / RJ45 (from FS03, V3.1), BA SCRJ / FC (from FS03, V3.1), BA 2x LC (from FS03, V3.3), BA LC / RJ45 (from FS03, V3.3), BA LC / FC (from FS03, V3.3)
Protocols	
• Number of connections via this interface	88
• PROFINET IO controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes
• Web server	Yes
PROFINET IO controller	
Services	
- Isochronous mode	Yes
- shortest clock pulse	500 µs
- IRT	Yes
- MRP	Yes
- MRPD	Yes
- PROFIenergy	Yes
- Prioritized startup	Yes; Max. 32 PROFINET devices; if you want to use the "Prioritized startup" functionality in STEP 7 for the PROFINET interface of the CPU, the CPU and the device must be separated by means of a switch (e.g. SCALANCE X205)
- Number of connectable IO Devices, max.	128
- Of which IO devices with IRT, max.	64
- of which in line, max.	64
- Number of connectable IO Devices for RT, max.	128
- of which in line, max.	128
- Number of IO Devices that can be simultaneously activated/ deactivated, max.	8
- IO Devices changing during operation (partner ports), supported	Yes
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communi-cation share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data

Article number	**6ES7677-2WB42-0GB0**
	CPU1515SP PC2 TF
Update time for IRT	
- for send cycle of 500 µs	500 µs to 8 ms
- for send cycle of 1 ms	1 ms to 16 ms
- for send cycle of 2 ms	2 ms to 32 ms
- for send cycle of 4 ms	4 ms to 64 ms
- With IRT and parameterization of "odd" send cycles	Update time = set "odd" send clock (any multiple of 125 µs: 375 µs, 625 µs ... 3 875 µs)
Update time for RT	
- for send cycle of 500 µs	500 µs to 256 ms
- for send cycle of 1 ms	1 ms to 512 ms
- for send cycle of 2 ms	2 ms to 512 ms
- for send cycle of 4 ms	4 ms to 512 ms
Address area	
- Inputs, max.	8 kbyte
- Outputs, max.	8 kbyte
PROFINET IO Device	
Services	
- Isochronous mode	No
- shortest clock pulse	500 µs
- IRT	Yes
- MRP	Yes
- MRPD	Yes
- PROFIenergy	Yes
- Prioritized startup	Yes
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- Asset management record	Yes
2. Interface	
Interface type	Integrated Ethernet interface
automatic detection of transmission rate	Yes
Autonegotiation	Yes
Autocrossing	Yes
Interface types	
• Number of ports	1
• RJ 45 (Ethernet)	Yes; Integrated
- Transmission rate, max.	1 000 Mbit/s
- Industrial Ethernet status LED	No
3. Interface	
Interface type	PROFIBUS with CM DP
Interface types	
• RS 485	Yes
Protocols	
• Number of connections via this interface	44
• PROFIBUS DP master	Yes
• PROFIBUS DP slave	Yes
• SIMATIC communication	Yes

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Technical specifications (continued)

Article number	6ES7677-2WB42-0GB0 CPU1515SP PC2 TF
PROFIBUS DP master	
• Number of DP slaves, max.	125
Services	
- Equidistance	No
- Isochronous mode	No
Address area	
- Inputs, max.	8 kbyte
- Outputs, max.	8 kbyte
PROFIBUS DP slave	
Services	
- Equidistance	No
- Isochronous mode	No
Protocols	
Number of connections	
• Number of connections, max.	88
OPC UA	
• OPC UA client	Yes; From SW CPU 1505SP V2.6
• OPC UA server	Yes; Data access (read, write, subscribe), runtime license required
Supported technology objects	
Motion Control	Yes
• Number of available Motion Control resources for technology objects (except cam disks)	2 400
• Required Motion Control resources	
- per speed-controlled axis	40; per axis
- per positioning axis	80; per axis
- per synchronous axis	160; per axis
- per external encoder	80; per external encoder
- per output cam	20; per cam
- per cam track	160; per cam track
- per probe	40; per probe
• Number of available Extended Motion Control resources for technology objects	120
• Required Extended Motion Control resources	
- for each cam	2
- for each set of kinematics	30
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes
Standards, approvals, certificates	
Highest safety class achievable in safety mode	
Probability of failure (for service life of 20 years and repair time of 100 hours)	
- Low demand mode: PFDavg in accordance with SIL3	< 2.00E-05
- High demand/continuous mode: PFH in accordance with SIL3	< 1.00E-09 1/h

Article number	6ES7677-2WB42-0GB0 CPU1515SP PC2 TF
Ambient conditions	
Ambient temperature during operation	
• min.	-20 °C
• max.	Up to 60 °C with max. 32 ET 200SP modules; up to 55 °C with max. 64 ET 200SP modules
• horizontal installation, min.	-20 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	-20 °C
• vertical installation, max.	50 °C; With max. 32 ET 200SP modules
Operating systems	
pre-installed operating system	Windows 10 IoT Enterprise 2016 LTSB, 64bit, MUI
Configuration	
Programming	
Programming language	
- LAD	Yes; incl. failsafe
- FBD	Yes; incl. failsafe
- STL	Yes
- SCL	Yes
- CFC	No
- GRAPH	Yes
Know-how protection	
• User program protection/ password protection	Yes
• Copy protection	Yes
• Block protection	Yes
Access protection	
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Complete protection	Yes
Open Development interfaces	
• Size of ODK SO file, max.	5.8 Mbyte
Peripherals/Options	
Peripherals	
• SD card	Optionally for additional mass storage
Dimensions	
Width	160 mm
Height	117 mm
Depth	75 mm
Weights	
Weight, approx.	0.83 kg

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Ordering data

	Article No.
SIMATIC ET 200SP Open Controller CPU 1515SP PC2 TF Fail-safe ET 200SP CPU with Windows 10 IoT Enterprise 64-bit and pre-installed fail-safe SIMATIC S7-1500 Software Controller; 8 GB RAM, 30 GB CFast card; with enhanced motion control functionality Type of delivery: en, de, fr, it, es, zh	
• CPU 1515SP PC2 TF	**6ES7677-2WB42-0GB0**
Accessories	
Upgrade from SIMATIC S7-1500 Software Controller CPU 1505SP to SIMATIC Open Controller From V 1.x to V 2.0; software download incl. documentation and license key Email address required for delivery	**6ES7672-5DC01-0YK0**
BusAdapter BA 2xRJ45	**6ES7193-6AR00-0AA0**
BusAdapter BA 2xFC	**6ES7193-6AF00-0AA0**
BusAdapter BA 2xSCRJ	**6ES7193-6AP00-0AA0**
BusAdapter BA SCRJ/RJ45	**6ES7193-6AP20-0AA0**
BusAdapter BA SCRJ/FC For increased vibration and EMC loads	**6ES7193-6AP40-0AA0**
BusAdapter BA 2XLC	**6ES7193-6AG00-0AA0**
BusAdapter BA LC/RJ45	**6ES7193-6AG20-0AA0**
BusAdapter BA LC/FC	**6ES7193-6AG40-0AA0**
CM DP for ET 200SP CPU PROFIBUS DP master with electrical interface for connecting the ET 200SP CPUs to PROFIBUS at up to 12 Mbps	**6ES7545-5DA00-0AB0**
Server module Spare part	**6ES7193-6PA00-0AA0**
Power supply connector Spare part; for connecting the 24 V DC supply voltage; with push-in terminals (10 units)	**6ES7193-4JB00-0AA0**
Equipment labeling plates 10 sheets of 16 plates	**6ES7193-6LF30-0AW0**
Labeling strips	
500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer	**6ES7193-6LR10-0AA0**
1 000 labeling strips DIN A4, light gray, card, for inscription with laser printer	**6ES7193-6LA10-0AA0**

	Article No.
STEP 7 Professional V15.1 Target system: SIMATIC S7-1200, S7-1500, S7-300, S7-400, WinAC Requirement: Windows 7 Home Premium SP1 (64-bit) Windows 7 Professional SP1 (64-bit) Windows 7 Enterprise SP1 (64-bit) Windows 7 Ultimate SP1 (64-bit) Windows 10 Home Version 1709, 1803 Windows 10 Professional Version 1709, 1803 Windows 10 Enterprise Version 1709, 1803 Windows 10 Enterprise 2016 LTSB Windows 10 IoT Enterprise 2015 LTSB Windows 10 IoT Enterprise 2016 LTSB Windows Server 2012 R2 StdE (full installation) Windows Server 2016 Standard (full installation) Type of delivery: en, de, fr, it, es, zh	
STEP 7 Professional V15.1, floating license	**6ES7822-1AA05-0YA5**
STEP 7 Professional V15.1, floating license software download incl. license key [1] Email address required for delivery	**6ES7822-1AE05-0YA5**
SIMATIC ODK 1500S	
Open Development Kit for support in developing Windows and real-time library functions for S7-1500 Software Controllers; supplied on DVD	**6ES7806-2CD03-0YA0**
Open Development Kit for support in developing Windows and real-time library functions for S7-1500 Software Controllers; software download including license key [1] Email address required for delivery	**6ES7806-2CD03-0YG0**
SIMATIC WinCC Advanced V15.1 Engineering software in the TIA Portal; for engineering SIMATIC Panels, WinCC Runtime Advanced; runs with Windows 7 (64-bit), Windows 10 (64-bit), WinSrv 2012 R2/2016 (64-bit), Class A; 6 languages: en, de, fr, it, es, zh	
• Floating license; software and documentation on DVD; license key on USB flash drive	**6AV2102-0AA05-0AA5**
• Floating license; software, documentation and license key for download [1]: Email address required for delivery	**6AV2102-0AA05-0AH5**

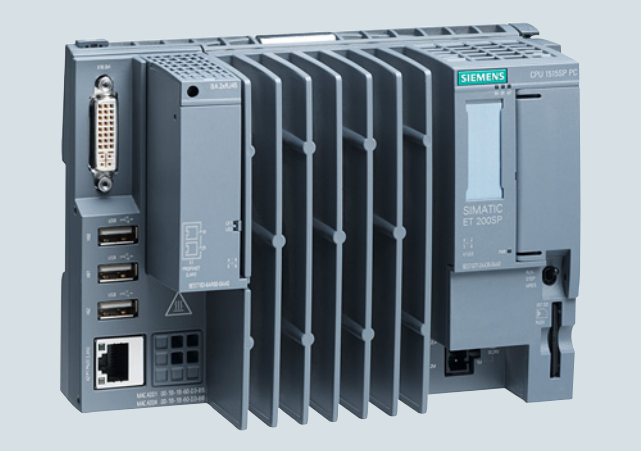
[1] For up-to-date information and download availability, see: http://www.siemens.com/tia-online-software-delivery

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SIPLUS CPU 1515SP PC

Overview



- Turnkey, all-in-one solution with pre-installed SIMATIC S7-1500 Software Controller Standard or fail-safe, optionally pre-installed WinCC Runtime Advanced
- Fail-safe versions make it possible to control machines or plants in a fail-safe environment. This makes it possible to address applications which require an SIL3 (Safety Integrity Level) safety class according to IEC 61508 2nd Edition or a PL e (Performance Level) according to ISO 13849.
- Central expansion via ET 200SP modules (station width up to 1 m or up to 64 modules)
- SIMATIC Hypervisor:
  for separating Windows systems from control functions
- Dual-core processor for optimal use of the hypervisor
- Swappable flash memory (CFast card) for operating system, runtime and project data
- Integrated DVI-I graphics connection; 3x USB 2.0 connection
- 2 PROFINET interfaces:
  X1 via PN-IO bus adapter (RJ45 or FC) with 2 ports;
  X2: GB Ethernet interface (RJ45)
- PROFINET IRT
- Open Ethernet communication (TCP/IP, UDP, Iso-on-TCP)
- Web server functionality for information, status, diagnostics and user-defined web pages
- PROFIBUS DP communication optionally via CM DP module as DP master
- Configuration control (option handling)
- Improved know-how and copy protection; Security Integrated
- Integrated system diagnostics
- Integrated motion control functionalities for controlling speed-controlled and positioning axes with support for external encoders.
- Trace function
- Especially suitable for high data volumes and user-specific, open applications
- Integration of control functions and applications implemented in C/C++ (using SIMATIC ODK-1500S Open Development Kit)

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

Technical specifications

Article number	**6AG1677-2AA31-4EB0**	**6AG1677-2AA40-4AA0**
Based on	**6ES7677-2AA31-0EB0**	**6ES7677-2AA40-0AA0**
	SIPLUS ET 200SP CPU 1515SP PC 4GB	SIPLUS ET 200SP CPU 1515SP PC SPARE 4GB; **Spare part (module without CFast card and without installed software)**
Ambient conditions		
Ambient temperature during operation		
• min.	0 °C; = Tmin (incl. condensation/frost)	0 °C; = Tmin (incl. condensation/frost)
• max.	60 °C; Up to 60 °C with max. 32 ET 200SP modules and 3x 100 mA USB load; up to 55 °C with max. 64 ET 200SP modules and 2x max. 500 mA and 1x max. 100 mA USB load	60 °C; Up to 60 °C with max. 32 ET 200SP modules and 3x 100 mA USB load; up to 55 °C with max. 64 ET 200SP modules and 2x max. 500 mA and 1x max. 100 mA USB load
• horizontal installation, min.	0 °C; = Tmin	0 °C; = Tmin
• horizontal installation, max.	60 °C; = Tmax; up to 60 °C with max. 32 ET 200SP modules and 3x 100 mA USB load; up to 55 °C with max. 64 ET 200SP modules and 2x max. 500 mA and 1x max. 100 mA USB load	60 °C; = Tmax; up to 60 °C with max. 32 ET 200SP modules and 3x 100 mA USB load; up to 55 °C with max. 64 ET 200SP modules and 2x max. 500 mA and 1x max. 100 mA USB load
• vertical installation, min.	0 °C; = Tmin	0 °C; = Tmin
• vertical installation, max.	50 °C; = Tmax; at max. 32 ET 200SP modules and 3x 100 mA USB load	50 °C; = Tmax; at max. 32 ET 200SP modules and 3x 100 mA USB load
Altitude during operation relating to sea level		
• Installation altitude above sea level, max.	5 000 m	5 000 m

• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at
	1 140 hPa ... 795 hPa
	(-1 000 m ... +2 000 m) //
	Tmin ... (Tmax - 10 K) at
	795 hPa ... 658 hPa
	(+2 000 m ... +3 500 m) //
	Tmin ... (Tmax -20 K) at
	658 hPa ... 540 hPa
	(+3 500 m ... +5 000 m)
		Tmin ... Tmax at
		1 140 hPa ... 795 hPa
		(-1 000 m ... +2 000 m) //
		Tmin ... (Tmax - 10 K) at
		795 hPa ... 658 hPa
		(+2 000 m ... +3 500 m) //
		Tmin ... (Tmax -20 K) at
		658 hPa ... 540 hPa
		(+3 500 m ... +5 000 m)

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Technical specifications (continued)

Article number	**6AG1677-2AA31-4EB0**	**6AG1677-2AA40-4AA0**
Based on	**6ES7677-2AA31-0EB0**	**6ES7677-2AA40-0AA0**
	SIPLUS ET 200SP CPU 1515SP PC 4GB	SIPLUS ET 200SP CPU 1515SP PC SPARE 4GB; **Spare part (module without CFast card and without installed software)**
Relative humidity		
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance		
Coolants and lubricants		
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems		
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
Use on ships/at sea		
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Remark		
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating		
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability	Yes; Class 2 for high availability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

Ordering data

	Article No.
SIPLUS ET 200SP Open Controller CPU 1515SP PC	
(Extended temperature range and exposure to environmental substances)	
ET 200SP CPU with Windows Embedded Standard 7 and pre-installed controller, SIMATIC S7-1500 Software Controller (optionally with WinCC RT Advanced);	
Type of delivery: en, de, fr, it, es, zh	
Windows Embedded Standard 7 E 32-bit, 8 GB CFast card	
• CPU 1515SP PC (4 GB RAM)	**6AG1677-2AA31-4EB0**
Spare part (module without CFast card and without installed software)	
• CPU 1515SP PC (4 GB RAM)	**6AG1677-2AA40-4AA0**

	Article No.
Accessories	
BusAdapter BA 2xRJ45	**6AG1193-6AR00-7AA0**
(Extended temperature range and exposure to environmental substances)	
BusAdapter BA 2xFC for increased vibration and EMC loads	**6AG1193-6AF00-7AA0**
(Extended temperature range and exposure to environmental substances)	
Other accessories	See SIMATIC CPU 1515SP PC, page 7/32

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IM 154-8 PN/DP CPU

Overview



- CPU with PLC functionality equivalent to S7-315-2 PN/DP provides distributed intelligence for preprocessing
- Interface module for exchanging pre-processed I/O data between the ET 200pro and a higher-level master/IO controller via PROFIBUS DP/PROFINET IO
- PROFINET IO controller for operating distributed I/O on PROFINET
- Component Based Automation (CBA) on PROFINET
- PROFINET proxy for intelligent devices on PROFIBUS DP in Component Based Automation (CBA)
- PROFINET interface with 3-port switch
- Isochronous mode on PROFIBUS or PROFINET
- Integrated web server with the option of creating user-defined web pages
- CPU with PLC functionality equivalent to S7-315-2 PN/DP provides distributed intelligence for preprocessing
- Fast, simple and end-to-end programming of a system with modular programs via STEP 7
- Fail-safe IM 154-8F PN/DP CPU PROFIsafe available

Note:

SIMATIC Micro Memory Card required for operation of CPU.

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Technical specifications

Article number	**6ES7154-8AB01-0AB0** ET 200pro: IM 154-8 PN/DP CPU, 384KB
Supply voltage	
Rated value (DC)	24 V
Power loss	
Power loss, typ.	8.5 W
Memory	
Work memory	
• integrated	384 kbyte
• expandable	No
Load memory	
• Plug-in (MMC), max.	8 Mbyte
CPU processing times	
for bit operations, typ.	0.05 µs
for word operations, typ.	0.09 µs
for fixed point arithmetic, typ.	0.12 µs
for floating point arithmetic, typ.	0.45 µs
Counters, timers and their retentivity	
S7 counter	
• Number	256
IEC counter	
• present	Yes
S7 times	
• Number	256
IEC timer	
• present	Yes
Data areas and their retentivity	
Flag	
• Number, max.	2 048 byte

Article number	**6ES7154-8AB01-0AB0** ET 200pro: IM 154-8 PN/DP CPU, 384KB
Address area	
I/O address area	
• Inputs	2 048 byte
• Outputs	2 048 byte
Process image	
• Inputs, adjustable	2 048 byte
• Outputs, adjustable	2 048 byte
Time of day	
Clock	
• Hardware clock (real-time)	Yes
Operating hours counter	
• Number	1
Interfaces	
Interfaces/bus type	1x MPI/PROFIBUS DP, 1x PROFINET (3 ports)
1. Interface	
Interface type	Integrated RS 485 interface
Interface types	
• RS 485	Yes
• Connection method	2x M12 b-coded
Protocols	
• MPI	Yes
• PROFIBUS DP master	Yes
• PROFIBUS DP slave	Yes
• Point-to-point connection	No
PROFIBUS DP master	
• Number of DP slaves, max.	124

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Technical specifications (continued)

Article number	**6ES7154-8AB01-0AB0** ET 200pro: IM 154-8 PN/DP CPU, 384KB
2. Interface	
Interface type	PROFINET
Physics	Ethernet (2x M12 d-coded; 1x RJ45)
Interface types	
• Number of ports	3
Protocols	
• MPI	No
• PROFINET IO controller	Yes; Also simultaneously with IO-Device functionality
• PROFINET IO Device	Yes; Also simultaneously with IO Controller functionality
• PROFINET CBA	Yes
• PROFIBUS DP master	No
• PROFIBUS DP slave	No
PROFINET IO controller	
Services	
- Number of connectable IO Devices, max.	128
- Of which IO devices with IRT, max.	64
- Number of IO Devices with IRT and the option "high flexibility"	128
- Number of connectable IO Devices for RT, max.	128
Protocols	
Open IE communication	
• TCP/IP	Yes; via integrated PROFINET interface and loadable FBs
- Number of connections, max.	8
• ISO-on-TCP (RFC1006)	Yes
- Number of connections, max.	8
• UDP	Yes
- Number of connections, max.	8
Web server	
• supported	Yes
Isochronous mode	
Isochronous operation (application synchronized up to terminal)	Yes; Via PROFIBUS DP or PROFINET interface

Article number	**6ES7154-8AB01-0AB0** ET 200pro: IM 154-8 PN/DP CPU, 384KB
Communication functions	
PG/OP communication	Yes
Global data communication	
• supported	Yes
S7 basic communication	
• supported	Yes
S7 communication	
• supported	Yes
Number of connections	
• overall	16
Degree and class of protection	
IP degree of protection	IP65/67
Configuration	
Programming	
Programming language	
- LAD	Yes
- FBD	Yes
- STL	Yes
- SCL	Yes
- CFC	Yes
- GRAPH	Yes
- HiGraph®	Yes
Know-how protection	
• User program protection/password protection	Yes
• Block encryption	Yes; With S7 block Privacy
Dimensions	
Width	135 mm
Height	130 mm
Depth	65 mm; 60 mm without cover for RJ45 socket; 65 mm with cover for RJ45 socket
Weights	
Weight, approx.	720 g

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IM 154-8 PN/DP CPU

Ordering data	Article No.
IM 154-8 PN/DP CPU interface module, V3.2 PROFINET IO controller for operating distributed I/Os on PROFINET, with integrated PLC functionality.	**6ES7154-8AB01-0AB0**
Accessories	
MMC 64 KB [1] For program backup.	**6ES7953-8LF31-0AA0**
MMC 128 KB [1] For program backup.	**6ES7953-8LG31-0AA0**
MMC 512 KB [1] For program backup.	**6ES7953-8LJ31-0AA0**
MMC 2 MB [1] For program backup and/or firmware updates.	**6ES7953-8LL31-0AA0**
MMC 4 MB [1] For program backup.	**6ES7953-8LM31-0AA0**
MMC 8 MB [1] For program backup.	**6ES7953-8LP31-0AA0**
Connection module For CPU IM154-8 PN/DP, with 4 x M12 and 2 x 7/8", for connecting PROFINET and PROFIBUS DP.	**6ES7194-4AN00-0AA0**
SCALANCE X-200 Industrial Ethernet switches With integral SNMP access, web diagnostics, copper cable diagnostics and PROFINET diagnostics, for setting up linear, star and ring structures SCALANCE X208PRO, in degree of protection IP65, with eight 10/100 Mbps M12 ports, incl. eleven M12 dust caps.	**6GK5208-0HA10-2AA6**
Industrial Ethernet FC RJ45 plug 180 RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 180° cable outlet	
• 1 unit	**6GK1901-1BB10-2AA0**
• 10 units	**6GK1901-1BB10-2AB0**
• 50 units	**6GK1901-1BB10-2AE0**
Industrial Ethernet FastConnect installation cables	
• FastConnect standard cable	**6XV1840-2AH10**
• FastConnect trailing cable	**6XV1840-3AH10**
• FastConnect marine cable	**6XV1840-4AH10**
Industrial Ethernet FastConnect installation cables	
• **IE FC TP trailing cable GP 2 x 2**; sold by the meter, max. delivery unit 1 000 m; minimum order quantity 20 m.	**6XV1870-2D**
• **IE TP torsion cable GP 2 x 2**; sold by the meter, max. delivery unit 1 000 m; minimum order quantity 20 m.	**6XV1870-2F**
Industrial Ethernet FastConnect Stripping tool	**6GK1901-1GA00**

	Article No.
IE connecting cable M12-180/M12-180	
• Pre-assembled IE FC TP trailing cable GP 2 x 2 (PROFINET Type C) with two 4-pin M12 plugs (4-pin, D-coded), degree of protection IP65/IP67, in various lengths:	
- 0.3 m	**6XV1870-8AE30**
- 0.5 m	**6XV1870-8AE50**
- 1.0 m	**6XV1870-8AH10**
- 1.5 m	**6XV1870-8AH15**
- 2.0 m	**6XV1870-8AH20**
- 3.0 m	**6XV1870-8AH30**
- 5.0 m	**6XV1870-8AH50**
- 10 m	**6XV1870-8AN10**
- 15 m	**6XV1870-8AN15**
• PROFINET M12 trailing connecting cable, pre-assembled at both ends with angled M12 connectors (male insert), in various lengths:	
- 3.0 m	**3RK1902-2NB30**
- 5.0 m	**3RK1902-2NB50**
- 10 m	**3RK1902-2NC10**
• PROFINET M12 trailing connecting cable, pre-assembled at one end with angled M12 connector (male insert at one end, other end open), in various lengths:	
- 3.0 m	**3RK1902-2HB30**
- 5.0 m	**3RK1902-2HB50**
- 10 m	**3RK1902-2HC10**
IE FC M12 Plug PRO PROFINET M12 plug connector, D-coded with fast connection system, axial cable outlet.	
• 1 unit	**6GK1901-0DB20-6AA0**
• 8 units	**6GK1901-0DB20-6AA8**
• PROFINET M12 plug connector, D-coded, angled.	**3RK1902-2DA00**
IE panel feed-through Cabinet feed-through for converting from the M12 connection system (D-coded, IP65/IP67) to the RJ45 connection system (IP20), 1 pack = 5 units.	**6GK1901-0DM20-2AA5**

[1] An MMC is essential for operating the CPU

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Ordering data	Article No.
7/8" connecting cable to power supply	
5-wire, 5 x 1.5 mm^2, trailing type, pre-assembled with two 7/8" connectors (axial cable outlet), 5-pin, up to 50 m, in various lengths:	
- 1.5 m	**6XV1822-5BH15**
- 2.0 m	**6XV1822-5BH20**
- 3.0 m	**6XV1822-5BH30**
- 5.0 m	**6XV1822-5BH50**
- 10 m	**6XV1822-5BN10**
- 15 m	**6XV1822-5BN15**
- Other special lengths with 90° or 180° cable outlet.	See http://support.automation.siemens.com/WW/view/en/26999294
• Power cable, can be trailed, 5 x 1.5 mm^2, pre-assembled at both ends with 7/8" angled connectors (female insert at one end, male insert at the other end), in various lengths:	
- 3.0 m	**3RK1902-3NB30**
- 5.0 m	**3RK1902-3NB50**
- 10 m	**3RK1902-3NC10**
• Power cable, can be trailed, 5 x 1.5 mm^2, pre-assembled at one end with 7/8" angled connector with female insert (female insert at one end, other end open), in various lengths:	
- 3.0 m	**3RK1902-3GB30**
- 5.0 m	**3RK1902-3GB50**
- 10 m	**3RK1902-3GC10**
Power line	**6XV1830-8AH10**
5-wire, 5 x 1.5 mm^2, trailing type, sold by the meter, minimum order quantity 20 m, maximum order quantity 1 000 m.	
7/8" cable connector	
For ET 200eco, with axial cable outlet	
• with male insert, 5-pack	**6GK1905-0FA00**
• with female insert, 5-pack	**6GK1905-0FB00**
• angled, with female insert, 1 unit	**3RK1902-3DA00**
• angled, with male insert, 1 unit	**3RK1902-3BA00**
7/8" cover cap, 10 per pack	**6ES7194-3JA00-0AA0**
Twisted Pair cables 4x2 with RJ45 connectors	
0.5 m	**6XV1870-3QE50**
1 m	**6XV1870-3QH10**
2 m	**6XV1870-3QH20**
6 m	**6XV1870-3QH60**
10 m	**6XV1870-3QN10**
Crossed Twisted Pair cables 4x2 with RJ45 connectors	
0.5 m	**6XV1870-3RE50**
1 m	**6XV1870-3RH10**
2 m	**6XV1870-3RH20**
6 m	**6XV1870-3RH60**
10 m	**6XV1870-3RN10**

	Article No.
M12 sealing cap	**3RX9802-0AA00**
For protection of unused M12 connections with ET 200pro	
M12 sealing caps with female thread	**6ES7194-4JD60-0AA0**
5 units	
PROFIBUS M12 connecting cable	
Pre-assembled, with two 5-pole M12 connectors/sockets, up to 100 m, in various lengths:	
1.5 m	**6XV1830-3DH15**
2.0 m	**6XV1830-3DH20**
3.0 m	**6XV1830-3DH30**
5.0 m	**6XV1830-3DH50**
10 m	**6XV1830-3DN10**
15 m	**6XV1830-3DN15**
Other special lengths with 90° or 180° cable outlet	See http://support.automation.siemens.com/WW/view/en/26999294
M12 bus termination connector for PROFIBUS, female insert	**6GK1905-0ED00**
M12 bus termination connector for PROFIBUS, male insert	**6GK1905-0EC00**
M12 plug connector, axial outlet, with male insert	**6GK1905-0EA00**
PROFIBUS FC standard cable GP	**6XV1830-0EH10**
Standard type with special design for fast mounting, 2-wire, shielded.	
Sold by the meter, max. delivery unit 1 000 m, minimum order quantity 20 m.	
PROFIBUS FC trailing cable	**6XV1830-3EH10**
2-wire, shielded.	
PROFIBUS FC food cable	**6XV1830-0GH10**
2-wire, shielded.	
Sold by the meter, max. delivery unit 1 000 m, minimum order quantity 20 m.	
PROFIBUS FC robust cable	**6XV1830-0JH10**
2-wire, shielded	
Sold by the meter, max. delivery unit 1 000 m, minimum order quantity 20 m.	
PROFIBUS M12 cable connector	
5-pole, B-coded, metal housing, 1 pack = 5 units.	
• Female insert	**6GK1905-0EB00**

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CPU 1516pro-2 PN

Overview



- CPU 1516pro-2 PN for SIMATIC ET 200pro based on S7-1500 CPU 1516-3 PN/DP
- For applications with high requirements on the program scope and processing speed, for distributed setup via PROFINET IO
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or non-Siemens PROFINET IO controller
- PROFINET shared I-Device for 4 controllers
- PROFINET IO RT/IRT interface with integrated 3-port switch
- Additional PROFINET IO RT interface with separate IP address
- Isochronous mode on PROFINET
- Integrated motion control functionalities for controlling speed-controlled and positioning axes, support for external encoders, output cams/cam tracks and probes
- OPC UA server and client (data access) as runtime option for the easy connection of SIMATIC ET 200pro to third-party devices/systems
- Integrated web server with the option of creating user-defined web pages

Note:

SIMATIC memory card required for operation of the CPU

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Technical specifications

Article number	**6ES7516-2PN00-0AB0**
	ET 200pro: CPU 1516PRO-2 PN
General information	
Product type designation	CPU 1516pro-2 PN
Engineering with	
• STEP 7 TIA Portal configurable/ integrated as of version	V15.1 (FW V2.6)/V14 (FW V2.0) or higher
Supply voltage	
Type of supply voltage	24 V DC
Memory	
Work memory	
• integrated (for program)	1 Mbyte
• integrated (for data)	5 Mbyte
Load memory	
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte
CPU processing times	
for bit operations, typ.	10 ns
for word operations, typ.	12 ns
for fixed point arithmetic, typ.	16 ns
for floating point arithmetic, typ.	64 ns

Article number	**6ES7516-2PN00-0AB0**
	ET 200pro: CPU 1516PRO-2 PN
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
IEC counter	
• Number	Any (only limited by the main memory)
S7 times	
• Number	2 048
IEC timer	
• Number	Any (only limited by the main memory)
Data areas and their retentivity	
Flag	
• Number, max.	16 kbyte
Address area	
I/O address area	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image

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Technical specifications (continued)

Article number	**6ES7516-2PN00-0AB0**
	ET 200pro: CPU 1516PRO-2 PN
Time of day	
Clock	
• Type	Hardware clock
1. Interface	
Interface types	
• Number of ports	3; 2x M12 + 1x RJ45
• integrated switch	Yes
• RJ 45 (Ethernet)	Yes; X1 P3
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes
• Web server	Yes
• Media redundancy	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0
PROFINET IO controller	
Services	
- PG/OP communication	Yes
- S7 routing	Yes
- Isochronous mode	Yes
- Open IE communication	Yes
- IRT	Yes
- MRP	Yes; As MRP redundancy manager and/or MRP client; max. number of devices in the ring: 50
- MRPD	Yes; Requirement: IRT
- PROFIenergy	Yes
- Prioritized startup	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	256; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64
- Number of connectable IO Devices for RT, max.	256
- of which in line, max.	256
- Number of IO Devices that can be simultaneously activated/ deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communi-cation share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
Update time for IRT	
- for send cycle of 250 µs	250 µs to 4 ms; Note: In the case of IRT with isochronous mode, the minimum update time of 500 µs of the isochronous OB is decisive
- for send cycle of 500 µs	500 µs to 8 ms
- for send cycle of 1 ms	1 ms to 16 ms
- for send cycle of 2 ms	2 ms to 32 ms
- for send cycle of 4 ms	4 ms to 64 ms
- With IRT and parameterization of "odd" send cycles	Update time = set "odd" send clock (any multiple of 125 µs: 375 µs, 625 µs ... 3 875 µs)
Update time for RT	
- for send cycle of 250 µs	250 µs to 128 ms
- for send cycle of 500 µs	500 µs to 256 ms
- for send cycle of 1 ms	1 ms to 512 ms
- for send cycle of 2 ms	2 ms to 512 ms
- for send cycle of 4 ms	4 ms to 512 ms

Article number	**6ES7516-2PN00-0AB0**
	ET 200pro: CPU 1516PRO-2 PN
PROFINET IO Device	
Services	
- PG/OP communication	Yes
- S7 routing	Yes
- Isochronous mode	No
- Open IE communication	Yes
- IRT	Yes
- MRP	Yes; As MRP redundancy manager and/or MRP client; max. number of devices in the ring: 50
- MRPD	Yes; Requirement: IRT
- PROFIenergy	Yes
- Prioritized startup	No
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- Asset management record	Yes; Per user program
2. Interface	
Interface types	
• Number of ports	1; 1x M12
• integrated switch	No
• RJ 45 (Ethernet)	No
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes
• Web server	Yes
• Media redundancy	No
PROFINET IO controller	
Services	
- PG/OP communication	Yes
- S7 routing	Yes
- Isochronous mode	No
- Open IE communication	Yes
- IRT	No
- MRP	No
- MRPD	No
- PROFIenergy	Yes
- Prioritized startup	No
- Number of connectable IO Devices, max.	32; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Number of connectable IO Devices for RT, max.	32
- of which in line, max.	32
- Number of IO Devices that can be simultaneously activated/deacti-vated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communi-cation share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
Update time for RT	
- for send cycle of 1 ms	1 ms to 512 ms

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Technical specifications (continued)

Article number	6ES7516-2PN00-0AB0
	ET 200pro: CPU 1516PRO-2 PN
PROFINET IO Device	
Services	
- PG/OP communication	Yes
- S7 routing	Yes
- Isochronous mode	No
- Open IE communication	Yes
- IRT	No
- MRP	No
- MRPD	No
- PROFIenergy	Yes
- Prioritized startup	No
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- Asset management record	Yes; Per user program
Protocols	
Number of connections	
• Number of connections, max.	128; Via integrated interfaces of the CPU
OPC UA	
• OPC UA client	Yes; Data access (read, write), method call, custom address space
• OPC UA server	Yes; Data access (read, write, subscribe), method call, custom address space; embedded 2017 UA server profile V1.02
Isochronous mode	
Isochronous operation (application synchronized up to terminal)	Yes; Via X1, with minimum OB 6x cycle of 500 µs
Supported technology objects	
Motion Control	Yes; Note: The number of axes affects the cycle time of the PLC program; selection guide via the TIA Selection Tool or SIZER
• Number of available Motion Control resources for technology objects (except cam disks)	2 400
• Required Motion Control resources	
- per speed-controlled axis	40
- per positioning axis	80
- per synchronous axis	160
- per external encoder	80
- per output cam	20
- per cam track	160
- per probe	40
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes

Article number	6ES7516-2PN00-0AB0
	ET 200pro: CPU 1516PRO-2 PN
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-25 °C
• horizontal installation, max.	55 °C
• vertical installation, min.	-25 °C
• vertical installation, max.	55 °C
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
Configuration	
Programming	
Programming language	
- LAD	Yes
- FBD	Yes
- STL	Yes
- SCL	Yes
- GRAPH	Yes
Know-how protection	
• User program protection/password protection	Yes
• Copy protection	Yes
• Block protection	Yes
Access protection	
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Complete protection	Yes
Dimensions	
Width	135 mm
Height	130 mm
Depth	65 mm
Weights	
Weight, approx.	614 g

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Ordering data	Article No.
CPU 1516pro-2 PN Work memory 1 MB for program, 5 MB for data, PROFINET IO IRT interface, PROFINET IO RT interface; SIMATIC memory card required	**6ES7516-2PN00-0AB0**
Accessories	
SIMATIC memory card	
4 MB[1]	**6ES7954-8LC03-0AA0**
12 MB[1]	**6ES7954-8LE03-0AA0**
24 MB[1]	**6ES7954-8LF03-0AA0**
256 MB[1]	**6ES7954-8LL03-0AA0**
2 GB[1]	**6ES7954-8LP02-0AA0**
32 GB[1]	**6ES7954-8LT03-0AA0**
Connection module CM CPU 2PN M12 / 7/8"; with 3 x M12 and 2 x 7/8", for connecting 2 x PROFINET	**6ES7194-4AP00-0AA0**
Industrial Ethernet FC RJ45 plug 180 RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 180° cable outlet	
• 1 unit	**6GK1901-1BB10-2AA0**
• 10 units	**6GK1901-1BB10-2AB0**
• 50 units	**6GK1901-1BB10-2AE0**
Industrial Ethernet FastConnect installation cables	
• FastConnect standard cable	**6XV1840-2AH10**
• FastConnect trailing cable	**6XV1840-3AH10**
• FastConnect marine cable	**6XV1840-4AH10**
Industrial Ethernet FastConnect installation cables	
• **IE FC TP trailing cable GP 2 x 2**; sold by the meter, max. delivery unit 1 000 m; minimum order quantity 20 m.	**6XV1870-2D**
• **IE TP torsion cable GP 2 x 2**; sold by the meter, max. delivery unit 1 000 m; minimum order quantity 20 m.	**6XV1870-2F**
Industrial Ethernet FastConnect	
Stripping tool	**6GK1901-1GA00**

	Article No.
IE connecting cable M12-180/M12-180	
• Preassembled IE FC TP trailing cable GP 2 x 2 (PROFINET Type C) with two 4-pin M12 plugs (4-pin, D-coded), degree of protection IP65/IP67, in various lengths:	
• 0.3 m	**6XV1870-8AE30**
• 0.5 m	**6XV1870-8AE50**
• 1.0 m	**6XV1870-8AH10**
• 1.5 m	**6XV1870-8AH15**
• 2.0 m	**6XV1870-8AH20**
• 3.0 m	**6XV1870-8AH30**
• 5.0 m	**6XV1870-8AH50**
• 10 m	**6XV1870-8AN10**
• 15 m	**6XV1870-8AN15**
• PROFINET M12 trailing connecting cable, pre-assembled at both ends with angled M12 connectors (male insert), in various lengths:	
• 3.0 m	**3RK1902-2NB30**
• 5.0 m	**3RK1902-2NB50**
• 10 m	**3RK1902-2NC10**
• PROFINET M12 trailing connecting cable, pre-assembled at one end with angled M12 connector (male insert at one end, other end open), in various lengths:	
• 3.0 m	**3RK1902-2HB30**
• 5.0 m	**3RK1902-2HB50**
• 10 m	**3RK1902-2HC10**
IE FC M12 Plug PRO PROFINET M12 plug connector, D-coded with fast connection system, axial cable outlet.	
• 1 unit	**6GK1901-0DB20-6AA0**
• 8 units	**6GK1901-0DB20-6AA8**
• PROFINET M12 plug connector, D-coded, angled.	**3RK1902-2DA00**
IE panel feedthrough Cabinet feedthrough for converting from the M12 connection system (D-coded, IP65/IP67) to the RJ45 connection system (IP20), 1 pack = 5 units.	**6GK1901-0DM20-2AA5**

[1] An MMC is essential for operating the CPU

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Ordering data	Article No.
7/8" connecting cable to power supply	
5-wire, 5 x 1.5 mm^2, trailing, preassembled with two 7/8" connectors (axial cable outlet), 5-pin, up to 50 m, in various lengths:	
• 1.5 m	**6XV1822-5BH15**
• 2.0 m	**6XV1822-5BH20**
• 3.0 m	**6XV1822-5BH30**
• 5.0 m	**6XV1822-5BH50**
• 10 m	**6XV1822-5BN10**
• 15 m	**6XV1822-5BN15**
• Other special lengths with 90° or 180° cable outlet.	See: http://support.automation.siemens.com/WW/view/en/26999294
• Trailing power cable, 5 x 1.5 mm^2, preassembled at both ends with 7/8" angled connectors (female insert at one end, male insert at the other end), in various lengths:	
• 3.0 m	**3RK1902-3NB30**
• 5.0 m	**3RK1902-3NB50**
• 10 m	**3RK1902-3NC10**
• Trailing power cable, 5 x 1.5 mm^2, preassembled at one end with 7/8" angled connector with female contact insert (female contact insert at one end, other end open), in various lengths:	
• 3.0 m	**3RK1902-3GB30**
• 5.0 m	**3RK1902-3GB50**
• 10 m	**3RK1902-3GC10**
Power line	**6XV1830-8AH10**
5-wire, 5 x 1.5 mm^2, trailing type, sold by the meter, minimum order quantity 20 m, maximum order quantity 1 000 m.	

	Article No.
7/8" cable connector	
For ET 200eco, with axial cable outlet	
• with male insert, 5-pack	**6GK1905-0FA00**
• with female insert, 5-pack	**6GK1905-0FB00**
• angled, with female insert, 1 unit	**3RK1902-3DA00**
• angled, with male insert, 1 unit	**3RK1902-3BA00**
7/8" cover cap, 10 per pack	**6ES7194-3JA00-0AA0**
Twisted Pair cables 4x2 with RJ45 connectors	
0.5 m	**6XV1870-3QE50**
1 m	**6XV1870-3QH10**
2 m	**6XV1870-3QH20**
6 m	**6XV1870-3QH60**
10 m	**6XV1870-3QN10**
Crossed Twisted Pair cables 4x2 with RJ45 connectors	
0.5 m	**6XV1870-3RE50**
1 m	**6XV1870-3RH10**
2 m	**6XV1870-3RH20**
6 m	**6XV1870-3RH60**
10 m	**6XV1870-3RN10**
M12 sealing cap	**3RX9802-0AA00**
For protection of unused M12 connections with ET 200pro	
M12 sealing caps with female thread	**6ES7194-4JD60-0AA0**
5 units	

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Overview



- Interface module for SIMATIC ET 200pro with integrated fail-safe CPU
- CPU with PLC functionality equivalent to CPU S7-315F PN/DP; with distributed intelligence for preprocessing
- For constructing a fail-safe automation system for plants with increased safety requirements
- Complies with safety requirements up to SIL 3 according to IEC 61508, IEC 62061 and PL e according to ISO 13849.1:2006
- For high-performance control solutions in ET 200pro
- Increase in availability of systems and machines
- Integral web server with the option of creating user-defined web pages
- Isochronous mode on PROFIBUS or PROFINET
- PROFINET IO controller for up to 128 IO devices
- PROFINET interface with integrated 3-port switch
- With multiple communication options: PG/OP communication, PROFINET IO, PROFINET CBA, open IE communication (TCP, ISO-on-TCP and UDP), web server and S7-communication (with loadable FBs)
- Fast, simple and end-to-end programming of a system with modular programs via STEP 7
- Compact SIMATIC Micro Memory Card (MMC)

Note:

SIMATIC Micro Memory Card required for operation of CPU.

Technical specifications

Article number	**6ES7154-8FB01-0AB0** ET 200pro: IM 154-8F PN/DP CPU, 512KB	**6ES7154-8FX00-0AB0** ET 200pro: IM 154-8FX PN/DP CPU, 1.5MB
Supply voltage		
Rated value (DC)	24 V	24 V
Power loss		
Power loss, typ.	8.5 W	8.5 W
Memory		
Work memory		
• integrated	512 kbyte	1 536 kbyte
• expandable	No	No
Load memory		
• Plug-in (MMC), max.	8 Mbyte	8 Mbyte
CPU processing times		
for bit operations, typ.	0.05 µs	0.025 µs
for word operations, typ.	0.09 µs	0.03 µs
for fixed point arithmetic, typ.	0.12 µs	0.04 µs
for floating point arithmetic, typ.	0.45 µs	0.16 µs
Counters, timers and their retentivity		
S7 counter		
• Number	256	256
IEC counter		
• present	Yes	Yes
S7 times		
• Number	256	256
IEC timer		
• present	Yes	Yes
Data areas and their retentivity		
Flag		
• Number, max.	2 048 byte	2 048 byte

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Technical specifications (continued)

Article number	**6ES7154-8FB01-0AB0** ET 200pro: IM 154-8F PN/DP CPU, 512KB	**6ES7154-8FX00-0AB0** ET 200pro: IM 154-8FX PN/DP CPU, 1.5MB
Address area		
I/O address area		
• Inputs	2 048 byte	2 048 byte
• Outputs	2 048 byte	2 048 byte
Process image		
• Inputs, adjustable	2 048 byte	2 048 byte
• Outputs, adjustable	2 048 byte	2 048 byte
Time of day		
Clock		
• Hardware clock (real-time)	Yes	Yes
Operating hours counter		
• Number	1	1
1. Interface		
Interface type	Integrated RS 485 interface	Integrated RS 485 interface
Interface types		
• RS 485	Yes	Yes
• Connection method	2x M12 b-coded	2x M12 b-coded
Protocols		
• MPI	Yes	Yes
• PROFIBUS DP master	Yes	Yes
• PROFIBUS DP slave	Yes	Yes
• Point-to-point connection	No	No
PROFIBUS DP master		
• Number of DP slaves, max.	124	124
2. Interface		
Interface type	PROFINET	PROFINET
Physics	Ethernet (2x M12 d-coded; 1x RJ45)	Ethernet (2x M12 d-coded; 1x RJ45)
Interface types		
• Number of ports	3	3
Protocols		
• MPI	No	No
• PROFINET IO controller	Yes; Also simultaneously with IO-Device functionality	Yes; Also simultaneously with IO-Device functionality
• PROFINET IO Device	Yes; Also simultaneously with IO Controller functionality	Yes; Also simultaneously with IO Controller functionality
• PROFINET CBA	Yes	Yes
• PROFIBUS DP master	No	No
• PROFIBUS DP slave	No	No
PROFINET IO controller		
Services		
- Number of connectable IO Devices, max.	128	128
- Of which IO devices with IRT, max.	64	64
- Number of IO Devices with IRT and the option "high flexibility"	128	128
- Number of connectable IO Devices for RT, max.	128	128
Protocols		
Open IE communication		
• TCP/IP	Yes; via integrated PROFINET interface and loadable FBs	Yes; via integrated PROFINET interface and loadable FBs
- Number of connections, max.	8	8
• ISO-on-TCP (RFC1006)	Yes	Yes
- Number of connections, max.	8	8
• UDP	Yes	Yes
- Number of connections, max.	8	8
Web server		
• supported	Yes	Yes
Isochronous mode		
Isochronous operation (application synchronized up to terminal)	Yes; Via PROFIBUS DP or PROFINET interface	Yes; Via PROFIBUS DP or PROFINET interface

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Technical specifications (continued)

Article number	**6ES7154-8FB01-0AB0** ET 200pro: IM 154-8F PN/DP CPU, 512KB	**6ES7154-8FX00-0AB0** ET 200pro: IM 154-8FX PN/DP CPU, 1.5MB
Communication functions		
PG/OP communication	Yes	Yes
Global data communication		
• supported	Yes	Yes
S7 basic communication		
• supported	Yes	Yes
S7 communication		
• supported	Yes	Yes
Number of connections		
• overall	16	16
Degree and class of protection		
IP degree of protection	IP65/67	IP65/67
Configuration		
Programming		
Programming language		
- LAD	Yes	Yes
- FBD	Yes	Yes
- STL	Yes	Yes
- SCL	Yes	Yes
- CFC	Yes	Yes
- GRAPH	Yes	Yes
- HiGraph®	Yes	Yes
Know-how protection		
• User program protection/password protection	Yes	Yes
• Block encryption	Yes; With S7 block Privacy	Yes; With S7 block Privacy
Dimensions		
Width	135 mm	135 mm
Height	130 mm	130 mm
Depth	65 mm; 60 mm without cover for RJ45 socket; 65 mm with cover for RJ45 socket	65 mm; 60 mm without cover for RJ45 socket; 65 mm with cover for RJ45 socket
Weights		
Weight, approx.	720 g	720 g

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IM 154-8 F PN/DP CPU

Ordering data	Article No.
IM 154-8 F PN/DP CPU interface module, V3.2	
Fail-safe PROFINET IO controller for operating distributed I/O on PROFINET, with integrated PLC functionality.	
• 512 KB work memory	**6ES7154-8FB01-0AB0**
• 1.5 MB work memory	**6ES7154-8FX00-0AB0**
S7 Distributed Safety V5.4 SP5 Update 2 programming tool	
Task: Configuration software for configuring fail-safe user programs for SIMATIC S7-300F, S7-400F, WinAC RTX F, ET 200S, ET 200M, ET 200iSP, ET 200pro, ET 200eco, ET 200SP Requirement: Windows 7 SP1 (64-bit), Windows 10 Professional/Enterprise (64-bit), Windows Server 2008 R2 SP1 (64-bit), Windows Server 2012 R2 (64-bit), Windows Server 2016 (64-bit); STEP 7 from V5.5 SP1; Please also note the operating systems that have been released for the STEP 7 version used	
Floating license for 1 user; software and documentation on DVD; license key on USB flash drive	**6ES7833-1FC02-0YA5**
Floating license for 1 user; software, documentation and license key for download[1]; email address required for delivery	**6ES7833-1FC02-0YH5**
S7 Distributed Safety upgrade	
From V5.x to V5.4; floating license for 1 user; software and documentation on DVD; license key on USB flash drive	**6ES7833-1FC02-0YE5**
STEP 7 Safety Advanced V15.1	
Task: Engineering tool for configuring and programming fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-1500F Software Controller, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller and the fail-safe ET 200SP, ET 200MP, ET 200S, ET 200M, ET 200iSP, ET 200pro and ET 200eco I/O Requirement: STEP 7 Professional V15.1	
Floating license for 1 user; software and documentation on DVD; license key on USB flash drive	**6ES7833-1FA15-0YA5**
Floating license for 1 user; software, documentation and license key for download[1]; email address required for delivery	**6ES7833-1FA15-0YH5**

	Article No.
Accessories	
SIMATIC Micro Memory Cards	
MMC 64 KB [2]	**6ES7953-8LF31-0AA0**
For program backup.	
MMC 128 KB [2]	**6ES7953-8LG31-0AA0**
For program backup.	
MMC 512 KB [2]	**6ES7953-8LJ31-0AA0**
For program backup.	
MMC 2 MB [2]	**6ES7953-8LL31-0AA0**
For program backup and/or firmware updates.	
MMC 4 MB [2]	**6ES7953-8LM31-0AA0**
For program backup.	
MMC 8 MB [2]	**6ES7953-8LP31-0AA0**
For program backup.	
Connection module	**6ES7194-4AN00-0AA0**
For CPU IM154-8 PN/DP, with 4 x M12 and 2 x 7/8", for connecting PROFINET and PROFIBUS DP.	
SCALANCE X-200 Industrial Ethernet switches	
With integral SNMP access, web diagnostics, copper cable diagnostics and PROFINET diagnostics, for setting up linear, star and ring structures SCALANCE X208PRO, in degree of protection IP65, with eight 10/100 Mbps M12 ports, incl. eleven M12 dust caps.	**6GK5208-0HA10-2AA6**
Industrial Ethernet FC RJ45 plug 90	
RJ45 plug connector for Industrial Ethernet with a rugged metal housing and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 90° cable outlet.	
• 1 unit	**6GK1901-1BB20-2AA0**
• 10 units	**6GK1901-1BB20-2AB0**
Industrial Ethernet FC RJ45 plug 180	
RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 180° cable outlet	
• 1 unit	**6GK1901-1BB10-2AA0**
• 10 units	**6GK1901-1BB10-2AB0**
• 50 units	**6GK1901-1BB10-2AE0**
Industrial Ethernet FastConnect installation cables	
• FastConnect standard cable	**6XV1840-2AH10**
• FastConnect trailing cable	**6XV1840-3AH10**
• FastConnect marine cable	**6XV1840-4AH10**

[1] For up-to-date information and download availability, see: http://www.siemens.com/tia-online-software-delivery

[2] An MMC is essential for operating the CPU

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Ordering data	Article No.
Industrial Ethernet FastConnect installation cables	
• **IE FC TP trailing cable GP 2 x 2**; sold by the meter, max. delivery unit 1 000 m; minimum order quantity 20 m.	**6XV1870-2D**
• **IE TP torsion cable GP 2 x 2**; sold by the meter, max. delivery unit 1 000 m; minimum order quantity 20 m.	**6XV1870-2F**
Industrial Ethernet FastConnect	
Stripping tool	**6GK1901-1GA00**
IE connecting cable M12-180/M12-180	
• Pre-assembled IE FC TP trailing cable GP 2 x 2 (PROFINET Type C) with two 4-pin M12 plugs (4-pin, D-coded), degree of protection IP65/IP67, in various lengths:	
- 0.3 m	**6XV1870-8AE30**
- 0.5 m	**6XV1870-8AE50**
- 1.0 m	**6XV1870-8AH10**
- 1.5 m	**6XV1870-8AH15**
- 2.0 m	**6XV1870-8AH20**
- 3.0 m	**6XV1870-8AH30**
- 5.0 m	**6XV1870-8AH50**
- 10 m	**6XV1870-8AN10**
- 15 m	**6XV1870-8AN15**
• PROFINET M12 trailing connecting cable, pre-assembled at both ends with angled M12 connectors (male insert), in various lengths:	
- 3.0 m	**3RK1902-2NB30**
- 5.0 m	**3RK1902-2NB50**
- 10 m	**3RK1902-2NC10**
• PROFINET M12 trailing connecting cable, pre-assembled at one end with angled M12 connector (male insert at one end, other end open), in various lengths:	
- 3.0 m	**3RK1902-2HB30**
- 5.0 m	**3RK1902-2HB50**
- 10 m	**3RK1902-2HC10**
IE FC M12 Plug PRO	
PROFINET M12 plug connector, D-coded with fast connection system, axial cable outlet.	
• 1 unit	**6GK1901-0DB20-6AA0**
• 8 units	**6GK1901-0DB20-6AA8**
• PROFINET M12 plug connector, D-coded, angled	**3RK1902-2DA00**
IE panel feed-through	
Cabinet feedthrough for converting from the M12 connection system (D-coded, IP65/IP67) to the RJ45 connection system (IP20), 1 pack = 5 units	**6GK1901-0DM20-2AA5**

	Article No.
7/8" connecting cable to power supply	
• 5-wire, 5 x 1.5 mm^2, trailing type, pre-assembled with two 7/8" connectors (axial cable outlet), 5-pin, up to 50 m, in various lengths:	
- 1.5 m	**6XV1822-5BH15**
- 2.0 m	**6XV1822-5BH20**
- 3.0 m	**6XV1822-5BH30**
- 5.0 m	**6XV1822-5BH50**
- 10 m	**6XV1822-5BN10**
- 15 m	**6XV1822-5BN15**
- Other special lengths with 90° or 180° cable outlet	See http://support.automation.siemens.com/WW/view/en/26999294
• Power cable, can be trailed, 5 x 1.5 mm^2, pre-assembled at both ends with 7/8" angled connectors (female insert at one end, male insert at the other end), in various lengths:	
- 3.0 m	**3RK1902-3NB30**
- 5.0 m	**3RK1902-3NB50**
- 10 m	**3RK1902-3NC10**
• Power cable, can be trailed, 5 x 1.5 mm^2, pre-assembled at one end with 7/8" angled connector with female contact insert (female contact insert at one end, other end open), in various lengths:	
- 3.0 m	**3RK1902-3GB30**
- 5.0 m	**3RK1902-3GB50**
- 10 m	**3RK1902-3GC10**
Power line	**6XV1830-8AH10**
5-wire, 5 x 1.5 mm^2, trailing type, sold by the meter, minimum order quantity 20 m, maximum order quantity 1 000 m.	
7/8" cable connector	
For ET 200eco, with axial cable outlet	
• with male contact insert, 5-pack	**6GK1905-0FA00**
• with female contact insert, 5-pack	**6GK1905-0FB00**
• angled, with female contact insert, 1 unit	**3RK1902-3DA00**
• angled, with male contact insert, 1 unit	**3RK1902-3BA00**
7/8" cover cap, 10 per pack	**6ES7194-3JA00-0AA0**
Twisted Pair cables 4x2 with RJ45 connectors	
0.5 m	**6XV1870-3QE50**
1 m	**6XV1870-3QH10**
2 m	**6XV1870-3QH20**
6 m	**6XV1870-3QH60**
10 m	**6XV1870-3QN10**
Crossed Twisted Pair cables 4x2 with RJ45 connectors	
0.5 m	**6XV1870-3RE50**
1 m	**6XV1870-3RH10**
2 m	**6XV1870-3RH20**
6 m	**6XV1870-3RH60**
10 m	**6XV1870-3RN10**

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IM 154-8 F PN/DP CPU

Ordering data	Article No.
M12 sealing cap For protection of unused M12 connections with ET 200pro	**3RX9802-0AA00**
M12 sealing caps with female thread 5 units	**6ES7194-4JD60-0AA0**
PROFIBUS M12 connecting cable Pre-assembled, with two 5-pole M12 connectors/sockets, up to 100 m, in various lengths:	
1.5 m	**6XV1830-3DH15**
2.0 m	**6XV1830-3DH20**
3.0 m	**6XV1830-3DH30**
5.0 m	**6XV1830-3DH50**
10 m	**6XV1830-3DN10**
15 m	**6XV1830-3DN15**
Additional special lengths with 90° or 180° cable outlet.	See http://support.automation.siemens.com/WW/view/en/26999294
M12 bus termination connector for PROFIBUS, female contact insert	**6GK1905-0ED00**
M12 bus termination connector for PROFIBUS, male contact insert	**6GK1905-0EC00**
M12 plug connector, axial outlet, with male contact insert	**6GK1905-0EA00**

	Article No.
PROFIBUS FC standard cable GP Standard type with special design for fast mounting, 2-wire, shielded. Sold by the meter, max. delivery unit 1 000 m, minimum order quantity 20 m.	**6XV1830-0EH10**
PROFIBUS FC trailing cable 2-wire, shielded.	**6XV1830-3EH10**
PROFIBUS FC food cable 2-wire, shielded. Sold by the meter, max. delivery unit 1 000 m, minimum order quantity 20 m.	**6XV1830-0GH10**
PROFIBUS FC robust cable 2-wire, shielded. Sold by the meter, max. delivery unit 1 000 m, minimum order quantity 20 m.	**6XV1830-0JH10**
PROFIBUS M12 cable connector 5-pole, B-coded, metal housing, 1 pack = 5 units.	
• Female contact insert	**6GK1905-0EB00**

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Overview



- Fail-safe CPU 1516pro F-2 PN for SIMATIC ET 200pro based on S7-1500 CPU 1516F-3 PN/DP
- For applications with high requirements on the program scope and processing speed, for distributed setup via PROFINET IO
- Can be used for safety functions up to SIL 3 according to IEC 61508 and up to PL e according to ISO 13849
- PROFINET IO controller for operating distributed I/O on PROFINET
- PROFINET I-Device for connecting the CPU as an intelligent PROFINET device with a SIMATIC or non-Siemens PROFINET IO controller
- Supports PROFIsafe in centralized and distributed configurations
- PROFINET shared I-Device for 4 controllers
- PROFINET IO RT/IRT interface with integrated 3-port switch
- Additional PROFINET IO RT interface with separate IP address
- Isochronous mode on PROFINET
- Integrated motion control functionalities for controlling speed-controlled and positioning axes, support for external encoders
- OPC UA server and client (data access) as runtime option for the easy connection of SIMATIC ET 200pro to third-party devices/systems
- Integrated web server with the option of creating user-defined web pages

Note:

SIMATIC memory card required for operation of the CPU.

Technical specifications

Article number	**6ES7516-2GN00-0AB0**
	ET 200pro: CPU 1516pro F-2 PN
General information	
Product type designation	CPU 1516pro F-2 PN
Engineering with	
• STEP 7 TIA Portal configurable/ integrated as of version	V15.1 (FW V2.6)/V14 (FW V2.0) or higher
Supply voltage	
Type of supply voltage	24 V DC
Memory	
Work memory	
• integrated (for program)	1.5 Mbyte
• integrated (for data)	5 Mbyte
Load memory	
• Plug-in (SIMATIC Memory Card), max.	32 Gbyte
CPU processing times	
for bit operations, typ.	10 ns
for word operations, typ.	12 ns
for fixed point arithmetic, typ.	16 ns
for floating point arithmetic, typ.	64 ns
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
IEC counter	
• Number	Any (only limited by the main memory)
S7 times	
• Number	2 048
IEC timer	
• Number	Any (only limited by the main memory)
Data areas and their retentivity	
Flag	
• Number, max.	16 kbyte
Address area	
I/O address area	
• Inputs	32 kbyte; All inputs are in the process image
• Outputs	32 kbyte; All outputs are in the process image
Time of day	
Clock	
• Type	Hardware clock

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Technical specifications (continued)

Article number	6ES7516-2GN00-0AB0
	ET 200pro: CPU 1516pro F-2 PN
1. Interface	
Interface types	
• Number of ports	3; 2x M12 + 1x RJ45
• integrated switch	Yes
• RJ 45 (Ethernet)	Yes; X1 P3
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes
• Web server	Yes
• Media redundancy	Yes; MRP Automanager according to IEC 62439-2 Edition 2.0
PROFINET IO controller	
Services	
- PG/OP communication	Yes
- S7 routing	Yes
- Isochronous mode	Yes
- Open IE communication	Yes
- IRT	Yes
- MRP	Yes; As MRP redundancy manager and/or MRP client; max. number of devices in the ring: 50
- MRPD	Yes; Requirement: IRT
- PROFIenergy	Yes
- Prioritized startup	Yes; Max. 32 PROFINET devices
- Number of connectable IO Devices, max.	256; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Of which IO devices with IRT, max.	64
- Number of connectable IO Devices for RT, max.	256
- of which in line, max.	256
- Number of IO Devices that can be simultaneously activated/ deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
Update time for IRT	
- for send cycle of 250 µs	250 µs to 4 ms; Note: In the case of IRT with isochronous mode, the minimum update time of 500 µs of the isochronous OB is decisive
- for send cycle of 500 µs	500 µs to 8 ms
- for send cycle of 1 ms	1 ms to 16 ms
- for send cycle of 2 ms	2 ms to 32 ms
- for send cycle of 4 ms	4 ms to 64 ms
- With IRT and parameterization of "odd" send cycles	Update time = set "odd" send clock (any multiple of 125 µs: 375 µs, 625 µs ... 3 875 µs)
Update time for RT	
- for send cycle of 250 µs	250 µs to 128 ms
- for send cycle of 500 µs	500 µs to 256 ms
- for send cycle of 1 ms	1 ms to 512 ms
- for send cycle of 2 ms	2 ms to 512 ms
- for send cycle of 4 ms	4 ms to 512 ms

Article number	6ES7516-2GN00-0AB0
	ET 200pro: CPU 1516pro F-2 PN
PROFINET IO Device	
Services	
- PG/OP communication	Yes
- S7 routing	Yes
- Isochronous mode	No
- Open IE communication	Yes
- IRT	Yes
- MRP	Yes; As MRP redundancy manager and/or MRP client; max. number of devices in the ring: 50
- MRPD	Yes; Requirement: IRT
- PROFIenergy	Yes
- Prioritized startup	No
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- Asset management record	Yes; Per user program
2. Interface	
Interface types	
• Number of ports	1; 1x M12
• integrated switch	No
• RJ 45 (Ethernet)	No
Protocols	
• IP protocol	Yes; IPv4
• PROFINET IO controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes
• Web server	Yes
• Media redundancy	No
PROFINET IO controller	
Services	
- PG/OP communication	Yes
- S7 routing	Yes
- Isochronous mode	No
- Open IE communication	Yes
- IRT	No
- MRP	No
- MRPD	No
- PROFIenergy	Yes
- Prioritized startup	No
- Number of connectable IO Devices, max.	32; In total, up to 1 000 distributed I/O devices can be connected via AS-i, PROFIBUS or PROFINET
- Number of connectable IO Devices for RT, max.	32
- of which in line, max.	32
- Number of IO Devices that can be simultaneously activated/deactivated, max.	8; in total across all interfaces
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
Update time for RT	
- for send cycle of 1 ms	1 ms to 512 ms

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Technical specifications (continued)

Article number	6ES7516-2GN00-0AB0 ET 200pro: CPU 1516pro F-2 PN
PROFINET IO Device	
Services	
- PG/OP communication	Yes
- S7 routing	Yes
- Isochronous mode	No
- Open IE communication	Yes
- IRT	No
- MRP	No
- MRPD	No
- PROFIenergy	Yes
- Prioritized startup	No
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- Asset management record	Yes; Per user program
Protocols	
Number of connections	
• Number of connections, max.	128; Via integrated interfaces of the CPU
OPC UA	
• OPC UA client	Yes; Data access (read, write), method call, custom address space
• OPC UA server	Yes; Data access (read, write, subscribe), method call, custom address space; embedded 2017 UA server profile V1.02
Isochronous mode	
Isochronous operation (application synchronized up to terminal)	Yes; Via X1, with minimum OB 6x cycle of 500 µs
Supported technology objects	
Motion Control	Yes; Note: The number of axes affects the cycle time of the PLC program; selection guide via the TIA Selection Tool or SIZER
• Number of available Motion Control resources for technology objects (except cam disks)	2 400
• Required Motion Control resources	
- per speed-controlled axis	40
- per positioning axis	80
- per synchronous axis	160
- per external encoder	80
- per output cam	20
- per cam track	160
- per probe	40
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes

Article number	6ES7516-2GN00-0AB0 ET 200pro: CPU 1516pro F-2 PN
Standards, approvals, certificates	
Highest safety class achievable in safety mode	
Probability of failure (for service life of 20 years and repair time of 100 hours)	
- Low demand mode: PFDavg in accordance with SIL3	< 2.00E-05
- High demand/continuous mode: PFH in accordance with SIL3	< 1.00E-09
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-25 °C
• horizontal installation, max.	55 °C
• vertical installation, min.	-25 °C
• vertical installation, max.	55 °C
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m; Restrictions for installation altitudes > 2 000 m, see manual
Configuration	
Programming	
Programming language	
- LAD	Yes; incl. failsafe
- FBD	Yes; incl. failsafe
- STL	Yes
- SCL	Yes
- GRAPH	Yes
Know-how protection	
• User program protection/password protection	Yes
• Copy protection	Yes
• Block protection	Yes
Access protection	
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Complete protection	Yes
Dimensions	
Width	135 mm
Height	130 mm
Depth	65 mm
Weights	
Weight, approx.	614 g

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CPU 1516pro F-2 PN

Ordering data	Article No.
CPU 1516pro F-2 PN	**6ES7516-2GN00-0AB0**
1.5 MB work memory for program, 5 MB for data, PROFINET IO IRT interface, PROFINET IO RT interface; SIMATIC memory card required	
Accessories	
SIMATIC memory card	
4 MB[1]	**6ES7954-8LC03-0AA0**
12 MB[1]	**6ES7954-8LE03-0AA0**
24 MB[1]	**6ES7954-8LF03-0AA0**
256 MB[1]	**6ES7954-8LL03-0AA0**
2 GB[1]	**6ES7954-8LP02-0AA0**
32 GB[1]	**6ES7954-8LT03-0AA0**
Connection module	**6ES7194-4AP00-0AA0**
CM CPU 2PN M12 / 7/8"; with 3 x M12 and 2 x 7/8", for connecting 2 x PROFINET	
Industrial Ethernet FC RJ45 plug 180	
RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 180° cable outlet	
• 1 unit	**6GK1901-1BB10-2AA0**
• 10 units	**6GK1901-1BB10-2AB0**
• 50 units	**6GK1901-1BB10-2AE0**
Industrial Ethernet FastConnect installation cables	
• FastConnect standard cable	**6XV1840-2AH10**
• FastConnect trailing cable	**6XV1840-3AH10**
• FastConnect marine cable	**6XV1840-4AH10**
Industrial Ethernet FastConnect installation cables	
• **IE FC TP trailing cable GP 2 x 2**; sold by the meter, max. delivery unit 1 000 m; minimum order quantity 20 m.	**6XV1870-2D**
• **IE TP torsion cable GP 2 x 2**; sold by the meter, max. delivery unit 1 000 m; minimum order quantity 20 m.	**6XV1870-2F**
Industrial Ethernet FastConnect	
Stripping tool	**6GK1901-1GA00**

	Article No.
IE connecting cable M12-180/M12-180	
Preassembled IE FC TP trailing cable GP 2 x 2 (PROFINET Type C) with two 4-pin M12 plugs (4-pin, D-coded), degree of protection IP65/IP67, in various lengths:	
• 0.3 m	**6XV1870-8AE30**
• 0.5 m	**6XV1870-8AE50**
• 1.0 m	**6XV1870-8AH10**
• 1.5 m	**6XV1870-8AH15**
• 2.0 m	**6XV1870-8AH20**
• 3.0 m	**6XV1870-8AH30**
• 5.0 m	**6XV1870-8AH50**
• 10 m	**6XV1870-8AN10**
• 15 m	**6XV1870-8AN15**
PROFINET M12 trailing connecting cable, pre-assembled at both ends with angled M12 connectors (male insert), in various lengths:	
• 3.0 m	**3RK1902-2NB30**
• 5.0 m	**3RK1902-2NB50**
• 10 m	**3RK1902-2NC10**
PROFINET M12 trailing connecting cable, pre-assembled at one end with angled M12 connector (male insert at one end, other end open), in various lengths:	
• 3.0 m	**3RK1902-2HB30**
• 5.0 m	**3RK1902-2HB50**
• 10 m	**3RK1902-2HC10**
IE FC M12 Plug PRO	
PROFINET M12 plug connector, D-coded with fast connection system, axial cable outlet.	
• 1 unit	**6GK1901-0DB20-6AA0**
• 8 units	**6GK1901-0DB20-6AA8**
• PROFINET M12 plug connector, D-coded, angled.	**3RK1902-2DA00**
IE panel feedthrough	
Cabinet feedthrough for converting from the M12 connection system (D-coded, IP65/IP67) to the RJ45 connection system (IP20), 1 pack = 5 units.	**6GK1901-0DM20-2AA5**

[1] An MMC is essential for operating the CPU

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Ordering data

	Article No.
7/8" connecting cable to power supply	
5-wire, 5 x 1.5 mm^2, trailing, preassembled with two 7/8" connectors (axial cable outlet), 5-pin, up to 50 m, in various lengths:	
• 1.5 m	**6XV1822-5BH15**
• 2.0 m	**6XV1822-5BH20**
• 3.0 m	**6XV1822-5BH30**
• 5.0 m	**6XV1822-5BH50**
• 10 m	**6XV1822-5BN10**
• 15 m	**6XV1822-5BN15**
• Other special lengths with 90° or 180° cable outlet.	See: http://support.automation.siemens.com/WW/view/en/26999294
Trailing power cable, 5 x 1.5 mm^2, preassembled at both ends with 7/8" angled connectors (female insert at one end, male insert at the other end), in various lengths:	
• 3.0 m	**3RK1902-3NB30**
• 5.0 m	**3RK1902-3NB50**
• 10 m	**3RK1902-3NC10**
Trailing power cable, 5 x 1.5 mm^2, preassembled at one end with 7/8" angled connector with female insert (female insert at one end, other end open), in various lengths:	
• 3.0 m	**3RK1902-3GB30**
• 5.0 m	**3RK1902-3GB50**
• 10 m	**3RK1902-3GC10**
Power line	**6XV1830-8AH10**
5-wire, 5 x 1.5 mm^2, trailing type, sold by the meter, minimum order quantity 20 m, maximum order quantity 1 000 m.	

	Article No.
7/8" cable connector	
For ET 200eco, with axial cable outlet	
• with male insert, 5-pack	**6GK1905-0FA00**
• with female insert, 5-pack	**6GK1905-0FB00**
• angled, with female insert, 1 unit	**3RK1902-3DA00**
• angled, with male insert, 1 unit	**3RK1902-3BA00**
7/8" cover cap, 10 per pack	**6ES7194-3JA00-0AA0**
Twisted Pair cables 4x2 with RJ45 connectors	
0.5 m	**6XV1870-3QE50**
1 m	**6XV1870-3QH10**
2 m	**6XV1870-3QH20**
6 m	**6XV1870-3QH60**
10 m	**6XV1870-3QN10**
Crossed Twisted Pair cables 4x2 with RJ45 connectors	
0.5 m	**6XV1870-3RE50**
1 m	**6XV1870-3RH10**
2 m	**6XV1870-3RH20**
6 m	**6XV1870-3RH60**
10 m	**6XV1870-3RN10**
M12 sealing cap	**3RX9802-0AA00**
For protection of unused M12 connections with ET 200pro	
M12 sealing caps with female thread	**6ES7194-4JD60-0AA0**
5 units	

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Notes

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8/2 SIMATIC S7-1500 Software Controllers
8/2 Standard CPUs
8/2 CPU 1507S
8/7 CPU 1508S
8/11 Fail-safe CPUs
8/11 CPU 1507S F
8/15 CPU 1508S F
8/19 Add-on applications
8/19 ODK 1500S SQL driver
8/19 ODK 1500S XML Data Access driver
8/20 ODK 1500S FileServer
8/20 ODK 1500S SMX driver
8/20 ODK 1500S RS 232 driver

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CPU 1507S

Overview



- Software Controller for implementing the functions of a SIMATIC S7-1500 Controller on a SIMATIC IPC
- For use as a PC-based controller in machines with distributed I/O via PROFINET and PROFIBUS
- For utilizing IPC onboard interfaces and PC plug-in cards for PROFINET and PROFIBUS connections
- Optimized for PC-based control tasks with the IPC427E Microbox PC and the IPC477E Panel PC
- Can also be used in IPC227E, IPC477D, IPC627D and IPC827D Box PCs, IPC277E, IPC477D and IPC677D Panel PCs, and IPC647D and IPC847D Rack PCs
- Execution of functions and algorithms implemented with high-level languages under Windows (C/C++, C#, VB) and locally in the CPU 1507S (C/C++)
- Integrated motion control functionalities for controlling speed-controlled and positioning axes as well as synchronous operation, support for external encoders, precise position gearing between axes, output cams/cam tracks and probes
- Integrated web server for diagnostics with the option of creating user-defined web pages
- OPC UA server (data access) and client as runtime option for easy connection of the software controller to Windows applications or third-party devices/systems

Technical specifications

Article number	**6ES7672-7AC01-0YA0** SIMATIC Software Controller CPU 1507S
General information	
Product type designation	CPU 1507S
Engineering with	
• STEP 7 TIA Portal configurable/ integrated as of version	V15.1
Memory	
Work memory	
• integrated (for program)	5 Mbyte
• integrated (for data)	20 Mbyte
• integrated (for CPU function library of CPU Runtime)	50 Mbyte
Load memory	
• integrated (on PC mass storage)	320 Mbyte
CPU processing times	
for bit operations, typ.	1 ns; On IPC427E, Intel Xeon processor
for word operations, typ.	2 ns; On IPC427E, Intel Xeon processor
for fixed point arithmetic, typ.	2 ns; On IPC427E, Intel Xeon processor
for floating point arithmetic, typ.	2 ns; On IPC427E, Intel Xeon processor
CPU-blocks	
Number of elements (total)	6 000; In addition to blocks such as DBs, FBs and FCs, UDTs, global constants, etc. are also regarded as elements
DB	
• Number, max.	5 999; Number range: 1 to 65535
• Size, max.	16 Mbyte
FB	
• Number, max.	5 998; Number range: 1 to 65535
• Size, max.	1 024 kbyte
FC	
• Number, max.	5 999; Number range: 1 to 65535
• Size, max.	1 024 kbyte
OB	
• Size, max.	1 024 kbyte
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
IEC counter	
• Number	Any (only limited by the main memory)
S7 times	
• Number	2 048
IEC timer	
• Number	Any (only limited by the main memory)
Data areas and their retentivity	
Flag	
• Number, max.	16 kbyte
Address area	
I/O address area	
• Inputs	32 kbyte
• Outputs	32 kbyte
Time of day	
Clock	
• Type	Software clock, synchronizable, no battery backup

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Technical specifications (continued)

Article number	**6ES7672-7AC01-0YA0** SIMATIC Software Controller CPU 1507S
Interfaces	
Number of interfaces	3
1. Interface	
Interface type	CP 1625
Interface types	
• Number of ports	2
• integrated switch	Yes
• RJ 45 (Ethernet)	Yes
- Transmission rate, max.	100 Mbit/s
- Industrial Ethernet status LED	Yes
Protocols	
• Number of connections via this interface	128
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes
• Web server	Yes
PROFINET IO Controller	
Services	
- Isochronous mode	Yes
- shortest clock pulse	500 µs
- IRT	Yes
- MRP	Yes
- MRPD	Yes
- PROFIenergy	Yes
- Prioritized startup	Yes; Max. 32 PROFINET devices; if you want to use the "Prioritized startup" functionality in STEP 7 for the PROFINET interface of the CPU, the CPU and the device must be separated by means of a switch (e.g. SCALANCE X205)
- Number of connectable IO Devices, max.	256
- Of which IO devices with IRT, max.	64
- Number of connectable IO Devices for RT, max.	256
- of which in line, max.	256
- Number of IO Devices that can be simultaneously activated/ deactivated, max.	8
- IO Devices changing during operation (partner ports), supported	Yes; The CPU and changing IO devices must be separated by a switch (e.g. SCALANCE X205)
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communi-cation share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
Update time for IRT	
- for send cycle of 250 µs	250 µs to 4 ms
- for send cycle of 500 µs	500 µs to 8 ms
- for send cycle of 1 ms	1 ms to 16 ms
- for send cycle of 2 ms	2 ms to 32 ms
- for send cycle of 4 ms	4 ms to 64 ms
- With IRT and parameterization of "odd" send cycles	Update time = set "odd" send clock (any multiple of 125 µs: 375 µs, 625 µs ... 3 875 µs)

Article number	**6ES7672-7AC01-0YA0** SIMATIC Software Controller CPU 1507S
Update time for RT	
- for send cycle of 250 µs	250 µs to 128 ms
- for send cycle of 500 µs	500 µs to 256 ms
- for send cycle of 1 ms	1 ms to 512 ms
- for send cycle of 2 ms	2 ms to 512 ms
- for send cycle of 4 ms	4 ms to 512 ms
Address area	
- Inputs, max.	8 kbyte
- Outputs, max.	8 kbyte
PROFINET IO Device	
Services	
- Isochronous mode	No
- IRT	Yes
- MRP	Yes
- MRPD	Yes
- PROFIenergy	Yes
- Prioritized startup	Yes; If you want to use the "Prioritized startup" functionality in STEP 7 for the PROFINET interface of the CPU, the CPU and the device must be separated by means of a switch (e.g. SCALANCE X205)
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- Asset management record	Yes
2. Interface	
Interface type	Onboard PROFINET / IE interface X2 of the SIMATIC IPC, Intel Springville i210T
Interface types	
• Number of ports	1
• integrated switch	No
• RJ 45 (Ethernet)	Yes
- Transmission rate, max.	100 Mbit/s
- Industrial Ethernet status LED	Yes
Protocols	
• Number of connections via this interface	128
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes
• Web server	Yes
• Media redundancy	No

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Technical specifications (continued)

Article number	**6ES7672-7AC01-0YA0** SIMATIC Software Controller CPU 1507S
PROFINET IO Controller	
Services	
- Isochronous mode	No
- IRT	No
- MRP	No
- MRPD	No
- PROFIenergy	Yes
- Prioritized startup	Yes; Max. 32 PROFINET devices; if you want to use the "Prioritized startup" functionality in STEP 7 for the PROFINET interface of the CPU, the CPU and the device must be separated by means of a switch (e.g. SCALANCE X205)
- Number of connectable IO Devices for RT, max.	128
- of which in line, max.	128
- Number of IO Devices that can be simultaneously activated/ deactivated, max.	8
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
Update time for RT	
- for send cycle of 1 ms	1 ms to 512 ms
Address area	
- Inputs, max.	8 kbyte
- Outputs, max.	8 kbyte
PROFINET IO Device	
Services	
- Isochronous mode	No
- IRT	No
- MRP	No
- MRPD	No
- PROFIenergy	Yes
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- Asset management record	Yes
3. Interface	
Interface type	PROFIBUS with CP 5622, CP 5622 onboard
Interface types	
• RS 485	Yes
Protocols	
• Number of connections via this interface	44
• PROFIBUS DP master	Yes
• PROFIBUS DP slave	No
• SIMATIC communication	Yes; no PG/STEP 7 connection possible
PROFIBUS DP master	
• Number of DP slaves, max.	64
Services	
- Equidistance	No
- Isochronous mode	No
Address area	
- Inputs, max.	8 kbyte
- Outputs, max.	8 kbyte

Article number	**6ES7672-7AC01-0YA0** SIMATIC Software Controller CPU 1507S
4. Interface	
Interface type	PROFIBUS with CP 5623
Interface types	
• RS 485	Yes
Protocols	
• Number of connections via this interface	44
• PROFIBUS DP master	Yes
• PROFIBUS DP slave	No
• SIMATIC communication	Yes; no PG/STEP 7 connection possible
PROFIBUS DP master	
• Number of DP slaves, max.	125
Services	
- Equidistance	No
- Isochronous mode	No
Address area	
- Inputs, max.	8 kbyte
- Outputs, max.	8 kbyte
Protocols	
Number of connections	
• Number of connections, max.	128
OPC UA	
• OPC UA client	Yes; Data access (read, write), method call
• OPC UA server	Yes; Data access (read, write, subscribe), method call, custom address space
Supported technology objects	
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool or SIZER
• Number of available Motion Control resources for technology objects (except cam disks)	4 800
• Required Motion Control resources	
- per speed-controlled axis	40; per axis
- per positioning axis	80; per axis
- per synchronous axis	160; per axis
- per external encoder	80; per external encoder
- per output cam	20; per cam
- per cam track	160; per cam track
- per probe	40; per probe
• Required Extended Motion Control resources	
- for each cam	2
- for each set of kinematics	30
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes

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Technical specifications (continued)

Article number	**6ES7672-7AC01-0YA0** SIMATIC Software Controller CPU 1507S
Hardware requirement	
Hardware required	SIMATIC IPC2x7E, IPC4x7D/E, IPC6x7D, IPC8x7D
Processor	
• Single-core processor	No
• Single-core processor with hyper-threading	No
• Multi-core processor	Yes
• Multi-core processor with hyper-threading	Yes
• occupied cores	1; For multicore processors with activated Hyper-Threading, one complete physical core is reserved for the CPU 1507S
Memory	
• Work memory, min.	4 Gbyte
• Hard disk memory required for installation	720 Mbyte
• Temporary hard disk memory for installation	230 Mbyte
• Hard disk memory required at runtime	400 Mbyte
Operating systems	
pre-installed operating system	
• Windows XP	No
• Windows 7	Yes; Professional, Enterprise, Ultimate (32 bit and 64 bit)
• Windows Embedded Standard 7	Yes; With the delivery image of the SIMATIC PC
• Windows 8	No
• Windows Embedded Standard 8	No
• Windows 10	Yes; Windows 10 Enterprise 2016 LTSB, 64 bit, MUI on IPC2x7E, IPC4x7E, IPC6x7D and IPC8x7D

Article number	**6ES7672-7AC01-0YA0** SIMATIC Software Controller CPU 1507S
Configuration	
Programming	
Programming language	
- LAD	Yes
- FBD	Yes
- STL	Yes
- SCL	Yes
- CFC	No
- GRAPH	Yes
Know-how protection	
• User program protection/ password protection	Yes
• Copy protection	Yes
• Block protection	Yes
Access protection	
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Complete protection	Yes
Open Development interfaces	
• Size of ODK SO file, max.	9.8 Mbyte

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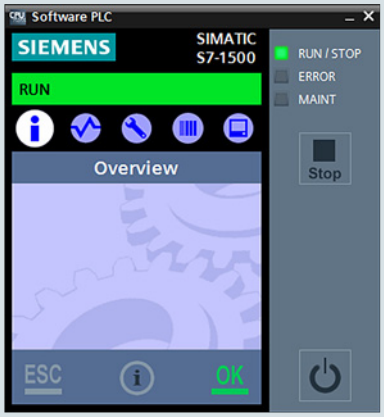
Ordering data	Article No.
SIMATIC S7-1500 Software Controller CPU 1507S For implementing the function of an S7-1500 controller on SIMATIC IPCs Target system: Optimized for PC-based control tasks with Microbox PC IPC427E and Panel PC IPC477E Can also be used with Panel PC IPC277E Panel PC IPC477D Panel PC IPC677D Box PC IPC227E Box PC IPC427D Box PC IPC627D Box PC IPC827D Rack PC IPC647D Rack PC IPC847D Requirement: Windows 7 / Windows Embedded Standard 7 / Windows 10 Enterprise LTSB 2016 with MBR boot Type of delivery: en, de, fr, it, es, zh	
• Single license for one installation Software and documentation on DVD, license key on USB flash drive	**6ES7672-7AC01-0YA0**
• Single license for one installation Software download including license key [1]	**6ES7672-7AC01-0YG0**
Upgrade of SIMATIC S7-1500 Software Controller CPU 1507S From V1.8 to V2.6; software download including documentation and license key. Email address required for delivery	**6ES7672-7AC01-0YK0**

Accessories	Article No.
SIMATIC IPC	
• SIMATIC IPC427E Microbox PC	**6AG4141-…..-….**
• SIMATIC IPC477E Panel PC	**6AV7241-…..-….**
• SIMATIC IPC427D Microbox PC	**6AG4140-…..-….**
• SIMATIC IPC227E Nanobox PC	**6ES7647-8B…-….**
• SIMATIC IPC277E Panel PC	**6AV7882-0…0-…0**
• SIMATIC IPC477D Panel PC	**6AV7240-…..-….**
• SIMATIC IPC677D Panel PC	**6AV7260-…..-….**
• SIMATIC IPC627D Box PC	**6AG4131-2….-….**
• SIMATIC IPC827D Box PC	**6AG4132-2….-….**
• SIMATIC IPC647D Rack PC	**6AG4112-2….-….**
• SIMATIC IPC847D Rack PC	**6AG4114-2….-….**
CP 1625 communications processor PCI Express x1 card for connecting PROFINET with IRT to the S7-1500 Software Controller	**6ES7648-2CF10-1AA0**
CP 5622 communications processor PCI Express x1 card (32-bit) for connecting a programming device or PC to PROFIBUS	**6GK1562-2AA00**
CP 5623 communications processor PCI Express x1 card (32-bit) for connection to PROFIBUS incl. DP-Base software with NCM PC; DP-RAM interface for DP master or DP slave, incl. PG and FDL protocols; single license for 1 installation, runtime software, software and electronic manual on CD-ROM, Class A; for operating system support see SIMATIC NET software en/de	**6GK1562-3AA00**

[1] For up-to-date information and download availability, see: http://www.siemens.com/tia-online-software-delivery

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Overview



- Software Controller for implementing the functions of a SIMATIC S7-1500 Controller on a SIMATIC IPC
- For use with control applications with increased requirements for program and data memory
- For use as a PC-based controller in machines with distributed I/O via PROFINET and PROFIBUS
- For utilizing IPC onboard interfaces and PC plug-in cards for PROFINET and PROFIBUS connections
- Optimized for PC-based control tasks with IPC627D and IPC827D Box PCs, IPC677D Panel PC and IPC647D and IPC847D Rack PCs
- Can also be used on IPC427E Box PCs and IPC477E Panel PCs
- Execution of functions and algorithms implemented with high-level languages under Windows (C/C++, C#, VB) and locally in the CPU 1508S (C/C++)
- Integrated motion control functionalities for controlling speed-controlled and positioning axes as well as synchronous operation, support for external encoders, precise position gearing between axes, output cams/cam tracks and probes
- OPC UA server (data access) and client as runtime option for easy connection of the software controller to Windows applications or third-party devices/systems

Technical specifications

Article number	**6ES7672-8AC01-0YA0** SIMATIC Software Controller CPU 1508S
General information	
Product type designation	CPU 1508S
Engineering with	
• STEP 7 TIA Portal configurable/ integrated as of version	V15.1
Memory	
Work memory	
• integrated (for program)	10 Mbyte
• integrated (for data)	100 Mbyte
• integrated (for CPU function library of CPU Runtime)	50 Mbyte
Load memory	
• integrated (on PC mass storage)	920 Mbyte
CPU processing times	
for bit operations, typ.	1 ns; On IPC427E, Intel Xeon processor
for word operations, typ.	2 ns; On IPC427E, Intel Xeon processor
for fixed point arithmetic, typ.	2 ns; On IPC427E, Intel Xeon processor
for floating point arithmetic, typ.	2 ns; On IPC427E, Intel Xeon processor
CPU-blocks	
Number of elements (total)	6 000; In addition to blocks such as DBs, FBs and FCs, UDTs, global constants, etc. are also regarded as elements
DB	
• Number, max.	5 999; Number range: 1 to 65535
• Size, max.	16 Mbyte
FB	
• Number, max.	5 998; Number range: 1 to 65535
• Size, max.	1 024 kbyte
FC	
• Number, max.	5 999; Number range: 1 to 65535
• Size, max.	1 024 kbyte
OB	
• Size, max.	1 024 kbyte
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
IEC counter	
• Number	Any (only limited by the main memory)
S7 times	
• Number	2 048
IEC timer	
• Number	Any (only limited by the main memory)
Data areas and their retentivity	
Flag	
• Number, max.	16 kbyte
Address area	
I/O address area	
• Inputs	32 kbyte
• Outputs	32 kbyte
Time of day	
Clock	
• Type	Software clock, synchronizable, no battery backup

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Technical specifications (continued)

Article number	**6ES7672-8AC01-0YA0** SIMATIC Software Controller CPU 1508S
Interfaces	
Number of interfaces	3
1. Interface	
Interface type	CP 1625
Interface types	
• Number of ports	2
• integrated switch	Yes
• RJ 45 (Ethernet)	Yes
- Transmission rate, max.	100 Mbit/s
- Industrial Ethernet status LED	Yes
Protocols	
• Number of connections via this interface	192
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes
• Web server	Yes
PROFINET IO Controller	
Services	
- Isochronous mode	Yes
- shortest clock pulse	500 µs
- IRT	Yes
- MRP	Yes
- MRPD	Yes
- PROFIenergy	Yes
- Prioritized startup	Yes; Max. 32 PROFINET devices; if you want to use the "Prioritized startup" functionality in STEP 7 for the PROFINET interface of the CPU, the CPU and the device must be separated by means of a switch (e.g. SCALANCE X205)
- Number of connectable IO Devices, max.	256
- Of which IO devices with IRT, max.	64
- Number of connectable IO Devices for RT, max.	256
- of which in line, max.	256
- Number of IO Devices that can be simultaneously activated/ deactivated, max.	8
- IO Devices changing during operation (partner ports), supported	Yes; The CPU and changing IO devices must be separated by a switch (e.g. SCALANCE X205)
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communi-cation share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
Update time for IRT	
- for send cycle of 250 µs	250 µs to 4 ms
- for send cycle of 500 µs	500 µs to 8 ms
- for send cycle of 1 ms	1 ms to 16 ms
- for send cycle of 2 ms	2 ms to 32 ms
- for send cycle of 4 ms	4 ms to 64 ms
- With IRT and parameterization of "odd" send cycles	Update time = set "odd" send clock (any multiple of 125 µs: 375 µs, 625 µs ... 3 875 µs)

Article number	**6ES7672-8AC01-0YA0** SIMATIC Software Controller CPU 1508S
Update time for RT	
- for send cycle of 250 µs	250 µs to 128 ms
- for send cycle of 500 µs	500 µs to 256 ms
- for send cycle of 1 ms	1 ms to 512 ms
- for send cycle of 2 ms	2 ms to 512 ms
- for send cycle of 4 ms	4 ms to 512 ms
Address area	
- Inputs, max.	16 kbyte
- Outputs, max.	16 kbyte
PROFINET IO Device	
Services	
- Isochronous mode	No
- IRT	Yes
- MRP	Yes
- MRPD	Yes
- PROFIenergy	Yes
- Prioritized startup	Yes
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- Asset management record	Yes
2. Interface	
Interface type	Onboard PROFINET / IE interface X2 of the SIMATIC IPC, Intel Springville i210T
Interface types	
• Number of ports	1
• integrated switch	No
• RJ 45 (Ethernet)	Yes
- Transmission rate, max.	100 Mbit/s
- Industrial Ethernet status LED	Yes
Protocols	
• Number of connections via this interface	192
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes
• Web server	Yes
• Media redundancy	No

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Technical specifications (continued)

Article number	**6ES7672-8AC01-0YA0** SIMATIC Software Controller CPU 1508S
PROFINET IO Controller	
Services	
- Isochronous mode	No
- IRT	No
- MRP	No
- MRPD	No
- PROFIenergy	Yes
- Prioritized startup	Yes; Max. 32 PROFINET devices; if you want to use the "Prioritized startup" functionality in STEP 7 for the PROFINET interface of the CPU, the CPU and the device must be separated by means of a switch (e.g. SCALANCE X205)
- Number of connectable IO Devices for RT, max.	128
- of which in line, max.	128
- Number of IO Devices that can be simultaneously activated/ deactivated, max.	8
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
Update time for RT	
- for send cycle of 1 ms	1 ms to 512 ms
Address area	
- Inputs, max.	8 kbyte
- Outputs, max.	8 kbyte
PROFINET IO Device	
Services	
- Isochronous mode	No
- IRT	No
- MRP	No
- MRPD	No
- PROFIenergy	Yes
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- Asset management record	Yes
3. Interface	
Interface type	PROFIBUS with CP 5622, CP 5622 onboard
Interface types	
• RS 485	Yes
Protocols	
• Number of connections via this interface	44
• PROFIBUS DP master	Yes
• PROFIBUS DP slave	No
• SIMATIC communication	Yes; no PG/STEP 7 connection possible
PROFIBUS DP master	
• Number of DP slaves, max.	64
Services	
- Equidistance	No
- Isochronous mode	No
Address area	
- Inputs, max.	8 kbyte
- Outputs, max.	8 kbyte

Article number	**6ES7672-8AC01-0YA0** SIMATIC Software Controller CPU 1508S
4. Interface	
Interface type	PROFIBUS with CP 5623
Interface types	
• RS 485	Yes
Protocols	
• Number of connections via this interface	44
• PROFIBUS DP master	Yes
• PROFIBUS DP slave	No
• SIMATIC communication	Yes; no PG/STEP 7 connection possible
PROFIBUS DP master	
• Number of DP slaves, max.	125
Services	
- Equidistance	No
- Isochronous mode	No
Address area	
- Inputs, max.	8 kbyte
- Outputs, max.	8 kbyte
Protocols	
Number of connections	
• Number of connections, max.	192
OPC UA	
• OPC UA client	Yes; Data access (read, write), method call
• OPC UA server	Yes; Data access (read, write, subscribe), method call, custom address space
Supported technology objects	
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool or SIZER
• Number of available Motion Control resources for technology objects (except cam disks)	4 800
• Required Motion Control resources	
- per speed-controlled axis	40; per axis
- per positioning axis	80; per axis
- per synchronous axis	160; per axis
- per external encoder	80; per external encoder
- per output cam	20; per cam
- per cam track	160; per cam track
- per probe	40; per probe
• Required Extended Motion Control resources	
- for each cam	2
- for each set of kinematics	30
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes

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Technical specifications (continued)

Article number	**6ES7672-8AC01-0YA0** SIMATIC Software Controller CPU 1508S
Hardware requirement	
Hardware required	SIMATIC IPC4x7E, IPC6x7D, IPC8x7D
Processor	
• Single-core processor	No
• Single-core processor with hyper-threading	No
• Multi-core processor	Yes
• Multi-core processor with hyper-threading	Yes
• occupied cores	1; For multicore processors with activated Hyper-Threading, one complete physical core is reserved for the CPU 1507S
Memory	
• Work memory, min.	8 Gbyte
• Hard disk memory required for installation	720 Mbyte
• Temporary hard disk memory for installation	230 Mbyte
• Hard disk memory required at runtime	1 000 Mbyte
Operating systems	
pre-installed operating system	
• Windows XP	No
• Windows 7	Yes; Professional, Enterprise, Ultimate (64-bit)
• Windows Embedded Standard 7	Yes; With the delivery image of the SIMATIC PC (64-bit)
• Windows 8	No
• Windows Embedded Standard 8	No
• Windows 10	Yes; Windows 10 Enterprise 2016 LTSB, 64 bit, MUI on IPC4x7E, IPC6x7D and IPC8x7D
Configuration	
Programming	
Programming language	
- LAD	Yes
- FBD	Yes
- STL	Yes
- SCL	Yes
- CFC	No
- GRAPH	Yes
Know-how protection	
• User program protection/ password protection	Yes
• Copy protection	Yes
• Block protection	Yes
Access protection	
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Complete protection	Yes
Open Development interfaces	
• Size of ODK SO file, max.	9.8 Mbyte

Ordering data

	Article No.
SIMATIC S7-1500 Software Controller CPU 1508S For implementing the function of an S7-1500 Controller on a SIMATIC IPC Target systems: Optimized for PC-based control tasks with: IPC677D Panel PC IPC627D Box PC IPC827D Box PC IPC647D Rack PC IPC847D Rack PC Can also be used with: IPC477E Panel PC IPC427E Box PC Requirement: Windows 7 / Windows Embedded Standard 7 / Windows 10 (64-bit) Type of delivery: en, de, fr, it, es, zh	
• Single license for one installation Software and documentation on DVD, license key on USB flash drive	**6ES7672-8AC01-0YA0**
• Single license for one installation Software download including license key [1]	**6ES7672-8AC01-0YG0**
Accessories	
SIMATIC IPC	
• SIMATIC IPC427E Microbox PC	**6AG4141-…..-….**
• SIMATIC IPC477E Panel PC	**6AV7241-…..-….**
• SIMATIC IPC477D Panel PC	**6AV7240-…..-….**
• SIMATIC IPC677D Panel PC	**6AV7260-…..-….**
• SIMATIC IPC627D Box PC	**6AG4131-2….-….**
• SIMATIC IPC827D Box PC	**6AG4132-2….-….**
• SIMATIC IPC647D Rack PC	**6AG4112-2….-….**
• SIMATIC IPC847D Rack PC	**6AG4114-2….-….**
For more information, see Catalog ST 80 / ST PC.	
CP 1625 communications processor PCI Express x1 card for connecting PROFINET with IRT to the S7-1500 Software Controller	**6ES7648-2CF10-1AA0**
CP 5622 communications processor PCI Express x1 card (32-bit) for connecting a programming device or PC to PROFIBUS	**6GK1562-2AA00**
CP 5623 communications processor PCI Express x1 card (32-bit) for connection to PROFIBUS incl. DP-Base software with NCM PC; DP-RAM interface for DP master or DP slave, incl. PG and FDL protocols; single license for 1 installation, runtime software, software and electronic manual on CD-ROM, Class A; for operating system support see SIMATIC NET software en/de	**6GK1562-3AA00**

[1] For up-to-date information and download availability, see: http://www.siemens.com/tia-online-software-delivery

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Overview



- Software Controller for implementing the functions of a SIMATIC S7-1500 Controller on a SIMATIC IPC
- For use as a PC-based controller in machines with distributed I/O via PROFINET and PROFIBUS
- For utilizing IPC onboard interfaces and PC plug-in cards for PROFINET and PROFIBUS connections
- Can be used for safety functions up to SIL 3 according to IEC 61508 and up to PLe according to ISO 13849
- Supports PROFIsafe in distributed configurations
- Optimized for PC-based control tasks with the IPC427E Microbox PC and the IPC477E Panel PC (requires configuration with NVRAM)
- Can also be used in IPC227E, IPC477D, IPC627D and IPC827D Box PCs as well as IPC277E, IPC477D and IPC677D Panel PCs (requires configuration with NVRAM)
- Execution of functions and algorithms implemented with high-level languages under Windows (C/C++, C#, VB) and locally in the CPU 1507S F (C/C++)
- Integrated motion control functionalities for controlling speed-controlled and positioning axes as well as synchronous operation, support for external encoders, precise position gearing between axes, output cams/cam tracks and probes
- Integrated web server for diagnostics with the option of creating user-defined web pages
- OPC UA server (data access) and client as runtime option for easy connection of the software controller to Windows applications or third-party devices/systems

Technical specifications

Article number	**6ES7672-7FC01-0YA0** SIMATIC Failsafe SW Ctrl CPU 1507S F
General information	
Product type designation	CPU 1507S F
Engineering with	
• STEP 7 TIA Portal configurable/ integrated as of version	V15.1
Memory	
Work memory	
• integrated (for program)	7.5 Mbyte
• integrated (for data)	20 Mbyte
• integrated (for CPU function library of CPU Runtime)	50 Mbyte
Load memory	
• integrated (on PC mass storage)	320 Mbyte
CPU processing times	
for bit operations, typ.	1 ns; On IPC427E, Intel Xeon processor
for word operations, typ.	2 ns; On IPC427E, Intel Xeon processor
for fixed point arithmetic, typ.	2 ns; On IPC427E, Intel Xeon processor
for floating point arithmetic, typ.	2 ns; On IPC427E, Intel Xeon processor
CPU-blocks	
Number of elements (total)	6 000; In addition to blocks such as DBs, FBs and FCs, UDTs, global constants, etc. are also regarded as elements
DB	
• Number, max.	5 999; Number range: 1 to 65535
• Size, max.	16 Mbyte
FB	
• Number, max.	5 998; Number range: 1 to 65535
• Size, max.	1 024 kbyte
FC	
• Number, max.	5 999; Number range: 1 to 65535
• Size, max.	1 024 kbyte
OB	
• Size, max.	1 024 kbyte
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
IEC counter	
• Number	Any (only limited by the main memory)
S7 times	
• Number	2 048
IEC timer	
• Number	Any (only limited by the main memory)
Data areas and their retentivity	
Flag	
• Number, max.	16 kbyte
Address area	
I/O address area	
• Inputs	32 kbyte
• Outputs	32 kbyte
Time of day	
Clock	
• Type	Software clock, synchronizable, no battery backup

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Technical specifications (continued)

Article number	**6ES7672-7FC01-0YA0** SIMATIC Failsafe SW Ctrl CPU 1507S F
Interfaces	
Number of interfaces	3
1. Interface	
Interface type	CP 1625
Interface types	
• Number of ports	2
• integrated switch	Yes
• RJ 45 (Ethernet)	Yes
- Transmission rate, max.	100 Mbit/s
- Industrial Ethernet status LED	Yes
Protocols	
• Number of connections via this interface	128
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes
• Web server	Yes
PROFINET IO Controller	
Services	
- Isochronous mode	Yes
- shortest clock pulse	500 µs
- IRT	Yes
- MRP	Yes
- MRPD	Yes
- PROFIenergy	Yes
- Prioritized startup	Yes; Max. 32 PROFINET devices; if you want to use the "Prioritized startup" functionality in STEP 7 for the PROFINET interface of the CPU, the CPU and the device must be separated by means of a switch (e.g. SCALANCE X205)
- Number of connectable IO Devices, max.	256
- Of which IO devices with IRT, max.	64
- Number of connectable IO Devices for RT, max.	256
- of which in line, max.	256
- Number of IO Devices that can be simultaneously activated/ deactivated, max.	8
- IO Devices changing during operation (partner ports), supported	Yes; The CPU and changing IO devices must be separated by a switch (e.g. SCALANCE X205)
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
Update time for IRT	
- for send cycle of 250 µs	250 µs to 4 ms
- for send cycle of 500 µs	500 µs to 8 ms
- for send cycle of 1 ms	1 ms to 16 ms
- for send cycle of 2 ms	2 ms to 32 ms
- for send cycle of 4 ms	4 ms to 64 ms
- With IRT and parameterization of "odd" send cycles	Update time = set "odd" send clock (any multiple of 125 µs: 375 µs, 625 µs ... 3 875 µs)

Article number	**6ES7672-7FC01-0YA0** SIMATIC Failsafe SW Ctrl CPU 1507S F
Update time for RT	
- for send cycle of 250 µs	250 µs to 128 ms
- for send cycle of 500 µs	500 µs to 256 ms
- for send cycle of 1 ms	1 ms to 512 ms
- for send cycle of 2 ms	2 ms to 512 ms
- for send cycle of 4 ms	4 ms to 512 ms
Address area	
- Inputs, max.	8 kbyte
- Outputs, max.	8 kbyte
PROFINET IO Device	
Services	
- Isochronous mode	No
- IRT	Yes
- MRP	Yes
- MRPD	Yes
- PROFIenergy	Yes
- Prioritized startup	Yes; If you want to use the "Prioritized startup" functionality in STEP 7 for the PROFINET interface of the CPU, the CPU and the device must be separated by means of a switch (e.g. SCALANCE X205)
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- Asset management record	Yes
2. Interface	
Interface type	Onboard PROFINET / IE interface X2 of the SIMATIC IPC, Intel Springville i210T
Interface types	
• Number of ports	1
• integrated switch	No
• RJ 45 (Ethernet)	Yes
- Transmission rate, max.	100 Mbit/s
- Industrial Ethernet status LED	Yes
Protocols	
• Number of connections via this interface	128
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes
• Web server	Yes
• Media redundancy	No
PROFINET IO Controller	
Services	
- Isochronous mode	No
- IRT	No
- MRP	No
- MRPD	No
- PROFIenergy	Yes
- Prioritized startup	Yes; Max. 32 PROFINET devices; if you want to use the "Prioritized startup" functionality in STEP 7 for the PROFINET interface of the CPU, the CPU and the device must be separated by means of a switch (e.g. SCALANCE X205)
- Number of connectable IO Devices for RT, max.	128
- of which in line, max.	128

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Technical specifications (continued)

Article number	**6ES7672-7FC01-0YA0** SIMATIC Failsafe SW Ctrl CPU 1507S F
Services (cont.)	
- Number of IO Devices that can be simultaneously activated/ deactivated, max.	8
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communi-cation share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
Update time for RT	
- for send cycle of 1 ms	1 ms to 512 ms
Address area	
- Inputs, max.	8 kbyte
- Outputs, max.	8 kbyte
PROFINET IO Device	
Services	
- Isochronous mode	No
- IRT	No
- MRP	No
- MRPD	No
- PROFIenergy	Yes
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- Asset management record	Yes
3. Interface	
Interface type	PROFIBUS with CP 5622, CP 5622 onboard
Interface types	
• RS 485	Yes
Protocols	
• Number of connections via this interface	44
• PROFIBUS DP master	Yes
• PROFIBUS DP slave	No
• SIMATIC communication	Yes; no PG/STEP 7 connection possible
PROFIBUS DP master	
• Number of DP slaves, max.	64
Services	
- Equidistance	No
- Isochronous mode	No
Address area	
- Inputs, max.	8 kbyte
- Outputs, max.	8 kbyte
4. Interface	
Interface type	PROFIBUS with CP 5623
Interface types	
• RS 485	Yes
Protocols	
• Number of connections via this interface	44
• PROFIBUS DP master	Yes
• PROFIBUS DP slave	No
• SIMATIC communication	Yes; no PG/STEP 7 connection possible

Article number	**6ES7672-7FC01-0YA0** SIMATIC Failsafe SW Ctrl CPU 1507S F
PROFIBUS DP master	
• Number of DP slaves, max.	125
Services	
- Equidistance	No
- Isochronous mode	No
Address area	
- Inputs, max.	8 kbyte
- Outputs, max.	8 kbyte
Protocols	
Number of connections	
• Number of connections, max.	128
OPC UA	
• OPC UA client	Yes; Data access (read, write), method call
• OPC UA server	Yes; Data access (read, write, subscribe), method call, custom address space
Supported technology objects	
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool or SIZER
• Number of available Motion Control resources for technology objects (except cam disks)	4 800
• Required Motion Control resources	
- per speed-controlled axis	40; per axis
- per positioning axis	80; per axis
- per synchronous axis	160; per axis
- per external encoder	80; per external encoder
- per output cam	20; per cam
- per cam track	160; per cam track
- per probe	40; per probe
• Required Extended Motion Control resources	
- for each cam	2
- for each set of kinematics	30
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes
Standards, approvals, certificates	
Highest safety class achievable in safety mode	
Probability of failure (for service life of 20 years and repair time of 100 hours)	
- Low demand mode: PFDavg in accordance with SIL3	< 2.00E-05
- High demand/continuous mode: PFH in accordance with SIL3	< 1.00E-09

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Technical specifications (continued)

Article number	**6ES7672-7FC01-0YA0** SIMATIC Failsafe SW Ctrl CPU 1507S F
Hardware requirement	
Hardware required	SIMATIC IPC2x7E, IPC4x7D/E, IPC627D, IPC677D, IPC827D
Processor	
• Single-core processor	No
• Single-core processor with hyper-threading	No
• Multi-core processor	Yes
• Multi-core processor with hyper-threading	Yes
• occupied cores	1; For multicore processors with activated Hyper-Threading, one complete physical core is reserved for the CPU 1507S
Memory	
• Work memory, min.	4 Gbyte
• Hard disk memory required for installation	720 Mbyte
• Temporary hard disk memory for installation	230 Mbyte
• Hard disk memory required at runtime	400 Mbyte
Operating systems	
pre-installed operating system	
• Windows XP	No
• Windows 7	Yes; Professional, Enterprise, Ultimate (32 bit and 64 bit)
• Windows Embedded Standard 7	Yes; With the delivery image of the SIMATIC PC
• Windows 8	No
• Windows Embedded Standard 8	No
• Windows 10	Yes; Windows 10 Enterprise 2016 LTSB, 64 bit, MUI on IPC2x7E, IPC4x7E, IPC6x7D and IPC8x7D
Configuration	
Programming	
Programming language	
- LAD	Yes; incl. failsafe
- FBD	Yes; incl. failsafe
- STL	Yes
- SCL	Yes
- CFC	No
- GRAPH	Yes
Know-how protection	
• User program protection/password protection	Yes
• Copy protection	Yes
• Block protection	Yes
Access protection	
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Complete protection	Yes
Open Development interfaces	
• Size of ODK SO file, max.	9.8 Mbyte

Ordering data

	Article No.
SIMATIC S7-1500 Software Controller CPU 1507S F For implementing the function of a fail-safe S7-1500 controller on SIMATIC IPCs Target system: Optimized for PC-based control tasks with IPC427E Microbox PC and IPC477E Panel PC Can also be used with IPC277E Panel PC IPC477D Panel PC IPC677D Panel PC IPC227E Box PC IPC427D Box PC IPC627D Box PC IPC827D Box PC Requirement: Windows 7 / Windows Embedded Standard 7 / Windows 10 Enterprise LTSB with MBR boot (IPC configuration with NVRAM required) Type of delivery: en, de, fr, it, es, zh	
• Single license for one installation Software and documentation on DVD, license key on USB flash drive	**6ES7672-7FC01-0YA0**
• Single license for one installation Software download including license key [1]	**6ES7672-7FC01-0YG0**
Accessories	
SIMATIC IPC	
• SIMATIC IPC427E Microbox PC	**6AG4141-…..-….**
• SIMATIC IPC477E Panel PC	**6AV7241-…..-….**
• SIMATIC IPC427D Microbox PC	**6AG4140-…..-….**
• SIMATIC IPC227E Nanobox PC	**6ES7647-8B…-….**
• SIMATIC IPC277E Panel PC	**6AV7882-0…0-…0**
• SIMATIC IPC477D Panel PC	**6AV7240-…..-….**
• SIMATIC IPC677D Panel PC	**6AV7260-…..-….**
• SIMATIC IPC627D Box PC	**6AG4131-2….-….**
• SIMATIC IPC827D Box PC	**6AG4132-2….-….**
CP 1625 communications processor PCI Express x1 card for connecting PROFINET with IRT to the S7-1500 Software Controller	**6ES7648-2CF10-1AA0**
CP 5622 communications processor PCI Express x1 card (32-bit) for connecting a programming device or PC to PROFIBUS	**6GK1562-2AA00**
CP 5623 communications processor PCI Express x1 card (32-bit) for connection to PROFIBUS incl. DP-Base software with NCM PC; DP-RAM interface for DP master or DP slave, incl. PG and FDL protocols; single license for 1 installation, runtime software, software and electronic manual on CD-ROM, Class A; for operating system support see SIMATIC NET software en/de	**6GK1562-3AA00**

[1] For up-to-date information and download availability, see: http://www.siemens.com/tia-online-software-delivery

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Overview



- Software Controller for implementing the functions of a SIMATIC S7-1500 Controller on a SIMATIC IPC
- For use with control applications with increased requirements for program and data memory
- For use as a PC-based controller in machines with distributed I/O via PROFINET and PROFIBUS
- For utilizing IPC onboard interfaces and PC plug-in cards for PROFINET and PROFIBUS connections
- Can be used for safety functions up to SIL 3 according to IEC 61508 and up to PLe according to ISO 13849
- Supports PROFIsafe in distributed configurations
- Optimized for PC-based control tasks with IPC627D and IPC827D Box PCs, IPC677D Panel PC and IPC647D and IPC847D Rack PCs (configuration with NVRAM required)
- Can also be used on IPC427E Box PC and IPC477E Panel PC (configuration with NVRAM required)
- Execution of functions and algorithms implemented with high-level languages under Windows (C/C++, C#, VB) and locally in the CPU 1508S F (C/C++)
- Integrated motion control functionalities for controlling speed-controlled and positioning axes as well as synchronous operation, support for external encoders, precise position gearing between axes, output cams/cam tracks and probes
- Integrated web server for diagnostics with the option of creating user-defined web pages
- OPC UA server (data access) and client as runtime option for easy connection of the software controller to Windows applications or third-party devices/systems

Technical specifications

Article number	**6ES7672-8FC01-0YA0** SIMATIC Failsafe SW Ctrl CPU 1508S F
General information	
Product type designation	CPU 1508S F
Engineering with	
• STEP 7 TIA Portal configurable/ integrated as of version	V15.1
Memory	
Work memory	
• integrated (for program)	12.5 Mbyte
• integrated (for data)	100 Mbyte
• integrated (for CPU function library of CPU Runtime)	50 Mbyte
Load memory	
• integrated (on PC mass storage)	920 Mbyte
CPU processing times	
for bit operations, typ.	1 ns; On IPC427E, Intel Xeon processor
for word operations, typ.	2 ns; On IPC42 7E, Intel Xeon processor
for fixed point arithmetic, typ.	2 ns; On IPC427E, Intel Xeon processor
for floating point arithmetic, typ.	2 ns; On IPC427E, Intel Xeon processor
CPU-blocks	
Number of elements (total)	6 000; In addition to blocks such as DBs, FBs and FCs, UDTs, global constants, etc. are also regarded as elements
DB	
• Number, max.	5 999; Number range: 1 to 65535
• Size, max.	16 Mbyte
FB	
• Number, max.	5 998; Number range: 1 to 65535
• Size, max.	1 024 kbyte
FC	
• Number, max.	5 999; Number range: 1 to 65535
• Size, max.	1 024 kbyte
OB	
• Size, max.	1 024 kbyte
Counters, timers and their retentivity	
S7 counter	
• Number	2 048
IEC counter	
• Number	Any (only limited by the main memory)
S7 times	
• Number	2 048
IEC timer	
• Number	Any (only limited by the main memory)
Data areas and their retentivity	
Flag	
• Number, max.	16 kbyte
Address area	
I/O address area	
• Inputs	32 kbyte
• Outputs	32 kbyte
Time of day	
Clock	
• Type	Software clock, synchronizable, no battery backup

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Technical specifications (continued)

Article number	6ES7672-8FC01-0YA0 SIMATIC Failsafe SW Ctrl CPU 1508S F
Interfaces	
Number of interfaces	3
1. Interface	
Interface type	CP 1625
Interface types	
• Number of ports	2
• integrated switch	Yes
• RJ 45 (Ethernet)	Yes
- Transmission rate, max.	100 Mbit/s
- Industrial Ethernet status LED	Yes
Protocols	
• Number of connections via this interface	192
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes
• Web server	Yes
PROFINET IO Controller	
Services	
- Isochronous mode	Yes
- shortest clock pulse	500 µs
- IRT	Yes
- MRP	Yes
- MRPD	Yes
- PROFIenergy	Yes
- Prioritized startup	Yes; Max. 32 PROFINET devices; if you want to use the "Prioritized startup" functionality in STEP 7 for the PROFINET interface of the CPU, the CPU and the device must be separated by means of a switch (e.g. SCALANCE X205)
- Number of connectable IO Devices, max.	256
- Of which IO devices with IRT, max.	64
- Number of connectable IO Devices for RT, max.	256
- of which in line, max.	256
- Number of IO Devices that can be simultaneously activated/ deactivated, max.	8
- IO Devices changing during operation (partner ports), supported	Yes; The CPU and changing IO devices must be separated by a switch (e.g. SCALANCE X205)
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
Update time for IRT	
- for send cycle of 250 µs	250 µs to 4 ms
- for send cycle of 500 µs	500 µs to 8 ms
- for send cycle of 1 ms	1 ms to 16 ms
- for send cycle of 2 ms	2 ms to 32 ms
- for send cycle of 4 ms	4 ms to 64 ms
- With IRT and parameterization of "odd" send cycles	Update time = set "odd" send clock (any multiple of 125 µs: 375 µs, 625 µs ... 3 875 µs)

Article number	6ES7672-8FC01-0YA0 SIMATIC Failsafe SW Ctrl CPU 1508S F
Update time for RT	
- for send cycle of 250 µs	250 µs to 128 ms
- for send cycle of 500 µs	500 µs to 256 ms
- for send cycle of 1 ms	1 ms to 512 ms
- for send cycle of 2 ms	2 ms to 512 ms
- for send cycle of 4 ms	4 ms to 512 ms
Address area	
- Inputs, max.	16 kbyte
- Outputs, max.	16 kbyte
PROFINET IO Device	
Services	
- Isochronous mode	No
- IRT	Yes
- MRP	Yes
- MRPD	Yes
- PROFIenergy	Yes
- Prioritized startup	Yes
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- Asset management record	Yes
2. Interface	
Interface type	Onboard PROFINET / IE interface X2 of the SIMATIC IPC, Intel Springville i210T
Interface types	
• Number of ports	1
• integrated switch	No
• RJ 45 (Ethernet)	Yes
- Transmission rate, max.	100 Mbit/s
Protocols	
• Number of connections via this interface	192
• PROFINET IO Controller	Yes
• PROFINET IO Device	Yes
• SIMATIC communication	Yes
• Open IE communication	Yes
• Web server	Yes
• Media redundancy	No
PROFINET IO Controller	
Services	
- Isochronous mode	No
- IRT	No
- MRP	No
- MRPD	No
- PROFIenergy	Yes
- Prioritized startup	Yes; Max. 32 PROFINET devices; if you want to use the "Prioritized startup" functionality in STEP 7 for the PROFINET interface of the CPU, the CPU and the device must be separated by means of a switch (e.g. SCALANCE X205)
- Number of connectable IO Devices for RT, max.	128
- of which in line, max.	128
- Number of IO Devices that can be simultaneously activated/ deactivated, max.	8

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Technical specifications (continued)

Article number	**6ES7672-8FC01-0YA0** SIMATIC Failsafe SW Ctrl CPU 1508S F
Services (cont.)	
- Number of IO Devices per tool, max.	8
- Updating times	The minimum value of the update time also depends on communication share set for PROFINET IO, on the number of IO devices, and on the quantity of configured user data
Update time for RT	
- for send cycle of 1 ms	1 ms to 512 ms
Address area	
- Inputs, max.	8 kbyte
- Outputs, max.	8 kbyte
PROFINET IO Device	
Services	
- Isochronous mode	No
- IRT	No
- MRP	No
- MRPD	No
- PROFIenergy	Yes
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
- Asset management record	Yes
3. Interface	
Interface type	PROFIBUS with CP 5622, CP 5622 onboard
Interface types	
• RS 485	Yes
Protocols	
• Number of connections via this interface	44
• PROFIBUS DP master	Yes
• PROFIBUS DP slave	No
• SIMATIC communication	Yes
PROFIBUS DP master	
• Number of DP slaves, max.	64
Services	
- Equidistance	No
- Isochronous mode	No
Address area	
- Inputs, max.	8 kbyte
- Outputs, max.	8 kbyte
4. Interface	
Interface type	PROFIBUS with CP 5623
Interface types	
• RS 485	Yes
Protocols	
• Number of connections via this interface	44
• PROFIBUS DP master	Yes
• PROFIBUS DP slave	No
• SIMATIC communication	Yes; no PG/STEP 7 connection possible
PROFIBUS DP master	
• Number of DP slaves, max.	125
Services	
- Equidistance	No
- Isochronous mode	No
Address area	
- Inputs, max.	8 kbyte
- Outputs, max.	8 kbyte

Article number	**6ES7672-8FC01-0YA0** SIMATIC Failsafe SW Ctrl CPU 1508S F
Protocols	
Number of connections	
• Number of connections, max.	192
OPC UA	
• OPC UA client	Yes; Data access (read, write), method call
• OPC UA server	Yes; Data access (read, write, subscribe), method call, custom address space
Supported technology objects	
Motion Control	Yes; Note: The number of technology objects affects the cycle time of the PLC program; selection guide via the TIA Selection Tool or SIZER
• Number of available Motion Control resources for technology objects (except cam disks)	4 800
• Required Motion Control resources	
- per speed-controlled axis	40; per axis
- per positioning axis	80; per axis
- per synchronous axis	160; per axis
- per external encoder	80; per external encoder
- per output cam	20; per cam
- per cam track	160; per cam track
- per probe	40; per probe
• Required Extended Motion Control resources	
- for each cam	2
- for each set of kinematics	30
Controller	
• PID_Compact	Yes; Universal PID controller with integrated optimization
• PID_3Step	Yes; PID controller with integrated optimization for valves
• PID-Temp	Yes; PID controller with integrated optimization for temperature
Counting and measuring	
• High-speed counter	Yes
Standards, approvals, certificates	
Highest safety class achievable in safety mode	
Probability of failure (for service life of 20 years and repair time of 100 hours)	
- Low demand mode: PFDavg in accordance with SIL3	< 2.00E-05
- High demand/continuous mode: PFH in accordance with SIL3	< 1.00E-09

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Technical specifications (continued)

Article number	**6ES7672-8FC01-0YA0** SIMATIC Failsafe SW Ctrl CPU 1508S F
Hardware requirement	
Hardware required	SIMATIC IPC4x7E, IPC627D, IPC677D, IPC827D
Processor	
• Single-core processor	No
• Single-core processor with hyper-threading	No
• Multi-core processor	Yes
• Multi-core processor with hyper-threading	Yes
• occupied cores	1; For multicore processors with activated Hyper-Threading, one complete physical core is reserved for the CPU 1507S
Memory	
• Work memory, min.	8 Gbyte
• Hard disk memory required for installation	720 Mbyte
• Temporary hard disk memory for installation	230 Mbyte
• Hard disk memory required at runtime	1 000 Mbyte
Operating systems	
pre-installed operating system	
• Windows XP	No
• Windows 7	Yes; Professional, Enterprise, Ultimate (64-bit)
• Windows Embedded Standard 7	Yes; With the delivery image of the SIMATIC PC (64-bit)
• Windows 8	No
• Windows Embedded Standard 8	No
• Windows 10	Yes; Windows 10 Enterprise 2016 LTSB, 64 bit, MUI on IPC4x7E, IPC6x7D and IPC8x7D
Configuration	
Programming	
Programming language	
- LAD	Yes; incl. failsafe
- FBD	Yes; incl. failsafe
- STL	Yes
- SCL	Yes
- CFC	No
- GRAPH	Yes
Know-how protection	
• User program protection/ password protection	Yes
• Copy protection	Yes
• Block protection	Yes
Access protection	
• Protection level: Write protection	Yes
• Protection level: Read/write protection	Yes
• Protection level: Complete protection	Yes
Open Development interfaces	
• Size of ODK SO file, max.	9.8 Mbyte

Ordering data

	Article No.
SIMATIC S7-1500 Software Controller CPU 1508S F For implementing the function of an S7-1500 Controller on SIMATIC IPCs (IPC configuration with NVRAM required) Target system: Optimized for PC-based control tasks with: IPC677D Panel PC IPC627D Box PC IPC827D Box PC Can also be used with: IPC477E Panel PC IPC427E Box PC Requirement: Windows 7 / Windows Embedded Standard 7 / Windows 10 (64-bit) Type of delivery: en, de, fr, it, es, zh	
• Single license for one installation Software and documentation on DVD, license key on USB flash drive	**6ES7672-8FC01-0YA0**
• Single license for one installation Software download including license key [1]	**6ES7672-8FC01-0YG0**
Accessories	
SIMATIC IPC	
• SIMATIC IPC427E Microbox PC	**6AG4141-…..-….**
• SIMATIC IPC477E Panel PC	**6AV7241-…..-….**
• SIMATIC IPC677D Panel PC	**6AV7260-…..-….**
• SIMATIC IPC627D Box PC	**6AG4131-2….-….**
• SIMATIC IPC827D Box PC	**6AG4132-2….-….**
For more information, see Catalog ST 80 / ST PC.	
CP 1625 communications processor PCI Express x1 card for connecting PROFINET with IRT to the S7-1500 Software Controller	**6ES7648-2CF10-1AA0**
CP 5622 communications processor PCI Express x1 card (32-bit) for connecting a programming device or PC to PROFIBUS	**6GK1562-2AA00**
CP 5623 communications processor PCI Express x1 card (32-bit) for connection to PROFIBUS incl. DP-Base software with NCM PC; DP-RAM interface for DP master or DP slave, incl. PG and FDL protocols; single license for 1 installation, runtime software, software and electronic manual on CD-ROM, Class A; for operating system support see SIMATIC NET software en/de	**6GK1562-3AA00**

[1] For up-to-date information and download availability, see: http://www.siemens.com/tia-online-software-delivery

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Overview ODK 1500S SQL driver

Note

This catalog entry contains non-binding information on a supplementary application software for the SIMATIC S7-1500 Software Controller and the SIMATIC ET 200SP Open Controller.

Overview

The ODK 1500S SQL driver enables direct access to an SQL database from the PLC program. In this case the database can be installed on the same computer as the S7-1500 Software Controller or in the network.

- Direct data exchange with SQL-based database by means of SQL commands from the PCL program
- Connection to SQL-based database on the same PC or to database servers in the network

Technical specifications

Supported SQL commands	• SELECT • INSERT • UPDATE • DELETE
Supported data types	All standard SQL data types
System requirements	
• Runtime PC	SIMATIC IPC with S7-1500 Software Controller or SIMATIC ET 200SP Open Controller
• Engineering	STEP 7 in the TIA Portal V13 SP1

More information

If you are interested, please contact your sales representative:
http://www.automation.siemens.com/partner/

You can find Service and Support at:
https://support.industry.siemens.com/cs/ww/en/view/109479140

Overview ODK 1500S XML Data Access driver

Note

This catalog entry contains non-binding information on a supplementary application software for the SIMATIC S7-1500 Software Controller and the SIMATIC ET 200SP Open Controller.

Overview

With the function blocks of the ODK 1500S XML Data Access driver it is possible to access specific information in XML files in the Windows file system from the PLC program.

XPath expressions are used for accessing XML file elements since they provide the highest possible flexibility for processing XML data. This means that extremely large XML files can be edited, too.

The driver offers the following functionality:

- XML data can be read into and processed in the PLC.
- XML data can be modified and written back to the XML file.

Technical specifications

System requirements	
• Runtime PC	SIMATIC IPC with S7-1500 Software Controller or SIMATIC ET 200SP Open Controller
• Engineering	STEP 7 in the TIA Portal V13 SP1

More information

If you are interested, please contact your sales representative:
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You can find Service and Support at:
https://support.industry.siemens.com/cs/ww/en/view/109479496

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ODK 1500S FileServer, ODK 1500S SMX driver, ODK 1500S RS 232 driver

Overview ODK 1500S FileServer

Note

This catalog entry contains non-binding information on a supplementary application software for the SIMATIC S7-1500 Software Controller and the SIMATIC ET 200SP Open Controller.

Overview

The ODK 1500S FileServer enhances the file functions of the SIMATIC S7-1500 Software Controller with an option enabling direct access to the Windows file system of the PC from the STEP 7 program.

The driver enables reading and writing of data blocks in/from files in structured form. Various file formats are supported.

There are also FBs available for handling files (e.g. renaming, deleting).

Technical specifications

Supported file formats	• CSV • ASCII • Windows-INI • XML[1)] • Binary
System requirements	
• Runtime PC	SIMATIC IPC with S7-1500 Software Controller or SIMATIC ET 200SP Open Controller
• Engineering	STEP 7 in the TIA Portal V13 SP1

1) The XML format is predefined. A DB can be saved and read in as an XML file. It is not possible to parse any particular XML file.

More information

If you are interested, please contact your sales representative:
http://www.automation.siemens.com/partner/

You can find Service and Support at:
https://support.industry.siemens.com/cs/ww/en/view/109479497

Overview ODK 1500S SMX driver

Note

This catalog entry contains non-binding information about supplementary application software for the SIMATIC S7-1500 Software Controller and the SIMATIC ET 200SP Open Controller.

Overview

The ODK 1500S SMX driver permits access from a Windows user program to data of the PLC program. A shared memory which can be accessed by the PLC and user program is set up for this purpose. The ODK 1500S simplifies the changeover to the S7-1500 Software Controller of applications that previously used the SMX interface of the SIMATIC WinAC RTX.

More information

If you are interested, please contact your sales representative:
http://www.automation.siemens.com/partner/

You can find Service and Support at:
https://support.industry.siemens.com/cs/ww/en/view/109741583

Overview ODK 1500S RS 232 driver

Note

This catalog entry contains non-binding information about supplementary application software for the SIMATIC S7-1500 Software Controller and the SIMATIC ET 200SP Open Controller.

Overview

The ODK 1500S RS 232 driver enables serial RS 232 communication from the STEP 7 user program via the integrated serial interface of a SIMATIC IPC or, depending on the application environment, via a USB-RS 232 adapter.

More information

If you are interested, please contact your sales representative:
http://www.automation.siemens.com/partner/

You can find Service and Support at:
https://support.industry.siemens.com/cs/ww/en/view/109479259

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Overview



SIMATIC ET 200 offers the right solution for every application

With SIMATIC ET 200 a wide range of distributed I/O systems is available - for solutions in the control cabinet or without a control cabinet directly at the machine, as well as for applications in hazardous areas. The modular design makes it possible to scale and expand the ET 200 systems simply and in small stages. Already integrated add-on modules reduce costs and at the same time offer a widely diverse range of possible applications. You can choose from many different combination options: digital and analog inputs/outputs, intelligent modules with CPU functionality, safety systems, motor starters, pneumatic devices, frequency converters, as well as various different technology modules (e.g. for counting, positioning).

Communication over PROFINET and PROFIBUS, uniform engineering, transparent diagnostic possibilities as well as optimal interfacing to SIMATIC controllers and HMI units prove the unique integration of Totally Integrated Automation.

PROFINET

PROFINET is the open, cross-vendor Industrial Ethernet standard (IEC 61158/61784) for automation.

Based on Industrial Ethernet, PROFINET enables direct communication between field devices (IO devices) and controllers (IO controllers), up to and including the solution of isochronous drive controls for motion control applications.

As PROFINET is based on Standard Ethernet according to IEEE 802.3, any devices from the field level to the management level can be connected.

In this way, PROFINET enables system-wide communication, supports plant-wide engineering and applies IT standards, such as web server or FTP, right down to field level. Tried and tested fieldbus systems, such as PROFIBUS or AS-Interface, can be easily integrated without any modification to the existing devices.

PROFIBUS

PROFIBUS is the international standard (IEC 61158/61784) for the field level. It is the only fieldbus to allow communication both in manufacturing applications and in process-oriented applications.

PROFIBUS is used to connect field devices, e.g. distributed I/O devices or drives, to automation systems such as SIMATIC S7, SIMOTION, SINUMERIK, or PCs.

PROFIBUS is standardized in accordance with IEC 61158 and is a powerful, open and rugged fieldbus system with short response times. PROFIBUS is available in different forms for various applications.

PROFIBUS DP (distributed I/O)

PROFIBUS DP is used for connecting distributed field devices, e.g. SIMATIC ET 200, or drives with extremely fast response times. PROFIBUS DP is used when sensors/actuators are distributed at the machine or in the plant (e.g. field level).

AS-Interface

AS-Interface is the international standard (IEC 62026/EN 50295) which, as an alternative to the cable harness, links especially cost-effective sensors and actuators by means of a two-wire line. This two-wire line is also used to supply the individual stations with power. This makes the AS-Interface the ideal partner for PROFINET and PROFIBUS DP. AS-i communication modules in the ET 200SP enable the flexible combination of AS-Interface and distributed I/Os. AS-Interface transmits standard data and safety data up to PL e / SIL 3 in the same AS-i network. AS-Interface is not only suitable for efficient transmission of digital and analog I/O signals but also ideal for the user-friendly connection of EMERGENCY STOP pushbuttons and protective doors.

IO-Link

The communication standard IO-Link permits the intelligent connection of sensors and switching devices to the control level. IO-Link facilitates the integration of all components in the control cabinet and on the field level - for maximum integration and seamless communication on the final meters to the process.

IO-Link solutions from Siemens ensure maximum precision and cost-effectiveness in any production system. IO-Link is completely integrated in Totally Integrated Automation (TIA) and offers many advantages.

- The open standard permits the networking of devices from different manufacturers
- Simple wiring facilitates the installation process
- Reduced wiring effort saves time and money during installation
- Efficient engineering facilitates configuration and commissioning
- High-speed diagnostics ensures short plant standstill times and high plant availability
- High process transparency permits, for example, efficient power management

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Overview

SIMATIC ET 200SP



The scalable SIMATIC ET 200SP I/O system is a highly flexible, modular I/O system with IP20 degree of protection. Via an interface module with PROFINET or PROFIBUS interface it can exchange IO data of the connected I/O modules with a higher-level control system. Alternatively, as further head-end stations, various PLC, F-PLC and Open Controllers are available as compact S7-1500 controllers (Distributed Controller).
ET 200SP components are available as SIPLUS version for extreme requirements and a high degree of robustness.

For ET 200SP, a comprehensive range of I/O modules, including fail-safe versions, is available:

- Digital input modules (DI), with color coding white
- Digital output modules (DQ), with color coding black
- Analog input modules (AI), with color coding light blue
- Analog output modules (AQ), with color coding dark blue
- Technology modules (TM), with color coding turquoise
- Communication modules (CM), with color coding light gray
- Special modules, with color coding mint green
- Motor starters as direct on-line starters (DS) and reversing starters (RS)
- Pneumatics

Apart from the standard type of delivery as an individual package, selected I/O modules and BaseUnits are also available in a pack of 10 units. The pack of 10 units enables the amount of waste to be reduced considerably, as well as saving the time and cost of unpacking individual modules.

Compact design

- Modular configuration with up to 64 modules
- System-integrated self-assembling load group supply without power module via light BaseUnits
- Small size and highly flexible due to the modular design and comprehensive product range
- Up to 16 channels per module
- Permanent wiring
- Hot swapping: Module replacement without tools in RUN
- Startup and operation with slot gaps (free spaces)

Flexible connection system

- Push-in terminals for cross-sections up to 1.5 mm^2 with wire end ferrule, and up 2.5 mm^2 without wire end ferrule
- BaseUnits for 1-wire or direct multi-wire connection
- PotDis module for system-integrated and space-saving provision of additional potential terminals
- Optimum accessibility for wiring due to spring release and measuring tap next to the conductor opening
- Flexible PROFINET connection via BusAdapter (RJ45, FastConnect, plastic or glass fiber-optic cables), also as integrated media converter

Safety Integrated

- Easy integration of fail-safe modules
- Easy F parameter assignment via software
- Group-by-group disconnection of non-fail-safe modules

High performance

- Isochronous PROFINET
- Internal data transfer with up to 100 Mbps
- Record analog values and output as of 50 µs
- Record digital values and output as of 1 µs

High-performance technology

- Modules for the functions Counting, Positioning, Weighing, Output cams, PWM, Force measurement, etc.

Energy efficiency

- Energy meter for recording electrical variables
- System-integrated PROFIenergy with interval substitute values

Advanced functions

- Configuration control:
  application-based adaptation of the actual configuration via user software (option handling)
- Time-based IO:
  time stamping of the signals to the µs
- MSI/MSO:
  Simultaneous access to I/O data from up to 4 PLCs
- MtM:
  Direct data exchange between IO modules (**M**odule-**t**o-**M**odule communication)
- Oversampling:
  n-fold acquisition or output of digital and analog signals within a PN cycle
- Adaptation of measuring range:
  increased resolution by adapting the measuring range to a limited section of a measuring range supported by the analog input module
- Scaling of measured values:
  permits the transmission of the analog value normalized to the required physical value as a REAL value (32-bit floating point)

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Overview (continued)

Communication standards

- PROFINET IO
- PROFIBUS DP V0/V1
- ET connection for connecting the ET 200AL (IP67)
- IO-Link V1.1
- AS-Interface
- Modbus TCP
- Point-to-point (RS 232, RS 485, RS 422)
- Freeport
- 3964(R)
- USS
- Modbus RTU (master/slave)

CPU

- PROFINET connection with 3 ports
- IO controller and PN IO device
- Optional expansion as DP master/slave
- Also as fail-safe version and Open Controller

Labeling of I/O modules

- Meaningful labeling on the front of the I/O modules
  - Module type in plain text including function class, e.g. "DI 8x24VDC HF"
  - Article No.
  - 2D matrix code with article and serial number (with call via the "Industry Online Support" app, direct link to the support page of the module)
  - Hardware functional status and firmware version
  - Suitable BU type for the respective I/O module
  - Color code of the suitable color-coding plate
  - Connection diagram
- Optionally expandable with
  - Labeling strips
  - Equipment labeling plate

Overview of ET 200SP components

Basic components	Function
CPU	The CPU: • executes the user program • is used as IO controller, I-device on PROFINET IO, or as stand-alone CPU • connects the ET 200SP with the IO devices or the IO controller • exchanges data with the I/O modules via the backplane bus Further functions of the CPU: • Communication via PROFIBUS DP (in combination with the CM DP communication module, the CPU can be used as DP master or slave) • Integrated web server • Integrated technology • Integrated trace functionality • Integrated system diagnostics • Integrated safety
Open Controller	As the first controller of this type, the SIMATIC ET 200SP Open Controller combines the functions of a PC-based software controller with visualization, PC applications and central I/Os (inputs/outputs) in a single, compact device. • All in one • High system availability • Compact and modular • Rugged • User-friendly design • Efficient engineering in the TIA Portal

Basic components	Function
Interface modules for PROFINET IO (IM 155-6PN)	The interface module: • is used as IO device on the PROFINET IO • connects the ET 200SP with the IO controller • exchanges data with the I/O modules via the backplane bus
Interface module for PROFIBUS DP (IM 155-6DP)	The interface module: • is used as DP slave on the PROFIBUS DP • connects the ET 200SP with the DP master • exchanges data with the I/O modules via the backplane bus
SIMATIC BusAdapter (BA)	SIMATIC BusAdapters permit the free selection of the connection method and connection technology for head-end stations with PROFINET interface. Various versions are available for the connection of copper cables or plastic and glass fiber-optic cables. Hybrid copper/fiber-optic versions are also available as integrated media converters. Cable length between 2 stations: max.100 m (Cu), max. 50 m (POF), max. 100 m (PCF), max. 3 km (multi-mode glass FOC). For expanding the station with the I/O system ET 200AL via ET connection, the BA-Send BusAdapter is available.

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Overview (continued)

Basic components	Function
BaseUnit (BU)	The BaseUnits provide the electrical and mechanical connection for the ET 200SP components. • Light BaseUnits permit a new potential group up to max. 10 A • Dark BaseUnits forward the self-assembling voltage busbars P1, P2 and AUX from the left to the right BaseUnit • Suitable BaseUnits with 12 to 28 terminals are available for different connection systems (single or direct multi-conductor connection) and functions • The I/O module is plugged onto the desired BaseUnit and determines the potential assignment of the terminals on the BaseUnit • For expanding the station with the I/O systems ET 200AL via ET connection, the BaseUnit BU-Send is available
Potential distributor modules (PotDis BU, PotDis TB)	With the potential distributor modules for the SIMATIC ET 200SP, additional potentials required within an ET 200SP station can be set up quickly and in a space-saving manner. Due to the free combinability of PotDis BUs and PotDis TBs, the potential distributor modules allow a variety of design variants and thus simple adaptation to individual needs. Within the station, existing potentials can be multiplied or even new potential groups can be formed. With 36 terminals per 15 mm width, the PotDis modules require very little space without compromising on the conductor cross-sections (maximum 2.5 mm^2). They allow the connection of voltages up to 48 V DC with a maximum current carrying capacity of 10 A, and with the PotDis TB-BR-W even up to 230 V AC/10 A as well as the possibility to connect a protective conductor.
I/O modules and fail-safe I/O modules	The I/O module determines the function at the terminals. The controller detects the current process state via the connected sensors and triggers corresponding responses via the connected actuators. Some I/O modules feature extended functions, in part they are also designed as individual operating mode. I/O modules are divided into the following module types; the fail-safe versions are identified by a preceding 'F-' and a yellow module enclosure. • DI (digital input) • DQ (digital output) • AI (analog input) • AQ (analog output) • TM (technology modules) • CM (communication modules) • SM (special modules)

Basic components	Function
Protective cover (BU cover)	The ET 200SP system can be operated with any number of slot gaps (BU slot without I/O module). Applications for this include: • partial commissioning • prewired, and currently unequipped options To protect against damage, such slot gaps must be covered by a BU cover. Within the BU cover, an equipment labeling plate can be kept for the possible later use of an I/O module. Versions: • for BaseUnits with a width of 15 mm • for BaseUnits with a width of 20 mm
Server module	The server module concludes the setup of an ET 200SP station. On the server module there are holders for 3 spare fuses (5 × 20 mm). The server module is included in the scope of supply of all head-end stations.
Standard rail according to EN 60715	The standard rail is the module support of the ET 200SP. The ET 200SP is mounted on the standard rail.
Coding element	When plugging an I/O module onto a BaseUnit for the first time, the coding element moves from the I/O module to the BaseUnit. There it prevents the destruction of the ET 200SP components in the event of a subsequent module replacement with incorrectly selected I/O module. The coding element is available in two versions: • Mechanical coding element • Electronic coding element: additionally features an electronic, re-writable memory for the redundant storage of module-specific configuration data (e.g. F target address for fail-safe modules, parameter data for IO-Link master). Thus these data are automatically backed up during a module replacement
System-integrated shield connection	The shield connection permits the connection of cable shields. Compared to external shield supports, the system offers the following advantages: • Quick installation without tools by plugging the shield connection element onto the BaseUnit • Automatic low-impedance connection to the functional ground (mounting rail) • Optimized EMC properties by separating the supply voltage lines from the signal cables by means of the shield connection element and short, unshielded cable lengths • Low space requirements

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Overview (continued)

Basic components	Function
Labeling strips	Optionally, for system-specific marking the head-end stations and I/O modules can be equipped with labeling strips (13 x 31 mm). The labeling strips can be inscribed mechanically. Labeling strips are available in two versions in the colors light gray and yellow: • 500 strips on the roll, for printing on thermal-transfer printers. Core diameter 40 mm, external diameter 70 mm, width 62 mm • 10 DIN A4 sheets with 100 strips each, card 180 g/mm^2, perforated, for printing with a laser printer direct from TIA Portal or via print templates
Equipment labeling plate	Optionally, one equipment labeling plate each can be plugged onto head-end stations, BusAdapters, BaseUnits, potential distributor modules (PotDis BU and PotDis TB), and I/O modules. Equipment labeling plates are supplied in packs of 10 sheets with 16 labels each. The labels can be printed with thermal-transfer card printers or plotters, or stickers can be attached to them. Advantages compared to labels that are attached directly: • The inscription on the front is not covered • Simple label replacement when replacing a module • No parallax errors when marking the BaseUnits on the mounting plate The size of the inscribable area of the labels is 14.8 x 10.5 mm (W x H)

Basic components	Function
Color-coded labels	The I/O modules that are plugged onto the BaseUnits determine the potentials connected at the push-in terminals. The +/- potentials can optionally be identified using module-specific color-coded labels. The potentials of the AUX and add-on terminals as well as potential distributor modules can also be marked using color-coded labels. Color-coded labels are supplied in packs of 10 or 50 labels. Advantages of the color-coded labels: • Quick installation (one label for marking up to 16 terminals) • Avoidance of wiring errors • Simple detection of potentials during servicing

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Overview



Thanks to their wide scope of functions, the interface modules of the scalable SIMATIC ET 200SP I/O system, even in their basic versions, cover a wide range of applications. The basic functions of the interface modules include:

- Short data update times of typically 1 ms
- Single Hot Swap (withdrawing and insertion of an I/O module during operation without impairing the communication with the remaining modules)
- Operation with gaps (empty BaseUnits)
- Complete diagnostic support, extending to channel-by-channel diagnostics
- Configuration control / option handling (adaptation of the actual configuration via user software)
- Device replacement without PG, with automatic re-initialization, with and without topological configuring
- I&M data 0 to 3 (electronic rating plate with non-volatile storage of plant data)
- Firmware update
- Pluggable 24 V DC supply connection
- Mains/voltage failure buffering time of at least 5 ms or 10 ms
- Labeling option via optional labeling strips and equipment labeling plates

When using PROFINET interface modules, the following basic functions are also included:

- Media redundancy (MRP)
- Integrated 2-port switch
- Freely selectable connection system (Standard function class and above) and physical connection (High Feature function class and above) by means of SIMATIC BusAdapters, also as system-integrated media converter from fiber-optic to copper cable
- Reset button for simple return to factory settings without the need for programming device
- Automatic synchronization of the backplane bus to the PROFINET cycle to minimize the response time fluctuations (jitter)

Listed below is a short overview of the interface modules available for the ET 200SP, showing the essential differences. An up-to-date, clear and more precise comparison of functions of the different interface modules is offered by the TIA Selection Tool.

SIMATIC IM155-6DP High Feature with PROFIBUS connection

- Max. 32 I/O modules, also PROFIsafe modules with complete diagnostic support.
- Expansion option with max. 16 modules from the ET 200AL series using the BU-Send BaseUnit and the BA-Send BusAdapter
- Max. 244 bytes in each case for input and output data per module and per station
- Data update time: typ. 5 ms
- PROFIBUS connection via 9-pin sub D socket
- Package includes server module and PROFIBUS connector with programming device socket

SIMATIC IM155-6PN Basic with PROFINET access

- Max. 12 I/O modules, no PROFIsafe modules, with complete diagnostic support
- Max. 32 bytes in each case for input and output data per module and per station
- Data update time: typ.1 ms
- PROFINET connection via 2 integrated RJ45 sockets (integrated 2-port switch)
- Package includes server module

SIMATIC IM 155-6PN Standard with a PROFINET interface for SIMATIC BusAdapters

- Two types of delivery:
  - As package with IM155-6PN ST, with pre-assembled BA 2xRJ45 BusAdapter, including server module
  - As package with IM155-6PN ST, without BusAdapter, including server module
- Max. 32 I/O modules, also PROFIsafe modules, with complete diagnostic support
- Expansion option with max. 16 modules from the ET 200AL series using the BU-Send BaseUnit and the BA-Send BusAdapter
- Max. 256 bytes in each case for input and output data per module and max. 512 bytes per station (depending on configuration)
- Data update time: typ.1 ms
- Selection of the type of connection of the PROFINET by means of SIMATIC BusAdapter (BusAdapter for copper cables only)

SIMATIC IM155-6PN/2 High Feature, 2-port IM with one slot for SIMATIC BusAdapter

- Max. 64 I/O modules, also PROFIsafe modules, with complete diagnostic support
- Expansion option with max. 16 modules from the ET 200AL series using the BU-Send BaseUnit and the BA-Send BusAdapter
- Max. 288 bytes in each case for input and output data per module and max. 1440 bytes per station (depending on configuration)
- Fast data refresh time from 250 µs, also in isochronous mode
- S2 system redundancy
- Choice of connection type and physical connection of the PROFINET by means of SIMATIC BusAdapter. All BusAdapters with a connection for copper and/or fiber-optic cables can be used; BusAdapter must be ordered separately
- Package includes server module

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Overview (continued)

SIMATIC IM155-6PN/3 High Feature, 3-port IM with two slots for SIMATIC BusAdapter

Additional functions compared to 2-port High Feature IM:

- Second slot for SIMATIC BusAdapter, max. 3 ports can be used
- Local IO data coupling between up to 4 controllers

SIMATIC IM 155-6PN High Speed with a PROFINET interface for SIMATIC BusAdapters

- Max. 30 I/O modules, also PROFIsafe modules, with complete diagnostic support
- Max. 32 bytes in each case for input and output data per module and max. 968 bytes per station (depending on configuration)
- Fast refresh data time: from 125 µs, even in isochronous mode
- Performance upgrade for PROFINET
- Choice of connection type and physical connection of the PROFINET by means of SIMATIC BusAdapter. All BusAdapters with a connection for copper and/or fiber-optic cables can be used; BusAdapter must be ordered separately
- Package includes server module

Technical specifications

Article number	**6ES7155-6AR00-0AN0**	**6ES7155-6AA01-0BN0**	**6ES7155-6AU01-0BN0**
	ET 200SP, IM155-6PN Basic	ET 200SP, IM155-6PN ST incl. BA 2xRJ45	ET 200SP, IM155-6PN ST
General information			
Product type designation	IM 155-6 PN BA	IM 155-6 PN ST	IM 155-6 PN ST
Product function			
• I&M data	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3
• Module swapping during operation (hot swapping)	Yes; Single hot swapping	Yes; Single hot swapping	Yes; Single hot swapping
Engineering with			
• STEP 7 TIA Portal configurable/ integrated as of version	V13 SP1	V14	V14
• STEP 7 configurable/integrated as of version	V5.5 SP4 and higher	V5.5 SP4 and higher	V5.5 SP4 and higher
• PROFINET as of GSD version/ GSD revision	V2.3 / -	V2.3 / -	V2.3 / -
Supply voltage			
Rated value (DC)	24 V	24 V	24 V
Reverse polarity protection	Yes	Yes	Yes
Short-circuit protection		Yes	Yes
Input current			
Current consumption (rated value)		450 mA	450 mA
Power loss			
Power loss, typ.	1.8 W	1.9 W	1.9 W
Address area			
Address space per station			
• Address space per station, max.	32 byte; per input / output	512 byte; Dependent on configuration	512 byte; Dependent on configuration
Hardware configuration			
Rack			
• Modules per rack, max.	12	32; + 16 ET 200AL modules	32; + 16 ET 200AL modules
Submodules			
• Number of submodules per station, max.		256	256
Interfaces			
Number of PROFINET interfaces	1; 2 ports (switch)	1; 2 ports (switch)	1; 2 ports (switch)
1. Interface			
Interface types			
• Number of ports	2	2	2
• integrated switch	Yes	Yes	Yes
• RJ 45 (Ethernet)	Yes; 2 integrated RJ45 ports	Yes; Pre-assembled BusAdapter BA 2x RJ45	
• BusAdapter (PROFINET)	No	Yes; Applicable BusAdapter: BA 2x RJ45, BA 2x FC	Yes; Applicable BusAdapter: BA 2x RJ45, BA 2x FC

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Technical specifications (continued)

Article number	**6ES7155-6AR00-0AN0** ET 200SP, IM155-6PN Basic	**6ES7155-6AA01-0BN0** ET 200SP, IM155-6PN ST incl. BA 2xRJ45	**6ES7155-6AU01-0BN0** ET 200SP, IM155-6PN ST
Protocols			
• PROFINET IO Device	Yes	Yes	Yes
• Open IE communication	Yes	Yes	Yes
• Media redundancy	Yes; PROFINET MRP	Yes; PROFINET MRP	Yes; PROFINET MRP
Interface types			
RJ 45 (Ethernet)			
• Transmission procedure	PROFINET with 100 Mbit/s full duplex (100BASE-TX)	PROFINET with 100 Mbit/s full duplex (100BASE-TX)	PROFINET with 100 Mbit/s full duplex (100BASE-TX)
• 10 Mbps	No	Yes; for Ethernet services	Yes; for Ethernet services
• 100 Mbps	Yes; PROFINET with 100 Mbit/s full duplex (100BASE-TX)	Yes; PROFINET with 100 Mbit/s full duplex (100BASE-TX)	Yes; PROFINET with 100 Mbit/s full duplex (100BASE-TX)
• Autonegotiation	Yes	Yes	Yes
• Autocrossing	Yes	Yes	Yes
Protocols			
PROFINET IO Device			
Services			
- Isochronous mode	No	No	No
- Open IE communication	Yes	Yes	Yes
- IRT	No	Yes; with send cycles of between 250 µs and 4 ms in increments of 125 µs	Yes; with send cycles of between 250 µs and 4 ms in increments of 125 µs
- PROFIenergy	No	Yes	Yes
- Prioritized startup	No	Yes	Yes
- Shared device	No	Yes	Yes
- Number of IO Controllers with shared device, max.		2	2
Redundancy mode			
• MRP	Yes	Yes	Yes
• MRPD	No	No	No
• PROFINET system redundancy (S2)	No	No	No
Open IE communication			
• TCP/IP	Yes	Yes	Yes
• SNMP	Yes	Yes	Yes
• LLDP	Yes	Yes	Yes
Isochronous mode			
Isochronous operation (application synchronized up to terminal)	No	No	No
Equidistance	No		
Interrupts/diagnostics/ status information			
Status indicator	Yes	Yes	Yes
Alarms	Yes	Yes	Yes
Diagnostics function	Yes	Yes	Yes
Diagnostics indication LED			
• RUN LED	Yes; Green LED	Yes; Green LED	Yes; Green LED
• ERROR LED	Yes; Red LED	Yes; Red LED	Yes; Red LED
• MAINT LED	Yes; yellow LED	Yes; yellow LED	Yes; yellow LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED
• Connection display LINK TX/RX	Yes; 2x green LED		
• Connection to network LINK (green)		Yes; 2x green link LEDs on BusAdapter	Yes; 2x green link LEDs on BusAdapter
Standards, approvals, certificates			
Network loading class	2	2	2
Security level		According to Security Level 1 Test Cases V1.1.1	According to Security Level 1 Test Cases V1.1.1

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Technical specifications (continued)

Article number	**6ES7155-6AR00-0AN0**	**6ES7155-6AA01-0BN0**	**6ES7155-6AU01-0BN0**
	ET 200SP, IM155-6PN Basic	ET 200SP, IM155-6PN ST incl. BA 2xRJ45	ET 200SP, IM155-6PN ST
Ambient conditions			
Ambient temperature during operation			
• horizontal installation, min.	0 °C	0 °C	0 °C
• horizontal installation, max.	60 °C	60 °C	60 °C
• vertical installation, min.	0 °C	0 °C	0 °C
• vertical installation, max.	50 °C	50 °C	50 °C
Dimensions			
Width	35 mm	50 mm	50 mm
Height	117 mm	117 mm	117 mm
Depth	74 mm	74 mm	74 mm
Weights			
Weight, approx.	125 g	190 g; IM 155-6 PN BA with 2x RJ45 ports and server module	147 g; without BusAdapter

Article number	**6ES7155-6AU01-0CN0**	**6ES7155-6AU30-0CN0**	**6ES7155-6AU00-0DN0**	**6ES7155-6BA01-0CN0**
	ET 200SP, IM155-6PN/2 HF	ET 200SP, IM155-6PN/3 HF	ET 200SP, IM155-6PN HS	ET 200SP, IM155-6DP HF incl. DP-Connect.
General information				
Product type designation	IM 155-6 PN/2 HF with server module	IM 155-6 PN/3 HF with server module	IM 155-6 PN HS	IM 155-6DP HF with PROFIBUS connector and server module
Number of MtM communication relationships/connections, max.	16	16		
Product function				
• I&M data	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3
• Module swapping during operation (hot swapping)	Yes; Multi-hot swapping	Yes; Multi-hot swapping	Yes; Multi-hot swapping	Yes; Multi-hot swapping
• Tool changer	Yes; Docking station and docking unit	Yes; Docking station and docking unit		
• Local coupling, IO data	No	Yes		
- Number of coupling modules		16		
- Number of coupling submodules per module		4		
• Local coupling, data records	No	No		
Engineering with				
• STEP 7 TIA Portal configurable/ integrated as of version	STEP 7 V15.1 or higher	V15.1	STEP 7 V14 or higher	V15 SP1
• STEP 7 configurable/integrated as of version	Configurable via GSD file	Configurable via GSD file	V5.5 SP4 and higher	As of V5.5 SP4, only up to FW V3.1
• PROFIBUS as of GSD version/ GSD revision				One GSD file each, Revision 3 and 5 and higher
• PROFINET as of GSD version/ GSD revision	GSDML V2.3	GSDML V2.3	- / V2.3	
Supply voltage				
Rated value (DC)	24 V	24 V	24 V	24 V
Reverse polarity protection	Yes	Yes	Yes	Yes
Input current				
Current consumption (rated value)		175 mA; At 24 V, 2 slots 2x RJ45 BusAdapter, no I/O modules		
Power loss				
Power loss, typ.	2.4 W	4.9 W	1.7 W	1.5 W
Address area				
Address space per station				
• Address space per station, max.	1 440 byte; Dependent on configuration	1 440 byte; Dependent on configuration	968 byte; For input and output data respectively	244 byte; per input / output
Hardware configuration				
Rack				
• Modules per rack, max.	64; + 16 ET 200AL modules	64; + 16 ET 200AL modules	30	32; + 16 ET 200AL modules
Submodules				
• Number of submodules per station, max.	256	256	125	

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Technical specifications (continued)

Article number	6ES7155-6AU01-0CN0 ET 200SP, IM155-6PN/2 HF	6ES7155-6AU30-0CN0 ET 200SP, IM155-6PN/3 HF	6ES7155-6AU00-0DN0 ET 200SP, IM155-6PN HS	6ES7155-6BA01-0CN0 ET 200SP, IM155-6DP HF incl. DP-Connect.
Time stamping				
Accuracy	10 ms			
Interfaces				
Number of PROFINET interfaces	1; 2 ports (switch)	1; 3 ports (switch)	1; 2 ports (switch)	
Number of PROFIBUS interfaces				1
1. Interface				
Interface types				
• Number of ports	2; via BusAdapter	3; Via 2 BusAdapter slots	2	
• integrated switch	Yes	Yes	Yes	
• RS 485				Yes
• BusAdapter (PROFINET)	Yes; Compatible BusAdapter: BA 2x RJ45, BA 2x FC, BA 2x SCRJ, BA SCRJ / RJ45, BA SCRJ / FC, BA 2x LC, BA LC / RJ45, BA LC / FC	Yes; Compatible BusAdapter: BA 2x RJ45, BA 2x FC, BA 2x SCRJ, BA SCRJ / RJ45, BA SCRJ / FC, BA 2x LC, BA LC / RJ45, BA LC / FC	Yes; Compatible BusAdapter: BA 2x RJ45, BA 2x FC, BA 2x SCRJ, BA SCRJ / RJ45, BA SCRJ / FC, BA 2x LC, BA LC / RJ45, BA LC / FC	
• Output current of the interface, max.				90 mA
Protocols				
• PROFINET IO Device	Yes	Yes	Yes	
• PROFIBUS DP slave				Yes
• Open IE communication	Yes	Yes	Yes	
• Media redundancy	Yes; PROFINET MRP	Yes; PROFINET MRP	Yes; As MRP or MRPD client; max. 50 or 30 devices in the ring	
Interface types				
RJ 45 (Ethernet)				
• Transmission procedure	PROFINET with 100 Mbit/s full duplex (100BASE-TX)	PROFINET with 100 Mbit/s full duplex (100BASE-TX)	PROFINET with 100 Mbit/s full duplex (100BASE-TX)	
• 10 Mbps	No	No	No	
• 100 Mbps	Yes; PROFINET with 100 Mbit/s full duplex (100BASE-TX)	Yes; PROFINET with 100 Mbit/s full duplex (100BASE-TX)	Yes; PROFINET with 100 Mbit/s full duplex (100BASE-TX)	
• Autonegotiation	Yes	Yes	Yes	
• Autocrossing	Yes	Yes	Yes	
RS 485				
• Transmission rate, max.				12 Mbit/s
Protocols				
PROFINET IO Device				
Services				
- Isochronous mode	Yes; Bus cycle time: min. 250 µs	Yes; Bus cycle time: min. 250 µs	Yes; Bus cycle time: min. 125 µs	
- Open IE communication	Yes	Yes	Yes	
- IRT	Yes; 250 µs, 500 µs, 1 ms, 2 ms, 4 ms additionally with IRT with high performance: 250 µs to 4 ms in 125 µs frame	Yes; 250 µs, 500 µs, 1 ms, 2 ms, 4 ms additionally with IRT with high performance: 250 µs to 4 ms in 125 µs frame	Yes; 125 µs, 250 µs, 500 µs, 1 ms, 2 ms, 4 ms additionally with IRT with high performance: 250 µs to 4 ms in 125 µs frame	
- PROFIenergy	Yes	Yes	Yes	
- Prioritized startup	Yes	Yes	Yes	
- Shared device	Yes	Yes	Yes	
- Number of IO Controllers with shared device, max.	4	4	4	

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Technical specifications (continued)

Article number	**6ES7155-6AU01-0CN0** ET 200SP, IM155-6PN/2 HF	**6ES7155-6AU30-0CN0** ET 200SP, IM155-6PN/3 HF	**6ES7155-6AU00-0DN0** ET 200SP, IM155-6PN HS	**6ES7155-6BA01-0CN0** ET 200SP, IM155-6DP HF incl. DP-Connect.
Redundancy mode				
• MRP	Yes	Yes	Yes	
• MRPD	No	No	Yes	
• PROFINET system redundancy (S2)	Yes; NAP S2	Yes; NAP S2	No	
• Redundant PROFINET configuration (R1)	No	No		
• H-Sync forwarding	Yes	Yes		
Open IE communication				
• TCP/IP	Yes	Yes	Yes	
• SNMP	Yes	Yes	Yes	
• LLDP	Yes	Yes	Yes	
PROFIBUS DP				
Services				
- SYNC capability				Yes
- FREEZE capability				Yes
- DPV0				Yes
- DPV1				Yes
Isochronous mode				
Isochronous operation (application synchronized up to terminal)	Yes	Yes	Yes	No
Equidistance	Yes	Yes	Yes	
shortest clock pulse	250 µs	250 µs	125 µs	
max. cycle	4 ms	4 ms	4 ms	
Bus cycle time (TDP), min.	250 µs	250 µs	125 µs	
Interrupts/diagnostics/ status information				
Status indicator	Yes	Yes	Yes	Yes
Alarms	Yes	Yes	Yes	Yes
Diagnostics function	Yes	Yes	Yes	Yes
Diagnostics indication LED				
• RUN LED	Yes; Green LED	Yes; Green LED	Yes; Green LED	Yes; Green LED
• ERROR LED	Yes; Red LED	Yes; Red LED	Yes; Red LED	Yes; Red LED
• MAINT LED	Yes; yellow LED	Yes; yellow LED	Yes; yellow LED	Yes; yellow LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED
• Connection display DP				Yes; Green DP LED
• Connection to network LINK (green)	Yes; 2x green link LEDs on BusAdapter	Yes; 2x green link LEDs on BusAdapter	Yes; 2x green link LEDs on BusAdapter	
Standards, approvals, certificates				
Network loading class	3	3	3	
Security level	According to Security Level 1 Test Cases V1.1.1	According to Security Level 1 Test Cases V1.1.1	According to Security Level 1 Test Cases V1.1.1	
Ambient conditions				
Ambient temperature during operation				
• horizontal installation, min.	-30 °C; No condensation	-30 °C; No condensation	0 °C	-25 °C
• horizontal installation, max.	60 °C	60 °C	60 °C	60 °C
• vertical installation, min.	-30 °C; No condensation	-30 °C; No condensation	0 °C	-25 °C
• vertical installation, max.	50 °C	50 °C	50 °C	50 °C
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.	2 000 m; On request: Installation altitudes greater than 2 000 m	2 000 m; On request: Installation altitudes greater than 2 000 m		2 000 m; On request: Installation altitudes greater than 2 000 m
Mechanics/material				
Strain relief	Yes; Optional	Yes; Optional		
Dimensions				
Width	50 mm	100 mm	50 mm	50 mm
Height	117 mm	117 mm	117 mm	117 mm
Depth	74 mm	74 mm	74 mm	74 mm
Weights				
Weight, approx.	120 g; without BusAdapter	220 g; without BusAdapter	147 g; without BusAdapter	150 g

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Ordering data	Article No.
IM155-6PN Basic PROFINET interface module With server module; two integrated RJ45 sockets	**6ES7155-6AR00-0AN0**
IM155-6PN Basic PROFINET interface module With server module	
• With attached SIMATIC BA 2xRJ45 BusAdapter	**6ES7155-6AA01-0BN0**
• Without SIMATIC BusAdapter	**6ES7155-6AU01-0BN0**
IM155-6PN/2 High Feature PROFINET interface module 2-port IM with server module, without SIMATIC BusAdapter	**6ES7155-6AU01-0CN0**
IM155-6PN/3 High Feature PROFINET interface module 3-port IM with server module, without SIMATIC BusAdapter	**6ES7155-6AU30-0CN0**
IM155-6PN High Speed PROFINET interface module With server module, without SIMATIC BusAdapter	**6ES7155-6AU00-0DN0**
IM155-6DP High Feature PROFIBUS interface module With server module, with PROFIBUS plug with PG socket	**6ES7155-6BA01-0CN0**
Accessories	
Strain relief for the PROFINET cable System-integrated strain relief for High Feature PN interface modules (5 units)	**6ES7193-6RA00-1AN0**
SIMATIC BA 2xRJ45 BusAdapter For PROFINET interface modules, standard function class or above; max. cable length 50 m	**6ES7193-6AR00-0AA0**
SIMATIC BA 2xFC BusAdapter For PROFINET interface modules, standard function class or above; for increased vibration and EMC loads; max. cable length 50 m	**6ES7193-6AF00-0AA0**
SIMATIC BA 2xSCRJ BusAdapter For PROFINET interface modules from High Feature function class or above; fiber-optic cable connection for POF or PCF; for increased vibration and EMC load capacity; max. cable length 50 m (POF) or 100 m (PCF)	**6ES7193-6AP00-0AA0**
SIMATIC BA SCRJ/RJ45 BusAdapter For PROFINET interface modules from High Feature function class or above; with media converter FOC-Cu; for increased vibration and EMC loads; max. cable length 50 m (POF, copper) or 100 m (PCF)	**6ES7193-6AP20-0AA0**
SIMATIC BA SCRJ/FC BusAdapter For PROFINET interface modules from High Feature function class or above; with media converter FOC-Cu; for increased vibration and EMC loads; max. cable length 50 m (POF, copper) or 100 m (PCF)	**6ES7193-6AP40-0AA0**
SIMATIC BA 2XLC BusAdapter For PROFINET interface modules from High Feature function class or above; with LC fiber-optic connection; for increased vibration and EMC load capacity; max. cable length 2 km	**6ES7193-6AG00-0AA0**
SIMATIC BA LC/RJ45 BusAdapter For PROFINET interface modules from High Feature function class or above; with media converter FOC-Cu; for increased vibration and EMC loads; max. cable length 2 km (glass) or 50 m (copper)	**6ES7193-6AG20-0AA0**
SIMATIC BA LC/FC BusAdapter For PROFINET interface modules from High Feature function class or above; with media converter FOC-Cu; for increased vibration and EMC loads; max. cable length 2 km (glass) or 50 m (copper)	**6ES7193-6AG40-0AA0**
Station expansion with IP67 I/O system ET 200AL	
ET 200SP BA-Send 1 x FC BusAdapter	**6ES7193-6AS00-0AA0**
BaseUnit BU-Send	**6ES7193-6BN00-0NE0**

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Ordering data	Article No.
Further accessories	
Labeling strips	
500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer	**6ES7193-6LR10-0AA0**
500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer	**6ES7193-6LR10-0AG0**
1000 labeling strips DIN A4, light gray, card, perforated, for inscription with laser printer	**6ES7193-6LA10-0AA0**
1000 labeling strips DIN A4, yellow, card, perforated, for inscription with laser printer	**6ES7193-6LA10-0AG0**
Equipment labeling plate	**6ES7193-6LF30-0AW0**
10 sheets of 16 labels, for printing with thermal transfer card printer or plotter	
Standard rail 35 mm	
Length: 483 mm for 19" cabinets	**6ES5710-8MA11**
Length: 530 mm for 600 mm cabinets	**6ES5710-8MA21**
Length: 830 mm for 900 mm cabinets	**6ES5710-8MA31**
Length: 2 m	**6ES5710-8MA41**
Manuals for ET 200SP distributed I/O system	
SIMATIC ET 200SP Manual Collection: PDF file with the following content: • Basic information System manual, product information, overview tables, correction information or manual supplements • Device-specific information Device manuals for the interface modules, PLC, OC and I/O modules, including fail-safe and motor starters • Comprehensive information Function manuals The Manual Collection can be downloaded from the Internet as a PDF file: https://support.industry.siemens.com/cs/ww/en/view/84133942	

	Article No.
SIMATIC Manual Collection	**6ES7998-8XC01-8YE0**
Electronic manuals on DVD, multi-language: LOGO!, SIMADYN, SIMATIC Bus Components, SIMATIC C7, SIMATIC Distributed I/O, SIMATIC HMI, SIMATIC sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	
SIMATIC Manual Collection update service for 1 year	**6ES7998-8XC01-8YE2**
Current "Manual Collection" DVD and the three subsequent updates	
Spare parts	
Server module	**6ES7193-6PA00-0AA0**
Terminates an ET 200SP station; included in the scope of supply of the interface modules	
Power supply connector for ET 200SP head-end stations (interface module, CPU and open controller)	
For connecting the 24 V DC supply voltage, push-in version; included in scope of supply of the head-end station	
with push-in terminals (10 units)	**6ES7193-4JB00-0AA0**
with screw-type terminals (10 units)	**6ES7193-4JB50-0AA0**

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Overview



- Interface module for linking the I/O modules to a higher-level controller with PROFINET or PROFIBUS
- Server module included in the scope of supply
- Station expansion with IP67 I/O system ET 200AL via ET-connection to BU-Send / BA-Send
- PROFINET bus connection
  - 2 ports for line configuration
  - PN connection selected via BusAdapter (ST, HF) Two integrated RJ45 sockets (BA)
- PROFIBUS bus connection
  - 9-pin sub D socket
  - PROFIBUS connector included in scope of supply
  - Hot swapping (module replacement during operation)
  - Startup and operation with gaps
  - Dynamic re-parameterization in RUN mode
  - Configuration control (option handling)
  - Pluggable 24 V DC supply connector
  - Electronically readable rating plate (I&M data)

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

Technical specifications

Article number	**6AG1155-6AA01-7BN0**	**6AG1155-6AU00-2CN0**	**6AG1155-6AU01-7BN0**	**6AG1155-6BA00-7CN0**
Based on	**6ES7155-6AA01-0BN0**	**6ES7155-6AU00-0CN0**	**6ES7155-6AU01-0BN0**	**6ES7155-6BA00-0CN0**
	SIPLUS ET 200SP IM155-6PN ST / BA	SIPLUS ET 200SP IM155-6PN HF	SIPLUS ET 200SP IM155-6PN ST	SIPLUS ET 200SP IM155-6DP HF
Ambient conditions				
Ambient temperature during operation				
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C
• horizontal installation, max.	70 °C; = Tmax	60 °C; = Tmax	70 °C; = Tmax	70 °C; = Tmax
• vertical installation, min.	-40 °C; = Tmin	-40 °C; = Tmin	-40 °C; = Tmin	-40 °C; = Tmin; Startup @ -25 °C
• vertical installation, max.	50 °C; = Tmax	50 °C; = Tmax	50 °C; = Tmax	50 °C; = Tmax
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity				
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance				
Coolants and lubricants				
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air

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Technical specifications (continued)

Article number	6AG1155-6AA01-7BN0	6AG1155-6AU00-2CN0	6AG1155-6AU01-7BN0	6AG1155-6BA00-7CN0
Based on	6ES7155-6AA01-0BN0	6ES7155-6AU00-0CN0	6ES7155-6AU01-0BN0	6ES7155-6BA00-0CN0
	SIPLUS ET 200SP IM155-6PN ST / BA	SIPLUS ET 200SP IM155-6PN HF	SIPLUS ET 200SP IM155-6PN ST	SIPLUS ET 200SP IM155-6DP HF
Use in stationary industrial systems				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
Use on ships/at sea				
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Remark				
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating				
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability	Yes; Class 2 for high availability	Yes; Class 2 for high availability	Yes; Class 2 for high availability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

Ordering data

	Article No.
SIPLUS PROFINET IM155-6PN Standard interface module	
(Extended temperature range and exposure to environmental substances)	
• IM 155-6PN ST, with server module and installed BA 2xRJ45 BusAdapter, plus extended power failure backup time	**6AG1155-6AA01-7BN0**
SIPLUS interface module High Feature	
(Extended temperature range and exposure to environmental substances)	
• IM 155-6DP HF, with server module, with multi-hot-swap, incl. PROFIBUS connector	**6AG1155-6BA00-7CN0**
• IM 155-6PN HF, incl. server module, without BusAdapter	**6AG1155-6AU00-2CN0**
• IM 155-6PN HF, including server module, without BusAdapter, plus extended power failure backup time	**6AG1155-6AU01-7BN0**

	Article No.
Accessories	See SIMATIC ET 200SP, IM 155-6 interface module, page 9/14

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Overview



- 4, 8 and 16-channel digital input (DI) modules
- Apart from the standard type of delivery in an individual package, selected I/O modules and BaseUnits are also available in a pack of 10 units. The pack of 10 units enables the amount of waste to be reduced considerably, as well as saving the time and cost of unpacking individual modules.

For different requirements, the digital input modules offer:

- Function classes Basic, Standard, High Feature and High Speed as well as fail-safe DI (see "Fail-safe I/O modules")
- BaseUnits for single or multiple-conductor connection with automatic slot coding
- Potential distributor modules for system-integrated expansion with additional potential terminals
- Individual system-integrated load group formation with self-assembling voltage distribution bars (a separate power module is no longer required for ET 200SP)

- Option of connecting sensors compliant with IEC 61131 type 1, 2 or 3 (module-dependent) for rated voltages of up to 24 V DC or 230 V AC
- PNP (sink input) and NPN (source input) versions
- Clear labeling on front of module
- LEDs for diagnostics, status, supply voltage and faults (e.g. wire break/short-circuit)
- Electronically readable and non-volatile writable rating plate (I&M data 0 to 3)
- Extended functions and additional operating modes in some cases
  - MSI operating mode (simultaneous reading of input data from as many as three other controllers)
  - Counting operating mode (multi-channel counter for pulse generators with 32-bit counting width and up to 10 kHz counting frequency)
  - Oversampling operating mode (n-fold equidistant acquisition of digital values within one PN cycle for increasing the time resolution for slow CPU cycles)
  - Parameterizable input delay time
  - Isochronous mode (simultaneous equidistant reading of all input channels)
  - Hardware interrupts
  - Pulse extension
  - Re-parameterization during operation
  - Firmware update
  - Diagnosis of wire break and short-circuit (on channel or module basis)
  - Value status (optional binary validity information of the input signal in the process image)
  - Supports the PROFIenergy profile
- Optional accessories
  - Labeling strips (film or card)
  - Equipment labeling plate
  - Color-coded label with module-specific CC code
  - Shielding terminal

A quick and clear comparison of the functions of the different DI modules is offered by the TIA Selection Tool.

Overview of digital input modules

Digital input	PU	Article No.	CC code	BU type
DI 16 x 24 V DC ST	1	6ES7131-6BH01-0BA0	CC00	A0
DI 16 x 24 V DC ST	10	6ES7131-6BH01-2BA0	CC00	A0
DI 8 x 24 V DC BA	1	6ES7131-6BF01-0AA0	CC01	A0
DI 8 x 24 V DC BA	10	6ES7131-6BF01-2AA0	CC01	A0
DI 8 x 24 V DC SRC BA	1	6ES7131-6BF61-0AA0	CC02	A0
DI 8 x 24 V DC ST	1	6ES7131-6BF01-0BA0	CC01	A0
DI 8 x 24 V DC ST	10	6ES7131-6BF01-2BA0	CC01	A0
DI 8 x 24 V DC HF	1	6ES7131-6BF00-0CA0	CC01	A0
DI 8 x 24 V DC HF	10	6ES7131-6BF00-2CA0	CC01	A0
DI 8 x NAMUR HF	1	6ES7131-6TF00-0CA0	CC01	A0
DI 8 x 24 V DC HS With three operating modes: • High-speed isochronous DI • 4 pulse counters, 32-bit, 10 kHz • Oversampling	1	6ES7131-6BF00-0DA0	CC01	A0
DI 4 x 120 ... 230 V AC ST	1	6ES7131-6FD01-0BB1	CC41	B1
DI 8 x 24 V AC ... 48 V UC	1	6ES7131-6CF00-0AU0	CC20	U0

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Overview (continued)

Overview of BaseUnits

BaseUnit	PU	Article No.	CC codes for push-in terminals	CC codes for AUX terminals
BU type A0 • New load group (light) • 16 push-in terminals • With 10 AUX terminals	1	6ES7193-6BP20-0DA0	CC00 to CC05	CC71 to CC73
BU type A0 • New load group (light) • 16 push-in terminals • With 10 AUX terminals	10	6ES7193-6BP20-2DA0	CC00 to CC05	CC71 to CC73
BU type A0 • New load group (light) • 16 push-in terminals • Without AUX terminals	1	6ES7193-6BP00-0DA0	CC00 to CC05	--
BU type A0 • New load group (light) • 16 push-in terminals • Without AUX terminals	10	6ES7193-6BP00-2DA0	CC00 to CC05	--
BU type A0 • Forwarding of load group (dark) • 16 push-in terminals • With 10 AUX terminals	1	6ES7193-6BP20-0BA0	CC00 to CC05	CC71 to CC73
BU type A0 • Forwarding of load group (dark) • 16 push-in terminals • With 10 AUX terminals	10	6ES7193-6BP20-2BA0	CC00 to CC05	CC71 to CC73
BU type A0 • Forwarding of load group (dark) • 16 push-in terminals • Without AUX terminals	1	6ES7193-6BP00-0BA0	CC00 to CC05	--
BU type A0 • Forwarding of load group (dark) • 16 push-in terminals • Without AUX terminals	10	6ES7193-6BP00-2BA0	CC00 to CC05	--
BU type B1 • Forwarding of load group (dark) • 12 push-in terminals • 2 x 2 (1L, 2L, 1N, 2N) direct infeed module • Without AUX terminals	1	6ES7193-6BP20-0BB1	CC41	--
BU type B1 • Forwarding of load group (dark) • 12 push-in terminals • 2 x 2 (1L, 2L, 1N, 2N) direct infeed module • Without AUX terminals	10	6ES7193-6BP20-2BB1	CC41	--
BU type U0 • New load group (light) • 16 push-in terminals • Without AUX terminals	1	6ES7193-6BP00-0DU0	CC00	--
BU type U0 • New load group (light) • 16 push-in terminals • Without AUX terminals	10	6ES7193-6BP00-2DU0	CC00	--
BU type U0 • Forwarding of load group (dark) • 16 push-in terminals • Without AUX terminals	1	6ES7193-6BP00-0BU0	CC00	--
BU type U0 • Forwarding of load group (dark) • 16 push-in terminals • Without AUX terminals	10	6ES7193-6BP00-2BU0	CC00	--

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Overview (continued)

Overview of potential distributor modules

Potential distribution module	PU	Article No.	CC codes for push-in terminals
PotDis BU Type P1 (light), 17x P1 potential, 1x P2 potential, for starting a new load group (max. 10 A)	1	6ES7193-6UP00-0DP1	CC00, CC62
PotDis BU Type P1 (dark), 17x P1 potential, 1x P2 potential, for continuing the load group	1	6ES7193-6UP00-0BP1	CC00, CC62
PotDis BU Type P2 (light), 1x P1 potential, 17x P2 potential, for starting a new load group (max. 10 A)	1	6ES7193-6UP00-0DP2	CC00, CC63
PotDis BU Type P2 (dark), 1x P1 potential, 17x P2 potential, for continuing the load group	1	6ES7193-6UP00-0BP2	CC00, CC63
PotDis TB Type BR-W, 18x internally jumpered terminals, without reference to P1, P2 or AUX, (total current max. 10 A)	1	6ES7193-6TP00-0TP0	CC10 to CC13
PotDis TB Type P1-R, 18x P1 potential, (total current max. 10 A)	1	6ES7193-6TP00-0TP1	CC10, CC12
PotDis TB Type P2-B, 18x P2 potential, (total current max. 10 A)	1	6ES7193-6TP00-0TP2	CC10, CC13
PotDis TB Type n.c.-G, 18x n.c. (not connected) terminals, without reference to P1, P2 or AUX	1	6ES7193-6TP00-0TN0	CC10

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Technical specifications

Article number	**6ES7131-6BF01-0AA0** ET 200SP, DI 8x 24V DC Basic, PU 1	**6ES7131-6BF61-0AA0** ET 200SP, DI 8x 24V DC SRC BA	**6ES7131-6BF01-0BA0** ET 200SP, DI 8x 24V DC ST, PU 1	**6ES7131-6BH01-0BA0** ET 200SP, DI 16x 24V DC ST, PU 1
General information				
Product type designation	DI 8x 24 V DC BA, PU 1	DI 8x24 VDC SRC BA	DI 8x24 VDC ST	DI 16x24VDC ST
Engineering with				
• STEP 7 TIA Portal configurable/ integrated as of version	V14	V14	V14	V14
• STEP 7 configurable/integrated as of version	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 or higher	V5.5 SP3
• PCS 7 configurable/integrated as of version			V8.1 SP1	V8.1 SP1
• PROFIBUS as of GSD version/ GSD revision	One GSD file each, Revision 3 and 5 and higher	One GSD file each, Revision 3 and 5 and higher	One GSD file each, Revision 3 and 5 and higher	One GSD file each, Revision 3 and 5 and higher
• PROFINET as of GSD version/ GSD revision	GSDML V2.3	GSDML V2.3	GSDML V2.3	GSDML V2.3
Operating mode				
• DI	Yes	Yes	Yes	Yes
• Counter	No	No	No	No
• Oversampling	No	No	No	No
• MSI	No	No	No	No

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Technical specifications (continued)

Article number	**6ES7131-6BF01-0AA0** ET 200SP, DI 8x 24V DC Basic, PU 1	**6ES7131-6BF61-0AA0** ET 200SP, DI 8x 24V DC SRC BA	**6ES7131-6BF01-0BA0** ET 200SP, DI 8x 24V DC ST, PU 1	**6ES7131-6BH01-0BA0** ET 200SP, DI 16x 24V DC ST, PU 1
Supply voltage				
Rated value (DC)	24 V	24 V	24 V	24 V
Reverse polarity protection	Yes	Yes	Yes	Yes
Encoder supply				
Number of outputs	8		8	
Short-circuit protection	Yes; per module	No	Yes; per module	
24 V encoder supply				
• 24 V	Yes		Yes	No
• Short-circuit protection	Yes		Yes	
• Output current, max.			700 mA	
• Output current per channel, max.	700 mA		700 mA	
• Output current per module, max.	700 mA		700 mA	
Digital inputs				
Number of digital inputs	8	8	8	16
Digital inputs, parameterizable	Yes	Yes	Yes	Yes
Source/sink input	P-reading	m-reading	P-reading	P-reading
Input characteristic curve in accordance with IEC 61131, type 1	Yes	Yes		
Input characteristic curve in accordance with IEC 61131, type 2	Yes			
Input characteristic curve in accordance with IEC 61131, type 3	Yes		Yes	Yes
Input voltage				
• Rated value (DC)	24 V	24 V	24 V	24 V
• for signal "0"	-30 to +5V	30 V to -5 V (reference potential is L+)	-30 to +5V	-30 to +5V
• for signal "1"	+11 to +30V	-11 V to -30 V (reference potential is L+)	+11 to +30V	+11 to +30V
Input current				
• for signal "1", typ.	6.8 mA	6 mA	2.5 mA	2.5 mA
Input delay (for rated value of input voltage)				
for standard inputs				
- parameterizable	Yes; 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms (in each case + delay of 30 to 500 µs, depending on line length)	Yes; 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms (in each case + delay of 30 to 500 µs, depending on line length)	Yes; 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms (in each case + delay of 30 to 500 µs, depending on line length)	Yes; 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms (in each case + delay of 30 to 500 µs, depending on line length)
Encoder				
Connectable encoders				
• 2-wire sensor	Yes	Yes	Yes	Yes
- permissible quiescent current (2-wire sensor), max.	2 mA	1.5 mA	1.5 mA	1.5 mA
Isochronous mode				
Isochronous operation (application synchronized up to terminal)	No	No	No	No
Interrupts/diagnostics/ status information				
Diagnostics function	Yes	Yes	Yes	Yes
Alarms				
• Diagnostic alarm	Yes	Yes	Yes	Yes
Diagnostic messages				
• Diagnostic information readable	Yes	Yes	Yes	Yes
• Monitoring the supply voltage	Yes	Yes	Yes	Yes
- parameterizable	Yes	Yes	Yes	Yes
• Monitoring of encoder power supply	No	No	Yes; Module-by-module, optional protective circuit for preventing wire-break diagnostics in the case of simple encoder contacts: 25 kOhm to 45 kOhm	No

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Technical specifications (continued)

Article number	6ES7131-6BF01-0AA0 ET 200SP, DI 8x 24V DC Basic, PU 1	6ES7131-6BF61-0AA0 ET 200SP, DI 8x 24V DC SRC BA	6ES7131-6BF01-0BA0 ET 200SP, DI 8x 24V DC ST, PU 1	6ES7131-6BH01-0BA0 ET 200SP, DI 16x 24V DC ST, PU 1
Diagnostic messages (cont.)				
• Wire-break	No	No	Yes; Module-wise	Yes; Module-by-module, optional protective circuit for preventing wire-break diagnostics in the case of simple encoder contacts: 25 kOhm to 45 kOhm
• Short-circuit	No	No	Yes; Module-wise	No
• Group error	Yes			Yes
Diagnostics indication LED				
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED
• Channel status display	Yes; Green LED	Yes; Green LED	Yes; Green LED	Yes; Green LED
• for channel diagnostics	No	No	No	No
• for module diagnostics	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED
Potential separation				
Potential separation channels				
• between the channels and backplane bus	Yes	Yes	Yes	Yes
Standards, approvals, certificates				
Suitable for safety functions		No		
Ambient conditions				
Ambient temperature during operation				
• horizontal installation, min.	-30 °C	-30 °C	-30 °C	-30 °C
• horizontal installation, max.	60 °C	60 °C	60 °C	60 °C
• vertical installation, min.	-30 °C	-30 °C	-30 °C	-30 °C
• vertical installation, max.	50 °C	50 °C	50 °C	50 °C
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.	2 000 m; On request: Installation altitudes greater than 2 000 m	2 000 m; On request: Installation altitudes greater than 2 000 m	2 000 m; On request: Installation altitudes greater than 2 000 m	2 000 m; On request: Installation altitudes greater than 2 000 m
Dimensions				
Width	15 mm	15 mm	15 mm	15 mm
Height	73 mm	73 mm	73 mm	73 mm
Depth	58 mm	58 mm	58 mm	58 mm
Weights				
Weight, approx.	28 g	28 g	28 g	28 g

Article number	6ES7131-6BF00-0CA0 ET 200SP, DI 8x24VDC HF, PU 1	6ES7131-6BF00-0DA0 ET 200SP, DI 8x24VDC High Speed	6ES7131-6TF00-0CA0 ET 200SP, DI 8xNAMUR HF	6ES7131-6FD01-0BB1 ET 200SP, DI 4x 120..230V AC ST	6ES7131-6CF00-0AU0 ET 200SP, DI 8x 24VAC..48VUC BA, PU 1
General information					
Product type designation	DI 8x24 V DC HF	DI 8x24 V DC HS	DI 8xNAMUR HF	DI 4x120 … 230 V AC ST	DI 8x24VAC/48VUC BA
Engineering with					
• STEP 7 TIA Portal configurable/ integrated as of version	V13 SP1 / -	V13 SP1	V13 / V13	V14	V15
• STEP 7 configurable/integrated as of version	V5.5 / -	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3	V5.6
• PCS 7 configurable/integrated as of version	V8.1 SP1				
• PROFIBUS as of GSD version/ GSD revision	One GSD file each, Revision 3 and 5 and higher	GSD Revision 5	GSD Revision 5	One GSD file each, Revision 3 and 5 and higher	One GSD file each, Revision 3 and 5 and higher
• PROFINET as of GSD version/ GSD revision	GSDML V2.3	GSDML V2.3	GSDML V2.3	GSDML V2.3	GSDML V2.3

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Technical specifications (continued)

Article number	**6ES7131-6BF00-0CA0**	**6ES7131-6BF00-0DA0**	**6ES7131-6TF00-0CA0**	**6ES7131-6FD01-0BB1**	**6ES7131-6CF00-0AU0**
	ET 200SP, DI 8x24VDC HF, PU 1	ET 200SP, DI 8x24VDC High Speed	ET 200SP, DI 8xNAMUR HF	ET 200SP, DI 4x 120..230V AC ST	ET 200SP, DI 8x 24VAC..48VUC BA, PU 1
Operating mode					
• DI	Yes	Yes	Yes	Yes	Yes
• Counter	No	Yes	No	No	No
• Oversampling	No	Yes	No	No	No
• MSI	Yes	No	No	No	No
Supply voltage					
Rated value (DC)	24 V	24 V	24 V		48 V
Rated value (AC)				230 V	48 V; 24 V/48 V; 50 Hz/60 Hz
Reverse polarity protection	Yes	Yes	Yes	No	Yes
Encoder supply					
Number of outputs	8		8	4	8
Short-circuit protection	Yes		Yes	No; when using BU type B1, a fuse with 10 A tripping current must be provided	Yes; Per module, 5x 20 mm fuse, 2 A/250 V, quick-response, replaceable
Output current					
• up to 60 °C, max.				10 A	1 A
24 V encoder supply					
• 24 V	Yes	Yes	No		No
• Short-circuit protection	Yes; per channel, electronic	Yes; per module, electronic	No		
• Output current, max.		700 mA			
• Output current per channel, max.	700 mA				
• Output current per module, max.	700 mA				
Digital inputs					
Number of digital inputs	8	8	8; NAMUR	4	8
Digital inputs, parameterizable	Yes		Yes		
Source/sink input	P-reading	P-reading			P-reading
Input characteristic curve in accordance with IEC 61131, type 1					Yes
Input characteristic curve in accordance with IEC 61131, type 2					No
Input characteristic curve in accordance with IEC 61131, type 3	Yes			Yes	No
Pulse extension	Yes; Pulse duration from 4 µs	Yes	Yes; 0.5 s, 1 s, 2 s		No
• Length	2 s; 50 ms, 100 ms, 200 ms, 500 ms, 1 s, 2 s	2 s; 50 ms, 100 ms, 200 ms, 500 ms, 1 s, 2 s			
Edge evaluation	Yes; rising edge, falling edge, edge change		Yes; rising edge, falling edge, edge change		
Signal change flutter			Yes; 2 to 32 signal changes		
Flutter observation window			Yes; 0.5 s, 1 s to 100 s in 1-s steps		
Digital input functions, parameterizable					
• Gate start/stop		Yes			
• Freely usable digital input		Yes			
• Counter		Yes			
• Digital input with oversampling		Yes			
Input voltage					
• Rated value (DC)	24 V	24 V	8.2 V		
• Rated value (AC)				230 V	
• for signal "0"	-30 to +5V	-30 to +5V		0V AC to 40V AC	AC/DC < 10 V
• for signal "1"	+11 to +30V	+11 to +30V		74 V AC to 264 V AC	AC > 14 V, DC > 34 V

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Technical specifications (continued)

Article number	6ES7131-6BF00-0CA0 ET 200SP, DI 8x24VDC HF, PU 1	6ES7131-6BF00-0DA0 ET 200SP, DI 8x24VDC High Speed	6ES7131-6TF00-0CA0 ET 200SP, DI 8xNAMUR HF	6ES7131-6FD01-0BB1 ET 200SP, DI 4x 120..230V AC ST	6ES7131-6CF00-0AU0 ET 200SP, DI 8x 24VAC..48VUC BA, PU 1
Input current					
• for signal "1", typ.	2.5 mA	6 mA		10.8 mA	3.5 mA
for 10 k switched contact					
- for signal "0"			0.35 to 1.2 mA		
- for signal "1"			2.1 to 7 mA		
for unswitched contact					
- for signal "0", max. (permissible quiescent current)			0.5 mA		
- for signal "1"			typ. 8 mA		
for NAMUR encoders					
- for signal "0"			0.35 to 1.2 mA		
- for signal "1"			2.1 to 7 mA		
Input delay (for rated value of input voltage)					
• tolerated changeover time for changeover contacts			300 ms		
for standard inputs					
- parameterizable	Yes; 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms (in each case + delay of 30 to 500 µs, depending on line length)	Yes; none / 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms	No	No	No
for interrupt inputs					
- parameterizable		Yes			
for technological functions					
- parameterizable		Yes			
Encoder					
Connectable encoders					
• NAMUR encoder/changeover contact according to EN 60947			Yes		
• Single contact / changeover contact unconnected			Yes		
• Single contact / changeover contact connected with 10 kΩ			Yes		
• 2-wire sensor	Yes	Yes		Yes	Yes
- permissible quiescent current (2-wire sensor), max.	1.5 mA	1.5 mA			
Isochronous mode					
Isochronous operation (application synchronized up to terminal)	Yes	Yes	No	No	No
Filtering and processing time (TCI), min.	420 µs				
Bus cycle time (TDP), min.	500 µs	125 µs			
Interrupts/diagnostics/ status information					
Diagnostics function	Yes	Yes	Yes		Yes
Alarms					
• Diagnostic alarm	Yes; channel by channel	Yes	Yes; channel by channel	No	Yes
• Hardware interrupt	Yes; Parameterizable, channels 0 to 7	Yes	Yes; Parameterizable, channels 0 to 7	No	

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Technical specifications (continued)

Article number	6ES7131-6BF00-0CA0 ET 200SP, DI 8x24VDC HF, PU 1	6ES7131-6BF00-0DA0 ET 200SP, DI 8x24VDC High Speed	6ES7131-6TF00-0CA0 ET 200SP, DI 8xNAMUR HF	6ES7131-6FD01-0BB1 ET 200SP, DI 4x 120..230V AC ST	6ES7131-6CF00-0AU0 ET 200SP, DI 8x 24VAC..48VUC BA, PU 1
Diagnostic messages					
• Diagnostic information readable	Yes	Yes	Yes		Yes
• Monitoring the supply voltage	Yes	Yes	Yes	No	Yes
- parameterizable	Yes	Yes	Yes		
• Monitoring of encoder power supply	Yes; channel by channel	Yes; Module-wise	No		Yes
• Wire-break	Yes; Channel by channel, optional protective circuit for preventing wire-break diagnostics in the case of simple encoder contacts: 25 kOhm to 45 kOhm	No	Yes; channel by channel	No	
• Short-circuit	Yes; channel by channel	Yes; Module-wise	Yes; channel by channel	No	
• Group error					Yes
Diagnostics indication LED					
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED
• Channel status display	Yes; Green LED	Yes; Green LED	Yes; Green LED	Yes; Green LED	Yes; Green LED
• for channel diagnostics	Yes; Red LED	No	Yes; Red LED	No	No
• for module diagnostics	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED
Potential separation					
Potential separation channels					
• between the channels and backplane bus	Yes	Yes	Yes	Yes	Yes
Standards, approvals, certificates					
Suitable for safety functions	No	No	No	No	No
Ambient conditions					
Ambient temperature during operation					
• horizontal installation, min.	-30 °C	-30 °C	-30 °C		-30 °C
• horizontal installation, max.	60 °C	60 °C	60 °C		60 °C
• vertical installation, min.	-30 °C	-30 °C	-30 °C		-30 °C
• vertical installation, max.	50 °C	50 °C	50 °C		50 °C
Altitude during operation relating to sea level					
• Installation altitude above sea level, max.	2 000 m; On request: Installation altitudes greater than 2 000 m	2 000 m; On request: Installation altitudes greater than 2 000 m	2 000 m; On request: Installation altitudes greater than 2 000 m		2 000 m; On request: Installation altitudes greater than 2 000 m
• Ambient air temperature-barometric pressure-altitude				On request: Ambient temperatures lower than 0 °C (without condensation) and/or installation altitudes greater than 2 000 m	
Dimensions					
Width	15 mm	15 mm	15 mm	20 mm	20 mm
Height	73 mm	73 mm	73 mm	73 mm	73 mm
Depth	58 mm	58 mm	58 mm	58 mm	58 mm
Weights					
Weight, approx.	28 g	28 g	32 g	36 g	40 g

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Ordering data	Article No.
Digital input modules	
Delivery options: Apart from the standard type of delivery in an individual package, selected I/O modules and BaseUnits are also available in a pack of 10 units. The pack of 10 units enables the amount of waste to be reduced considerably, as well as saving the time and cost of unpacking individual modules.	
The number of modules required is the number of modules ordered. The type of packaging is chosen by selecting the article number. Packs of 10 can therefore only be ordered in integer multiples of 10.	
Digital input module DI 8x24 V DC, Basic, BU type A0, color code CC01	
• PU: 1 unit	**6ES7131-6BF01-0AA0**
• PU: 10 units	**6ES7131-6BF01-2AA0**
Digital input module DI 8x24 V DC source input, Basic, BU type A0, color code CC02; PU: 1 unit	**6ES7131-6BF61-0AA0**
Digital input module DI 8x24 V DC Standard, BU type A0, color code CC01	
• PU: 1 unit	**6ES7131-6BF01-0BA0**
• PU: 10 units	**6ES7131-6BF01-2BA0**
Digital input module DI 16 x 24 V DC Standard, BU type A0, color code CC00	
• PU: 1 unit	**6ES7131-6BH01-0BA0**
• PU: 10 units	**6ES7131-6BH01-2BA0**
Digital input module DI 8x24 V DC High Feature, BU type A0, color code CC01, channel-specific diagnostics, isochronous mode, shared input (MSI); PU: 1 unit	
• PU: 1 unit	**6ES7131-6BF00-0CA0**
• PU: 10 units	**6ES7131-6BF00-2CA0**
Digital input module DI 8x24 V DC High Speed, BU type A0, color code CC01; 3 operating modes (fast isochronous DI, 4 pulse counters 32-bit 10 kHz, oversampling); PU: 1 unit	**6ES7131-6BF00-0DA0**
Digital input module DI 8xNAMUR High Feature, BU type A0, color code CC01; PU: 1 unit	**6ES7131-6TF00-0CA0**
Digital input module DI 4x120 V AC ... 230 V AC Standard, BU type B1, color code CC41; PU: 1 unit	**6ES7131-6FD01-0BB1**
Digital input module DI 8x24 V AC ... 48 V UC Basic, BU type U0, color code CC20, module diagnostics, PU: 1 unit	**6ES7131-6CF00-0AU0**

Suitable BaseUnits	Article No.
BU15-P16+A10+2D	
BU type A0; BaseUnit (light) with 16 push-in terminals (1 ... 16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)	
• 1 unit	**6ES7193-6BP20-0DA0**
• 10 units	**6ES7193-6BP20-2DA0**
BU15-P16+A0+2D	
BU type A0; BaseUnit (light) with 16 push-in terminals to the module; for starting a new load group (max. 10 A)	
• 1 unit	**6ES7193-6BP00-0DA0**
• 10 units	**6ES7193-6BP00-2DA0**
2BU15-P16+A0+2DB	
Double BaseUnit for holding 2 I/O modules; BU type A0; BaseUnit (light/dark) with 16 push-in terminals to the module; for starting a new load group (max. 10 A)	
• 1 unit	**6ES7193-6BP60-0DA0**
BU15-P16+A10+2B	
BU type A0; BaseUnit (dark) with 16 push-in terminals (1 ... 16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A) for continuing the load group	
• 1 unit	**6ES7193-6BP20-0BA0**
• 10 units	**6ES7193-6BP20-2BA0**
BU15-P16+A0+2B	
BU type A0; BaseUnit (dark) with 16 push-in terminals to the module; for continuing the load group	
• 1 unit	**6ES7193-6BP00-0BA0**
• 10 units	**6ES7193-6BP00-2BA0**
2BU15-P16+A0+2B	
Double BaseUnit for holding 2 I/O modules; BU type A0; BaseUnit (dark/dark) with 16 push-in terminals to the module; for continuing the load group	
• 1 unit	**6ES7193-6BP60-0BA0**
BU20-P12+A0+4B	
BU type B1; BaseUnit (dark) with 12 push-in terminals to the module; for continuing the load group; 1 unit	
• 1 unit	**6ES7193-6BP20-0BB1**
• 10 units	**6ES7193-6BP20-2BB1**
BU20-P16+A0+2D	
BU type U0; BaseUnit (light) with 16 push-in terminals to the module; for starting a new load group (max. 10 A)	
• 1 unit	**6ES7193-6BP00-0DU0**
• 10 units	**6ES7193-6BP00-2DU0**
BU20-P16+A0+2B	
BU type U0; BaseUnit (dark) with 16 push-in terminals to the module; for continuing the load group	
• 1 unit	**6ES7193-6BP00-0BU0**
• 10 units	**6ES7193-6BP00-2BU0**

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Ordering data	Article No.
Potential distributor modules	
PotDis BU	
PotDis BU, type P1 (light), 17x P1 potential, 1x P2 potential, for starting a new load group (max. 10 A)	**6ES7193-6UP00-0DP1**
PotDis BU, type P1 (dark), 17x P1 potential, 1x P2 potential, for continuing the load group	**6ES7193-6UP00-0BP1**
PotDis BU, type P2 (light), 1x P1 potential, 17x P2 potential, for starting a new load group (max. 10 A)	**6ES7193-6UP00-0DP2**
PotDis BU, type P2 (dark), 1x P1 potential, 17x P2 potential, for continuing the load group	**6ES7193-6UP00-0BP2**
PotDis TB	
PotDis TB, type BR-W, 18x internally jumpered terminals, without reference to P1, P2 or AUX, (total current max. 10 A)	**6ES7193-6TP00-0TP0**
PotDis TB, type P1-R, 18x P1 potential, (total current max. 10 A)	**6ES7193-6TP00-0TP1**
PotDis TB, type P2-B, 18x P2 potential, (total current max. 10 A)	**6ES7193-6TP00-0TP2**
PotDis TB, type n.c.-G, 18x n.c. (not connected) terminals, without reference to P1, P2 or AUX	**6ES7193-6TP00-0TN0**
Accessories	
Equipment labeling plate	**6ES7193-6LF30-0AW0**
10 sheets of 16 labels, for printing with thermal transfer card printer or plotter	
Labeling strips	
500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer	**6ES7193-6LR10-0AA0**
500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer	**6ES7193-6LR10-0AG0**
1000 labeling strips DIN A4, light gray, card, perforated, for inscription with laser printer	**6ES7193-6LA10-0AA0**
1000 labeling strips DIN A4, yellow, card, perforated, for inscription with laser printer	**6ES7193-6LA10-0AG0**
BU cover	
For covering empty slots (gaps); 5 units	
• 15 mm wide	**6ES7133-6CV15-1AM0**
• 20 mm wide	**6ES7133-6CV20-1AM0**
Shield connection	**6ES7193-6SC00-1AM0**
5 shield supports and 5 shield terminals	

	Article No.
Color-coded labels for 15 mm-wide BaseUnits	
Color code CC00, for 16 push-in terminals, BU type A0, A1, gray (terminals 1 to 8), red (terminals 9 to 16); 10 units	**6ES7193-6CP00-2MA0**
Color code CC01, for 16 push-in terminals, BU type A0, A1, gray (terminals 1 to 8), red (terminals 9 to 16); 10 units	**6ES7193-6CP01-2MA0**
Color code CC01, for 16 push-in terminals, BU type A0, A1, gray (terminals 1 to 8), red (terminals 9 to 16); 50 units	**6ES7193-6CP01-4MA0**
Color code CC02, for 16 push-in terminals, BU type A0, A1, gray (terminals 1 to 8), blue (terminals 9 to 16); 10 units	**6ES7193-6CP02-2MA0**
Color code CC02, for 16 push-in terminals, BU type A0, A1, gray (terminals 1 to 8), blue (terminals 9 to 16); 50 units	**6ES7193-6CP02-4MA0**
Color code CC71, for 10 AUX terminals, BU type A0, yellow/green (terminals 1 A to 10 A); 10 units	**6ES7193-6CP71-2AA0**
Color code CC72, for 10 AUX terminals, BU type A0, red (terminals 1 A to 10 A); 10 units	**6ES7193-6CP72-2AA0**
Color code CC73, for 10 AUX terminals, BU type A0, blue (terminals 1 A to 10 A); 10 units	**6ES7193-6CP73-2AA0**
Color code CC73, for 10 AUX terminals, BU type A0, blue (terminals 1 A to 10 A); 50 units	**6ES7193-6CP73-4AA0**
Color-coded labels for 20 mm-wide BaseUnits	
Color code CC41, for 16 push-in terminals; BU type B1, gray (terminals 1 to 4), red (terminals 5 to 8), blue (terminals 9 to 12); 10 units	**6ES7193-6CP41-2MB0**
Color-coded labels for PotDis BU	
Color code CC62, for 16 push-in terminals, PotDis BU type P1, red (terminals 1 to 16); 10 units	**6ES7193-6CP62-2MA0**
Color code CC63, for 16 push-in terminals, PotDis BU type P2, blue (terminals 1 to 16); 10 units	**6ES7193-6CP63-2MA0**
Color-coded labels for PotDis TB	
Color code CC10, for 18 push-in terminals, PotDis TB, gray (terminals 1 to 18); 10 units	**6ES7193-6CP10-2MT0**
Color code CC11, for 18 push-in terminals, PotDis TB, yellow-green (terminals 1 to 18); 10 units	**6ES7193-6CP11-2MT0**
Color code CC12, for 18 push-in terminals, PotDis TB, type P1 and BR, red (terminals 1 to 18); 10 units	**6ES7193-6CP12-2MT0**
Color code CC13, for 18 push-in terminals, PotDis TB, type P2 and BR, blue (terminals 1 to 18); 10 units	**6ES7193-6CP13-2MT0**

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Overview



- 4, 8 and 16-channel digital output (DQ) modules
- Apart from the standard type of delivery in an individual package, selected I/O modules and BaseUnits are also available in a pack of 10 units. The pack of 10 units enables the amount of waste to be reduced considerably, as well as saving the time and cost of unpacking individual modules.

For different requirements, the digital output modules offer:

- Function classes Basic, Standard, High Feature and High Speed as well as fail-safe DQ (see "Fail-safe I/O modules")
- BaseUnits for single or multiple-conductor connection with automatic slot coding
- Potential distributor modules for system-integrated expansion with potential terminals
- Individual system-integrated load group formation with self-assembling voltage distribution bars (a separate power module is no longer required for ET 200SP)
- Option of connecting actuators with rated load voltages of up to 120 V DC or 230 V AC and load currents of up to 5 A (depending on module)
- Relay modules
  - NO contact or changeover contact
  - for load or signal voltages (coupling relay)
  - with manual operation (as simulation module for inputs and outputs, jog mode for commissioning or emergency operation on failure of controller)
- PNP (source output) and NPN (sink output) versions
- Clear labeling on front of module
- LEDs for diagnostics, status, supply voltage and faults
- Electronically readable and non-volatile writable rating plate (I&M data 0 to 3)
- Extended functions and additional operating modes in some cases
  - MSO operating mode (simultaneous reading of input data from as many as three other controllers)
  - Pulse width modulation mode (output value as pulse-pause ratio of between 0.0% and 100.0% for controlling the output current)
  - Oversampling operating mode (n-fold equidistant output of digital values within a PN cycle for the precise time control of an output or a sequence of output values)
  - Isochronous mode (simultaneous equidistant output of all output channels)
  - Output of substitute value in the event of interruptions to communication (0, 1 or last value retained)
  - Re-parameterization during operation
  - Firmware update
  - Valve control (output signal does not switch automatically after a set pickup time to a current-saving PWM output)
  - Diagnosis of wire break and short-circuit (on channel or module basis)
  - Value status (optional binary validity information of the output signal in the process image)
  - Supports the PROFIenergy profile
- Optional accessories
  - Labeling strips (film or card)
  - Equipment labeling plate
  - Color-coded label with module-specific CC code
  - Shielding terminal

A quick and clear comparison of the functions of the different DQ modules is offered by the TIA Selection Tool.

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Overview (continued)

Overview of digital output modules

Digital output	PU	Article No.	CC code	BU type
DQ 16 x 24 V DC/0.5 A BA	1	6ES7132-6BH00-0AA0	CC00	A0
DQ 16 x 24 V DC/0.5 A BA	10	6ES7132-6BH00-2AA0	CC00	A0
DQ 16 x 24 V DC/0.5 A ST	1	6ES7132-6BH01-0BA0	CC00	A0
DQ 16 x 24 V DC/0.5 A ST	10	6ES7132-6BH01-2BA0	CC00	A0
DQ 8 x 24 V DC/0.5 A SNK BA	1	6ES7132-6BF61-0AA0	CC01	A0
DQ 8 x 24 V DC/0.5 A BA	1	6ES7132-6BF01-0AA0	CC02	A0
DQ 8 x 24 V DC/0.5 A BA	10	6ES7132-6BF01-2AA0	CC02	A0
DQ 8 x 24 V DC/0.5 A ST	1	6ES7132-6BF01-0BA0	CC02	A0
DQ 8 x 24 V DC/0.5 A ST	10	6ES7132-6BF01-2BA0	CC02	A0
DQ 8 x 24 V DC/0.5 A HF	1	6ES7132-6BF00-0CA0	CC02	A0
DQ 8 x 24 V DC/0.5 A HF	10	6ES7132-6BF00-2CA0	CC02	A0
DQ 4 x 24 V DC/2 A ST	1	6ES7132-6BD20-0BA0	CC02	A0
DQ 4 x 24 V DC/2 A ST	10	6ES7132-6BD20-2BA0	CC02	A0
DQ 4 x 24 V DC/2 A HF	1	6ES7132-6BD20-0CA0	CC02	A0
DQ 4 x 24 V DC/2 A HS With three operating modes: • Fast isochronous DQ with valve control • Pulse width modulation • Oversampling	1	6ES7132-6BD20-0DA0	CC02	A0
DQ 4 x 24 ... 230 V AC/2 A ST	1	6ES7132-6FD00-0BB1	CC41	B0, B1
DQ 4 x 24 ... 230 V AC/2 A ST	10	6ES7132-6FD00-2BB1	CC41	B0, B1
DQ 4 x 24 ... 230 V AC/2 A HF With two operating modes: • DQ • PC: Power control via phase angle, half-wave or full-wave control	1	6ES7132-6FD00-0CU0	CC20	U0
RQ 4 x 24 V UC/2 A CO ST	1	6ES7132-6GD51-0BA0	--	A0
RQ 4 x 120 V DC-230 V AC/5 A NO ST	1	6ES7132-6HD01-0BB1	--	B0, B1
RQ 4 x 120 V DC-230 V AC/5 A NO ST	10	6ES7132-6HD01-2BB1	--	B0, B1
RQ MA 4 x 120 V DC ... 230 V AC/5 A NO ST	1	6ES7132-6MD00-0BB1	--	B0, B1

Overview of BaseUnits

BaseUnit	PU	Article No.	CC codes for push-in terminals	CC codes for AUX terminals
BU type A0 • New load group (light) • 16 push-in terminals • With 10 AUX terminals	1	6ES7193-6BP20-0DA0	CC01 to CC05	CC71 to CC73
BU type A0 • New load group (light) • 16 push-in terminals • With 10 AUX terminals	10	6ES7193-6BP20-2DA0	CC01 to CC05	CC71 to CC73
BU type A0 • New load group (light) • 16 push-in terminals • Without AUX terminals	1	6ES7193-6BP00-0DA0	CC01 to CC05	--
BU type A0 • New load group (light) • 16 push-in terminals • Without AUX terminals	10	6ES7193-6BP00-2DA0	CC01 to CC05	--
BU type A0 • Forwarding of load group (dark) • 16 push-in terminals • With 10 AUX terminals	1	6ES7193-6BP20-0BA0	CC01 to CC05	CC71 to CC73

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Overview (continued)

BaseUnit	PU	Article No.	CC codes for push-in terminals	CC codes for AUX terminals
BU type A0 • Forwarding of load group (dark) • 16 push-in terminals • With 10 AUX terminals	10	6ES7193-6BP20-2BA0	CC01 to CC05	CC71 to CC73
BU type A0 • Forwarding of load group (dark) • 16 push-in terminals • Without AUX terminals	1	6ES7193-6BP00-0BA0	CC01 to CC05	--
BU type A0 • Forwarding of load group (dark) • 16 push-in terminals • Without AUX terminals	10	6ES7193-6BP00-2BA0	CC01 to CC05	--
BU type B0 • Forwarding of load group (dark) • 12 push-in terminals • With 4 AUX terminals	1	6ES7193-6BP20-0BB0	CC41	CC81 to CC83
BU type B0 • Forwarding of load group (dark) • 12 push-in terminals • With 4 AUX terminals	10	6ES7193-6BP20-0BB0	CC41	CC81 to CC83
BU type B1 • Forwarding of load group (dark) • 12 push-in terminals • 2 x 2 (1L, 2L, 1N, 2N) direct infeed module • Without AUX terminals	1	6ES7193-6BP20-0BB1	CC41	--
BU type B1 • Forwarding of load group (dark) • 12 push-in terminals • 2 x 2 (1L, 2L, 1N, 2N) direct infeed module • Without AUX terminals	10	6ES7193-6BP20-2BB1	CC41	--
BU type U0 • Forwarding of load group (dark) • 16 push-in terminals • Without AUX terminals	1	6ES7193-6BP00-0BU0	CC20	--
BU type U0 • Forwarding of load group (dark) • 16 push-in terminals • Without AUX terminals	10	6ES7193-6BP00-2BU0	CC20	--
BU type U0 • New load group (light) • 16 push-in terminals • Without AUX terminals	1	6ES7193-6BP00-0DU0	CC20	--
BU type U0 • New load group (light) • 16 push-in terminals • Without AUX terminals	10	6ES7193-6BP00-2DU0	CC20	--

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Overview (continued)

Overview of potential distributor modules

Potential distribution module	PU	Article No.	CC codes for push-in terminals
PotDis BU Type P1 (light), 17x P1 potential, 1x P2 potential, for starting a new load group (max. 10 A)	1	6ES7193-6UP00-0DP1	CC00, CC62
PotDis BU Type P1 (dark), 17x P1 potential, 1x P2 potential, for continuing the load group	1	6ES7193-6UP00-0BP1	CC00, CC62
PotDis BU Type P2 (light), 1x P1 potential, 17x P2 potential, for starting a new load group (max. 10 A)	1	6ES7193-6UP00-0DP2	CC00, CC63
PotDis BU Type P2 (dark), 1x P1 potential, 17x P2 potential, for continuing the load group	1	6ES7193-6UP00-0BP2	CC00, CC63
PotDis TB Type BR-W, 18x internally jumpered terminals, without reference to P1, P2 or AUX, (total current max. 10 A)	1	6ES7193-6TP00-0TP0	CC10 to CC13
PotDis TB Type P1-R, 18x P1 potential, (total current max. 10 A)	1	6ES7193-6TP00-0TP1	CC10, CC12
PotDis TB Type P2-B, 18x P2 potential, (total current max. 10 A)	1	6ES7193-6TP00-0TP2	CC10, CC13
PotDis TB Type n.c.-G, 18x n.c. (not connected) terminals, without reference to P1, P2 or AUX	1	6ES7193-6TP00-0TN0	CC10

Technical specifications

Article number	**6ES7132-6BH00-0AA0** ET 200SP, DQ 16X24VDC/0.5A BA, PU 1	**6ES7132-6BH01-0BA0** ET 200SP, DQ 16x 24V DC/0.5A ST, PU 1	**6ES7132-6BF61-0AA0** ET 200SP, DQ 8x 24VDC/0.5A SINK BA, PU 1	**6ES7132-6BF01-0AA0** ET 200SP, DQ 8x 24V DC/0.5A Basic, PU 1	**6ES7132-6BF01-0BA0** ET 200SP, DQ 8x 24V DC/0.5A ST, PU 1
General information					
Product type designation	DQ 16x 24 V DC/0.5 A BA, PU 1	DQ 16x24VDC/0.5A ST, PU 1	DQ 8x24VDC/0,5A SNK BA	DQ 8x 24 V DC/0.5 A BA, PU 1	DQ 8x24VDC/0.5A ST
Engineering with					
• STEP 7 TIA Portal configurable/ integrated as of version	V14	V14	V14	V14	V14
• STEP 7 configurable/integrated as of version	STEP 7 V5.5 or higher	V5.5 SP3	V5.5 SP3	V5.5 SP3	V5.5 SP3 or higher
• PCS 7 configurable/integrated as of version		V8.1 SP1			V8.1 SP1
• PROFIBUS as of GSD version/ GSD revision	One GSD file each, Revision 3 and 5 and higher	One GSD file each, Revision 3 and 5 and higher	One GSD file each, Revision 3 and 5 and higher	One GSD file each, Revision 3 and 5 and higher	One GSD file each, Revision 3 and 5 and higher
• PROFINET as of GSD version/ GSD revision	GSDML V2.3	GSDML V2.3	GSDML V2.3	GSDML V2.3	GSDML V2.3
Operating mode					
• DQ	Yes	Yes	Yes	Yes	Yes
• DQ with energy-saving function	No	No	No	No	No
• PWM	No	No	No	No	No
• Oversampling	No	No	No	No	No
• MSO	No	No	No	No	No
Supply voltage					
Rated value (DC)	24 V	24 V	24 V	24 V	24 V
Reverse polarity protection	Yes	Yes		Yes	Yes

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Technical specifications (continued)

Article number	6ES7132-6BH00-0AA0	6ES7132-6BH01-0BA0	6ES7132-6BF61-0AA0	6ES7132-6BF01-0AA0	6ES7132-6BF01-0BA0
	ET 200SP, DQ 16X24VDC/0.5A BA, PU 1	ET 200SP, DQ 16x 24V DC/0.5A ST, PU 1	ET 200SP, DQ 8x 24VDC/0.5A SINK BA, PU 1	ET 200SP, DQ 8x 24V DC/0.5A Basic, PU 1	ET 200SP, DQ 8x 24V DC/0.5A ST, PU 1
Digital outputs					
Type of digital output	Source output (PNP, current-sourcing)	Source output (PNP, current-sourcing)	Sink output (NPN)	Source output (PNP, current-sourcing)	Source output (PNP, current-sourcing)
Number of digital outputs	16	16	8	8	8
Current-sinking	No	No	Yes		
Current-sourcing	Yes	Yes		Yes	Yes
Digital outputs, parameterizable	Yes	Yes	Yes	Yes	Yes
Short-circuit protection	Yes	Yes	Yes	Yes; per channel, electronic	Yes
Open-circuit detection	No	Yes			
Limitation of inductive shutdown voltage to	Typ. L+ (-53 V)	Typ. L+ (-50 V)	Typ. 47 V	Typ. L+ (-50 V)	Typ. L+ (-50 V)
Controlling a digital input	Yes	Yes	Yes	Yes	Yes
Switching capacity of the outputs					
• with resistive load, max.	0.5 A	0.5 A	0.5 A	0.5 A	0.5 A
• on lamp load, max.	5 W	5 W	5 W	5 W	5 W
Load resistance range					
• lower limit	48 Ω	48 Ω	48 Ω	48 Ω	48 Ω
• upper limit	100 kΩ	12 kΩ	3 400 Ω	100 kΩ	12 kΩ
Output voltage					
• for signal "1", min.					L+ (-0.8 V)
Output current					
• for signal "1" rated value	0.5 A	0.5 A	0.5 A	0.5 A	0.5 A
• for signal "0" residual current, max.	30 µA	0.1 mA	5 µA	10 µA	0.1 mA
Output delay with resistive load					
• "0" to "1", typ.	80 µs; at rated load	50 µs			
• "0" to "1", max.	150 µs; at rated load		300 µs	100 µs; at rated load	50 µs; at rated load
• "1" to "0", typ.	100 µs; at rated load	100 µs			
• "1" to "0", max.	200 µs; at rated load		600 µs	150 µs; at rated load	100 µs; at rated load
Parallel switching of two outputs					
• for uprating	No	No	No	No	No
• for redundant control of a load	Yes	Yes	Yes	Yes	Yes
Switching frequency					
• with resistive load, max.	100 Hz	100 Hz	100 Hz	100 Hz	100 Hz
• with inductive load, max.	2 Hz	2 Hz	0.5 Hz	2 Hz	2 Hz
• on lamp load, max.	10 Hz	10 Hz	10 Hz	10 Hz	10 Hz
Total current of the outputs					
• Current per channel, max.	0.5 A	0.5 A	0.5 A	0.5 A	0.5 A
• Current per module, max.	8 A	8 A	4 A	4 A	4 A
Total current of the outputs (per module)					
horizontal installation					
- up to 30 °C, max.		8 A		4 A	4 A
- up to 40 °C, max.		8 A		4 A	4 A
- up to 50 °C, max.		6 A		4 A	4 A
- up to 60 °C, max.	8 A	4 A	4 A	4 A	4 A
vertical installation					
- up to 30 °C, max.		8 A		4 A	4 A
- up to 40 °C, max.		6 A		4 A	4 A
- up to 50 °C, max.	8 A	4 A	4 A	4 A	4 A

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Technical specifications (continued)

Article number	**6ES7132-6BH00-0AA0** ET 200SP, DQ 16X24VDC/0.5A BA, PU 1	**6ES7132-6BH01-0BA0** ET 200SP, DQ 16x 24V DC/0.5A ST, PU 1	**6ES7132-6BF61-0AA0** ET 200SP, DQ 8x 24VDC/0.5A SINK BA, PU 1	**6ES7132-6BF01-0AA0** ET 200SP, DQ 8x 24V DC/0.5A Basic, PU 1	**6ES7132-6BF01-0BA0** ET 200SP, DQ 8x 24V DC/0.5A ST, PU 1
Cable length					
• shielded, max.	1 000 m	1 000 m	1 000 m	1 000 m	1 000 m
• unshielded, max.	600 m	600 m	600 m	600 m	600 m
Isochronous mode					
Isochronous operation (application synchronized up to terminal)	No	No	No	No	No
Interrupts/diagnostics/ status information					
Diagnostics function	Yes	Yes	Yes	Yes	Yes
Substitute values connectable	Yes	Yes	Yes	Yes	Yes
Alarms					
• Diagnostic alarm	Yes	Yes	Yes	Yes	Yes
Diagnostic messages					
• Monitoring the supply voltage	Yes	Yes	Yes	Yes	Yes
• Wire-break	No	Yes; Module-wise	No	No	Yes; Module-wise
• Short-circuit	No		No	No	
• Short-circuit to M		Yes; Module-wise			Yes; Module-wise
• Short-circuit to L+		Yes; Module-wise			Yes; Module-wise
• Group error	Yes	Yes	Yes	Yes	Yes
Diagnostics indication LED					
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED
• Channel status display	Yes; Green LED	Yes; Green LED	Yes; Green LED	Yes; Green LED	Yes; Green LED
• for channel diagnostics	No	No	No	No	No
• for module diagnostics	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED
Potential separation					
Potential separation channels					
• between the channels and backplane bus	Yes	Yes	Yes	Yes	Yes
Standards, approvals, certificates					
Suitable for safety functions	No	No	No	No	No
Suitable for safety-related tripping of standard modules		Yes; From FS01		Yes; From FS01	Yes; From FS01
Highest safety class achievable in safety mode					
• Performance level according to ISO 13849-1		PL d		PL d	PL d
• SIL acc. to IEC 61508		SIL 2		SIL 2	SIL 2
Ambient conditions					
Ambient temperature during operation					
• horizontal installation, min.	-30 °C	-30 °C	-25 °C	-30 °C	-30 °C
• horizontal installation, max.	60 °C	60 °C	60 °C	60 °C	60 °C
• vertical installation, min.	-30 °C	-30 °C	-25 °C	-30 °C	-30 °C
• vertical installation, max.	50 °C	50 °C	50 °C	50 °C	50 °C
Altitude during operation relating to sea level					
• Installation altitude above sea level, max.	2 000 m; On request: Installation altitudes greater than 2 000 m	2 000 m; On request: Installation altitudes greater than 2 000 m	2 000 m; On request: Installation altitudes greater than 2 000 m	2 000 m; On request: Installation altitudes greater than 2 000 m	2 000 m; On request: Installation altitudes greater than 2 000 m
Dimensions					
Width	15 mm	15 mm	15 mm	15 mm	15 mm
Height	73 mm	73 mm	73 mm	73 mm	73 mm
Depth	58 mm	58 mm	58 mm	58 mm	58 mm
Weights					
Weight, approx.	30 g	30 g	30 g	30 g	30 g

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Technical specifications (continued)

Article number	**6ES7132-6BF00-0CA0**	**6ES7132-6BD20-0BA0**	**6ES7132-6BD20-0CA0**	**6ES7132-6BD20-0DA0**	**6ES7132-6FD00-0BB1**
	ET 200SP, DQ 8x24VDC/0.5A HF, PU 1	ET 200SP, DQ 4x24VDC/2A ST	ET 200SP, DQ 4x24VDC/2A HF	ET 200SP, DQ 4x24VDC/2A High Speed, PU 1	ET 200SP, DQ 4x24..230VAC/2A ST
General information					
Product type designation	DQ 8x24 V DC/0.5 A HF	DQ 4x24 V DC/2 A ST	ET 200SP, DQ 4x 24 V DC/2 A HF, PU 1	DQ 4x24 V DC/2 A HS	DQ 4x24 ... 230 V AC/ 2 A ST
Engineering with					
• STEP 7 TIA Portal configurable/ integrated as of version	V13 SP1 / -	V11 SP2 / V13	V13 SP1 / -	STEP 7 V15.1 or higher	V13 / V13
• STEP 7 configurable/integrated as of version	V5.5 / -	V5.5 SP3 / -	V5.5 / -	Via GSD as of V5.6 HF4	V5.5 SP3 / -
• PCS 7 configurable/integrated as of version	V8.1 SP1	V8.1 SP1			
• PROFIBUS as of GSD version/ GSD revision	One GSD file each, Revision 3 and 5 and higher	GSD Revision 5	GSD Revision 5	One GSD file each, Revision 3 and 5 and higher	GSD Revision 5
• PROFINET as of GSD version/ GSD revision	GSDML V2.3	GSDML V2.3	GSDML V2.3	GSDML V2.33	GSDML V2.3
Operating mode					
• DQ	Yes	Yes	Yes	Yes	Yes
• DQ with energy-saving function	No	No	No	Yes; Valve control	No
• PWM	No	No	No	Yes	No
• Cam control (switching at comparison values)				Yes; Via MtM (module-to-module communication)	
• Oversampling	No	No	No	Yes	No
• MSO	Yes	No	Yes	No	No
Supply voltage					
Rated value (DC)	24 V	24 V	24 V	24 V	
Rated value (AC)					230 V
Reverse polarity protection	Yes	Yes	Yes	Yes	
Digital outputs					
Type of digital output	Source output (PNP, current-sourcing)	Source output (PNP, current-sourcing)		Source output (PNP, current-sourcing)	Triac with zero point detection
Number of digital outputs	8	4	4	4	4
Current-sinking	No	No	No	No	No
Current-sourcing	Yes	Yes	Yes	Yes; Push-pull output	Yes
Digital outputs, parameterizable	Yes	Yes	Yes	Yes	No
Short-circuit protection	Yes	Yes	Yes	Yes	No; When using BU type B1, a miniature, quick-response fuse with 10 A tripping current must be provided
Limitation of inductive shutdown voltage to	Typ. L+ (-50 V)	Typ. L+ (-50 V)	L+ -(37 to 41V)	M (-1 V)	
Controlling a digital input	Yes	Yes	Yes; Minimum current consumption 7 mA	No	Yes
Size of motor starters according to NEMA, max.					5

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Technical specifications (continued)

Article number	**6ES7132-6BF00-0CA0** ET 200SP, DQ 8x24VDC/0.5A HF, PU 1	**6ES7132-6BD20-0BA0** ET 200SP, DQ 4x24VDC/2A ST	**6ES7132-6BD20-0CA0** ET 200SP, DQ 4x24VDC/2A HF	**6ES7132-6BD20-0DA0** ET 200SP, DQ 4x24VDC/2A High Speed, PU 1	**6ES7132-6FD00-0BB1** ET 200SP, DQ 4x24..230VAC/2A ST
Digital output functions, parameterizable					
• Switching tripped by comparison values				Yes	
- Number of cam tracks, max.				4	
• Freely usable digital output				Yes	
• PWM output				Yes	
- Number, max.				4	
• Digital output with oversampling				Yes	
- Number, max.				4	
Switching capacity of the outputs					
• with resistive load, max.	0.5 A	2 A	2 A	2 A	2 A
• on lamp load, max.	5 W	10 W	10 W	10 W	100 W
Load resistance range					
• lower limit	48 Ω	12 Ω	12 Ω	12 Ω	
• upper limit	12 kΩ	3 400 Ω	3 400 Ω	3 400 Ω	
Output voltage					
• for signal "1", min.					20.4 V
Output current					
• for signal "1" rated value	0.5 A	2 A	2 A	2 A	2 A
• for signal "0" residual current, max.	0.1 mA	0.1 mA	0.1 mA	0.1 mA	460 µA
Output delay with resistive load					
• "0" to "1", typ.	50 µs	50 µs	50 µs		
• "0" to "1", max.		50 µs		1 µs	10 ms
• "1" to "0", typ.	100 µs	100 µs	100 µs		
• "1" to "0", max.		100 µs		1 µs	10 ms
Parallel switching of two outputs					
• for logic links					No
• for uprating	No	No	No	No	No
• for redundant control of a load	Yes	Yes			Yes
Switching frequency					
• with resistive load, max.	100 Hz	100 Hz	100 Hz	5 kHz	10 Hz
• with inductive load, max.	2 Hz	2 Hz	2 Hz	5 kHz	0.5 Hz; Higher frequencies are possible, see Equipment Manual / Product Information
• on lamp load, max.	10 Hz	10 Hz	10 Hz	5 kHz	1 Hz
Total current of the outputs					
• Current per channel, max.	0.5 A	2 A	2 A	2 A	2 A
• Current per module, max.	4 A	8 A	8 A	8 A	8 A
Total current of the outputs (per module)					
horizontal installation					
- up to 30 °C, max.		8 A		8 A; DQ mode	
- up to 40 °C, max.		8 A	8 A	6.9 A; DQ mode	8 A
- up to 50 °C, max.		6 A	6 A	4.7 A; DQ mode	6 A
- up to 60 °C, max.	4 A	4 A	4 A	2.5 A; DQ mode	4 A
vertical installation					
- up to 30 °C, max.		8 A	8 A	7.2 A; DQ mode	8 A
- up to 40 °C, max.		6 A	6 A	5.6 A; DQ mode	6 A
- up to 50 °C, max.	4 A	4 A	4 A	4 A; DQ mode	4 A
- up to 60 °C, max.		4 A			
Cable length					
• shielded, max.	1 000 m	1 000 m	1 000 m	50 m	1 000 m
• unshielded, max.	600 m	600 m	600 m	50 m	600 m

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Technical specifications (continued)

Article number	6ES7132-6BF00-0CA0	6ES7132-6BD20-0BA0	6ES7132-6BD20-0CA0	6ES7132-6BD20-0DA0	6ES7132-6FD00-0BB1
	ET 200SP, DQ 8x24VDC/0.5A HF, PU 1	ET 200SP, DQ 4x24VDC/2A ST	ET 200SP, DQ 4x24VDC/2A HF	ET 200SP, DQ 4x24VDC/2A High Speed, PU 1	ET 200SP, DQ 4x24..230VAC/2A ST
Isochronous mode					
Isochronous operation (application synchronized up to terminal)	Yes	No	Yes	Yes; Operating modes DQ and OVS only	No
Execution and activation time (TCO), min.	48 µs			40 µs	
Bus cycle time (TDP), min.	500 µs		500 µs	125 µs	
Interrupts/diagnostics/ status information					
Diagnostics function	Yes	Yes	Yes		No
Diagnostics function				Yes	
Substitute values connectable	Yes	Yes	Yes	Yes	Yes
Alarms					
• Diagnostic alarm	Yes	Yes	Yes	Yes	No
Diagnostic messages					
• Diagnostic information readable				Yes	
• Monitoring the supply voltage	Yes	Yes	Yes	Yes	No
• Wire-break	Yes; channel by channel	Yes; Module-wise	Yes; channel by channel	No	No
• Short-circuit	Yes; channel by channel	Yes; Module-wise	Yes; channel by channel	Yes; Module-wise	No
• Group error	Yes	Yes	Yes	Yes	Yes
Diagnostics indication LED					
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED
• Channel status display	Yes; Green LED	Yes; Green LED	Yes; Green LED	Yes; Green LED	Yes; Green LED
• for channel diagnostics	Yes; Red LED	No	Yes; Red LED	No	No
• for module diagnostics	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED
Potential separation					
Potential separation channels					
• between the channels and backplane bus	Yes	Yes	Yes	Yes	Yes
Standards, approvals, certificates					
Suitable for safety functions	No	No	No	No	No
Suitable for safety-related tripping of standard modules	Yes; From FS02	Yes; From FS03	Yes; From FS02	No	
Highest safety class achievable in safety mode					
• Performance level according to ISO 13849-1	PL d	PL d	PL d		
• SIL acc. to IEC 61508	SIL 2	SIL 2	SIL 2		
Ambient conditions					
Ambient temperature during operation					
• horizontal installation, min.	-30 °C	-30 °C	-30 °C	-30 °C	-30 °C
• horizontal installation, max.	60 °C	60 °C	60 °C	60 °C	60 °C
• vertical installation, min.	-30 °C	-30 °C	-30 °C	-30 °C	-30 °C
• vertical installation, max.	50 °C	50 °C	50 °C	50 °C	60 °C
Altitude during operation relating to sea level					
• Installation altitude above sea level, max.	2 000 m; On request: Installation altitudes greater than 2 000 m	2 000 m; On request: Installation altitudes greater than 2 000 m	2 000 m; On request: Installation altitudes greater than 2 000 m	2 000 m; On request: Installation altitudes greater than 2 000 m	2 000 m; On request: Installation altitudes greater than 2 000 m
Dimensions					
Width	15 mm	15 mm	15 mm	15 mm	20 mm
Height	73 mm	73 mm	73 mm	73 mm	73 mm
Depth	58 mm	58 mm	58 mm	58 mm	58 mm
Weights					
Weight, approx.	30 g	30 g	30 g	31 g	50 g

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Technical specifications (continued)

Article number	**6ES7132-6FD00-0CU0**	**6ES7132-6GD51-0BA0**	**6ES7132-6HD01-0BB1**	**6ES7132-6MD00-0BB1**
	ET 200SP, DQ 4x24..230VAC/2A HF, PU 1	ET 200SP, RQ CO 4x 24V DC/2A ST, PU 1	ET 200SP, RQ NO 4x 120VDC..230VAC/ 5A,PU1	ET 200SP, RQ NO-MA 4x120VDC..230VAC/5A ST
General information				
Product type designation	DQ 4x24 ... 230 V AC/2 A HF, PU 1	RQ CO 4x24VDC/2A ST	RQ 4x120 VDC ... 230 VAC/5 A NO ST	RQ 4x120 V DC ... 230 V AC/ 5 A NO MA ST
Engineering with				
• STEP 7 TIA Portal configurable/ integrated as of version	V14	V14	V14	V13 SP1
• STEP 7 configurable/integrated as of version	STEP 7 V5.5 or higher	V5.5 SP3	V5.5 SP3	V5.5 SP3 / -
• PCS 7 configurable/integrated as of version			V8.1 SP1	
• PROFIBUS as of GSD version/ GSD revision	GSD as of Revision 5	One GSD file each, Revision 3 and 5 and higher	One GSD file each, Revision 3 and 5 and higher	GSD Revision 5
• PROFINET as of GSD version/ GSD revision	GSDML V2.3	GSDML V2.3	GSDML V2.3	GSDML V2.3
Operating mode				
• DQ	Yes	Yes	Yes	Yes
• DQ with energy-saving function	Yes	No	No	No
• PWM	No	No	No	No
• Oversampling	No	No	No	No
• MSO	No	No	No	No
• Phase control	Yes; Control area: 8.5 ... 100% of the phase angle			
• Trailing-edge phase	No			
• Half-wave	Yes			
• Full-wave	Yes			
Supply voltage				
Rated value (DC)		24 V	24 V	24 V
Rated value (AC)	230 V; 47 ... 63 Hz, max. rate of change of frequency 1 mHz/s			
Reverse polarity protection		Yes	Yes	Yes
Digital outputs				
Type of digital output		Relays	Relays	Relays
Number of digital outputs	4	4	4	4
Current-sinking	No	Yes	Yes	
Current-sourcing	Yes	Yes	Yes	
Digital outputs, parameterizable	Yes	Yes	Yes	
Short-circuit protection	No; external fusing necessary	No	No	No
Open-circuit detection	Yes; channel by channel			
Overload protection	No; A miniature fuse with 10 tripping current and tripping characteristic "quick response" must be provided in the module supply			
Controlling a digital input	Yes			
Switching capacity of the outputs				
• with resistive load, max.	2 A; Max. 4 A, see additional description in manual			
• with inductive load, max.	2 A			
• on lamp load, max.	100 W; Tungsten rating in accordance with UL; for thermistors with higher power ratings, see the notes in the manual			
Output voltage				
• for signal "1", min.	20.4 V			
Output current				
• for signal "1" rated value	2 A			
• for signal "0" residual current, max.	3 mA			

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Technical specifications (continued)

Article number	6ES7132-6FD00-0CU0 ET 200SP, DQ 4x24..230VAC/2A HF, PU 1	6ES7132-6GD51-0BA0 ET 200SP, RQ CO 4x 24V DC/2A ST, PU 1	6ES7132-6HD01-0BB1 ET 200SP, RQ NO 4x 120VDC..230VAC/ 5A,PU1	6ES7132-6MD00-0BB1 ET 200SP, RQ NO-MA 4x120VDC..230VAC/5A ST
Output delay with resistive load				
• "0" to "1", max.	40 ms; 2 AC cycles			
• "1" to "0", max.	20 ms; 1 AC cycle			
Parallel switching of two outputs				
• for logic links	No	Yes	Yes	
• for uprating	No	No	No	
• for redundant control of a load	Yes	Yes	Yes	
Switching frequency				
• with resistive load, max.	10 Hz; Applies to DQ mode; limited by line frequency in PC mode	2 Hz	2 Hz	2 Hz
• with inductive load, max.			0.5 Hz	0.5 Hz
• with inductive load (acc. to IEC 60947-5-1, AC15), max.	10 Hz; Applies to DQ mode; limited by line frequency in PC mode			
• on lamp load, max.	1 Hz; Applies to DQ mode; limited by line frequency in PC mode		2 Hz	2 Hz
Total current of the outputs				
• Current per channel, max.	2 A; Max. 4 A, see additional description in manual	2 A	5 A	5 A
• Current per module, max.	8 A	8 A	20 A	20 A
Total current of the outputs (per module)				
horizontal installation				
- up to 40 °C, max.	8 A	8 A		
- up to 50 °C, max.	6 A	6 A	20 A	20 A
- up to 60 °C, max.	4 A	4 A	16 A	16 A
vertical installation				
- up to 30 °C, max.	8 A	8 A		
- up to 40 °C, max.	6 A	6 A	20 A	20 A
- up to 50 °C, max.	4 A	4 A	16 A	16 A
Relay outputs				
• Number of relay outputs		4	4	4
• Rated supply voltage of relay coil L+ (DC)		24 V	24 V	24 V
• Current consumption of relays (coil current of all relays), max.		40 mA	40 mA	40 mA
• external protection for relay outputs			Yes, with 6A	Yes, with 6A
• Number of operating cycles, max.			7 000 000; see additional description in the manual	7 000 000; see additional description in the manual
Switching capacity of contacts				
- with inductive load, max.			2 A; see additional description in the manual	2 A; see additional description in the manual
- with resistive load, max.		2 A	5 A; see additional description in the manual	5 A; see additional description in the manual
- Thermal continuous current, max.		2 A	5 A; Max. 1 385 VA, 150 W	5 A
- Switching current, min.		1 mA; 5 V DC	100 mA; 5 V DC	100 mA; 5 V DC
- Rated switching voltage (DC)		24 V	24 V DC to 120 V DC	24 V DC to 120 V DC
- Rated switching voltage (AC)		24 V	24V AC to 230V AC	24V AC to 230V AC

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Technical specifications (continued)

Article number	**6ES7132-6FD00-0CU0** ET 200SP, DQ 4x24..230VAC/2A HF, PU 1	**6ES7132-6GD51-0BA0** ET 200SP, RQ CO 4x 24V DC/2A ST, PU 1	**6ES7132-6HD01-0BB1** ET 200SP, RQ NO 4x 120VDC..230VAC/ 5A,PU1	**6ES7132-6MD00-0BB1** ET 200SP, RQ NO-MA 4x120VDC..230VAC/5A ST
Cable length				
• shielded, max.	1 000 m	1 000 m	1 000 m	1 000 m
• unshielded, max.	600 m	200 m	200 m	200 m
Isochronous mode				
Isochronous operation (application synchronized up to terminal)	No	No	No	
Interrupts/diagnostics/ status information				
Diagnostics function	Yes	Yes	Yes	Yes
Substitute values connectable	Yes	Yes	Yes	Yes
Alarms				
• Diagnostic alarm	Yes	Yes	Yes	Yes
Diagnostic messages				
• Diagnostic information readable	Yes			
• Monitoring the supply voltage	Yes	Yes	Yes	Yes
• Wire-break	Yes; channel by channel	No	No	No
• Short-circuit	No	No	No	No
• Group error	Yes			Yes
Diagnostics indication LED				
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED
• Channel status display	Yes; Green LED	Yes; Green LED	Yes; Green LED	Yes; Green LED
• for channel diagnostics	Yes; red Fn LED	No	No	No
• for module diagnostics	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED
Potential separation				
Potential separation channels				
• between the channels and backplane bus	Yes	Yes	Yes	Yes
Standards, approvals, certificates				
Suitable for safety functions	No	No	No	No
Ambient conditions				
Ambient temperature during operation				
• horizontal installation, min.	-30 °C	-30 °C	-30 °C	-30 °C
• horizontal installation, max.	60 °C	60 °C	60 °C	60 °C
• vertical installation, min.	-30 °C	-30 °C	-30 °C	-30 °C
• vertical installation, max.	50 °C	50 °C	50 °C	50 °C
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.	2 000 m; On request: Installation altitudes greater than 2 000 m	2 000 m; On request: Installation altitudes greater than 2 000 m	2 000 m; On request: Installation altitudes greater than 2 000 m	
Dimensions				
Width	20 mm	15 mm	20 mm	20 mm
Height	73 mm	73 mm	73 mm	73 mm
Depth	58 mm	58 mm	58 mm	58 mm
Weights				
Weight, approx.	50 g	30 g	40 g	45 g

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Ordering data	Article No.
Digital output modules	
Type of delivery: Apart from the standard type of delivery in an individual package, selected I/O modules and BaseUnits are also available in a pack of 10 units. The pack of 10 units enables the amount of waste to be reduced considerably, as well as saving the time and cost of unpacking individual modules. The number of modules required is the number of modules ordered. The type of packaging is chosen by selecting the article number. Packs of 10 can therefore only be ordered in integer multiples of 10.	
Digital output module DQ 16x24 V DC/0.5 A Basic, BU type A0, color code CC00	
• PU: 1 unit	**6ES7132-6BH00-0AA0**
• PU: 10 units	**6ES7132-6BH00-2AA0**
Digital output module DQ 16x24 V DC/0.5 A Standard, BU type A0, color code CC00	
• PU: 10 units	**6ES7132-6BH00-2BA0**
Digital output module DQ 16x24 V DC/0.5 A Standard, source output, BU type A0, color code CC00	
• PU: 1 unit	**6ES7132-6BH01-0BA0**
• PU: 10 units	**6ES7132-6BH01-2BA0**
Digital output module DQ 8x24 V DC/0.5 A sink output, Basic, BU type A0, color code CC01	
• PU: 1 unit	**6ES7132-6BF61-0AA0**
Digital output module DQ 8x24 V DC/0.5 A Basic, BU type A0, color code CC02	
• PU: 1 unit	**6ES7132-6BF01-0AA0**
• PU: 10 units	**6ES7132-6BF01-2AA0**
Digital output module DQ 8x24 V DC/0.5 A Standard, BU type A0, color code CC02	
• PU: 1 unit	**6ES7132-6BF01-0BA0**
• PU: 10 units	**6ES7132-6BF01-2BA0**
Digital output module DQ 8x24 V DC/0.5 A High Feature, BU type A0, color code CC02	
• PU: 1 unit	**6ES7132-6BF00-0CA0**
• PU: 10 units	**6ES7132-6BF00-2CA0**
Digital output module DQ 4x24 V DC/2 A Standard, BU type A0, color code CC02	
• PU: 1 unit	**6ES7132-6BD20-0BA0**
• PU: 10 units	**6ES7132-6BD20-2BA0**
Digital output module DQ 4x24 V DC/2 A High Feature, BU type A0, color code CC02, channel-precise diagnostics, isochronous mode, shared output (MSO)	
• PU: 1 unit	**6ES7132-6BD20-0CA0**
Digital output module DQ 4x24 V DC/2 A High Speed, BU type A0, color code CC02, 3 operating modes (fast isochronous DQ with valve control, pulse width modulation, oversampling)	
• PU: 1 unit	**6ES7132-6BD20-0DA0**
Digital output module DQ 4x24 V AC ... 230 V AC/2 A Standard for BU type B1, color code CC41	
• PU: 1 unit	**6ES7132-6FD00-0BB1**
• PU: 10 units	**6ES7132-6FD00-2BB1**

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Ordering data	Article No.
Digital output modules (cont.)	
Digital output module DQ 4x24 V AC ... 230 V AC/2 A High Feature for BU type U0, color code CC20, 2 operating modes: DQ and PC (power control via phase angle, half-wave and full-wave control)	
• PU: 1 unit	**6ES7132-6FD00-0CU0**
Signal relay module RQ CO 4x24 V UC/2 A Standard, changeover contact, BU type A0, color code CC00	
• PU: 1 unit	**6ES7132-6GD51-0BA0**
Relay module RQ NO 4x120 V DC ... 230 V AC/ 5 A Standard, NO contact, BU type B0, B1	
• PU: 1 unit	**6ES7132-6HD01-0BB1**
• PU: 10 units	**6ES7132-6HD01-2BB1**
Relay module RQ NO 4x120 V DC ... 230 V AC/ 5 A Standard, NO contact, with manual operation, BU type B0, B1	**6ES7132-6MD00-0BB1**
Suitable BaseUnits	
BU15-P16+A10+2D	
BU type A0; BaseUnit (light) with 16 push-in terminals (1 ... 16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)	
• PU: 1 unit	**6ES7193-6BP20-0DA0**
• PU: 10 units	**6ES7193-6BP20-2DA0**
BU15-P16+A0+2D	
BU type A0; BaseUnit (light) with 16 push-in terminals to the module; for starting a new load group (max. 10 A)	
• PU: 1 unit	**6ES7193-6BP00-0DA0**
• PU: 10 units	**6ES7193-6BP00-2DA0**
2BU15-P16+A0+2DB	
Double BaseUnit for holding 2 I/O modules; BU type A0; BaseUnit (light/dark) with 16 push-in terminals to the module; for starting a new load group (max. 10 A)	
• 1 unit	**6ES7193-6BP60-0DA0**
BU15-P16+A10+2B	
BU type A0; BaseUnit (dark) with 16 push-in terminals (1 ... 16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for continuing the load group	
• PU: 1 unit	**6ES7193-6BP20-0BA0**
• PU: 10 units	**6ES7193-6BP20-2BA0**
BU15-P16+A0+2B	
BU type A0; BaseUnit (dark) with 16 push-in terminals to the module; for continuing the load group	
• PU: 1 unit	**6ES7193-6BP00-0BA0**
• PU: 10 units	**6ES7193-6BP00-2BA0**
2BU15-P16+A0+2B	
Double BaseUnit for holding 2 I/O modules; BU type A0; BaseUnit (dark/dark) with 16 push-in terminals to the module; for continuing the load group	
• 1 unit	**6ES7193-6BP60-0BA0**
BU20-P12+A4+0B	
BU type B0; BaseUnit (dark) with 12 push-in terminals (1 ... 12) to the module and an additional 4 internally jumpered AUX terminals (1 A to 4 A); for continuing the load group	
• PU: 1 unit	**6ES7193-6BP20-0BB0**
• PU: 10 units	**6ES7193-6BP20-2BB0**
BU20-P12+A0+4B	
BU type B1; BaseUnit (dark) with 12 push-in terminals to the module; for continuing the load group; PU: 1 unit	
• PU: 1 unit	**6ES7193-6BP20-0BB1**
• PU: 10 units	**6ES7193-6BP20-2BB1**
BU20-P16+A0+2D	
BU type U0; BaseUnit (light) with 16 push-in terminals to the module; for starting a new load group (max. 10 A)	
• PU: 1 unit	**6ES7193-6BP00-0DU0**
• PU: 10 units	**6ES7193-6BP00-2DU0**
BU20-P16+A0+2B	
BU type U0; BaseUnit (dark) with 16 push-in terminals to the module; for continuing the load group	
• PU: 1 unit	**6ES7193-6BP00-0BU0**
• PU: 10 units	**6ES7193-6BP00-2BU0**
Potential distributor modules	
PotDis BU	
PotDis BU, type P1 (light), 17x P1 potential, 1x P2 potential, for starting a new load group (max. 10 A)	**6ES7193-6UP00-0DP1**
PotDis BU, type P1 (dark), 17x P1 potential, 1x P2 potential, for continuing the load group	**6ES7193-6UP00-0BP1**
PotDis BU, type P2 (light), 1x P1 potential, 17x P2 potential, for starting a new load group (max. 10 A)	**6ES7193-6UP00-0DP2**
PotDis BU, type P2 (dark), 1x P1 potential, 17x P2 potential, for continuing the load group	**6ES7193-6UP00-0BP2**

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Ordering data	Article No.
PotDis TB	
PotDis TB, type BR-W, 18x internally jumpered terminals, without reference to P1, P2 or AUX, (total current max. 10 A)	**6ES7193-6TP00-0TP0**
PotDis TB, type P1-R, 18x P1 potential, (total current max. 10 A)	**6ES7193-6TP00-0TP1**
PotDis TB, type P2-B, 18x P2 potential, (total current max. 10 A)	**6ES7193-6TP00-0TP2**
PotDis TB, type n.c.-G, 18x n.c. (not connected) terminals, without reference to P1, P2 or AUX	**6ES7193-6TP00-0TN0**
Accessories	
Equipment labeling plate	**6ES7193-6LF30-0AW0**
10 sheets of 16 labels, for printing with thermal transfer card printer or plotter	
Labeling strips	
500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer	**6ES7193-6LR10-0AA0**
500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer	**6ES7193-6LR10-0AG0**
1000 labeling strips DIN A4, light gray, card, perforated, for inscription with laser printer	**6ES7193-6LA10-0AA0**
1000 labeling strips DIN A4, yellow, card, perforated, for inscription with laser printer	**6ES7193-6LA10-0AG0**
BU cover	
For covering empty slots (gaps); 5 units	
• 15 mm wide	**6ES7133-6CV15-1AM0**
• 20 mm wide	**6ES7133-6CV20-1AM0**
Shield connection	**6ES7193-6SC00-1AM0**
5 shield supports and 5 shield terminals	
Color-coded labels for 15 mm-wide BaseUnits	
Color code CC00, for 16 push-in terminals, BU type A0, A1, gray (terminals 1 to 8), red (terminals 9 to 16); 10 units	**6ES7193-6CP00-2MA0**
Color code CC01, for 16 push-in terminals, BU type A0, A1, gray (terminals 1 to 8), red (terminals 9 to 16); 10 units	**6ES7193-6CP01-2MA0**
Color code CC01, for 16 push-in terminals, BU type A0, A1, gray (terminals 1 to 8), red (terminals 9 to 16); 50 units	**6ES7193-6CP01-4MA0**
Color code CC02, for 16 push-in terminals, BU type A0, A1, gray (terminals 1 to 8), blue (terminals 9 to 16); 10 units	**6ES7193-6CP02-2MA0**

	Article No.
Color-coded labels for 15 mm-wide BaseUnits (cont.)	
Color code CC02, for 16 push-in terminals, BU type A0, A1, gray (terminals 1 to 8), blue (terminals 9 to 16); 50 units	**6ES7193-6CP02-4MA0**
Color code CC71, for 10 AUX terminals, BU type A0, yellow/green (terminals 1 A to 10 A); 10 units	**6ES7193-6CP71-2AA0**
Color code CC72, for 10 AUX terminals, BU type A0, red (terminals 1 A to 10 A); 10 units	**6ES7193-6CP72-2AA0**
Color code CC73, for 10 AUX terminals, BU type A0, blue (terminals 1 A to 10 A); 10 units	**6ES7193-6CP73-2AA0**
Color code CC73, for 10 AUX terminals, BU type A0, blue (terminals 1 A to 10 A); 50 units	**6ES7193-6CP73-4AA0**
Color-coded labels for 20 mm-wide BaseUnits	
Color code CC41, for 16 push-in terminals; BU type B1, gray (terminals 1 to 4), red (terminals 5 to 8), blue (terminals 9 to 12); 10 units	**6ES7193-6CP41-2MB0**
Color code CC81, for 4 AUX terminals, BU type B0, yellow/green (terminals 1 A to 4 A); 10 units	**6ES7193-6CP81-2AB0**
Color code CC82, for 4 AUX terminals, BU type B0, red (terminals 1 A to 4 A); 10 units	**6ES7193-6CP82-2AB0**
Color code CC83, for 4 AUX terminals, BU type B0, blue (terminals 1 A to 4 A); 10 units	**6ES7193-6CP83-2AB0**
Color-coded labels for PotDis BU	
Color code CC62, for 16 push-in terminals, PotDis BU type P1, red (terminals 1 to 16); 10 units	**6ES7193-6CP62-2MA0**
Color code CC63, for 16 push-in terminals, PotDis BU type P2, blue (terminals 1 to 16); 10 units	**6ES7193-6CP63-2MA0**
Color-coded labels for PotDis TB	
Color code CC10, for 18 push-in terminals, PotDis TB, gray (terminals 1 to 18); 10 units	**6ES7193-6CP10-2MT0**
Color code CC11, for 18 push-in terminals, PotDis TB, yellow-green (terminals 1 to 18); 10 units	**6ES7193-6CP11-2MT0**
Color code CC12, for 18 push-in terminals, PotDis TB, type P1 and BR, red (terminals 1 to 18); 10 units	**6ES7193-6CP12-2MT0**
Color code CC13, for 18 push-in terminals, PotDis TB, type P2 and BR, blue (terminals 1 to 18); 10 units	**6ES7193-6CP13-2MT0**

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Overview



- 2, 4 and 8-channel analog input (AI) modules
- Apart from the standard type of delivery in an individual package, selected I/O modules and BaseUnits are also available in a pack of 10 units. The pack of 10 units enables the amount of waste to be reduced considerably, as well as saving the time and cost of unpacking individual modules.

For different requirements, the digital output modules offer:

- Function classes Basic, Standard, High Feature and High Speed
- BaseUnits for single or multiple-conductor connection with automatic slot coding
- Potential distributor modules for system-integrated expansion with potential terminals
- Individual system-integrated load group formation with self-assembling voltage distribution bars (a separate power module is no longer required for ET 200SP)
- Option of connecting current, voltage and resistance sensors, as well as thermocouples
- Option of connecting force and torque sensors
- Energy Meter for recording up to 200 electrical variables
- Clear labeling on front of module
- LEDs for diagnostics, status, supply voltage and faults
- Electronically readable and non-volatile writable rating plate (I&M data 0 to 3)
- Extended functions and additional operating modes in some cases
  - MSI operating mode (simultaneous reading of input data from as many as three other controllers)
  - Oversampling operating mode (n-fold equidistant acquisition of analog values within one PN cycle for increasing the time resolution for slow CPU cycles)
  - Isochronous mode (simultaneous equidistant reading in of all analog values)
  - Scalable measuring range (adaptation of measuring range, increase of the 16-bit resolution by adapting the measuring range to a limited section)
  - Scaling of the measured values (transmission of the analog value normalized to the required physical value as a 32-bit floating point value)
  - Internal compensation of the line resistance for thermo-couples by means of terminal temperature measurement in the BaseUnit for BU type A1
  - Internal compensation also for 2-conductor resistance measurement by means of adjustable line resistance
  - Calibration during runtime
  - Single-channel galvanic isolation
  - HART communication
  - Re-parameterization during operation
  - Firmware update
  - Diagnosis of wire break, short circuit, overflow, underflow
  - Two upper and lower hardware interrupts in each case, interference frequency suppression, smoothing
  - Value status (optional binary validity information of the analog signal in the process image)
  - Supports the PROFIenergy profile
- Optional accessories
  - Labeling strips (film or card)
  - Equipment labeling plate
  - Color-coded label with module-specific CC code
  - Shielding terminal

A quick and clear comparison of the functions of the AI modules is offered by the TIA Selection Tool.

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Overview (continued)

Overview of analog input modules

Analog input	PU	Article No.	CC code	BU type
AI 8 x I 2/4-wire BA	1	6ES7134-6GF00-0AA1	CC01	A0, A1
AI 2 x U ST	1	6ES7134-6FB00-0BA1	CC00	A0, A1
AI 8 x U BA	1	6ES7134-6FF00-0AA1	CC02	A0, A1
AI 4 x U/I 2-wire ST	1	6ES7134-6HD00-0BA1	CC03	A0, A1
AI 4 x U/I 2-wire ST	10	6ES7134-6HD00-2BA1	CC03	A0, A1
AI 2 x I 2/4-wire ST	1	6ES7134-6GB00-0BA1	CC05	A0, A1
AI 4 x I 2/4-wire ST	1	6ES7134-6GD00-0BA1	CC03	A0, A1
AI 4 x I 2/4-wire ST	10	6ES7134-6GD00-2BA1	CC03	A0, A1
AI 4 x I 2-wire 4 ... 20 mA HART	1	6ES7134-6TD00-0CA1	CC03	A0, A1
AI 2 x U/I 2/4-wire HF	1	6ES7134-6HB00-0CA1	CC05	A0, A1
AI 2 x U/I 2/4-wire HS With two operating modes: • High-speed isochronous AI • Oversampling	1	6ES7134-6HB00-0DA1	CC00	A0, A1
AI 8 x RTD/TC 2-wire HF	1	6ES7134-6JF00-0CA1	CC00	A0, A1
AI 8 x RTD/TC 2-wire HF	10	6ES7134-6JF00-2CA1	CC00	A0, A1
AI 4 x RTD/TC 2/3/4-wire HF	1	6ES7134-6JD00-0CA1	CC00	A0, A1
AI 4 x RTD/TC 2/3/4-wire HF	10	6ES7134-6JD00-2CA1	CC00	A0, A1
AI 4 x TC High Speed	1	6ES7134-6JD00-0DA1	CC00	A0, A1
AI 2 x SG 4/6-wire High Speed	1	7MH4134-6LB00-0DA0	CC00	A0
AI Energy Meter 400 V AC ST	1	6ES7134-6PA01-0BD0	--	D0
AI Energy Meter 480 V AC ST	1	6ES7134-6PA20-0BD0	--	D0
AI Energy Meter 480 V AC/CT High Feature	1	6ES7134-6PA00-0CU0	--	U0
AI Energy Meter 480 V AC/RT High Feature	1	6ES7134-6PA20-0CU0	--	U0

Overview of BaseUnits

BaseUnit	PU	Article No.	CC codes for push-in terminals	CC codes for AUX terminals
BU type A0 • New load group (light) • 16 push-in terminals • With 10 AUX terminals	1	6ES7193-6BP20-0DA0	CC01 to CC05	CC71 to CC73
BU type A0 • New load group (light) • 16 push-in terminals • With 10 AUX terminals	10	6ES7193-6BP20-2DA0	CC01 to CC05	CC71 to CC73
BU type A0 • New load group (light) • 16 push-in terminals • Without AUX terminals	1	6ES7193-6BP00-0DA0	CC01 to CC05	--
BU type A0 • New load group (light) • 16 push-in terminals • Without AUX terminals	10	6ES7193-6BP00-2DA0	CC01 to CC05	--
BU type A0 • Forwarding of load group (dark) • 16 push-in terminals • With 10 AUX terminals	1	6ES7193-6BP20-0BA0	CC01 to CC05	CC71 to CC73
BU type A0 • Forwarding of load group (dark) • 16 push-in terminals • With 10 AUX terminals	10	6ES7193-6BP20-2BA0	CC01 to CC05	CC71 to CC73

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Overview (continued)

BaseUnit	PU	Article No.	CC codes for push-in terminals	CC codes for AUX terminals
BU type A0 • Forwarding of load group (dark) • 16 push-in terminals • Without AUX terminals	1	6ES7193-6BP00-0BA0	CC01 to CC05	--
BU type A0 • Forwarding of load group (dark) • 16 push-in terminals • Without AUX terminals	10	6ES7193-6BP00-2BA0	CC01 to CC05	--
BU type A1 • New load group (light) • With temperature sensor • 16 push-in terminals • With 2x5 additional terminals	1	6ES7193-6BP40-0DA1	CC01 to CC05	CC74
BU type A1 • New load group (light) • With temperature sensor • 16 push-in terminals • Without 2x5 additional terminals	1	6ES7193-6BP00-0DA1	CC01 to CC05	--
BU type A1 • Forwarding of load group (dark) • With temperature sensor • 16 push-in terminals • With 2x5 additional terminals	1	6ES7193-6BP40-0BA1	CC01 to CC05	CC74
BU type A1 • Forwarding of load group (dark) • With temperature sensor • 16 push-in terminals • Without 2x5 additional terminals	1	6ES7193-6BP00-0BA1	CC01 to CC05	--
BU type D0 • Forwarding of load group (dark) • 12 push-in terminals • Without AUX terminals	1	6ES7193-6BP00-0BD0	--	--
BU type U0 • New load group (light) • 16 push-in terminals • Without AUX terminals	1	6ES7193-6BP00-0DU0	CC00	--
BU type U0 • New load group (light) • 16 push-in terminals • Without AUX terminals	10	6ES7193-6BP00-2DU0	CC00	--
BU type U0 • Forwarding of load group (dark) • 16 push-in terminals • Without AUX terminals	1	6ES7193-6BP00-0BU0	CC00	--
BU type U0 • Forwarding of load group (dark) • 16 push-in terminals • Without AUX terminals	10	6ES7193-6BP00-2BU0	CC00	--

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Overview (continued)

Overview of potential distributor modules

Potential distribution module	PU	Article No.	CC codes for push-in terminals
PotDis BU Type P1 (light), 17x P1 potential, 1x P2 potential, for starting a new load group (max. 10 A)	1	6ES7193-6UP00-0DP1	CC00, CC62
PotDis BU Type P1 (dark), 17x P1 potential, 1x P2 potential, for continuing the load group	1	6ES7193-6UP00-0BP1	CC00, CC62
PotDis BU Type P2 (light), 1x P1 potential, 17x P2 potential, for starting a new load group (max. 10 A)	1	6ES7193-6UP00-0DP2	CC00, CC63
PotDis BU Type P2 (dark), 1x P1 potential, 17x P2 potential, for continuing the load group	1	6ES7193-6UP00-0BP2	CC00, CC63
PotDis TB Type BR-W, 18x internally jumpered terminals, without reference to P1, P2 or AUX, (total current max. 10 A)	1	6ES7193-6TP00-0TP0	CC10 to CC13
PotDis TB Type P1-R, 18x P1 potential, (total current max. 10 A)	1	6ES7193-6TP00-0TP1	CC10, CC12
PotDis TB Type P2-B, 18x P2 potential, (total current max. 10 A)	1	6ES7193-6TP00-0TP2	CC10, CC13
PotDis TB Type n.c.-G, 18x n.c. (not connected) terminals, without reference to P1, P2 or AUX	1	6ES7193-6TP00-0TN0	CC10

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Technical specifications

Article number	**6ES7134-6GF00-0AA1** ET 200SP, AI 8XI 2/4-wire Basic	**6ES7134-6FB00-0BA1** ET 200SP, AI 2xU Standard, PU 1	**6ES7134-6FF00-0AA1** ET 200SP, AI 8xU Basic	**6ES7134-6HD01-0BA1** ET 200SP, AI 4xU/I 2-Wire ST, PU 1	**6ES7134-6GB00-0BA1** ET 200SP, AI 2xI 2/4-wire ST, PU 1
General information					
Product type designation	AI 8xI 2-/4-wire BA	AI 2xU ST	AI 8xU BA	AI 4x U/I 2-wire	AI 2xI 2-/4-wire ST
Product function					
• I&M data	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3
• Measuring range scalable	No	No	No	No	No
Engineering with					
• STEP 7 TIA Portal configurable/ integrated as of version	V13 SP1	V13 SP1	V13 SP1	V14 / -	V13 SP1
• STEP 7 configurable/integrated as of version	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -	V5.6 and higher	V5.5 SP3
• PCS 7 configurable/integrated as of version				V8.1 SP1	
• PROFIBUS as of GSD version/ GSD revision	GSD Revision 5	GSD Revision 5	GSD Revision 5	One GSD file each, Revision 3 and 5 and higher	GSD Revision 5
• PROFINET as of GSD version/ GSD revision	GSDML V2.3	GSDML V2.3	GSDML V2.3	GSDML V2.3	V2.3 / -
Operating mode					
• Oversampling	No	No	No	No	No
• MSI	No	No	No	No	No
Supply voltage					
Rated value (DC)	24 V	24 V	24 V	24 V	24 V
Reverse polarity protection	Yes	Yes	Yes	Yes	Yes

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Technical specifications (continued)

Article number	**6ES7134-6GF00-0AA1** ET 200SP, AI 8XI 2/4-wire Basic	**6ES7134-6FB00-0BA1** ET 200SP, AI 2xU Standard, PU 1	**6ES7134-6FF00-0AA1** ET 200SP, AI 8xU Basic	**6ES7134-6HD01-0BA1** ET 200SP, AI 4xU/I 2-Wire ST, PU 1	**6ES7134-6GB00-0BA1** ET 200SP, AI 2xI 2/4-wire ST, PU 1
Analog inputs					
Number of analog inputs	8; Single-ended	2	8; Single-ended	4; Differential inputs	2
• For current measurement	8				2
• For voltage measurement		2	8		
permissible input voltage for voltage input (destruction limit), max.		30 V	30 V	30 V	
permissible input current for current input (destruction limit), max.	50 mA			50 mA	50 mA
Cycle time (all channels), min.	1 ms; per channel	500 µs	1 ms; per channel	Sum of the basic conversion times and additional processing times (depending on the parameterization of the active channels)	500 µs
Input ranges (rated values), voltages					
• 0 to +10 V		Yes; 15 bit	Yes; 15 bit	Yes; 15 bit	
• 1 V to 5 V		Yes; 15 bit		Yes; 15 bit	
• -10 V to +10 V		Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	
• -5 V to +5 V		Yes; 16 bit incl. sign		Yes; 16 bit incl. sign	
Input ranges (rated values), currents					
• 0 to 20 mA	Yes			Yes; 15 bit	Yes; 15 bit
• -20 mA to +20 mA	Yes				Yes; 16 bit incl. sign
• 4 mA to 20 mA	Yes			Yes; 15 bit	Yes; 15 bit
Cable length					
• shielded, max.	200 m	200 m	200 m	1 000 m; 200 m for voltage measurement	1 000 m
Analog value generation for the inputs					
Measurement principle		Sigma Delta		integrating (Sigma-Delta)	Sigma Delta
Integration and conversion time/ resolution per channel					
• Resolution with overrange (bit including sign), max.	16 bit	16 bit	16 bit	16 bit	16 bit
• Integration time, parameterizable	Yes	Yes	Yes	Yes	Yes
• Interference voltage suppression for interference frequency f1 in Hz	16.67 / 50 / 60 / 4 800 (16.67 / 50 / 60)	16.6 / 50 / 60 Hz / off	16.67 / 50 / 60 / 4 800 (16.67 / 50 / 60)	16.6 / 50 / 60 Hz	16.6 / 50 / 60 Hz / off
• Conversion time (per channel)	180 / 60 / 50 / 0.625 (67.5 / 22.5 / 18.75) ms	50 ms @ 60 Hz, 60 ms @ 50 Hz, 180 ms @ 16.6 Hz, 250 µs without filter	180 / 60 / 50 / 0.625 (67.5 / 22.5 / 18.75) ms	180 / 60 / 50 ms	50 ms @ 60 Hz, 60 ms @ 50 Hz, 180 ms @ 16.6 Hz, 500 µs without filter
Smoothing of measured values					
• Number of smoothing levels	4; None; 4/8/16 times	4	4; None; 4/8/16 times	4; None; 4/8/16 times	4
• parameterizable	Yes	Yes	Yes	Yes	Yes
Encoder					
Connection of signal encoders					
• for voltage measurement	No	Yes	Yes	Yes	
• for current measurement as 2-wire transducer	Yes			Yes	Yes
- Burden of 2-wire transmitter, max.	650 Ω			650 Ω	650 Ω
• for current measurement as 4-wire transducer	Yes		No	No	Yes

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Technical specifications (continued)

Article number	6ES7134-6GF00-0AA1 ET 200SP, AI 8XI 2/4-wire Basic	6ES7134-6FB00-0BA1 ET 200SP, AI 2xU Standard, PU 1	6ES7134-6FF00-0AA1 ET 200SP, AI 8xU Basic	6ES7134-6HD01-0BA1 ET 200SP, AI 4xU/I 2-Wire ST, PU 1	6ES7134-6GB00-0BA1 ET 200SP, AI 2xI 2/4-wire ST, PU 1
Errors/accuracies					
Basic error limit (operational limit at 25 °C)					
• Voltage, relative to input range, (+/-)		0.3 %	0.3 %	0.3 %	
• Current, relative to input range, (+/-)	0.3 %			0.3 %	0.3 %
Interference voltage suppression for f = n x (f1 +/- 1 %), f1 = interference frequency					
• Series mode interference (peak value of interference < rated value of input range), min.	70 dB; With conversion time 67.5 / 22.5 / 18.75 ms: 40 dB	70 dB	70 dB; With conversion time 67.5 / 22.5 / 18.75 ms: 40 dB	70 dB	70 dB
• Common mode voltage, max.		10 V		10 V	10 V
• Common mode interference, min.		90 dB		90 dB	90 dB
Isochronous mode					
Isochronous operation (application synchronized up to terminal)	No	No	No	No	No
Interrupts/diagnostics/ status information					
Diagnostics function	Yes	Yes	Yes	Yes	Yes
Alarms					
• Diagnostic alarm	Yes	Yes	Yes	Yes	Yes
• Limit value alarm	No	No	No	No	No
Diagnostic messages					
• Monitoring the supply voltage	Yes	Yes	Yes	Yes	Yes
• Wire-break	Yes; at 4 to 20 mA	No	No	Yes; at 4 to 20 mA	Yes; at 4 to 20 mA
• Short-circuit	Yes; Sensor supply to M; module by module	Yes; at 1 to 5 V	No	Yes; with 1 to 5 V or 2-wire mode: Short-circuit of the encoder supply to ground or of an input to the encoder supply	Yes; Short-circuit of the encoder supply
• Group error	Yes	Yes	Yes	Yes	Yes
• Overflow/underflow	Yes	Yes	Yes	Yes	Yes
Diagnostics indication LED					
• Monitoring of the supply voltage (PWR-LED)	Yes; Green LED	Yes; green PWR LED	Yes; green PWR LED	Yes; Green LED	Yes; green PWR LED
• Channel status display	Yes; Green LED	Yes; Green LED	Yes; Green LED	Yes; Green LED	Yes; Green LED
• for channel diagnostics	No	No	No	No	No
• for module diagnostics	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; Green/red LED	Yes; green/red DIAG LED
Potential separation					
Potential separation channels					
• between the channels and backplane bus	Yes	Yes	Yes	Yes	Yes
Standards, approvals, certificates					
Suitable for applications according to AMS 2750				Yes; Declaration of Conformity, see online support entry 109757262	
Suitable for applications according to CQI-9				Yes	
Ambient conditions					
Ambient temperature during operation					
• horizontal installation, min.		-30 °C	-30 °C	-30 °C	-30 °C
• horizontal installation, max.		60 °C	60 °C	60 °C	60 °C
• vertical installation, min.		-30 °C	-30 °C	-30 °C	-30 °C
• vertical installation, max.		50 °C	50 °C	50 °C	50 °C

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Technical specifications (continued)

Article number	6ES7134-6GF00-0AA1 ET 200SP, AI 8XI 2/4-wire Basic	6ES7134-6FB00-0BA1 ET 200SP, AI 2xU Standard, PU 1	6ES7134-6FF00-0AA1 ET 200SP, AI 8xU Basic	6ES7134-6HD01-0BA1 ET 200SP, AI 4xU/I 2-Wire ST, PU 1	6ES7134-6GB00-0BA1 ET 200SP, AI 2xI 2/4-wire ST, PU 1
Altitude during operation relating to sea level					
• Installation altitude above sea level, max.			2 000 m; On request: Installation altitudes greater than 2 000 m	2 000 m; On request: Installation altitudes greater than 2 000 m	2 000 m; On request: Installation altitudes greater than 2 000 m
Dimensions					
Width	15 mm	15 mm	15 mm	15 mm	15 mm
Height	73 mm	73 mm	73 mm	73 mm	73 mm
Depth	58 mm	58 mm	58 mm	58 mm	58 mm
Weights					
Weight, approx.	31 g	31 g	31 g	31 g	32 g

Article number	6ES7134-6GD01-0BA1 ET 200SP, AI 4XI 2/4-wire ST, PU 1	6ES7134-6TD00-0CA1 ET 200SP, AI 4XI 2-WIRE 4...20MA HART	6ES7134-6HB00-0CA1 ET 200SP AI 2 X U/I 2-, 4-Wire HF	6ES7134-6HB00-0DA1 ET 200SP AI 2 X U/I 2-, 4-Wire HS
General information				
Product type designation	AI 4xI 2-/4-wire ST	AI 4xI 2-wire HART	AI 2xU/I 2-/4-wire HF	AI 2xU/I 2-/4-wire HS
Product function				
• I&M data	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3
• Measuring range scalable	No	No	No	No
• Scalable measured values				No
• Adjustment of measuring range				No
Engineering with				
• STEP 7 TIA Portal configurable/ integrated as of version	V14 / -	V13 SP1	V13	V13 SP1
• STEP 7 configurable/integrated as of version	V5.6 and higher	V5.5 SP4 and higher	V5.5 / -	V5.5 SP3 / -
• PCS 7 configurable/integrated as of version	V8.1 SP1	V8.1 SP1	V8.1 SP1	
• PROFIBUS as of GSD version/ GSD revision	One GSD file each, Revision 3 and 5 and higher	GSD Revision 5	GSD Revision 5	GSD Revision 5
• PROFINET as of GSD version/ GSD revision	GSDML V2.3	GSDML V2.3	GSDML V2.3	GSDML V2.3
Operating mode				
• Oversampling	No	No	No	Yes; 2 channels per module
• MSI	No	No	Yes	No
Supply voltage				
Rated value (DC)	24 V	24 V	24 V	24 V
Reverse polarity protection	Yes	Yes	Yes	Yes
Analog inputs				
Number of analog inputs	4; Differential inputs	4; Differential inputs	2; Differential inputs	2; Differential inputs
• For current measurement		4	2	2
• For voltage measurement			2	2
permissible input voltage for voltage input (destruction limit), max.			30 V	30 V
permissible input current for current input (destruction limit), max.	50 mA	50 mA	50 mA	50 mA
Cycle time (all channels), min.	Sum of the basic conversion times and additional processing times (depending on the parameterization of the active channels)			125 µs
Analog input with oversampling			No	Yes
• Values per cycle, max.				16
• Resolution, min.				50 µs
Standardization of measured values			Yes	

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Technical specifications (continued)

Article number	6ES7134-6GD01-0BA1 ET 200SP, AI 4XI 2/4-wire ST, PU 1	6ES7134-6TD00-0CA1 ET 200SP, AI 4XI 2-WIRE 4...20MA HART	6ES7134-6HB00-0CA1 ET 200SP AI 2 X U/I 2-, 4-Wire HF	6ES7134-6HB00-0DA1 ET 200SP AI 2 X U/I 2-, 4-Wire HS
Input ranges (rated values), voltages				
• 0 to +10 V			Yes; 15 bit	Yes; 15 bit
• 1 V to 5 V			Yes; 15 bit	Yes; 13 bit
• -10 V to +10 V			Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
• -5 V to +5 V			Yes; 16 bit incl. sign	Yes; 15 bit incl. sign
Input ranges (rated values), currents				
• 0 to 20 mA	Yes; 16 bit incl. sign	No	Yes; 15 bit	Yes; 15 bit
• -20 mA to +20 mA	Yes	No	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
• 4 mA to 20 mA	Yes; 15 bit	Yes; 15 bit + sign	Yes; 15 bit	Yes; 14 bit
Cable length				
• shielded, max.	1 000 m	800 m	1 000 m; 200 m for voltage measurement	1 000 m; 200 m for voltage measurement
Analog value generation for the inputs				
Measurement principle	integrating (Sigma-Delta)	integrating (Sigma-Delta)	Sigma Delta	Actual value encryption (successive approximation)
Integration and conversion time/ resolution per channel				
• Resolution with overrange (bit including sign), max.	16 bit	16 bit	16 bit	16 bit
• Integration time, parameterizable	Yes	Yes; channel by channel	Yes	
• Integration time (ms)			67.5 / 22.5 / 18.75 / 10 / 5 / 2.5 / 1.25 / 0.625 ms	
• Basic conversion time, including integration time (ms)			68.03 / 22.83 / 19.03 / 10.28 / 5.23 / 2.68 / 1.43 / 0.730 ms	
• Interference voltage suppression for interference frequency f1 in Hz	16.6 / 50 / 60 Hz	10 / 50 / 60 Hz	16.6 / 50 / 60 / 300 / 600 / 1 200 / 2 400 / 4 800	No
• Conversion time (per channel)	180 / 60 / 50 ms		68.2 / 23 / 19.2 / 10.45 / 5.40 / 2.85 / 1.6 / 0.9 ms	10 µs
• Basic execution time of the module (all channels released)			1 ms	
Smoothing of measured values				
• Number of smoothing levels	4; None; 4/8/16 times	4; None; 4/8/16 times	6; none; 2-/4-/8-/16-/32-fold	7; none; 2-/4-/8-/16-/32-/64-fold
• parameterizable	Yes	Yes	Yes	Yes
Encoder				
Connection of signal encoders				
• for voltage measurement	No	No	Yes	Yes
• for current measurement as 2-wire transducer	Yes	Yes	Yes	Yes
- Burden of 2-wire transmitter, max.	650 Ω		650 Ω	650 Ω
• for current measurement as 4-wire transducer	Yes		Yes	Yes
Errors/accuracies				
Basic error limit (operational limit at 25 °C)				
• Voltage, relative to input range, (+/-)			0.05 %; 0.1 % at SFU 4.8 kHz	0.2 %
• Current, relative to input range, (+/-)	0.3 %	0.3 %	0.05 %; 0.1 % at SFU 4.8 kHz	0.2 %
Interference voltage suppression for f = n x (f1 +/- 1 %), f1 = interference frequency				
• Series mode interference (peak value of interference < rated value of input range), min.	70 dB	60 dB		
• Common mode voltage, max.	10 V		35 V	35 V
• Common mode interference, min.	90 dB		90 dB	90 dB

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Technical specifications (continued)

Article number	**6ES7134-6GD01-0BA1** ET 200SP, AI 4XI 2/4-wire ST, PU 1	**6ES7134-6TD00-0CA1** ET 200SP, AI 4XI 2-WIRE 4...20MA HART	**6ES7134-6HB00-0CA1** ET 200SP AI 2 X U/I 2-, 4-Wire HF	**6ES7134-6HB00-0DA1** ET 200SP AI 2 X U/I 2-, 4-Wire HS
Isochronous mode				
Isochronous operation (application synchronized up to terminal)	No	No	Yes	Yes
Filtering and processing time (TCI), min.			800 µs	80 µs
Bus cycle time (TDP), min.			1 ms	125 µs; Starting from firmware Version V2.0.1
Interrupts/diagnostics/ status information				
Diagnostics function	Yes	Yes	Yes	
Alarms				
• Diagnostic alarm	Yes	Yes	Yes	Yes
• Limit value alarm	No	Yes	Yes; two upper and two lower limit values in each case	Yes; two upper and two lower limit values in each case
Diagnostic messages				
• Monitoring the supply voltage	Yes	Yes	Yes	
• Wire-break	Yes; at 4 to 20 mA	Yes; channel by channel	Yes; Measuring range 4 to 20 mA only	Yes; channel-by-channel, at 4 to 20 mA only
• Short-circuit	Yes; 2-wire mode: Short-circuit of the encoder supply to ground or of an input to the encoder supply	Yes; Channel-by-channel, short-circuit of the encoder supply to ground or of an input to the encoder supply	Yes; channel-by-channel, at 1 to 5 V or for short-circuit in encoder supply	Yes; channel-by-channel, at 1 to 5 V or for current measuring ranges short-circuit in encoder supply
• Group error	Yes	Yes	Yes	Yes
• Overflow/underflow	Yes	Yes; channel by channel	Yes	Yes
Diagnostics indication LED				
• Monitoring of the supply voltage (PWR-LED)	Yes; Green LED	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED
• Channel status display	Yes; Green LED	Yes; Green LED	Yes; Green LED	Yes; Green LED
• for channel diagnostics	No	Yes; Red LED	Yes; Red LED	Yes; Red LED
• for module diagnostics	Yes; Green/red LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED
Potential separation				
Potential separation channels				
• between the channels and backplane bus	Yes	Yes	Yes	Yes
Ambient conditions				
Ambient temperature during operation				
• horizontal installation, min.	-30 °C		-30 °C	-30 °C
• horizontal installation, max.	60 °C		60 °C	60 °C
• vertical installation, min.	-30 °C		-30 °C	-30 °C
• vertical installation, max.	50 °C		50 °C	50 °C
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.	2 000 m; On request: Installation altitudes greater than 2 000 m		2 000 m; On request: Installation altitudes greater than 2 000 m	2 000 m; On request: Installation altitudes greater than 2 000 m
Dimensions				
Width	15 mm	15 mm	15 mm	15 mm
Height	73 mm	73 mm	73 mm	73 mm
Depth	58 mm	58 mm	58 mm	58 mm
Weights				
Weight, approx.	31 g	31 g	32 g	32 g

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Technical specifications (continued)

Article number	**6ES7134-6JF00-0CA1** ET 200SP, AI 8xRTD/TC 2-Wire HF	**6ES7134-6JD00-0CA1** ET 200SP, AI 4xRTD/TC 2-/3-/4-Wire HF	**6ES7134-6JD00-0DA1** ET 200SP, AI 4x TC HS
General information			
Product type designation	AI 8xRTD/TC 2-wire HF	AI 4xRTD/TC 2-/3-/4-wire HF	AI 4xTC HS
Product function			
• I&M data	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3
• Measuring range scalable			Yes
Engineering with			
• STEP 7 TIA Portal configurable/ integrated as of version	V13	V12 SP1 / V13	V15 with HSP 265/integrated as of V15.1
• STEP 7 configurable/integrated as of version	V5.5 / -	V5.5 SP3 / V5.5 SP4	V5.5 SP3 or higher
• PCS 7 configurable/integrated as of version		V8.1 SP1	
• PROFIBUS as of GSD version/ GSD revision	GSD Revision 5	GSD Revision 5	One GSD file each, Revision 3 and 5 and higher
• PROFINET as of GSD version/ GSD revision	GSDML V2.3	GSDML V2.3	GSDML V2.3
Operating mode			
• Oversampling	No	No	No
• MSI	No	No	Yes
Supply voltage			
Rated value (DC)	24 V	24 V	24 V
Reverse polarity protection	Yes	Yes	Yes
Analog inputs			
Number of analog inputs	8	4	4
• For voltage measurement	8	4	
• For resistance/resistance thermometer measurement	8	4	
• For thermocouple measurement	8	4	
permissible input voltage for voltage input (destruction limit), max.	30 V	30 V	30 V
Constant measurement current for resistance-type transmitter, typ.	2 mA	0.7 mA; 1.7 mA for Cu10 sensors	
Cycle time (all channels), min.	Sum of the basic conversion times and additional processing times (depending on the parameterization of the active channels)	Sum of the basic conversion times and additional processing times (depending on the parameterization of the active channels); for line compensation in case of a three-wire connection, an additional cycle is necessary	5 ms; Sum of the basic conversion times and additional processing times (depending on the parameterization of the active channels)
Technical unit for temperature measurement adjustable	Yes; °C/°F/K	Yes; °C/°F/K	Yes; °C/°F/K
Input ranges (rated values), voltages			
• -1 V to +1 V	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
• -250 mV to +250 mV	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
• -50 mV to +50 mV	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
• -80 mV to +80 mV	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
Input ranges (rated values), thermocouples			
• Type B	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
• Type C	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
• Type E	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
• Type J	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
• Type K	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
• Type L	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
• Type N	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
• Type R	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
• Type S	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
• Type T	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
• Type U	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
• Type TXK/TXK(L) to GOST	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign

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Technical specifications (continued)

Article number	**6ES7134-6JF00-0CA1** ET 200SP, AI 8xRTD/TC 2-Wire HF	**6ES7134-6JD00-0CA1** ET 200SP, AI 4xRTD/TC 2-/3-/4-Wire HF	**6ES7134-6JD00-0DA1** ET 200SP, AI 4x TC HS
Input ranges (rated values), resistance thermometer			
• Cu 10		Yes; 16 bit incl. sign	
• Ni 100	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	
• Ni 1000	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	
• LG-Ni 1000	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	
• Ni 120	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	
• Ni 200	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	
• Ni 500	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	
• Pt 100	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	
• Pt 1000	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	
• Pt 200	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	
• Pt 500	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	
Input ranges (rated values), resistors			
• 0 to 150 ohms	Yes; 15 bit	Yes; 15 bit	
• 0 to 300 ohms	Yes; 15 bit	Yes; 15 bit	
• 0 to 600 ohms	Yes; 15 bit	Yes; 15 bit	
• 0 to 3000 ohms	Yes; 15 bit	Yes; 15 bit	
• 0 to 6000 ohms	Yes; 15 bit	Yes; 15 bit	
• PTC	Yes; 15 bit	Yes; 15 bit	
Thermocouple (TC)			
Temperature compensation			
- parameterizable	Yes	Yes	Yes
Cable length			
• shielded, max.	200 m; 50 m with thermocouples	200 m; 50 m with thermocouples	200 m; 100 m for thermocouples
Analog value generation for the inputs			
Measurement principle	integrating (Sigma-Delta)	integrating (Sigma-Delta)	integrating (Sigma-Delta)
Integration and conversion time/ resolution per channel			
• Resolution with overrange (bit including sign), max.	16 bit	16 bit	16 bit
• Integration time, parameterizable	Yes	Yes	Yes
• Basic conversion time, including integration time (ms)			
- additional processing time for wire-break check	2 ms; In the ranges resistance thermometers, resistors and thermocouples	2 ms; In the ranges resistance thermometers, resistors and thermocouples	1 ms
- additional power line wire-break check		2 ms; for 3/4 wire transducer (resistance thermometer and resistor)	
• Interference voltage suppression for interference frequency f1 in Hz	16.6 / 50 / 60 Hz	16.6 / 50 / 60 Hz	16.6 / 50 / 60 Hz / off
• Conversion time (per channel)	180 / 60 / 50 ms	180 / 60 / 50 ms	180/60/50/1.25 ms
Smoothing of measured values			
• Number of smoothing levels	4; None; 4/8/16 times	4; None; 4/8/16 times	4; None; 4/8/16 times
• parameterizable	Yes	Yes	Yes
Encoder			
Connection of signal encoders			
• for voltage measurement	Yes	Yes	Yes
• for resistance measurement with two-wire connection	Yes	Yes	
• for resistance measurement with three-wire connection	No	Yes	
• for resistance measurement with four-wire connection	No	Yes	

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Technical specifications (continued)

Article number	6ES7134-6JF00-0CA1 ET 200SP, AI 8xRTD/TC 2-Wire HF	6ES7134-6JD00-0CA1 ET 200SP, AI 4xRTD/TC 2-/3-/4-Wire HF	6ES7134-6JD00-0DA1 ET 200SP, AI 4x TC HS
Errors/accuracies			
Basic error limit (operational limit at 25 °C)			
• Voltage, relative to input range, (+/-)	0.05 %	0.05 %	0.05 %; 0.2 % when SFU OFF
• Resistance, relative to input range, (+/-)	0.05 %	0.05 %	
Interference voltage suppression for f = n x (f1 +/- 1 %), f1 = interference frequency			
• Series mode interference (peak value of interference < rated value of input range), min.	70 dB	70 dB	70 dB
• Common mode voltage, max.	10 V	10 V	60 V; DC
• Common mode interference, min.	90 dB	90 dB	90 dB
Isochronous mode			
Isochronous operation (application synchronized up to terminal)	No	No	No
Interrupts/diagnostics/ status information			
Diagnostics function	Yes	Yes	Yes
Alarms			
• Diagnostic alarm	Yes	Yes	Yes
• Limit value alarm	Yes; two upper and two lower limit values in each case	Yes; two upper and two lower limit values in each case	Yes; two upper and two lower limit values in each case
Diagnostic messages			
• Monitoring the supply voltage	Yes	Yes	Yes
• Wire-break	Yes; channel by channel	Yes; channel by channel	Yes; channel by channel
• Group error	Yes	Yes	Yes
• Overflow/underflow	Yes; channel by channel	Yes; channel by channel	Yes; channel by channel
Diagnostics indication LED			
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED
• Channel status display	Yes; Green LED	Yes; Green LED	Yes; Green LED
• for channel diagnostics	Yes; Red LED	Yes; Red LED	Yes; Red LED
• for module diagnostics	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; Green/red LED
Potential separation			
Potential separation channels			
• between the channels and backplane bus	Yes	Yes	Yes
Standards, approvals, certificates			
Suitable for applications according to AMS 2750			Yes; Declaration of Conformity, see online support entry 109757262
Suitable for applications according to CQI-9			Yes; Based on AMS 2750 E
Ambient conditions			
Ambient temperature during operation			
• horizontal installation, min.			-30 °C
• horizontal installation, max.			60 °C
• vertical installation, min.			-30 °C
• vertical installation, max.			50 °C
Altitude during operation relating to sea level			
• Installation altitude above sea level, max.			2 000 m; On request: Installation altitudes greater than 2 000 m
Dimensions			
Width	15 mm	15 mm	15 mm
Height	73 mm	73 mm	73 mm
Depth	58 mm	58 mm	58 mm
Weights			
Weight, approx.	32 g	30 g	33 g

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Technical specifications (continued)

Article number	**7MH4134-6LB00-0DA0** ET 200SP AI 2 X SG 4-/6-WIRE HS
General information	
Product type designation	AI 2xSG 4-/6-wire HS
Product function	
• I&M data	Yes; I&M0 to I&M3
• Measuring range scalable	Yes
• Scalable measured values	No
• Adjustment of measuring range	Yes; ±0.5 ... 320 mV/V
Engineering with	
• STEP 7 TIA Portal configurable/ integrated as of version	V14 SP1
• STEP 7 configurable/integrated as of version	V5.6
• PROFIBUS as of GSD version/ GSD revision	V03.01.105
• PROFINET as of GSD version/ GSD revision	GSDML V2.33
Operating mode	
• Oversampling	Yes; 2 channels per module
• MSI	No
Supply voltage	
Rated value (DC)	24 V
Reverse polarity protection	Yes
Analog inputs	
Number of analog inputs	2; Differential inputs
Cycle time (all channels), min.	100 µs
Analog input with oversampling	Yes
• Values per cycle, max.	14
• Resolution, min.	100 µs
Input ranges	
• Strain gauges (full bridges)	Yes
Cable length	
• shielded, max.	500 m
Analog value generation for the inputs	
Measurement principle	Sigma Delta
Integration and conversion time/ resolution per channel	
• Resolution with overrange (bit including sign), max.	28 bit; 16 bits with oversampling
• Integration time, parameterizable	Yes
• Interference voltage suppression for interference frequency f1 in Hz	60 / 50 Hz / no
• Conversion time (per channel)	100 µs
Smoothing of measured values	
• IIR low-pass filter frequency	0.01 ... 600 Hz
• IIR low-pass filter ordinal number	1 ... 4
• Notch filter frequency	0.1 ... 1 000 Hz
• Notch filter quality	5.00 ... 250.00
• Average value filter	0.1 ... 655.3 ms
Encoder	
Connection of signal encoders	
• For strain gauges (full bridges) with 4-conductor connection	Yes
• For strain gauges (full bridges) with 6-conductor connection	Yes
• Resistance of full bridge, min.	80 Ω
• Resistance of full bridge, max.	5 000 Ω

Article number	**7MH4134-6LB00-0DA0** ET 200SP AI 2 X SG 4-/6-WIRE HS
Errors/accuracies	
Temperature coefficient, zero point	≤ ±0.25 µV/K
Temperature coefficient, span, 4-conductor connection (referred to end value)	≤ ±5 ppm/K
Temperature coefficient, span, 6-conductor connection (referred to end value)	≤ ±10 ppm/K
Basic error limit (operational limit at 25 °C)	
• Voltage, relative to input range, (+/-)	0.05 %; See manual for details
Isochronous mode	
Isochronous operation (application synchronized up to terminal)	Yes
Filtering and processing time (TCI), min.	87 µs
Bus cycle time (TDP), min.	125 µs
Interrupts/diagnostics/ status information	
Diagnostics function	Yes
Alarms	
• Diagnostic alarm	Yes
• Limit value alarm	Yes; two upper and two lower limit values in each case
Diagnostic messages	
• Monitoring the supply voltage	Yes
• Wire-break	Yes
• Short-circuit	Yes
• Group error	Yes
• Overflow/underflow	Yes
Diagnostics indication LED	
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
• Channel status display	Yes; Green LED
• for channel diagnostics	Yes; Red LED
• for module diagnostics	Yes; green/red DIAG LED
Potential separation	
Potential separation channels	
• between the channels and backplane bus	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-25 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	-25 °C
• vertical installation, max.	50 °C
Altitude during operation relating to sea level	
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax – 1 K/100 m) at 795 hPa ... 701 hPa (+2 000 m ... +3 000 m)
Dimensions	
Width	15 mm
Height	73 mm
Depth	58 mm
Weights	
Weight, approx.	45 g

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Technical specifications (continued)

Article number	6ES7134-6PA01-0BD0	6ES7134-6PA20-0BD0	6ES7134-6PA00-0CU0	6ES7134-6PA20-0CU0
	ET 200SP AI Energy Meter 400VAC ST	ET 200SP AI Energy Meter 480VAC ST	ET 200SP AI Energy Meter 480V AC/CT HF	ET 200SP AI Energy Meter 480V AC/RC HF
General information				
Product type designation	AI energy meter 400VAC ST	AI Energy Meter 480VAC ST	AI Energy Meter 480 VAC/CT HF, PU 1	AI Energy Meter 480 VAC/RC HF, PU 1
Product function				
• Voltage measurement	Yes	Yes	Yes	Yes
- without voltage transformer		Yes	Yes	Yes
- with voltage transformer	No	Yes	Yes	Yes
• Current measurement	Yes	Yes	Yes	Yes
- without current transformer	No	No	No	No
- with current transformer	Yes	Yes	Yes; 1 A or 5 A current transformer	No
- with Rogowski coil		No	No	Yes
- with current/voltage transformer		No	No	Yes; 333 mV interface
• Energy measurement	Yes	Yes	Yes	Yes
• Frequency measurement	Yes	Yes	Yes	Yes
• Power measurement	Yes	Yes	Yes	Yes
• Active power measurement	Yes	Yes	Yes	Yes
• Reactive power measurement	Yes	Yes	Yes	Yes
• Power factor measurement		Yes	Yes	Yes
• Active factor measurement		No	Yes	Yes
• Reactive power compensation		No	Yes	Yes
• Line analysis		No	Yes	Yes
- Monitoring of instantaneous and half-wave values			Yes	Yes
- THD measurement for current and voltage			Yes	Yes
- Harmonics for current and voltage			Yes	Yes
- Voltage dip (DIP)			Yes	Yes
- Voltage swell			Yes	Yes
• I&M data	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3
• Isochronous mode	No	No	No	No
Engineering with				
• STEP 7 TIA Portal configurable/ integrated as of version	V13 SP1	V13 SP1	STEP 7 V15 or higher	STEP 7 V15 or higher
• STEP 7 configurable/integrated as of version	V5.5 SP4 and higher	V5.5 SP4 and higher	V5.5 SP3 or higher	V5.5 SP3 or higher
• PROFIBUS as of GSD version/ GSD revision	GSD Revision 5	GSD Revision 5	One GSD file each, Revision 3 and 5 and higher	One GSD file each, Revision 3 and 5 and higher
• PROFINET as of GSD version/ GSD revision	V2.3	V2.3	V2.3	V2.3
Operating mode				
• Switching between operating modes in RUN			Yes; For module version 32 I/20 Q, it is possible to dynamically switch between 25 user data variants, 23 of which are pre-defined and 2 of which can be defined by the specific user	Yes; For module version 32 I/20 Q, it is possible to dynamically switch between 25 user data variants, 23 of which are pre-defined and 2 of which can be defined by the specific user
• cyclic measurement	Yes			
• acyclic measurement	Yes			
• Cyclic measured value access		Yes	Yes	Yes
• Acyclic measured value access	Yes	Yes	Yes	Yes
• Fixed measured value sets	Yes	Yes	Yes	Yes
• Freely definable measured value sets	No	Yes	Yes; For cyclic and acyclic measured value access	Yes; For cyclic and acyclic measured value access

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Technical specifications (continued)

Article number	**6ES7134-6PA01-0BD0** ET 200SP AI Energy Meter 400VAC ST	**6ES7134-6PA20-0BD0** ET 200SP AI Energy Meter 480VAC ST	**6ES7134-6PA00-0CU0** ET 200SP AI Energy Meter 480V AC/CT HF	**6ES7134-6PA20-0CU0** ET 200SP AI Energy Meter 480V AC/RC HF
Installation type/mounting				
Mounting position	Any	Any	Any	Any
Supply voltage				
Design of the power supply	Supply via voltage measurement channel L1	Supply via voltage measurement channel L1	DC	DC
Type of supply voltage	100 - 240 V AC	AC 100 - 277 V	24 V DC	24 V DC
Line frequency				
• permissible range, lower limit	47 Hz	47 Hz		
• permissible range, upper limit	63 Hz	63 Hz		
Analog inputs				
Cycle time (all channels), typ.	50 ms; Time for consistent update of all measured and calculated values (cyclic and acyclic data)	50 ms; Time for consistent update of all measured and calculated values (cyclic and acyclic data)	50 ms; Time for consistent update of all measured and calculated values (cyclic and acyclic data)	50 ms; Time for consistent update of all measured and calculated values (cyclic and acyclic data)
Cable length				
• shielded, max.			200 m	200 m
• unshielded, max.		200 m	200 m	30 m
Isochronous mode				
Isochronous operation (application synchronized up to terminal)		No	No	No
Interrupts/diagnostics/ status information				
Alarms				
• Diagnostic alarm	Yes	Yes	Yes	Yes
• Limit value alarm	No	Yes	Yes	Yes
• Hardware interrupt	No	Yes; Monitoring of up to 16 freely selectable process values (exceeding or undershooting of value)	Yes; Monitoring of up to 16 freely selectable process values (exceeding or undershooting of value)	Yes; Monitoring of up to 16 freely selectable process values (exceeding or undershooting of value)
Diagnostic messages				
• Line quality			Yes	Yes
• Supply voltage			Yes	Yes
• Hardware interrupt lost			Yes	Yes
• Parameter assignment error			Yes	Yes
• Module fault			Yes	Yes
• Channel not available			Yes	Yes
• Overflow/underflow			Yes	Yes
• Overload current			Yes	Yes
Diagnostics indication LED				
• Monitoring of the supply voltage (PWR-LED)	Yes	Yes	Yes	Yes
• Channel status display	Yes; Green LED	Yes; Green LED	Yes; Green LED	Yes; Green LED
• for channel diagnostics	Yes; red Fn LED	Yes; red Fn LED	Yes; red Fn LED	Yes; red Fn LED
• for module diagnostics	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED
Integrated Functions				
Measuring functions				
• Measuring procedure for voltage measurement	TRMS	TRMS	TRMS	TRMS
• Measuring procedure for current measurement	TRMS	TRMS	TRMS	TRMS
• Type of measured value acquisition	seamless	seamless	seamless	seamless
• Curve shape of voltage	Sinusoidal or distorted	Sinusoidal or distorted	Sinusoidal or distorted	Sinusoidal or distorted
• Buffering of measured variables	No	Yes	Yes	Yes
• Parameter length	38 byte	74 byte	128 byte	128 byte
• Bandwidth of measured value acquisition	2 kHz; Harmonics: 39 / 50 Hz, 32 / 60 Hz	2 kHz; Harmonics: 39 / 50 Hz, 32 / 60 Hz	3.2 kHz; Harmonics: 63 / 50 Hz, 52 / 60 Hz	3.2 kHz; Harmonics: 63 / 50 Hz, 52 / 60 Hz

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Technical specifications (continued)

Article number	6ES7134-6PA01-0BD0 ET 200SP AI Energy Meter 400VAC ST	6ES7134-6PA20-0BD0 ET 200SP AI Energy Meter 480VAC ST	6ES7134-6PA00-0CU0 ET 200SP AI Energy Meter 480V AC/CT HF	6ES7134-6PA20-0CU0 ET 200SP AI Energy Meter 480V AC/RC HF
Measuring range				
- Frequency measurement, min.	45 Hz	45 Hz	45 Hz	45 Hz
- Frequency measurement, max.	65 Hz	65 Hz	65 Hz	65 Hz
Measuring inputs for voltage				
- Measurable line voltage between phase and neutral conductor	230 V	277 V	300 V	300 V
- Measurable line voltage between the line conductors	400 V	480 V	519 V	519 V
- Measurable line voltage between phase and neutral conductor, min.	90 V	90 V	3 V	3 V
- Measurable line voltage between phase and neutral conductor, max.	264 V	293 V	300 V	300 V
- Measurable line voltage between the line conductors, min.	155 V	155 V	6 V	6 V
- Measurable line voltage between the line conductors, max.	460 V	508 V	519 V	519 V
- Measurement category for voltage measurement in accordance with IEC 61010-2-030	CAT II; CAT III in case of guaranteed protection level of 1.5 kV	CAT II; CAT III in case of guaranteed protection level of 1.5 kV	CAT II	CAT II
- Internal resistance line conductor and neutral conductor	3.4 MΩ	3.4 MΩ	1.5 MΩ	1.5 MΩ
- Power consumption per phase	20 mW	20 mW	60 mW; 300 V AC	60 mW; 300 V AC
- Impulse voltage resistance 1, 2/50µs	1 kV	1 kV	2.5 kV	2.5 kV
Measuring inputs for current				
- measurable relative current (AC), min.	5 %; Relative to the secondary rated current; 1 A, 5 A	1 %; Relative to the secondary rated current 5 A	1 %; Relative to the secondary rated current 5 A	
- measurable relative current (AC), max.	100 %; Relative to the secondary rated current; 1 A, 5 A	100 %; Relative to the secondary rated current 5 A	100 %; Relative to the secondary rated current 5 A	
- Continuous current with AC, maximum permissible	5 A	5 A	5 A; 6 A permanent thermal overload	
- Apparent power consumption per phase for measuring range 5 A	0.6 V·A	0.6 V·A	0.6 V·A	
- Rated value short-time withstand current restricted to 1 s	100 A	100 A	100 A	
- Input resistance measuring range 0 to 5 A	25 mΩ; At the terminal	25 mΩ; At the terminal	25 mΩ; At the terminal	
- Zero point suppression	Parameterizable: 20 ... 250 mA, default 50 mA	Parameterizable: 2 ... 250 mA, default 50 mA	0 ... 20%, referred to the nominal current	
- Surge strength	10 A; for 1 minute	10 A; for 1 minute	10 A; for 1 minute	
Measuring inputs for current (Rog. or I/U converter)				
- Measurable current at AC, max.				424 mV
- Continuous voltage, maximum permissible				2 V
- Rated value, short-time withstand voltage restricted to 1 s				30 V
- Input resistance				120 kΩ
- Zero point suppression				Yes; 0 ... 20%, referred to the nominal current
Accuracy class according to IEC 61557-12				
- Measured variable voltage	0.5	0,2	0,2	0,2
- Measured variable current	0.5	0,2	0,2	0,2
- Measured variable apparent power	1	0.5	0.5	0.5
- Measured variable active power	1	0.5	0.5	0.5
- Measured variable reactive power	1	1	1	1
- Measured variable power factor	0.5	0.5	0.5	0.5
- Measured variable active energy	1	0.5	0.5	0.5
- Measured variable reactive energy	2	1	1	1
- Measured variable neutral current		0.5; calculated	0,2	0,2

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Technical specifications (continued)

Article number	**6ES7134-6PA01-0BD0**	**6ES7134-6PA20-0BD0**	**6ES7134-6PA00-0CU0**	**6ES7134-6PA20-0CU0**
	ET 200SP AI Energy Meter 400VAC ST	ET 200SP AI Energy Meter 480VAC ST	ET 200SP AI Energy Meter 480V AC/CT HF	ET 200SP AI Energy Meter 480V AC/RC HF
Accuracy class according to IEC 61557-12 (cont.)				
- Measured variable phase angle	±1 °; not covered by IEC 61557-12	±1 °; not covered by IEC 61557-12	±0.5 °; not covered by IEC 61557-12	±0.5 °; not covered by IEC 61557-12
- Measured variable frequency	0.05	0.05	0.05	0.05
- Measured variable harmonic			1	1
- Measured variable THDU			1	1
- Measured variable THDI			1	1
Accuracy class line analysis acc. to IEC 61000-4-30				
- Measured variable voltage			Class S	Class S
- Measured variable current			Class S	Class S
- Measured variable frequency			Class S	Class S
- Measured variable voltage interruption			Class S	Class S
- Measured variable voltage dip and swell			Class S	Class S
- Measured variable harmonic voltage			Class S	Class S
- Measured variable harmonic current			Class S	Class S
Potential separation				
Potential separation channels				
• between the channels and backplane bus	Yes; 3 700V AC (type test) CAT III	Yes; 3 700V AC (type test) CAT III	Yes	Yes
Ambient conditions				
Ambient temperature during operation				
• horizontal installation, min.	0 °C	0 °C	-30 °C	-30 °C
• horizontal installation, max.	60 °C	60 °C	60 °C	60 °C
• vertical installation, min.	0 °C	0 °C	-30 °C	-30 °C
• vertical installation, max.	50 °C	50 °C	50 °C	50 °C
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.			3 000 m; Restrictions for installation altitudes > 2 000 m, see manual	3 000 m; Restrictions for installation altitudes > 2 000 m, see manual
• Ambient air temperature-barometric pressure-altitude		On request: Ambient temperatures lower than 0 °C (without condensation) and/or installation altitudes greater than 2 000 m		
Dimensions				
Width	20 mm	20 mm	20 mm	20 mm
Height	73 mm	73 mm	73 mm	73 mm
Depth	58 mm	58 mm	58 mm	58 mm
Weights				
Weight (without packaging)	45 g	45 g	45 g	45 g
Other				
Data for selecting a voltage transformer				
• Secondary side, max.		296 V	300 V	300 V
Data for selecting a current transformer				
• Burden power current transformer x/1A, min.	As a function of cable length and cross section, see device manual	As a function of cable length and cross section, see device manual	As a function of cable length and cross section, see device manual	
• Burden power current transformer x/5A, min.	As a function of cable length and cross section, see device manual	As a function of cable length and cross section, see device manual	As a function of cable length and cross section, see device manual	

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Ordering data	Article No.
Analog input modules	
Type of delivery: Apart from the standard type of delivery in an individual package, selected I/O modules and BaseUnits are also available in a pack of 10 units. The pack of 10 units enables the amount of waste to be reduced considerably, as well as saving the time and cost of unpacking individual modules. The number of modules required is the number of modules ordered. The type of packaging is chosen by selecting the article number. Packs of 10 can therefore only be ordered in integer multiples of 10.	
Analog input module AI 8xI 2/4-wire BA, BU type A0 or A1, color code CC01	**6ES7 134-6GF00-0AA1**
Analog input module AI 2xU ST, BU type A0 or A1, color code CC00	**6ES7134-6FB00-0BA1**
Analog input module AI 8xU BA, BU type A0 or A1, color code CC02	**6ES7 134-6FF00-0AA1**
Analog input module AI 4xU/I 2-wire Standard, BU type A0 or A1, color code CC03, 16-bit, ±0.3%	
• 1 unit	**6ES7134-6HD01-0BA1**
• 10 units	**6ES7134-6HD01-2BA1**
Analog input module AI 2xI 2/4-wire Standard, BU type A0 or A1, color code CC05, 16-bit	
• 1 unit	**6ES7134-6GB00-0BA1**
Analog input module AI 4xI 2/4-wire Standard, BU type A0 or A1, color code CC03, 16-bit, ±0.3%	
• 1 unit	**6ES7134-6GD01-0BA1**
• 10 units	**6ES7134-6GD01-2BA1**
Analog input module AI 4xI 2-wire 4 ... 20 mA HART, BU type A0 or A1, color code CC03	**6ES7134-6TD00-0CA1**
Analog input module AI 2xU/I 2/4-wire High Feature, BU type A0 or A1, color code CC05, 16-bit, ±0.1%, independent channel isolation, isochronous mode above 1 ms	**6ES7134-6HB00-0CA1**
Analog input module AI 2xU/I 2/4-wire High Speed, BU type A0 or A1, color code CC00, 16-bit, ±0.3%, isochronous mode above 250 µs, oversampling above 50 µs	**6ES7134-6HB00-0DA1**
Analog input module AI 8xRTD/TC 2-wire High Feature, BU type A0 or A1, color code CC00, 16-bit, ±0.1%, scalable measuring range	
• 1 unit	**6ES7134-6JF00-0CA1**
• 10 units	**6ES7134-6JF00-2CA1**
Analog input module AI 4xRTD/TC 2/3/4-wire High Feature, BU type A0 or A1, color code CC00, 16-bit, ±0.1%, scalable measuring range	
• 1 unit	**6ES7134-6JD00-0CA1**
• 10 units	**6ES7134-6JD00-2CA1**
Analog input module AI 4xTC High Speed, BU type A0 or A1, color code CC00, 16-bit, channel diagnostics	**6ES7134-6JD00-0DA1**
Analog input module AI 2x SG, 4/6-wire High Speed, BU type A0, color code CC00, channel diagnostics, 28/16-bit, ±0.05%, for DMS full bridges; for connecting force and torque sensors	**7MH4134-6LB00-0DA0**
Analog input module AI Energy Meter Standard, 400 V AC, BU type D0	**6ES7134-6PA01-0BD0**
Analog input module AI Energy Meter Standard, 480 V AC, BU type D0	**6ES7134-6PA20-0BD0**
Analog input module AI Energy Meter 480 V AC/CT High Feature, for 1 A or 5 A current transformers, with line analysis functions, channel diagnostics; BU type U0	**6ES7134-6PA00-0CU0**
Analog input module AI Energy Meter 480 V AC/RT High Feature, for Rogowski coils or 333 mV current/voltage transformers, with line analysis functions, channel diagnostics; BU type U0	**6ES7134-6PA20-0CU0**
Usable type A0 BaseUnits	
BU15-P16+A10+2D	
BU type A0; BaseUnit (light) with 16 push-in terminals (1 ... 16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)	
• 1 unit	**6ES7193-6BP20-0DA0**
• 10 units	**6ES7193-6BP20-2DA0**
BU15-P16+A0+2D	
BU type A0; BaseUnit (light) with 16 push-in terminals to the module; for starting a new load group (max. 10 A)	
• 1 unit	**6ES7193-6BP00-0DA0**
• 10 units	**6ES7193-6BP00-2DA0**
2BU15-P16+A0+2DB	
Double BaseUnit for holding 2 I/O modules; BU type A0; BaseUnit (light/dark) with 16 push-in terminals to the module; for starting a new load group (max. 10 A)	
• 1 unit	**6ES7193-6BP60-0DA0**

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Ordering data	Article No.
BU15-P16+A10+2B	
BU type A0; BaseUnit (dark) with 16 push-in terminals (1 ... 16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for continuing the load group	
• 1 unit	**6ES7193-6BP20-0BA0**
• 10 units	**6ES7193-6BP20-2BA0**
BU15-P16+A0+2B	
BU type A0; BaseUnit (dark) with 16 push-in terminals to the module; for continuing the load group	
• 1 unit	**6ES7193-6BP00-0BA0**
• 10 units	**6ES7193-6BP00-2BA0**
2BU15-P16+A0+2B	
Double BaseUnit for holding 2 I/O modules; BU type A0; BaseUnit (dark/dark) with 16 push-in terminals to the module; for continuing the load group	
• 1 unit	**6ES7193-6BP60-0BA0**
Usable type A1 BaseUnits (temperature detection)	
BU15-P16+A0+12D/T	**6ES7193-6BP40-0DA1**
BU type A1; BaseUnit (light) with 16 push-in terminals (1 ... 16) to the module and 2x5 internally jumpered additional terminals (1 B to 5 B and 1 C to 5 C); for starting a new load group (max. 10 A)	
BU15-P16+A0+2D/T	**6ES7193-6BP00-0DA1**
BU type A1; BaseUnit (light) with 16 push-in terminals to the module; for starting a new load group (max. 10 A)	
BU15-P16+A0+12B/T	**6ES7193-6BP40-0BA1**
BU type A1; BaseUnit (dark) with 16 push-in terminals (1 ... 16) to the module 2x5 internally jumpered additional terminals (1 B to 5 B and 1 C to 5 C); for continuing the load group	
BU15-P16+A0+2B/T	**6ES7193-6BP00-0BA1**
BU type A1; BaseUnit (dark) with 16 push-in terminals to the module; for continuing the load group	
Usable type D0 BaseUnits	
BU20-P12+A0+0B	**6ES7193-6BP00-0BD0**
BU type D0; BaseUnit with 12 push-in terminals, without AUX terminals, bridged to the left	
Usable type U0 BaseUnits	
BU20-P16+A0+2D	
BU type U0; BaseUnit (light) with 16 push-in terminals to the module; for starting a new load group (max. 10 A)	
• 1 unit	**6ES7193-6BP00-0DU0**
• 10 units	**6ES7193-6BP00-2DU0**
BU20-P16+A0+2B	
BU type U0; BaseUnit (dark) with 16 push-in terminals to the module; for continuing the load group	
• 1 unit	**6ES7193-6BP00-0BU0**
• 10 units	**6ES7193-6BP00-2BU0**

	Article No.
Potential distributor modules	
PotDis BU	
PotDis BU, type P1 (light), 17x P1 potential, 1x P2 potential, for starting a new load group (max. 10 A)	**6ES7193-6UP00-0DP1**
PotDis BU, type P1 (dark), 17x P1 potential, 1x P2 potential, for continuing the load group	**6ES7193-6UP00-0BP1**
PotDis BU, type P2 (light), 1x P1 potential, 17x P2 potential, for starting a new load group (max. 10 A)	**6ES7193-6UP00-0DP2**
PotDis BU, type P2 (dark), 1x P1 potential, 17x P2 potential, for continuing the load group	**6ES7193-6UP00-0BP2**
PotDis TB	
PotDis TB, type BR-W, 18x internally jumpered terminals, without reference to P1, P2 or AUX, (total current max. 10 A)	**6ES7193-6TP00-0TP0**
PotDis TB, type P1-R, 18x P1 potential, (total current max. 10 A)	**6ES7193-6TP00-0TP1**
PotDis TB, type P2-B, 18x P2 potential, (total current max. 10 A)	**6ES7193-6TP00-0TP2**
PotDis TB, type n.c.-G, 18x n.c. (not connected) terminals, without reference to P1, P2 or AUX	**6ES7193-6TP00-0TN0**
Accessories	
Equipment labeling plate	**6ES7193-6LF30-0AW0**
10 sheets of 16 labels, for printing with thermal transfer card printer or plotter	
Labeling strips	
500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer	**6ES7193-6LR10-0AA0**
500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer	**6ES7193-6LR10-0AG0**
1000 labeling strips DIN A4, light gray, card, perforated, for inscription with laser printer	**6ES7193-6LA10-0AA0**
1000 labeling strips DIN A4, yellow, card, perforated, for inscription with laser printer	**6ES7193-6LA10-0AG0**
BU cover	
For covering empty slots (gaps); 5 units	
• 15 mm wide	**6ES7133-6CV15-1AM0**
• 20 mm wide	**6ES7133-6CV20-1AM0**
Shield connection	**6ES7193-6SC00-1AM0**
5 shield supports and 5 shield terminals	

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Ordering data	Article No.
Color-coded labels	
Color code CC00, for 16 push-in terminals, BU type A0, A1, gray (terminals 1 to 8), red (terminals 9 to 16); 10 units	**6ES7193-6CP00-2MA0**
Color code CC01, for 16 push-in terminals, BU type A0, A1, gray (terminals 1 to 8), red (terminals 9 to 16); 10 units	**6ES7193-6CP01-2MA0**
Color code CC01, for 16 push-in terminals, BU type A0, A1, gray (terminals 1 to 8), red (terminals 9 to 16); 50 units	**6ES7193-6CP01-4MA0**
Color code CC02, for 16 push-in terminals, BU type A0, A1, gray (terminals 1 to 8), blue (terminals 9 to 16); 10 units	**6ES7193-6CP02-2MA0**
Color code CC02, for 16 push-in terminals, BU type A0, A1, gray (terminals 1 to 8), blue (terminals 9 to 16); 50 units	**6ES7193-6CP02-4MA0**
Color code CC03, for 16 push-in terminals, BU type A0, A1 gray (terminals 1 to 8), red (terminals 9 to 12), gray (terminals 13 to 16); 10 units	**6ES7193-6CP03-2MA0**
Color code CC05, for 16 push-in terminals, BU type A0, A1, gray (terminals 1 to 12), red (terminals 13 to 14), blue (terminals 15 to 16); 10 units	**6ES7193-6CP05-2MA0**
Color code CC71, for 10 AUX terminals, BU type A0, yellow/green (terminals 1 A to 10 A); 10 units	**6ES7193-6CP71-2AA0**
Color code CC72, for 10 AUX terminals, BU type A0, red (terminals 1 A to 10 A); 10 units	**6ES7193-6CP72-2AA0**
Color code CC73, for 10 AUX terminals, BU type A0, blue (terminals 1 A to 10 A); 10 units	**6ES7193-6CP73-2AA0**
Color code CC74, for 2x5 additional terminals, BU type A1, red (terminals 1B to 5B), blue (terminals 1C to 5C); 10 units	**6ES7193-6CP74-2AA0**

	Article No.
Color-coded labels for PotDis BU	
Color code CC62, for 16 push-in terminals, PotDis BU type P1, red (terminals 1 to 16); 10 units	**6ES7193-6CP62-2MA0**
Color code CC63, for 16 push-in terminals, PotDis BU type P2, blue (terminals 1 to 16); 10 units	**6ES7193-6CP63-2MA0**
Color-coded labels for PotDis TB	
Color code CC10, for 18 push-in terminals, PotDis TB, gray (terminals 1 to 18); 10 units	**6ES7193-6CP10-2MT0**
Color code CC11, for 18 push-in terminals, PotDis TB, yellow-green (terminals 1 to 18); 10 units	**6ES7193-6CP11-2MT0**
Color code CC12, for 18 push-in terminals, PotDis TB, type P1 and BR, red (terminals 1 to 18); 10 units	**6ES7193-6CP12-2MT0**
Color code CC13, for 18 push-in terminals, PotDis TB, type P2 and BR, blue (terminals 1 to 18); 10 units	**6ES7193-6CP13-2MT0**

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Overview



- 2 and 4-channel analog output (AQ) modules
- Apart from the standard type of delivery as an individual package, selected I/O modules and BaseUnits are also available in a pack of 10 units. The pack of 10 units enables the amount of waste to be reduced considerably, as well as saving the time and cost of unpacking individual modules.

For different requirements, the digital output modules offer:

- Function classes Standard, High Feature and High-Speed
- BaseUnits for single or multiple-conductor connection with automatic slot coding
- Potential distributor modules for system-integrated expansion with potential terminals
- Individual system-integrated load group formation with self-assembling voltage distribution bars (a separate power module is no longer required for ET 200SP)
- Option for connecting current and voltage actuators
- Clear labeling on front of module
- LEDs for diagnostics, status, supply voltage and faults
- Electronically readable and non-volatile writable rating plate (I&M data 0 to 3)
- Extended functions and additional operating modes in some cases
  - Oversampling operating mode (n-fold equidistant output of an analog value within one PN cycle and thus the precisely timed output of an analog value or a sequence of analog values)
  - Isochronous mode (simultaneous equidistant output of analog values)
  - Output of substitute value in the event of interruptions to communication (shutdown, output adjustable substitute value, or keep last value)
  - Calibration during runtime
  - Re-parameterization during operation
  - Firmware update
  - Diagnosis of wire break, short circuit, overflow, underflow
  - Value status (optional binary validity information of the analog signal in the process image)
  - Supports the PROFIenergy profile
- Optional accessories
  - Labeling strips (film or card)
  - Equipment labeling plate
  - Color-coded label with module-specific CC code
  - Shielding terminal

A quick and clear comparison of the functions of the AQ modules is offered by the TIA Selection Tool.

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Overview of analog output modules

Analog output	PU	Article No.	CC code	BU type
AQ 2 x U ST	1	6ES7135-6FB00-0BA1	CC00	A0, A1
AQ 2 x I ST	1	6ES7135-6GB00-0BA1	CC00	A0, A1
AQ 4 x U/I ST	1	6ES7135-6HD00-0BA1	CC00	A0, A1
AQ 2 x U/I HF	1	6ES7135-6HB00-0CA1	CC00	A0, A1
AQ 2xU/I HS With two operating modes: • High-speed isochronous AQ • Oversampling	1	6ES7135-6HB00-0DA1	CC00	A0, A1

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Overview (continued)

Overview of BaseUnits

BaseUnit	PU	Article No.	CC codes for push-in terminals	CC codes for AUX terminals
BU type A0 • New load group (light) • 16 push-in terminals • With 10 AUX terminals	1	6ES7193-6BP20-0DA0	CC01 to CC05	CC71 to CC73
BU type A0 • New load group (light) • 16 push-in terminals • With 10 AUX terminals	10	6ES7193-6BP20-2DA0	CC01 to CC05	CC71 to CC73
BU type A0 • New load group (light) • 16 push-in terminals • Without AUX terminals	1	6ES7193-6BP00-0DA0	CC01 to CC05	--
BU type A0 • New load group (light) • 16 push-in terminals • Without AUX terminals	10	6ES7193-6BP00-2DA0	CC01 to CC05	--
BU type A0 • Forwarding of load group (dark) • 16 push-in terminals • With 10 AUX terminals	1	6ES7193-6BP20-0BA0	CC01 to CC05	CC71 to CC73
BU type A0 • Forwarding of load group (dark) • 16 push-in terminals • With 10 AUX terminals	10	6ES7193-6BP20-2BA0	CC01 to CC05	CC71 to CC73
BU type A0 • Forwarding of load group (dark) • 16 push-in terminals • Without AUX terminals	1	6ES7193-6BP00-0BA0	CC01 to CC05	--
BU type A0 • Forwarding of load group (dark) • 16 push-in terminals • Without AUX terminals	10	6ES7193-6BP00-2BA0	CC01 to CC05	--
BU type A1 • New load group (light) • With temperature sensor • 16 push-in terminals • With 2x5 additional terminals	1	6ES7193-6BP40-0DA1	CC01 to CC05	CC74
BU type A1 • New load group (light) • With temperature sensor • 16 push-in terminals • Without 2x5 additional terminals	1	6ES7193-6BP00-0DA1	CC01 to CC05	--
BU type A1 • Forwarding of load group (dark) • With temperature sensor • 16 push-in terminals • With 2x5 additional terminals	1	6ES7193-6BP40-0BA1	CC01 to CC05	CC74
BU type A1 • Forwarding of load group (dark) • With temperature sensor • 16 push-in terminals • Without 2x5 additional terminals	1	6ES7193-6BP00-0BA1	CC01 to CC05	--

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Overview (continued)

Overview of potential distributor modules

Potential distributor module	PU	Article No.	CC codes for push-in terminals
PotDis BU Type P1 (light), 17x P1 potential, 1x P2 potential, for starting a new load group (max. 10 A)	1	6ES7193-6UP00-0DP1	CC00, CC62
PotDis BU Type P1 (dark), 17x P1 potential, 1x P2 potential, for continuing the load group	1	6ES7193-6UP00-0BP1	CC00, CC62
PotDis BU Type P2 (light), 1x P1 potential, 17x P2 potential, for starting a new load group (max. 10 A)	1	6ES7193-6UP00-0DP2	CC00, CC63
PotDis BU Type P2 (dark), 1x P1 potential, 17x P2 potential, for continuing the load group	1	6ES7193-6UP00-0BP2	CC00, CC63
PotDis TB Type BR-W, 18x internally jumpered terminals, without reference to P1, P2 or AUX, (total current max. 10 A)	1	6ES7193-6TP00-0TP0	CC10 to CC13
PotDis TB Type P1-R, 18x P1 potential, (total current max. 10 A)	1	6ES7193-6TP00-0TP1	CC10, CC12
PotDis TB Type P2-B, 18x P2 potential, (total current max. 10 A)	1	6ES7193-6TP00-0TP2	CC10, CC13
PotDis TB Type n.c.-G, 18x n.c. (not connected) terminals, without reference to P1, P2 or AUX	1	6ES7193-6TP00-0TN0	CC10

Technical specifications

Article number	**6ES7135-6FB00-0BA1** ET 200SP, AQ 2xU Standard, PU 1	**6ES7135-6GB00-0BA1** ET 200SP, AQ 2xI Standard, PU 1	**6ES7135-6HD00-0BA1** ET 200SP, AQ 4xU/I ST	**6ES7135-6HB00-0DA1** ET 200SP, AQ 2 X U/I High Speed	**6ES7135-6HB00-0CA1** ET 200SP, AQ 2 X U/I High Feature
General information					
Product type designation	AQ 2xU ST	AQ 2xI ST	AQ 4xU/I ST	AQ 2xU/I HS	AQ 2xU/I HF
Product function					
• I&M data	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3
• Output range scalable	No	No	No		
Engineering with					
• STEP 7 TIA Portal configurable/ integrated as of version	V13 SP1 / -	V13 SP1 / -	V11 SP2 / V13	V13 SP1	V13 / V13
• STEP 7 configurable/integrated as of version	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -	V5.5 SP3 / -
• PCS 7 configurable/integrated as of version			V8.1 SP1		V8.1 SP1
• PROFIBUS as of GSD version/ GSD revision	GSD Revision 5	GSD Revision 5	One GSD file each, Revision 3 and 5 and higher	GSD Revision 5	GSD Revision 5
• PROFINET as of GSD version/ GSD revision	GSDML V2.3	GSDML V2.3	GSDML V2.3	GSDML V2.3	GSDML V2.3
Operating mode					
• Oversampling	No	No	No	Yes; 2 channels per module	No
• MSO	No	No	No	No	No
Supply voltage					
Rated value (DC)	24 V	24 V	24 V	24 V	24 V
Reverse polarity protection	Yes	Yes	Yes	Yes	Yes

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Technical specifications (continued)

Article number	6ES7135-6FB00-0BA1	6ES7135-6GB00-0BA1	6ES7135-6HD00-0BA1	6ES7135-6HB00-0DA1	6ES7135-6HB00-0CA1
	ET 200SP, AQ 2xU Standard, PU 1	ET 200SP, AQ 2xI Standard, PU 1	ET 200SP, AQ 4xU/I ST	ET 200SP, AQ 2 X U/I High Speed	ET 200SP, AQ 2 X U/I High Feature
Analog outputs					
Number of analog outputs	2	2	4	2	2
Cycle time (all channels), min.	1 ms	1 ms	5 ms	125 µs	750 µs
Analog output with oversampling	No	No	No	Yes	
• Values per cycle, max.				16	
• Resolution, min.				45 µs; (2 channels), 35 µs (1 channel)	
Output ranges, voltage					
• 0 to 10 V	Yes; 15 bit		Yes; 15 bit	Yes; 15 bit	Yes; 15 bit
• 1 V to 5 V	Yes; 13 bit		Yes; 13 bit	Yes; 13 bit	Yes; 13 bit
• -5 V to +5 V	Yes; 15 bit incl. sign		Yes; 15 bit incl. sign	Yes; 15 bit incl. sign	Yes; 15 bit incl. sign
• -10 V to +10 V	Yes; 16 bit incl. sign		Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
Output ranges, current					
• 0 to 20 mA		Yes; 15 bit	Yes; 15 bit	Yes; 15 bit	Yes; 15 bit
• -20 mA to +20 mA		Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign	Yes; 16 bit incl. sign
• 4 mA to 20 mA		Yes; 14 bit	Yes; 14 bit	Yes; 14 bit	Yes; 14 bit
Connection of actuators					
• for voltage output two-wire connection	Yes		Yes	Yes	Yes
• for voltage output four-wire connection	No		Yes	Yes	Yes
• for current output two-wire connection		Yes	Yes	Yes	Yes
Load impedance (in rated range of output)					
• with voltage outputs, min.	2 kΩ		2 kΩ	2 kΩ	2 kΩ
• with voltage outputs, capacitive load, max.	1 µF		1 µF	1 µF	1 µF
• with current outputs, max.		500 Ω	500 Ω	500 Ω	500 Ω
• with current outputs, inductive load, max.		1 mH	1 mH	1 mH	1 mH
Cable length					
• shielded, max.	200 m	1 000 m	1 000 m; 200 m for voltage output	1 000 m; 200 m for voltage output	1 000 m; 200 m for voltage output
Analog value generation for the outputs					
Integration and conversion time/ resolution per channel					
• Resolution with overrange (bit including sign), max.	16 bit	16 bit	16 bit	16 bit	16 bit
Settling time					
• for resistive load	0.1 ms	0.1 ms; Typical value	0.1 ms	0.05 ms	0.05 ms
• for capacitive load	1 ms		1 ms	0.05 ms; Max. 47 nF and 20 m cable length	0.05 ms; Max. 47 nF and 20 m cable length
• for inductive load		0.5 ms	0.5 ms	0.05 ms	0.05 ms
Errors/accuracies					
Basic error limit (operational limit at 25 °C)					
• Voltage, relative to output range, (+/-)	0.3 %	0.3 %	0.3 %	0.1 %	0.1 %
• Current, relative to output range, (+/-)	0.3 %	0.3 %	0.3 %	0.1 %	0.1 %
Isochronous mode					
Isochronous operation (application synchronized up to terminal)	No	No	No	Yes	Yes
Execution and activation time (TCO), min.				70 µs	500 µs
Bus cycle time (TDP), min.				125 µs	750 µs

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Technical specifications (continued)

Article number	**6ES7135-6FB00-0BA1**	**6ES7135-6GB00-0BA1**	**6ES7135-6HD00-0BA1**	**6ES7135-6HB00-0DA1**	**6ES7135-6HB00-0CA1**
	ET 200SP, AQ 2xU Standard, PU 1	ET 200SP, AQ 2xI Standard, PU 1	ET 200SP, AQ 4xU/I ST	ET 200SP, AQ 2 X U/I High Speed	ET 200SP, AQ 2 X U/I High Feature
Interrupts/diagnostics/ status information					
Diagnostics function	Yes	Yes	Yes	Yes	Yes
Substitute values connectable	Yes	Yes	Yes	Yes	Yes
Alarms					
• Diagnostic alarm	Yes	Yes	Yes	Yes	Yes
Diagnostic messages					
• Monitoring the supply voltage	Yes	Yes	Yes	Yes	Yes
• Wire-break		Yes	Yes	Yes; channel-by-channel, only for output type "current"	Yes; channel-by-channel, only for output type "current"
• Short-circuit	Yes		Yes	Yes; channel-by-channel, only for output type "voltage"	Yes; channel-by-channel, only for output type "voltage"
• Group error	Yes	Yes	Yes	Yes	Yes
• Overflow/underflow	Yes	Yes	Yes	Yes	Yes
Diagnostics indication LED					
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED	Yes; green PWR LED
• Channel status display	Yes; Green LED	Yes; Green LED	Yes; Green LED	Yes; Green LED	Yes; Green LED
• for channel diagnostics	No	No	No	Yes; Red LED	Yes; Red LED
• for module diagnostics	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED	Yes; green/red DIAG LED
Potential separation					
Potential separation channels					
• between the channels and backplane bus	Yes	Yes	Yes	Yes	Yes
Ambient conditions					
Ambient temperature during operation					
• horizontal installation, min.	0 °C	-30 °C	-30 °C	-30 °C	-30 °C
• horizontal installation, max.	60 °C	60 °C	60 °C; Observe derating	60 °C	60 °C
• vertical installation, min.	0 °C	-30 °C	-30 °C	-30 °C	-30 °C
• vertical installation, max.	50 °C	50 °C	50 °C; Observe derating	50 °C	50 °C
Altitude during operation relating to sea level					
• Installation altitude above sea level, max.		2 000 m; On request: Installation altitudes greater than 2 000 m	2 000 m; On request: Installation altitudes greater than 2 000 m	2 000 m; On request: Installation altitudes greater than 2 000 m	2 000 m; On request: Installation altitudes greater than 2 000 m
Dimensions					
Width	15 mm	15 mm	15 mm	15 mm	15 mm
Height	73 mm	73 mm	73 mm	73 mm	73 mm
Depth	58 mm	58 mm	58 mm	58 mm	58 mm
Weights					
Weight, approx.	31 g	31 g	31 g	31 g	31 g

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Ordering data	Article No.
Analog output modules	
Analog output module AQ 2xU Standard, BU type A0 or A1, color code CC00, 16-bit	**6ES7135-6FB00-0BA1**
Analog output module AQ 2xI Standard, BU type A0 or A1, color code CC00, 16-bit	**6ES7135-6GB00-0BA1**
Analog output module AQ 4xU/I Standard, BU type A0 or A1, color code CC00, 16-bit, ± 0.3%	**6ES7135-6HD00-0BA1**
Analog output module AQ 2xU/I High Feature, BU type A0 or A1, color code CC00, 16-bit, ±0.1%	**6ES7135-6HB00-0CA1**
Analog output module AQ 2xU/I High Speed, BU type A0 or A1, color code CC00, 16-bit, ±0.3%	**6ES7135-6HB00-0DA1**
Usable type A0 BaseUnits	
Type of delivery: Apart from the standard type of delivery in an individual package, selected BaseUnits are also available in a pack of 10 units. The pack of 10 units enables the amount of waste to be reduced considerably, as well as saving the time and cost of unpacking individual modules. The number of modules required is the number of modules ordered. The type of packaging is chosen by selecting the article number. Packs of 10 can therefore only be ordered in integer multiples of 10.	
BU15-P16+A10+2D	
BU type A0; BaseUnit (light) with 16 push-in terminals (1 ... 16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)	
• 1 unit	**6ES7193-6BP20-0DA0**
• 10 units	**6ES7193-6BP20-2DA0**
BU15-P16+A0+2D	
BU type A0; BaseUnit (light) with 16 push-in terminals to the module; for starting a new load group (max. 10 A)	
• 1 unit	**6ES7193-6BP00-0DA0**
• 10 units	**6ES7193-6BP00-2DA0**
2BU15-P16+A0+2DB	
Double BaseUnit for holding 2 I/O modules; BU type A0; BaseUnit (light/dark) with 16 push-in terminals to the module; for starting a new load group (max. 10 A)	
• 1 unit	**6ES7193-6BP60-0DA0**
BU15-P16+A10+2B	
BU type A0; BaseUnit (dark) with 16 push-in terminals (1 ... 16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for continuing the load group	
• 1 unit	**6ES7193-6BP20-0BA0**
• 10 units	**6ES7193-6BP20-2BA0**
BU15-P16+A0+2B	
BU type A0; BaseUnit (dark) with 16 push-in terminals to the module; for continuing the load group	
• 1 unit	**6ES7193-6BP00-0BA0**
• 10 units	**6ES7193-6BP00-2BA0**
2BU15-P16+A0+2B	
Double BaseUnit for holding 2 I/O modules; BU type A0; BaseUnit (dark/dark) with 16 push-in terminals to the module; for continuing the load group	
• 1 unit	**6ES7193-6BP60-0BA0**
Usable type A1 BaseUnits (temperature detection)	
BU15-P16+A0+12D/T	**6ES7193-6BP40-0DA1**
BU type A1; BaseUnit (light) with 16 push-in terminals (1 ... 16) to the module and 2x5 internally jumpered additional terminals (1 B to 5 B and 1 C to 5 C); for starting a new load group (max. 10 A)	
BU15-P16+A0+2D/T	**6ES7193-6BP00-0DA1**
BU type A1; BaseUnit (light) with 16 push-in terminals to the module; for starting a new load group (max. 10 A)	
BU15-P16+A0+12B/T	**6ES7193-6BP40-0BA1**
BU type A1; BaseUnit (dark) with 16 push-in terminals (1 ... 16) to the module and 2x5 internally jumpered additional terminals (1 B to 5 B and 1 C to 5 C); for continuing the load group	
BU15-P16+A0+2B/T	**6ES7193-6BP00-0BA1**
BU type A1; BaseUnit (dark) with 16 push-in terminals to the module; for continuing the load group	

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Ordering data

	Article No.
Potential distributor modules	
PotDis BU	
PotDis BU, type P1 (light), 17x P1 potential, 1x P2 potential, for starting a new load group (max. 10 A)	**6ES7193-6UP00-0DP1**
PotDis BU, type P1 (dark), 17x P1 potential, 1x P2 potential, for continuing the load group	**6ES7193-6UP00-0BP1**
PotDis BU, type P2 (light), 1x P1 potential, 17x P2 potential, for starting a new load group (max. 10 A)	**6ES7193-6UP00-0DP2**
PotDis BU, type P2 (dark), 1x P1 potential, 17x P2 potential, for continuing the load group	**6ES7193-6UP00-0BP2**
PotDis TB	
PotDis TB, type BR-W, 18x internally jumpered terminals, without reference to P1, P2 or AUX, (total current max. 10 A)	**6ES7193-6TP00-0TP0**
PotDis TB, type P1-R, 18x P1 potential, (total current max. 10 A)	**6ES7193-6TP00-0TP1**
PotDis TB, type P2-B, 18x P2 potential, (total current max. 10 A)	**6ES7193-6TP00-0TP2**
PotDis TB, type n.c.-G, 18x n.c. (not connected) terminals, without reference to P1, P2 or AUX	**6ES7193-6TP00-0TN0**
Accessories	
Equipment labeling plate	**6ES7193-6LF30-0AW0**
10 sheets of 16 labels, for printing with thermal transfer card printer or plotter	
Labeling strips	
500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer	**6ES7193-6LR10-0AA0**
500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer	**6ES7193-6LR10-0AG0**
1000 labeling strips DIN A4, light gray, card, perforated, for inscription with laser printer	**6ES7193-6LA10-0AA0**
1000 labeling strips DIN A4, yellow, card, perforated, for inscription with laser printer	**6ES7193-6LA10-0AG0**
BU cover	
For covering empty slots (gaps); 5 units	
• 15 mm	**6ES7133-6CV15-1AM0**
• 20 mm	**6ES7133-6CV20-1AM0**
Shield connection	**6ES7193-6SC00-1AM0**
5 shield supports and 5 shield terminals	
Color-coded labels	
Color code CC00, for 16 push-in terminals, BU type A0, A1, gray (terminals 1 to 8), red (terminals 9 to 16); 10 units	**6ES7193-6CP00-2MA0**
Color code CC71, for 10 AUX terminals, BU type A0, yellow/green (terminals 1 A to 10 A); 10 units	**6ES7193-6CP71-2AA0**
Color code CC72, for 10 AUX terminals, BU type A0, red (terminals 1 A to 10 A); 10 units	**6ES7193-6CP72-2AA0**
Color code CC73, for 10 AUX terminals, BU type A0, blue (terminals 1 A to 10 A); 10 units	**6ES7193-6CP73-2AA0**
Color code CC74, for 2x5 additional terminals, BU type A1, red (terminals 1B to 5B), blue (terminals 1C to 5C); 10 units	**6ES7193-6CP74-2AA0**
Color-coded labels for PotDis BU	
Color code CC62, for 16 push-in terminals, PotDis BU type P1, red (terminals 1 to 16); 10 units	**6ES7193-6CP62-2MA0**
Color code CC63, for 16 push-in terminals, PotDis BU type P2, blue (terminals 1 to 16); 10 units	**6ES7193-6CP63-2MA0**
Color-coded labels for PotDis TB	
Color code CC10, for 18 push-in terminals, PotDis TB, gray (terminals 1 to 18); 10 units	**6ES7193-6CP10-2MT0**
Color code CC11, for 18 push-in terminals, PotDis TB, yellow-green (terminals 1 to 18); 10 units	**6ES7193-6CP11-2MT0**
Color code CC12, for 18 push-in terminals, PotDis TB, type P1 and BR, red (terminals 1 to 18); 10 units	**6ES7193-6CP12-2MT0**
Color code CC13, for 18 push-in terminals, PotDis TB, type P2 and BR, blue (terminals 1 to 18); 10 units	**6ES7193-6CP13-2MT0**

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Overview



- 4, 8 and 16-channel digital input (DI) modules

For different requirements, the digital input modules offer:

- Function classes Basic, Standard, High Feature and High Speed as well as fail-safe DI (see "Fail-safe I/O modules")
- BaseUnits for single or multiple-conductor connection with automatic slot coding
- Potential distributor modules for system-integrated expansion with additional potential terminals
- Individual system-integrated load group formation with self-assembling voltage distribution bars (a separate power module is no longer required for ET 200SP)
- Option of connecting sensors compliant with IEC 61131 type 1, 2 or 3 (module-dependent) for rated voltages of up to 24 V DC or 230 V AC
- PNP (sink input) and NPN (source input) versions
- Clear labeling on front of module
- LEDs for diagnostics, status, supply voltage and faults (e.g. wire break/short-circuit)
- Electronically readable and non-volatile writable rating plate (I&M data 0 to 3)
- Extended functions and additional operating modes in some cases
  - MSI operating mode (simultaneous reading of input data from as many as three other controllers)
  - Counting operating mode (multi-channel counter for pulse generators with 32-bit counting width and up to 10 kHz counting frequency)
  - Oversampling operating mode (n-fold equidistant acquisition of digital values within one PN cycle for increasing the time resolution for slow CPU cycles)
  - Parameterizable input delay time
  - Isochronous mode (simultaneous equidistant reading of all input channels)
  - Hardware interrupt pulse stretching
  - Re-parameterization during operation
  - Firmware update
  - Diagnosis of wire break and short-circuit (on channel or module basis)
  - Value status (optional binary validity information of the input signal in the process image)
  - Supports the PROFIenergy profile
- Optional accessories
  - Labeling strips (film or card)
  - Equipment labeling plate
  - Color-coded label with module-specific CC code
  - Shielding terminal

A quick and clear comparison of the functions of the different DI modules is offered by the TIA Selection Tool.

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

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Technical specifications

Article number	**6AG1131-6BF61-7AA0**	**6AG1131-6BF01-7BA0**	**6AG1131-6BH01-7BA0**
Based on	**6ES7131-6BF61-0AA0**	**6ES7131-6BF01-0BA0**	**6ES7131-6BH01-0BA0**
	SIPLUS ET 200SP DI 8x24VDC SOURCE BA	SIPLUS ET 200SP DI 8x24VDC ST	SIPLUS ET 200SP DI 16x24VDC ST
Ambient conditions			
Ambient temperature during operation			
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	70 °C; = Tmax	70 °C; = Tmax	70 °C; = Tmax
Altitude during operation relating to sea level			
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity			
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; incl. condensation / frost permitted (no commissioning under condensation conditions)	100 %; incl. condensation / frost permitted (no commissioning under condensation conditions)	100 %; incl. condensation / frost permitted (no commissioning under condensation conditions)

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Technical specifications (continued)

Article number	**6AG1131-6BF61-7AA0**	**6AG1131-6BF01-7BA0**	**6AG1131-6BH01-7BA0**
Based on	**6ES7131-6BF61-0AA0**	**6ES7131-6BF01-0BA0**	**6ES7131-6BH01-0BA0**
	SIPLUS ET 200SP DI 8x24VDC SOURCE BA	SIPLUS ET 200SP DI 8x24VDC ST	SIPLUS ET 200SP DI 16x24VDC ST
Resistance			
Coolants and lubricants			
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems			
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
Use on ships/at sea			
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Remark			
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating			
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability	Yes; Class 2 for high availability	Yes; Class 2 for high availability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

Article number	**6AG1131-6BF00-7CA0**	**6AG1131-6FD01-7BB1**	**6AG1131-6TF00-7CA0**	**6AG1131-6CF00-7AU0**
Based on	**6ES7131-6BF00-0CA0**	**6ES7131-6FD01-0BB1**	**6ES7131-6TF00-0CA0**	**6ES7131-6CF00-0AU0**
	SIPLUS ET 200SP DI 8x24VDC HF	SIPLUS ET 200SP DI 4X120..230VAC ST	SIPLUS ET 200SP DI 8XNAMUR HF	SIPLUS ET 200SP DI 8x48VUC BA
Ambient conditions				
Ambient temperature during operation				
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	70 °C; = Tmax; > +60 °C encoder supply output current max. 350 mA per channel	70 °C; = Tmax	70 °C; = Tmax; > +60 °C number of simultaneously controllable inputs max. 4 (no adjacent points)	70 °C; = Tmax
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.	5 000 m	2 000 m	5 000 m	2 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)

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Technical specifications (continued)

Article number	6AG1131-6BF00-7CA0	6AG1131-6FD01-7BB1	6AG1131-6TF00-7CA0	6AG1131-6CF00-7AU0
Based on	6ES7131-6BF00-0CA0	6ES7131-6FD01-0BB1	6ES7131-6TF00-0CA0	6ES7131-6CF00-0AU0
	SIPLUS ET 200SP DI 8x24VDC HF	SIPLUS ET 200SP DI 4X120..230VAC ST	SIPLUS ET 200SP DI 8XNAMUR HF	SIPLUS ET 200SP DI 8x48VUC BA
Relative humidity				
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; incl. condensation / frost permitted (no commissioning under condensation conditions)	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance				
Coolants and lubricants				
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
Use on ships/at sea				
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Remark				
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating				
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability	Yes; Class 2 for high availability	Yes; Class 2 for high availability	Yes; Class 2 for high availability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

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Ordering data

	Article No.
SIPLUS digital input modules	
(Extended temperature range and exposure to media)	
DI 8x24VDC Standard, BU type A0, color code CC01	**6AG1131-6BF01-7BA0**
DI 8x24VDC Source Input, Basic, BU type A0, color code CC02	**6AG1131-6BF61-7AA0**
DI 16x24 V DC Standard, BU type A0, color code CC00	**6AG1131-6BH01-7BA0**
DI 8x24VDC High Feature, BU type A0, color code CC01, channel-specific diagnostics, isochronous mode, shared input (MSI)	**6AG1131-6BF00-7CA0**
DI 4x120 V AC-230 V AC Standard, BU type B1, color code CC41	**6AG1131-6FD01-7BB1**
DI 8xNAMUR High Feature, BU type A0, color code CC01	**6AG1131-6TF00-7CA0**
DI 8x24 V AC-48 V UC Basic, BU type U0, color code CC20, module diagnostics	**6AG1131-6CF00-7AU0**
Usable SIPLUS BaseUnits	
BU15-P16+A0+2D	**6AG1193-6BP00-7DA0**
(Extended temperature range and exposure to media)	
BU type A0; BaseUnit (light) with 16 push-in terminals to the module; for starting a new load group (max. 10 A)	
BU15-P16+A0+2B	**6AG1193-6BP00-7BA0**
(Extended temperature range and exposure to media)	
BU type A0; BaseUnit (dark) with 16 push-in terminals to the module; for continuing the load group	
BU15-P16+A10+2D	**6AG1193-6BP20-7DA0**
(Extended temperature range and exposure to media)	
BU type A0; BaseUnit (light) with 16 push-in terminals (1...16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)	
BU15-P16+A10+2B	**6AG1193-6BP20-7BA0**
(Extended temperature range and exposure to media)	
BU type A0; BaseUnit (dark) with 16 push-in terminals (1...16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for continuing the load group	
BU20-P12+A0+4B	**6AG1193-6BP20-7BB1**
(Extended temperature range and exposure to media)	
BU type B1; BaseUnit (dark) with 12 push-in terminals to the module; for continuing the load group	
BU20-P16+A0+2D	**6AG1193-6BP00-7DU0**
(Extended temperature range and exposure to media)	
BU type U0; BaseUnit (light) with 16 push-in terminals to the module; for starting a new load group (max. 10 A)	
BU20-P16+A0+2B	**6AG1193-6BP00-7BU0**
(Extended temperature range and exposure to media)	
BU type U0; BaseUnit (dark) with 16 push-in terminals to the module; for continuing the load group	
Accessories	See SIMATIC ET 200SP, digital input modules, page 9/27

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Overview



- 4, 8 and 16-channel DQ modules
- 4-channel RQ modules
- BaseUnits for single conductor or multiple-conductor connection
- Function classes Basic, Standard, High Feature and High-Speed as well as fail-safe DQ and RQ
- Clear labeling on front of module
- LEDs for diagnostics, status and errors
- Individual system-integrated load group formation with self-assembling potential multi-terminal busbars (power module not required for ET 200SP)
- Electronically readable rating plate (I&M data)
- Additional operating modes in some cases
- Optional accessories:
  - Labeling strips
  - Equipment marking label
  - Color-coded label with module-specific CC code
  - Shielding terminal

Overview of digital output modules

Digital output	PU	Article No.	CC code	BU type
DQ 16 x 24 V DC/0.5 A ST	1	6AG1132-6BH01-7BA0	CC00	A0
DQ 8 x 24 V DC/0.5 A SNK BA	1	6AG1132-6BF61-7AA0	CC01	A0
DQ 8 x 24 V DC/0.5 A ST	1	6AG1132-6BF01-7BA0	CC02	A0
DQ 8 x 24 V DC/0.5 A HF	1	6AG1132-6BF00-7CA0	CC02	A0
DQ 4 x 24 V DC/2 A ST	1	6AG1132-6BD20-7BA0	CC02	A0
DQ 4 x 24 V DC/2 A HF	1	6AG1132-6BD20-7CA0	CC02	A0
DQ 4 x 24 ... 230 V AC/2 A HF With two operating modes: • DQ • PC: Power control via phase angle, half-wave or full-wave control	1	6AG1132-6FD00-7CU0	CC20	U0
RQ 4 x 24 V UC/2 A CO ST	1	6AG1132-6GD51-7BA0	--	A0
RQ 4 x 120 V DC-230 V AC/5 A NO ST	1	6AG1132-6HD01-7BB1	--	B0, B1

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

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Technical specifications

Article number	**6AG1132-6BF61-7AA0**	**6AG1132-6BD20-7BA0**	**6AG1132-6BF01-7BA0**
Based on	**6ES7132-6BF61-0AA0**	**6ES7132-6BD20-0BA0**	**6ES7132-6BF01-0BA0**
	SIPLUS ET 200SP DQ 8x24VDC/0.5A SNK BA	SIPLUS ET200SP DQ 4x24VDC/2A ST	SIPLUS ET 200SP DQ 8x24VDC/0.5A ST
Ambient conditions			
Ambient temperature during operation			
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	70 °C; = Tmax	70 °C; = Tmax; > +60 °C number of simultaneously controllable outputs max. 2 x 0.25 A or max. 4 x 0.125 A, max. total current 0.5 A	70 °C; = Tmax; > +60 °C max. total current 1.0 A
• vertical installation, min.		-40 °C; = Tmin	
• vertical installation, max.		50 °C; = Tmax	
Altitude during operation relating to sea level			
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity			
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; incl. condensation / frost permitted (no commissioning under condensation conditions)	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; incl. condensation / frost permitted (no commissioning under condensation conditions)
Resistance			
Coolants and lubricants			
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems			
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
Use on ships/at sea			
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Remark			
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating			
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability	Yes; Class 2 for high availability	Yes; Class 2 for high availability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

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Technical specifications (continued)

Article number	6AG1132-6BH01-7BA0	6AG1132-6BF00-7CA0	6AG1132-6GD51-7BA0
Based on	6ES7132-6BH01-0BA0	6ES7132-6BF00-0CA0	6ES7132-6GD51-0BA0
	SIPLUS ET 200SP DQ 16x24VDC/0,5A ST	SIPLUS ET 200SP DQ 8X24VDC/0,5A HF	SIPLUS ET 200SP RQ 4x24VDC/2A CO ST
Ambient conditions			
Ambient temperature during operation			
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	70 °C; = Tmax; see Derating BasedOn (e.g. manual), additionally Tmax > 60 °C max. total current 1 A	70 °C; = Tmax; > +60 °C max. total current 1.0 A	70 °C; = Tmax; see Derating BasedOn (e.g. manual), additionally Tmax > 60 °C max. aggregate current 2 A per group
• vertical installation, min.		-40 °C; = Tmin	
• vertical installation, max.		50 °C; = Tmax	
Altitude during operation relating to sea level			
• Installation altitude above sea level, max.	5 000 m	5 000 m	2 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)
Relative humidity			
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; incl. condensation / frost permitted (no commissioning under condensation conditions)	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; incl. condensation / frost permitted (no commissioning under condensation conditions)
Resistance			
Coolants and lubricants			
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems			
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna)
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
Use on ships/at sea			
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Remark			
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating			
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability	Yes; Class 2 for high availability	Yes; Class 2 for high availability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

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Technical specifications (continued)

Article number	**6AG1132-6HD01-7BB1**	**6AG1132-6BD20-7CA0**	**6AG1132-6FD00-7CU0**
Based on	**6ES7132-6HD01-0BB1**	**6ES7132-6BD20-0CA0**	**6ES7132-6FD00-0CU0**
	SIPLUS ET 200SP RQ 4x120VDC/230VAC/5A	SIPLUS ET 200SP DQ 4X24VDC/2A HF	SIPLUS ET 200SP DQ 4X24..230VAC/2A HF
Ambient conditions			
Ambient temperature during operation			
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	70 °C; = Tmax; see Derating BasedOn (e.g. manual), additionally Tmax > 60 °C max. continuous current of 3 A per relay	70 °C; = Tmax; see Derating BasedOn (e.g. manual), additionally Tmax > 60 °C max. total current 1 A	70 °C; = Tmax
• vertical installation, min.	-40 °C; in all other mounting positions		
• vertical installation, max.	50 °C; in all other mounting positions		
Altitude during operation relating to sea level			
• Installation altitude above sea level, max.	3 000 m	5 000 m	2 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax – 1 K/100 m) at 795 hPa ... 701 hPa (+2 000 m ... +3 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)
Relative humidity			
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; incl. condensation / frost permitted (no commissioning under condensation conditions)	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance			
Coolants and lubricants			
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems			
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
Use on ships/at sea			
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Remark			
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating			
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability	Yes; Class 2 for high availability	Yes; Class 2 for high availability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

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Ordering data	Article No.
SIPLUS digital output modules	
(Extended temperature range and exposure to media)	
Digital output module DQ 8x24 V DC/0.5 A sink output, Basic, BU type A0, color code CC01	**6AG1132-6BF61-7AA0**
Digital output module DQ 4x24 V DC/2 A Standard, BU type A0, color code CC02	**6AG1132-6BD20-7BA0**
Digital output module DQ 8x24 V DC/0.5 A Standard, BU type A0, color code CC02	**6AG1132-6BF01-7BA0**
Digital output module DQ 8x24 V DC/0.5 A High Feature, BU type A0, color code CC02	**6AG1132-6BF00-7CA0**
Digital output module DQ 16x24 V DC/0.5 A Standard, BU type A0, color code CC00	**6AG1132-6BH01-7BA0**
Digital output module DQ 4x24 V DC/2 A High Feature, BU type A0, color code CC02, channel-precise diagnostics, isochronous mode, shared output (MSO); PU: 1 unit	**6AG1132-6BD20-7CA0**
Signal relay module RQ CO 4x24 V UC/2 A Standard, changeover contact, BU type A0, color code CC00	**6AG1132-6GD51-7BA0**
Relay module RQ NO 4x120 V DC-230 V AC/5 A Standard, NO contact, BU type B0, B1	**6AG1132-6HD01-7BB1**
Digital output module DQ 4x24 V AC ... 230 V AC/2 A High Feature for BU type U0, color code CC20, 2 operating modes: DQ and PC (power control via phase angle, half-wave and full-wave control)	**6AG1132-6FD00-7CU0**
Usable SIPLUS BaseUnits	
BU15-P16+A10+2D	**6AG1193-6BP20-7DA0**
(Extended temperature range and exposure to media)	
BU type A0; BaseUnit (light) with 16 push-in terminals (1...16) to the module and additionally 10 internally jumpered AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)	
BU15-P16+A0+2D	**6AG1193-6BP00-7DA0**
(Extended temperature range and exposure to media)	
BU type A0; BaseUnit (light) with 16 push-in terminals to the module; for starting a new load group (max. 10 A)	
BU15-P16+A10+2B	**6AG1193-6BP20-7BA0**
(Extended temperature range and exposure to media)	
BU type A0; BaseUnit (dark) with 16 push-in terminals (1...16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for continuing the load group	
BU15-P16+A0+2B	**6AG1193-6BP00-7BA0**
(Extended temperature range and exposure to media)	
BU type A0; BaseUnit (dark) with 16 push-in terminals to the module; for continuing the load group	
BU20-P12+A4+0B	**6AG1193-6BP20-7BB0**
(Extended temperature range and exposure to media)	
BU type B0; BaseUnit (dark) with 12 push-in terminals (1...12) to the module and an additional 4 internally jumpered add-on terminals (1 A to 4 A); for continuing the load group; 1 unit	
BU20-P12+A0+4B	**6AG1193-6BP20-7BB1**
(Extended temperature range and exposure to media)	
BU type B1; BaseUnit (dark) with 12 push-in terminals to the module; for continuing the load group; 1 unit	
BU20-P16+A0+2D	**6AG1193-6BP00-7DU0**
(Extended temperature range and exposure to media)	
BU type U0; BaseUnit (light) with 16 push-in terminals to the module; for starting a new load group (max. 10 A)	
BU20-P16+A0+2B	**6AG1193-6BP00-7BU0**
(Extended temperature range and exposure to media)	
BU type U0; BaseUnit (dark) with 16 push-in terminals to the module; for continuing the load group	
Accessories	See SIMATIC ET 200SP, digital output modules, page 9/42

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Overview



- 2, 4 and 8-channel AI modules
- Measuring ranges for current, voltage, thermocouples, resistance thermometer, resistor and PTC
- BaseUnits for 2, 3 and 4-conductor connection
- Function classes Basic, Standard, High Feature and High Speed
- Clear labeling on front of module
- LEDs for diagnostics, status and errors
- Individual system-integrated load group formation with self-assembling potential multi-terminal busbars (power module not required for ET 200SP)
- Electronically readable rating plate (I&M data)
- Additional operating modes in some cases
- Optional accessories:
  - Labeling strips
  - Equipment marking label
  - Color-coded label with module-specific CC code
  - Shielding terminal

Overview of SIPLUS analog input modules

Analog input	PU	Article No.	CC code	BU type
AI 8 x U BA	1	6AG1134-6FF00-2AA1	CC02	A0, A1
AI 4 x U/I 2-wire ST	1	6AG1134-6HD01-7BA1	CC03	A0, A1
AI 4 x I 2/4-wire ST	1	6AG1134-6GD01-7BA1	CC03	A0, A1
AI 4 x I 2-wire 4 ... 20 mA HART	1	6AG1134-6TD00-2CA1	CC03	A0, A1
AI 2 x U/I 2/4-wire HF	1	6AG1134-6HB00-2CA1	CC05	A0, A1
AI 2xU/I 2/4-wire HS With two operating modes: • High-speed isochronous AI • Oversampling	1	6AG1134-6HB00-2DA1	CC00	A0, A1
AI 8 x RTD/TC 2-wire HF	1	6AG1134-6JF00-2CA1	CC00	A0, A1
AI 4 x RTD/TC 2/3/4-wire HF	1	6AG1134-6JD00-2CA1	CC00	A0, A1
AI Energy Meter 480 V AC ST	1	6AG1134-6PA20-7BD0	--	D0

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

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Technical specifications

Article number	**6AG1134-6FF00-2AA1**	**6AG1134-6HD01-7BA1**	**6AG1134-6GD01-7BA1**	**6AG1134-6TD00-2CA1**
Based on	**6ES7134-6FF00-0AA1**	**6ES7134-6HD01-0BA1**	**6ES7134-6GD01-0BA1**	**6ES7134-6TD00-0CA1**
	SIPLUS ET 200SP AI 8xU BASIC	SIPLUS ET 200SP AI 4xU/I 2-w ST	SIPLUS ET 200SP AI 4xI 2-/4-w ST	SIPLUS ET 200SP AI 4XI 2-WIRE 4...20MA H
Ambient conditions				
Ambient temperature during operation				
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C
• horizontal installation, max.	60 °C; = Tmax	70 °C; = Tmax; > 60 °C max. 1x ±20 mA or 4x ±10 V permissible	70 °C; = Tmax; > 60 °C max. 1x ±20 mA permissible	60 °C; = Tmax
• vertical installation, min.		-40 °C; = Tmin	-40 °C; = Tmin	-40 °C; = Tmin; Startup @ -25 °C
• vertical installation, max.		50 °C; = Tmax	50 °C; = Tmax	50 °C; = Tmax
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity				
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance				
Coolants and lubricants				
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
Use on ships/at sea				
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Remark				
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!

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Technical specifications (continued)

Article number	6AG1134-6FF00-2AA1	6AG1134-6HD01-7BA1	6AG1134-6GD01-7BA1	6AG1134-6TD00-2CA1
Based on	6ES7134-6FF00-0AA1	6ES7134-6HD01-0BA1	6ES7134-6GD01-0BA1	6ES7134-6TD00-0CA1
	SIPLUS ET 200SP AI 8xU BASIC	SIPLUS ET 200SP AI 4xU/I 2-w ST	SIPLUS ET 200SP AI 4xI 2-/4-w ST	SIPLUS ET 200SP AI 4XI 2-WIRE 4...20MA H
Conformal coating				
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability	Yes; Class 2 for high availability	Yes; Class 2 for high availability	Yes; Class 2 for high availability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

Article number	6AG1134-6HB00-2CA1	6AG1134-6HB00-2DA1	6AG1134-6JF00-2CA1	6AG1134-6JD00-2CA1
Based on	6ES7134-6HB00-0CA1	6ES7134-6HB00-0DA1	6ES7134-6JF00-0CA1	6ES7134-6JD00-0CA1
	SIPLUS ET 200SP AI 2 X U/I 2-, 4-WIRE HF	SIPLUS ET 200SP AI 2 X U/I 2-, 4-WIRE HS	SIPLUS ET 200SP AI 8XRTD/TC 2-WIRE HF	SIPLUS ET 200SP AI 4xRTD/TC HF
Ambient conditions				
Ambient temperature during operation				
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C
• horizontal installation, max.	60 °C; = Tmax	60 °C; = Tmax	60 °C; = Tmax	60 °C; = Tmax
• vertical installation, min.			-40 °C; = Tmin; Startup @ -25 °C	-40 °C; = Tmin; Startup @ -25 °C
• vertical installation, max.			50 °C; = Tmax	50 °C; = Tmax
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 080 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity				
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance				
Coolants and lubricants				
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *

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Technical specifications (continued)

Article number	6AG1134-6HB00-2CA1	6AG1134-6HB00-2DA1	6AG1134-6JF00-2CA1	6AG1134-6JD00-2CA1
Based on	6ES7134-6HB00-0CA1	6ES7134-6HB00-0DA1	6ES7134-6JF00-0CA1	6ES7134-6JD00-0CA1
	SIPLUS ET 200SP AI 2 X U/I 2-, 4-WIRE HF	SIPLUS ET 200SP AI 2 X U/I 2-, 4-WIRE HS	SIPLUS ET 200SP AI 8XRTD/TC 2-WIRE HF	SIPLUS ET 200SP AI 4xRTD/TC HF
Use on ships/at sea				
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Remark				
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating				
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability	Yes; Class 2 for high availability	Yes; Class 2 for high availability	Yes; Class 2 for high availability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

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Technical specifications (continued)

Article number	**6AG1134-6PA20-7BD0**
Based on	**6ES7134-6PA20-0BD0** SIPLUS ET 200SP AI EMETER 480VAC ST
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-40 °C; = Tmin; < -25 °C min. permissible supply voltage 110 V AC
• horizontal installation, max.	70 °C; = Tmax; > +60 °C max. permissible current 1 A per phase
• vertical installation, min.	-40 °C; = Tmin
• vertical installation, max.	50 °C; = Tmax
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	2 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance	
Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *

Article number	**6AG1134-6PA20-7BD0**
Based on	**6ES7134-6PA20-0BD0** SIPLUS ET 200SP AI EMETER 480VAC ST
Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
Remark	
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Electronic equipment on rolling stock acc. to EN 50155	Class PC2 protective coating acc. to EN 50155:2017
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A

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Ordering data	Article No.
SIPLUS analog input modules	
(Extended temperature range and exposure to media)	
Analog input module AI 8xU BA, BU type A0 or A1, color code CC02	**6AG1134-6FF00-2AA1**
Analog input module AI 4xU/I 2-wire Standard, BU type A0 or A1, color code CC03, 16-bit, ±0.3%	**6AG1134-6HD01-7BA1**
Analog input module AI 4xI 2/4-wire Standard, BU type A0 or A1, color code CC03, 16-bit, ±0.3%	**6AG1134-6GD01-7BA1**
Analog input module AI 4xRTD/TC 2-, 3-, 4-wire High Feature, BU type A0 or A1, color code CC00, 16-bit, ±0.1%, scalable measuring range	**6AG1134-6JD00-2CA1**
Analog input module AI 4xI 2-wire 4 ... 20 mA HART, BU type A0 or A1, color code CC03	**6AG1134-6TD00-2CA1**
Analog input module AI 2xU/I 2/4-wire High Feature, BU type A0 or A1, color code CC05, 16-bit, ±0.1%, independent channel isolation, isochronous mode above 1 ms	**6AG1134-6HB00-2CA1**
Analog input module AI 2xU/I 2/4-wire High Speed, BU type A0 or A1, color code CC00, 16-bit, ±0.3%, isochronous mode above 250 µs, oversampling above 50 µs	**6AG1134-6HB00-2DA1**
Analog input module AI 8xRTD/TC 2-wire High Feature, BU type A0 or A1, color code CC00, 16-bit, ±0.1%, scalable measuring range	**6AG1134-6JF00-2CA1**
Analog input module AI Energy Meter Standard, 480 V AC, BU type D0	**6AG1134-6PA20-7BD0**
Usable SIPLUS BaseUnits type A0	
BU15-P16+A0+2D	**6AG1193-6BP00-7DA0**
(Extended temperature range and exposure to media)	
BU type A0; BaseUnit (light) with 16 push-in terminals to the module; for starting a new load group (max. 10 A)	
BU15-P16+A0+2B	**6AG1193-6BP00-7BA0**
(Extended temperature range and exposure to media)	
BU type A0; BaseUnit (dark) with 16 push-in terminals to the module; for continuing the load group	
BU15-P16+A10+2D	**6AG1193-6BP20-7DA0**
(Extended temperature range and exposure to media)	
BU type A0; BaseUnit (light) with 16 push-in terminals (1...16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)	
BU15-P16+A10+2B	**6AG1193-6BP20-7BA0**
(Extended temperature range and exposure to media)	
BU type A0; BaseUnit (dark) with 16 push-in terminals (1...16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for continuing the load group	
Usable SIPLUS BaseUnits type A1 (temperature detection)	
BU15-P16+A0+2D/T	**6AG1193-6BP00-7DA1**
(Extended temperature range and exposure to media)	
BU type A1; BaseUnit (light) with 16 push-in terminals to the module; for starting a new load group (max. 10 A)	
BU15-P16+A0+2B/T	**6AG1193-6BP00-7BA1**
(Extended temperature range and exposure to media)	
BU type A1; BaseUnit (dark) with 16 push-in terminals to the module; for continuing the load group	
BU15-P16+A0+12D/T	**6AG1193-6BP40-7DA1**
(Extended temperature range and exposure to media)	
BU type A1; BaseUnit (light) with 16 push-in terminals (1...16) to the module and 2x5 internally jumpered additional terminals (1 B to 5 B and 1 C to 5 C); for starting a new load group (max. 10 A)	
BU15-P16+A0+12B/T	**6AG1193-6BP40-7BA1**
(Extended temperature range and exposure to media)	
BU type A1; BaseUnit (dark) with 16 push-in terminals (1...16) to the module and 2x5 internally jumpered additional terminals (1 B to 5 B and 1 C to 5 C); for continuing the load group	
Usable SIPLUS BaseUnits type D0	
BU20-P12+A0+0B	**6AG1193-6BP00-7BD0**
(Extended temperature range and exposure to media)	
BU type D0; BaseUnit with 12 push-in terminals, without AUX terminals, bridged to the left	
Accessories	See SIMATIC ET 200SP, analog input modules, page 9/61

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Overview



- 2 and 4-channel analog output (AQ) modules

For different requirements, the digital output modules offer:

- Function classes Standard, High Feature and High-Speed
- BaseUnits for single or multiple-conductor connection with automatic slot coding
- Potential distributor modules for system-integrated expansion with potential terminals
- Individual system-integrated load group formation with self-assembling voltage distribution bars (a separate power module is no longer required for ET 200SP)
- Option for connecting current and voltage actuators
- Clear labeling on front of module
- LEDs for diagnostics, status, supply voltage and faults
- Electronically readable and non-volatile writable rating plate (I&M data 0 to 3)
- Extended functions and additional operating modes in some cases
  - Oversampling operating mode (n-fold equidistant output of an analog value within one PN cycle and thus the precisely timed output of an analog value or a sequence of analog values)
  - Isochronous mode (simultaneous equidistant output of analog values)
  - Output of substitute value in the event of interruptions to communication (shutdown, output adjustable substitute value, or keep last value)
  - Calibration during runtime
  - Re-parameterization during operation
  - Firmware update
  - Diagnosis of wire break, short circuit, overflow, underflow
  - Value status (optional binary validity information of the analog signal in the process image)
  - Supports the PROFIenergy profile
- Optional accessories
  - Labeling strips (film or card)
  - Equipment labeling plate
  - Color-coded label with module-specific CC code
  - Shielding terminal

A quick and clear comparison of the functions of the AQ modules is offered by the TIA Selection Tool.

Overview of analog output modules

Analog output	PU	Article No.	CC code	BU type
AQ 2 x I ST	1	6AG1135-6GB00-7BA1	CC00	A0, A1
AQ 4 x U/I ST	1	6AG1135-6HD00-7BA1	CC00	A0, A1
AQ 2 x U/I HF	1	6AG1135-6HB00-7CA1	CC00	A0, A1
AQ 2xU/I HS With two operating modes: • High-speed isochronous AQ • Oversampling	1	6AG1135-6HB00-2DA1	CC00	A0, A1

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

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Technical specifications

Article number	**6AG1135-6HD00-7BA1**	**6AG1135-6GB00-7BA1**	**6AG1135-6HB00-2DA1**	**6AG1135-6HB00-7CA1**
Based on	**6ES7135-6HD00-0BA1**	**6ES7135-6GB00-0BA1**	**6ES7135-6HB00-0DA1**	**6ES7135-6HB00-0CA1**
	SIPLUS ET 200SP AQ 4xU/I ST	SIPLUS ET 200SP AQ 2xI STANDARD	SIPLUS ET 200SP AQ 2 X U/I HIGH SPEED	SIPLUS ET 200SP AQ 2xU/I HF
Ambient conditions				
Ambient temperature during operation				
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	70 °C; = Tmax; > +60 °C max. 2x ±10 V permissible	70 °C; = Tmax	60 °C; = Tmax	70 °C; = Tmax
• vertical installation, min.	-40 °C; = Tmin			-40 °C; = Tmin
• vertical installation, max.	50 °C; = Tmax			60 °C; = Tmax
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity				
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance				
Coolants and lubricants				
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
Use on ships/at sea				
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Remark				
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!

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Technical specifications (continued)

Article number	6AG1135-6HD00-7BA1	6AG1135-6GB00-7BA1	6AG1135-6HB00-2DA1	6AG1135-6HB00-7CA1
Based on	6ES7135-6HD00-0BA1	6ES7135-6GB00-0BA1	6ES7135-6HB00-0DA1	6ES7135-6HB00-0CA1
	SIPLUS ET 200SP AQ 4xU/I ST	SIPLUS ET 200SP AQ 2xI STANDARD	SIPLUS ET 200SP AQ 2 X U/I HIGH SPEED	SIPLUS ET 200SP AQ 2xU/I HF
Conformal coating				
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability	Yes; Class 2 for high availability	Yes; Class 2 for high availability	Yes; Class 2 for high availability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

Ordering data

	Article No.
SIPLUS analog output modules	
(Extended temperature range and exposure to media)	
Analog output module AQ 2xI Standard, BU type A0 or A1, color code CC00, 16-bit	**6AG1135-6GB00-7BA1**
Analog output module AQ 4xU/I Standard, BU type A0 or A1, color code CC03	**6AG1135-6HD00-7BA1**
Analog output module AQ 2xU/I High Feature, BU type A0 or A1, color code CC00, 16-bit, ±0.1%	**6AG1135-6HB00-7CA1**
Analog output module AQ 2xU/I High Speed, BU type A0 or A1, color code CC00, 16 bit, ± 0.3%	**6AG1135-6HB00-2DA1**
Usable SIPLUS BaseUnits type A0	
BU15-P16+A0+2D	**6AG1193-6BP00-7DA0**
(Extended temperature range and exposure to media)	
BU type A0; BaseUnit (light) with 16 push-in terminals to the module; for starting a new load group (max. 10 A)	
BU15-P16+A0+2B	**6AG1193-6BP00-7BA0**
(Extended temperature range and exposure to media)	
BU type A0; BaseUnit (dark) with 16 push-in terminals to the module; for continuing the load group	
BU15-P16+A10+2D	**6AG1193-6BP20-7DA0**
(Extended temperature range and exposure to media)	
BU type A0; BaseUnit (light) with 16 push-in terminals (1...16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)	
BU15-P16+A10+2B	**6AG1193-6BP20-7BA0**
(Extended temperature range and exposure to media)	
BU type A0; BaseUnit (dark) with 16 push-in terminals (1...16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for continuing the load group	

	Article No.
Usable SIPLUS BaseUnits type A1 (temperature detection)	
BU15-P16+A0+2D/T	**6AG1193-6BP00-7DA1**
(Extended temperature range and exposure to media)	
BU type A1; BaseUnit (light) with 16 push-in terminals to the module; for starting a new load group (max. 10 A)	
BU15-P16+A0+2B/T	**6AG1193-6BP00-7BA1**
(Extended temperature range and exposure to media)	
BU type A1; BaseUnit (dark) with 16 push-in terminals to the module; for continuing the load group	
BU15-P16+A0+12D/T	**6AG1193-6BP40-7DA1**
(Extended temperature range and exposure to media)	
BU type A1; BaseUnit (light) with 16 push-in terminals (1...16) to the module and 2x5 internally jumpered additional terminals (1 B to 5 B and 1 C to 5 C); for starting a new load group (max. 10 A)	
BU15-P16+A0+12B/T	**6AG1193-6BP40-7BA1**
(Extended temperature range and exposure to media)	
BU type A1; BaseUnit (dark) with 16 push-in terminals (1...16) to the module and 2x5 internally jumpered additional terminals (1 B to 5 B and 1 C to 5 C); for continuing the load group	
Accessories	See SIMATIC ET 200SP, analog output modules, page 9/69

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Overview



Technical properties

- Counter module for ET 200SP
- Interfaces:
  - 24 V encoder signals A, B and N from P, M or push-pull-switching encoders and sensors
  - 24 V encoder supply output, short-circuit proof
  - 3 digital inputs for controlling the count operation, for saving or for setting the count value
  - 2 digital outputs for fast reactions regardless of the counter status or measured value
- Counting frequency 200 kHz (800 kHz with quadruple evaluation)
- Counting range: +/- 31 bits
- Measurement function
- Parameterizable hardware interrupts
- Parameterizable input filters for suppressing interferences at sensor and digital inputs

Supported types of encoders/signals

- 24 V incremental encoder with and without signal N
- 24 V pulse encoder with direction signal
- 24 V pulse encoder without direction signal
- 24 V pulse encoder for pulse up and down respectively

Supported system functions

- Isochronous mode
- Firmware update
- Identification data I&M

Technical specifications

Article number	**6ES7138-6AA00-0BA0**
	ET 200SP, TM Count 1x24V
General information	
Product type designation	TM Count 1x24V
Product function	
• I&M data	Yes; I&M0 to I&M3
Engineering with	
• STEP 7 TIA Portal configurable/ integrated as of version	V13 (FW V1.0), V14 (V1.2), V15 (FW V1.3) / V13 (FW V1.0), V14 SP1 (V1.2)
• STEP 7 configurable/integrated as of version	As of V5.5 SP3, only up to FW V1.2
• PROFIBUS as of GSD version/ GSD revision	GSD Revision 5
• PROFINET as of GSD version/ GSD revision	GSDML V2.3
Supply voltage	
Load voltage L+	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes
Encoder supply	
Number of outputs	1
24 V encoder supply	
• 24 V	Yes; L+ (-0.8 V)
• Short-circuit protection	Yes; electronic/thermal
• Output current, max.	300 mA
Digital inputs	
Number of digital inputs	3
Digital inputs, parameterizable	Yes
Input characteristic curve in accordance with IEC 61131, type 3	Yes

Article number	**6ES7138-6AA00-0BA0**
	ET 200SP, TM Count 1x24V
Digital input functions, parameterizable	
• Gate start/stop	Yes
• Capture	Yes
• Synchronization	Yes
• Freely usable digital input	Yes
Input voltage	
• Rated value (DC)	24 V
• for signal "0"	-5 ... +5 V
• for signal "1"	+11 to +30V
• permissible voltage at input, min.	-30 V; -5 V continuous, -30 V brief reverse polarity protection
• permissible voltage at input, max.	30 V
Input current	
• for signal "1", typ.	2.5 mA
Input delay (for rated value of input voltage)	
for standard inputs	
- parameterizable	Yes; none / 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms
- at "0" to "1", min.	6 µs; for parameterization "none"
- at "1" to "0", min.	6 µs; for parameterization "none"
for technological functions	
- parameterizable	Yes
Cable length	
• shielded, max.	1 000 m
• unshielded, max.	600 m

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Technical specifications (continued)

Article number	**6ES7138-6AA00-0BA0**
	ET 200SP, TM Count 1x24V
Digital outputs	
Type of digital output	Transistor
Number of digital outputs	2
Digital outputs, parameterizable	Yes
Short-circuit protection	Yes; electronic/thermal
Limitation of inductive shutdown voltage to	L+ (-33 V)
Controlling a digital input	Yes
Digital output functions, parameterizable	
• Switching tripped by comparison values	Yes
• Freely usable digital output	Yes
Switching capacity of the outputs	
• with resistive load, max.	0.5 A; Per digital output
• on lamp load, max.	5 W
Load resistance range	
• lower limit	48 Ω
• upper limit	12 kΩ
Output voltage	
• for signal "1", min.	23.2 V; L+ (-0.8 V)
Output current	
• for signal "1" rated value	0.5 A; Per digital output
• for signal "0" residual current, max.	0.5 mA
Output delay with resistive load	
• "0" to "1", max.	50 µs
• "1" to "0", max.	50 µs
Switching frequency	
• with resistive load, max.	10 kHz
• with inductive load, max.	0.5 Hz; Acc. to IEC 60947-5-1, DC-13; observe derating curve
• on lamp load, max.	10 Hz
Total current of the outputs	
• Current per module, max.	1 A
Cable length	
• shielded, max.	1 000 m
• unshielded, max.	600 m
Encoder	
Connectable encoders	
• 2-wire sensor	Yes
- permissible quiescent current (2-wire sensor), max.	1.5 mA
Encoder signals, incremental encoder (asymmetrical)	
• Input voltage	24 V
• Input frequency, max.	200 kHz
• Counting frequency, max.	800 kHz; with quadruple evaluation
• Cable length, shielded, max.	600 m; depending on input frequency, encoder and cable quality; max. 50 m at 200 kHz
• Signal filter, parameterizable	Yes
• Incremental encoder with A/B tracks, 90° phase offset	Yes
• Incremental encoder with A/B tracks, 90° phase offset and zero track	Yes
• Pulse encoder	Yes
• Pulse encoder with direction	Yes
• Pulse encoder with one impulse signal per count direction	Yes

Article number	**6ES7138-6AA00-0BA0**
	ET 200SP, TM Count 1x24V
Encoder signal 24 V	
- permissible voltage at input, min.	-30 V
- permissible voltage at input, max.	30 V
Interface types	
• Source/sink input	Yes
• Input characteristic curve in accordance with IEC 61131, type 3	Yes
Isochronous mode	
Isochronous operation (application synchronized up to terminal)	Yes
Interrupts/diagnostics/ status information	
Substitute values connectable	Yes; Parameterizable
Alarms	
• Diagnostic alarm	Yes
• Hardware interrupt	Yes
Diagnostic messages	
• Monitoring the supply voltage	Yes
• Wire-break	Yes
• Short-circuit	Yes
• A/B transition error at incremental encoder	Yes
• Group error	Yes
Diagnostics indication LED	
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
• Channel status display	Yes; Green LED
• for module diagnostics	Yes; green/red DIAG LED
• Status indicator backward counting (green)	Yes
• Status indicator forward counting (green)	Yes
Integrated Functions	
Number of counters	1
Counting frequency (counter) max.	800 kHz; with quadruple evaluation
Fast mode	Yes; FW V1.2 or higher
Counting functions	
• Can be used with TO High_-Speed_Counter	Yes
• Continuous counting	Yes
• Counter response parameterizable	Yes
• Hardware gate via digital input	Yes
• Software gate	Yes
• Event-controlled stop	Yes
• Synchronization via digital input	Yes
• Counting range, parameterizable	Yes
Comparator	
- Number of comparators	2
- Direction dependency	Yes
- Can be changed from user program	Yes

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Technical specifications (continued)

Article number	6ES7138-6AA00-0BA0 ET 200SP, TM Count 1x24V
Position detection	
• Incremental acquisition	Yes
• Suitable for S7-1500 Motion Control	Yes
Measuring functions	
• Measuring time, parameterizable	Yes
• Dynamic measurement period adjustment	Yes
• Number of thresholds, parameterizable	2
Measuring range	
- Frequency measurement, min.	0.04 Hz
- Frequency measurement, max.	800 kHz
- Cycle duration measurement, min.	1.25 µs
- Cycle duration measurement, max.	25 s
Accuracy	
- Frequency measurement	100 ppm; depending on measuring interval and signal evaluation
- Cycle duration measurement	100 ppm; depending on measuring interval and signal evaluation
- Velocity measurement	100 ppm; depending on measuring interval and signal evaluation

Article number	6ES7138-6AA00-0BA0 ET 200SP, TM Count 1x24V
Potential separation	
Potential separation channels	
• between the channels and backplane bus	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-30 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	-30 °C
• vertical installation, max.	50 °C
Decentralized operation	
to SIMATIC S7-300	Yes
to SIMATIC S7-400	Yes
to SIMATIC S7-1200	Yes
to SIMATIC S7-1500	Yes
to standard PROFIBUS master	Yes
to standard PROFINET controller	Yes
Dimensions	
Width	15 mm
Height	73 mm
Depth	58 mm
Weights	
Weight, approx.	45 g

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Ordering data

	Article No.
TM Count 1x24V counter module	
With one channel, max. 200 kHz; for 24 V encoder	**6ES7138-6AA00-0BA0**
Suitable BaseUnits	
BU15-P16+A10+2D	
BU type A0; BaseUnit (light) with 16 push-in terminals (1 ... 16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)	
• 1 unit	**6ES7193-6BP20-0DA0**
• 10 units	**6ES7193-6BP20-2DA0**
BU15-P16+A0+2D	
BU type A0; BaseUnit (light) with 16 push-in terminals to the module; for starting a new load group (max. 10 A)	
• 1 unit	**6ES7193-6BP00-0DA0**
• 10 units	**6ES7193-6BP00-2DA0**
2BU15-P16+A0+2DB	
Double BaseUnit for holding 2 I/O modules; BU type A0; BaseUnit (light/dark) with 16 push-in terminals to the module; for starting a new load group (max. 10 A)	
• 1 unit	**6ES7193-6BP60-0DA0**
BU15-P16+A10+2B	
BU type A0; BaseUnit (dark) with 16 push-in terminals (1 ... 16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for continuing the load group	
• 1 unit	**6ES7193-6BP20-0BA0**
• 10 units	**6ES7193-6BP20-2BA0**
BU15-P16+A0+2B	
BU type A0; BaseUnit (dark) with 16 push-in terminals to the module; for continuing the load group	
• 1 unit	**6ES7193-6BP00-0BA0**
• 10 units	**6ES7193-6BP00-2BA0**
2BU15-P16+A0+2B	
Double BaseUnit for holding 2 I/O modules; BU type A0; BaseUnit (dark/dark) with 16 push-in terminals to the module; for continuing the load group	
• 1 unit	**6ES7193-6BP60-0BA0**

	Article No.
Accessories	
Equipment labeling plate	**6ES7193-6LF30-0AW0**
10 sheets of 16 labels	
Labeling strips	
500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer	**6ES7193-6LR10-0AA0**
500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer	**6ES7193-6LR10-0AG0**
1000 labeling strips DIN A4, light gray, card, for inscription with laser printer	**6ES7193-6LA10-0AA0**
1000 labeling strips DIN A4, yellow, card, for inscription with laser printer	**6ES7193-6LA10-0AG0**
BU cover	
For covering empty slots (gaps); 5 units	
• 15 mm wide	**6ES7133-6CV15-1AM0**
• 20 mm wide	**6ES7133-6CV20-1AM0**
Shield connection	**6ES7193-6SC00-1AM0**
5 shield supports and 5 shield terminals	
Color-coded labels	
• Color code CC71, for 10 AUX terminals 1 A to 10 A, for BU type A0, yellow/green, with push-in terminals; 10 units	**6ES7193-6CP71-2AA0**
• Color code CC72, for 10 AUX terminals 1 A to 10 A, for BU type A0, red, with push-in terminals; 10 units	**6ES7193-6CP72-2AA0**
• Color code CC73, for 10 AUX terminals 1 A to 10 A, for BU type A0, blue, with push-in terminals; 10 units	**6ES7193-6CP73-2AA0**

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Overview



Technical properties

- Counter and position detection module for ET 200SP
- Interfaces:
  - Encoder signals A, B and N for 5 V TTL or RS 422 differential signals
  - SSI interface with clock and data for RS 422 differential signals
  - 24 V encoder supply output, short-circuit proof
  - 2 digital inputs for controlling the counting process, for saving or setting the counter or position value
  - 2 digital outputs for fast reactions depending on the counter reading, position value or measured value
- Counter frequency 1 MHz (4 MHz with four-fold evaluation)
- Counting range: +/- 31 bits
- Measurement function
- Parameterizable hardware interrupts
- Parameterizable input filters for suppressing interferences at sensor and digital inputs

Supported types of encoders/signals

- Incremental encoders with or without N signal
- Pulse encoders with directional signal
- Pulse encoders without directional signal
- Pulse encoders for forward or reverse pulses
- SSI encoders with a frame length of 10 to 40 bits, of which up to 31 bits position value

Supported system functions

- Isochronous mode
- Firmware update
- Identification data (I&M)

Technical specifications

Article number	**6ES7138-6BA00-0BA0**
	ET 200SP, TM Posinput 1
General information	
Product type designation	TM PosInput 1
Product function	
• I&M data	Yes; I&M0 to I&M3
Engineering with	
• STEP 7 TIA Portal configurable/ integrated as of version	V13 (FW V1.0), V14 (V1.2), V15 (FW V1.3) / V13 (FW V1.0), V14 SP1 (V1.2)
• STEP 7 configurable/integrated as of version	As of V5.5 SP3, only up to FW V1.2
• PROFIBUS as of GSD version/ GSD revision	GSD Revision 5
• PROFINET as of GSD version/ GSD revision	GSDML V2.3
Supply voltage	
Load voltage L+	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes
Encoder supply	
Number of outputs	1
24 V encoder supply	
• 24 V	Yes; L+ (-0.8 V)
• Short-circuit protection	Yes; electronic/thermal
• Output current, max.	300 mA
Digital inputs	
Number of digital inputs	2
Digital inputs, parameterizable	Yes
Input characteristic curve in accordance with IEC 61131, type 3	Yes

Article number	**6ES7138-6BA00-0BA0**
	ET 200SP, TM Posinput 1
Digital input functions, parameterizable	
• Gate start/stop	Yes; only for pulse and incremental encoders
• Capture	Yes
• Synchronization	Yes; only for pulse and incremental encoders
• Freely usable digital input	Yes
Input voltage	
• Rated value (DC)	24 V
• for signal "0"	-5 ... +5 V
• for signal "1"	+11 to +30V
• permissible voltage at input, min.	-30 V; -5 V continuous, -30 V brief reverse polarity protection
• permissible voltage at input, max.	30 V
Input current	
• for signal "1", typ.	2.5 mA
Input delay (for rated value of input voltage)	
for standard inputs	
- parameterizable	Yes; none / 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms
- at "0" to "1", min.	6 µs; for parameterization "none"
- at "1" to "0", min.	6 µs; for parameterization "none"
for technological functions	
- parameterizable	Yes

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Technical specifications (continued)

Article number	6ES7138-6BA00-0BA0 ET 200SP, TM Posinput 1
Cable length	
• shielded, max.	1 000 m
• unshielded, max.	600 m
Digital outputs	
Type of digital output	Transistor
Number of digital outputs	2
Digital outputs, parameterizable	Yes
Short-circuit protection	Yes; electronic/thermal
Limitation of inductive shutdown voltage to	L+ (-33 V)
Controlling a digital input	Yes
Digital output functions, parameterizable	
• Switching tripped by comparison values	Yes
• Freely usable digital output	Yes
Switching capacity of the outputs	
• with resistive load, max.	0.5 A; Per digital output
• on lamp load, max.	5 W
Load resistance range	
• lower limit	48 Ω
• upper limit	12 kΩ
Output voltage	
• for signal "1", min.	23.2 V; L+ (-0.8 V)
Output current	
• for signal "1" rated value	0.5 A; Per digital output
• for signal "0" residual current, max.	0.5 mA
Output delay with resistive load	
• "0" to "1", max.	50 µs
• "1" to "0", max.	50 µs
Switching frequency	
• with resistive load, max.	10 kHz
• with inductive load, max.	0.5 Hz; Acc. to IEC 60947-5-1, DC-13; observe derating curve
• on lamp load, max.	10 Hz
Total current of the outputs	
• Current per module, max.	1 A
Cable length	
• shielded, max.	1 000 m
• unshielded, max.	600 m
Encoder signals, incremental encoder (symmetrical)	
• Input voltage	RS 422
• Input frequency, max.	1 MHz
• Counting frequency, max.	4 MHz; with quadruple evaluation
• Cable length, shielded, max.	32 m; at 1 MHz
• Signal filter, parameterizable	Yes
• Incremental encoder with A/B tracks, 90° phase offset	Yes
• Incremental encoder with A/B tracks, 90° phase offset and zero track	Yes
• Pulse encoder	Yes
• Pulse encoder with direction	Yes
• Pulse encoder with one impulse signal per count direction	Yes

Article number	6ES7138-6BA00-0BA0 ET 200SP, TM Posinput 1
Encoder signals, incremental encoder (asymmetrical)	
• Input voltage	5 V TTL (push-pull encoders only)
• Input frequency, max.	1 MHz
• Counting frequency, max.	4 MHz; with quadruple evaluation
• Signal filter, parameterizable	Yes
• Incremental encoder with A/B tracks, 90° phase offset	Yes
• Incremental encoder with A/B tracks, 90° phase offset and zero track	Yes
• Pulse encoder	Yes
• Pulse encoder with direction	Yes
• Pulse encoder with one impulse signal per count direction	Yes
Encoder signals, absolute encoder (SSI)	
• Input signal	to RS-422
• Telegram length, parameterizable	10 ... 40 bit
• Clock frequency, max.	2 MHz; 125 kHz, 250 kHz, 500 kHz, 1 MHz, 1.5 MHz or 2 MHz
• Binary code	Yes
• Gray code	Yes
• Cable length, shielded, max.	320 m; Cable length, RS-422 SSI absolute encoders, Siemens type 6FX2001-5, 24 V supply: 125 kHz, 320 meters shielded, max.; 250 kHz, 160 meters shielded, max.; 500 kHz, 60 meters shielded, max.; 1 MHz, 20 meters shielded, max. 1.5 MHz, 10 meters shielded, max.; 2 MHz, 8 meters shielded, max.
• Parity bit, parameterizable	Yes
• Monoflop time	16, 32, 48, 64 µs & automatic
• Multiturn	Yes
• Singleturn	Yes
Interface types	
• TTL 5 V	Yes; push-pull encoders only
• RS 422	Yes
Isochronous mode	
Isochronous operation (application synchronized up to terminal)	Yes
Interrupts/diagnostics/ status information	
Substitute values connectable	Yes; Parameterizable
Alarms	
• Diagnostic alarm	Yes
• Hardware interrupt	Yes
Diagnostic messages	
• Monitoring the supply voltage	Yes
• Wire-break	Yes
• Short-circuit	Yes
• A/B transition error at incremental encoder	Yes
• Telegram error at SSI encoder	Yes
• Group error	Yes

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Technical specifications (continued)

Article number	6ES7138-6BA00-0BA0 ET 200SP, TM Posinput 1
Diagnostics indication LED	
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
• Channel status display	Yes; Green LED
• for module diagnostics	Yes; green/red DIAG LED
• Status indicator backward counting (green)	Yes
• Status indicator forward counting (green)	Yes
Integrated Functions	
Number of counters	1
Counting frequency (counter) max.	4 MHz; with quadruple evaluation
Fast mode	Yes
Counting functions	
• Can be used with TO High_Speed_Counter	Yes; only for pulse and incremental encoders
• Continuous counting	Yes
• Counter response parameterizable	Yes
• Hardware gate via digital input	Yes
• Software gate	Yes
• Event-controlled stop	Yes
• Synchronization via digital input	Yes
• Counting range, parameterizable	Yes
Comparator	
- Number of comparators	2
- Direction dependency	Yes
- Can be changed from user program	Yes
Position detection	
• Incremental acquisition	Yes
• Absolute acquisition	Yes
• Suitable for S7-1500 Motion Control	Yes
Measuring functions	
• Measuring time, parameterizable	Yes
• Dynamic measurement period adjustment	Yes
• Number of thresholds, parameterizable	2
Measuring range	
- Frequency measurement, min.	0.04 Hz
- Frequency measurement, max.	4 MHz
- Cycle duration measurement, min.	0.25 µs
- Cycle duration measurement, max.	25 s
Accuracy	
- Frequency measurement	100 ppm; depending on measuring interval and signal evaluation
- Cycle duration measurement	100 ppm; depending on measuring interval and signal evaluation
- Velocity measurement	100 ppm; depending on measuring interval and signal evaluation

Article number	6ES7138-6BA00-0BA0 ET 200SP, TM Posinput 1
Potential separation	
Potential separation channels	
• between the channels and backplane bus	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-30 °C
• horizontal installation, max.	60 °C; Observe derating
• vertical installation, min.	-30 °C
• vertical installation, max.	50 °C; Observe derating
Decentralized operation	
to SIMATIC S7-300	Yes
to SIMATIC S7-400	Yes
to SIMATIC S7-1200	Yes
to SIMATIC S7-1500	Yes
to standard PROFIBUS master	Yes
to standard PROFINET controller	Yes
Dimensions	
Width	15 mm
Height	73 mm
Depth	58 mm
Weights	
Weight, approx.	45 g

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Ordering data	Article No.
TM PosInput 1 counting and position detection module	
With one channel, max. 1 MHz for 5 V TTL or RS 422 differential signals or SSI absolute encoder	**6ES7138-6BA00-0BA0**
Suitable BaseUnits	
BU15-P16+A10+2D	
BU type A0; BaseUnit (light) with 16 push-in terminals (1 ... 16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)	
• 1 unit	**6ES7193-6BP20-0DA0**
• 10 units	**6ES7193-6BP20-2DA0**
BU15-P16+A0+2D	
BU type A0; BaseUnit (light) with 16 push-in terminals to the module; for starting a new load group (max. 10 A)	
• 1 unit	**6ES7193-6BP00-0DA0**
• 10 units	**6ES7193-6BP00-2DA0**
2BU15-P16+A0+2DB	
Double BaseUnit for holding 2 I/O modules; BU type A0; BaseUnit (light/dark) with 16 push-in terminals to the module; for starting a new load group (max. 10 A)	
• 1 unit	**6ES7193-6BP60-0DA0**
BU15-P16+A10+2B	
BU type A0; BaseUnit (dark) with 16 push-in terminals (1 ... 16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for continuing the load group	
• 1 unit	**6ES7193-6BP20-0BA0**
• 10 units	**6ES7193-6BP20-2BA0**
BU15-P16+A0+2B	
BU type A0; BaseUnit (dark) with 16 push-in terminals to the module; for continuing the load group	
• 1 unit	**6ES7193-6BP00-0BA0**
• 10 units	**6ES7193-6BP00-2BA0**
2BU15-P16+A0+2B	
Double BaseUnit for holding 2 I/O modules; BU type A0; BaseUnit (dark/dark) with 16 push-in terminals to the module; for continuing the load group	
• 1 unit	**6ES7193-6BP60-0BA0**

Accessories	Article No.
Equipment labeling plate	**6ES7193-6LF30-0AW0**
10 sheets of 16 labels	
Labeling strips	
500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer	**6ES7193-6LR10-0AA0**
500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer	**6ES7193-6LR10-0AG0**
1000 labeling strips DIN A4, light gray, card, for inscription with laser printer	**6ES7193-6LA10-0AA0**
1000 labeling strips DIN A4, yellow, card, for inscription with laser printer	**6ES7193-6LA10-0AG0**
BU cover	
For covering empty slots (gaps); 5 units	
• 15 mm wide	**6ES7133-6CV15-1AM0**
• 20 mm wide	**6ES7133-6CV20-1AM0**
Shield connection	**6ES7193-6SC00-1AM0**
5 shield supports and 5 shield terminals	
Color-coded labels	
• Color code CC71, for 10 AUX terminals 1 A to 10 A, for BU type A0, yellow/green, with push-in terminals; 10 units	**6ES7193-6CP71-2AA0**
• Color code CC72, for 10 AUX terminals 1 A to 10 A, for BU type A0, red, with push-in terminals; 10 units	**6ES7193-6CP72-2AA0**
• Color code CC73, for 10 AUX terminals 1 A to 10 A, for BU type A0, blue, with push-in terminals; 10 units	**6ES7193-6CP73-2AA0**

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Overview



- 4 digital inputs, 6 digital outputs
- Inputs for detecting the input edges with µs accuracy
- Outputs for outputting the switching signals with µs accuracy
- 32x oversampling
- PWM output
- Counter function
- Outputs can be switched between 0.5 A standard and especially fast 0.1 A high-speed mode

Technical specifications

Article number	**6ES7138-6CG00-0BA0** ET 200SP, TM Timer DIDQ 10x24V
General information	
Product type designation	TM Timer DIDQ 10x24V
Product function	
• I&M data	Yes; I&M 0
Engineering with	
• STEP 7 TIA Portal configurable/ integrated as of version	V13 Update 3
• STEP 7 configurable/integrated as of version	V5.5 SP3 / -
Supply voltage	
Load voltage L+	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes; against destruction
Encoder supply	
Number of outputs	1
24 V encoder supply	
• 24 V	Yes; L+ (-0.8 V)
• Short-circuit protection	Yes
• Output current, max.	500 mA; Observe derating
Digital inputs	
Number of digital inputs	4
Digital inputs, parameterizable	Yes
Input characteristic curve in accordance with IEC 61131, type 3	Yes
Digital input functions, parameterizable	
• Digital input with time stamp	Yes
- Number, max.	4
• Counter	Yes
- Number, max.	3
• Counter for incremental encoder	Yes
- Number, max.	1
• Digital input with oversampling	Yes
- Number, max.	4
• HW enable for digital input	Yes
- Number, max.	1
• HW enable for digital output	Yes
- Number, max.	3

Article number	**6ES7138-6CG00-0BA0** ET 200SP, TM Timer DIDQ 10x24V
Input voltage	
• Type of input voltage	DC
• Rated value (DC)	24 V
• for signal "0"	-5 ... +5 V
• for signal "1"	+11 to +30V
• permissible voltage at input, min.	-30 V; -5 V continuous, -30 V brief reverse polarity protection
• permissible voltage at input, max.	30 V
Input current	
• for signal "1", typ.	2.5 mA
Input delay (for rated value of input voltage)	
• Minimum pulse width for program reactions	3 µs for parameterization "none"
for standard inputs	
- parameterizable	Yes; none / 0.05 / 0.1 / 0.4 / 0.8 ms
- at "0" to "1", min.	4 µs
- at "1" to "0", min.	4 µs
Cable length	
• shielded, max.	1 000 m; Depending on sensor, cable quality and rate of change
• unshielded, max.	600 m; Depending on sensor, cable quality and rate of change
Digital outputs	
Type of digital output	Transistor
Number of digital outputs	6
Current-sinking	Yes; With High Speed output
Current-sourcing	Yes
Digital outputs, parameterizable	Yes
Short-circuit protection	Yes; electronic/thermal
Limitation of inductive shutdown voltage to	-0.8 V

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Technical specifications (continued)

Article number	**6ES7138-6CG00-0BA0**
	ET 200SP, TM Timer DIDQ 10x24V
Digital output functions, parameterizable	
• Digital output with time stamp	Yes
- Number, max.	6
• PWM output	Yes
- Number, max.	6
• Digital output with oversampling	Yes
- Number, max.	6
Switching capacity of the outputs	
• with resistive load, max.	0.5 A; 0.1 A with High Speed output
• on lamp load, max.	5 W; 1 W with High Speed output
Load resistance range	
• lower limit	48 Ω; 240 ohm with High Speed output
• upper limit	12 kΩ
Output voltage	
• Type of output voltage	DC
• for signal "0", max.	1 V; With High Speed output
• for signal "1", min.	23.2 V; L+ (-0.8 V)
Output current	
• for signal "1" rated value	0.5 A; 0.1 A with High Speed output, observe derating
• for signal "0" residual current, max.	0.5 mA
Output delay with resistive load	
• "0" to "1", max.	1 µs; With High Speed output, 5 µs with Standard output
• "1" to "0", max.	1 µs; With High Speed output, 6 µs with Standard output
Switching frequency	
• with resistive load, max.	10 kHz
• on lamp load, max.	10 Hz
Total current of the outputs	
• Current per module, max.	3.5 A; Observe derating
Cable length	
• shielded, max.	1 000 m; Depending on load and cable quality
• unshielded, max.	600 m; Depending on load and cable quality
Encoder	
Connectable encoders	
• Incremental encoder (asymmetrical)	Yes
• 24 V initiator	Yes
• 2-wire sensor	Yes
- permissible quiescent current (2-wire sensor), max.	1.5 mA
Encoder signals, incremental encoder (asymmetrical)	
• Input voltage	24 V
• Input frequency, max.	50 kHz
• Counting frequency, max.	200 kHz; with quadruple evaluation
• Cable length, shielded, max.	600 m; Depending on input frequency, encoder and cable quality; max. 200 m at 50 kHz
• Incremental encoder with A/B tracks, 90° phase offset	Yes
• Pulse encoder	Yes

Article number	**6ES7138-6CG00-0BA0**
	ET 200SP, TM Timer DIDQ 10x24V
Encoder signal 24 V	
- permissible voltage at input, min.	-30 V
- permissible voltage at input, max.	30 V
Interface types	
• Input characteristic curve in accordance with IEC 61131, type 3	Yes
Isochronous mode	
Isochronous operation (application synchronized up to terminal)	Yes
Bus cycle time (TDP), min.	375 µs
Interrupts/diagnostics/ status information	
Diagnostics function	Yes
Substitute values connectable	Yes
Alarms	
• Diagnostic alarm	Yes
Diagnostic messages	
• Monitoring the supply voltage	Yes
• Short-circuit	Yes
Diagnostics indication LED	
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
• Channel status display	Yes
• for module diagnostics	Yes; green/red DIAG LED
Integrated Functions	
Number of counters	3
Counting frequency (counter) max.	200 kHz; with quadruple evaluation
Counting functions	
• Continuous counting	Yes
Potential separation	
Potential separation channels	
• between the channels and backplane bus	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-30 °C
• horizontal installation, max.	60 °C; Observe derating
• vertical installation, min.	-30 °C
• vertical installation, max.	50 °C; Observe derating
Decentralized operation	
to SIMATIC S7-1500	Yes
Dimensions	
Width	15 mm
Height	73 mm
Depth	58 mm
Weights	
Weight, approx.	45 g

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Ordering data	Article No.
TM Timer DIDQ 10x24V time-based IO module	
4 time-controlled inputs, 6 time-controlled outputs	**6ES7138-6CG00-0BA0**
Suitable BaseUnits	
BU15-P16+A10+2D	
BU type A0; BaseUnit (light) with 16 push-in terminals (1 ... 16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)	
• 1 unit	**6ES7193-6BP20-0DA0**
• 10 units	**6ES7193-6BP20-2DA0**
BU15-P16+A0+2D	
BU type A0; BaseUnit (light) with 16 push-in terminals to the module; for starting a new load group (max. 10 A)	
• 1 unit	**6ES7193-6BP00-0DA0**
• 10 units	**6ES7193-6BP00-2DA0**
2BU15-P16+A0+2DB	
Double BaseUnit for holding 2 I/O modules; BU type A0; BaseUnit (light/dark) with 16 push-in terminals to the module; for starting a new load group (max. 10 A)	
• 1 unit	**6ES7193-6BP60-0DA0**
BU15-P16+A10+2B	
BU type A0; BaseUnit (dark) with 16 push-in terminals (1 ... 16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for continuing the load group	
• 1 unit	**6ES7193-6BP20-0BA0**
• 10 units	**6ES7193-6BP20-2BA0**
BU15-P16+A0+2B	
BU type A0; BaseUnit (dark) with 16 push-in terminals to the module; for continuing the load group	
• 1 unit	**6ES7193-6BP00-0BA0**
• 10 units	**6ES7193-6BP00-2BA0**
2BU15-P16+A0+2B	
Double BaseUnit for holding 2 I/O modules; BU type A0; BaseUnit (dark/dark) with 16 push-in terminals to the module; for continuing the load group	
• 1 unit	**6ES7193-6BP60-0BA0**

	Article No.
Accessories	
Equipment labeling plate	**6ES7193-6LF30-0AW0**
10 sheets of 16 labels	
Labeling strips	
500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer	**6ES7193-6LR10-0AA0**
500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer	**6ES7193-6LR10-0AG0**
1000 labeling strips DIN A4, light gray, card, for inscription with laser printer	**6ES7193-6LA10-0AA0**
1000 labeling strips DIN A4, yellow, card, for inscription with laser printer	**6ES7193-6LA10-0AG0**
BU cover	
For covering empty slots (gaps); 5 units	
• 15 mm wide	**6ES7133-6CV15-1AM0**
• 20 mm wide	**6ES7133-6CV20-1AM0**
Shield connection	**6ES7193-6SC00-1AM0**
5 shield supports and 5 shield terminals	
Color-coded labels	
• Color code CC71, for 10 AUX terminals 1 A to 10 A, for BU type A0, yellow/green, with push-in terminals; 10 units	**6ES7193-6CP71-2AA0**
• Color code CC72, for 10 AUX terminals 1 A to 10 A, for BU type A0, red, with push-in terminals; 10 units	**6ES7193-6CP72-2AA0**
• Color code CC73, for 10 AUX terminals 1 A to 10 A, for BU type A0, blue, with push-in terminals; 10 units	**6ES7193-6CP73-2AA0**

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Overview



2-channel pulse output module for ET 200SP

- Operating modes:
  - Single pulse with defined length
  - Pulse chain with defined number of pulses
  - Pulse width modulation (with flexible ON period, optional current control and dither function)
  - PWM signal for controlling a DC motor
  - ON and OFF delay; rising and falling edge can be delayed separately to the microsecond
  - Frequency output with defined output frequency
- Hardware:
  - 2 channels 24 V, 2 A output current
  - Parallel switching for enhanced performance on 4 A output current
  - Switching frequencies to 10 kHz; at reduced output current to 0.1 A up to 100 kHz
  - Push-pull output driver for especially steep edges at the outputs
  - Polarity change in DC motor operation for direction reversal
  - 1 high-speed 24 V digital input per channel with parameterizable input delay from 4 µs
- Channel functions:
  - HW enable; start of signal output with the onboard digital input
  - Parameterizable ON delay; for precise deceleration between the HW enable and the start of output
  - Current measurement in the operating modes pulse-width modulation and pulse chain; enables control of the output current mean value over a period. This allows you to compensate for the effect of temperature on the actuator resistance.
  - Cyclic control of the respective main setpoint from the PLC in every operating mode; other values can be modified flexibly from the user program.
- Supported system functions:
  - Isochronous mode; enables precision-timed connection of the setpoint output to a higher-level controller
  - Firmware update
  - Identification data I&M

Technical specifications

Article number	**6ES7138-6DB00-0BB1** ET 200SP, TM Pulse 2x24V
General information	
Product type designation	TM Pulse 2x24 V
Product function	
• I&M data	Yes; I&M 0
• Isochronous mode	Yes
Engineering with	
• STEP 7 TIA Portal configurable/ integrated as of version	V13 SP1 + HSP
• STEP 7 configurable/integrated as of version	V5.5 SP4 and higher
• PROFIBUS as of GSD version/ GSD revision	GSD Revision 5
• PROFINET as of GSD version/ GSD revision	GSDML V2.31
Supply voltage	
Load voltage L+	
• Rated value (DC)	24 V
• Short-circuit protection	Yes
• Reverse polarity protection	Yes; against destruction
Encoder supply	
Number of outputs	2; A common 24V encoder supply for both channels
24 V encoder supply	
• 24 V	Yes; L+ (-0.8 V)
• Short-circuit protection	Yes; per module, electronic
• Output current, max.	300 mA

Article number	**6ES7138-6DB00-0BB1** ET 200SP, TM Pulse 2x24V
Digital inputs	
Number of digital inputs	2; 1 per channel
Digital inputs, parameterizable	Yes
Input characteristic curve in accordance with IEC 61131, type 3	Yes
Digital input functions, parameterizable	
• Freely usable digital input	Yes
• HW enable for digital output	Yes
Input voltage	
• Type of input voltage	DC
• Rated value (DC)	24 V
• for signal "0"	-5 ... +5 V
• for signal "1"	+11 to +30V
• permissible voltage at input, min.	-30 V; -5 V continuous, -30 V brief reverse polarity protection
• permissible voltage at input, max.	30 V
Input current	
• for signal "1", typ.	2.5 mA
Input delay (for rated value of input voltage)	
for standard inputs	
- parameterizable	Yes; none / 0.05 / 0.1 / 0.4 / 0.8 / 1.6 / 3.2 / 12.8 / 20 ms
- at "0" to "1", min.	4 µs; for parameterization "none"
- at "1" to "0", min.	4 µs; for parameterization "none"

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Technical specifications (continued)

Article number	6ES7138-6DB00-0BB1 ET 200SP, TM Pulse 2x24V
Digital outputs	
Type of digital output	P- and M-switching
Number of digital outputs	2; 1 per channel
Current-sinking	Yes
Current-sourcing	Yes
Digital outputs, parameterizable	Yes
Short-circuit protection	Yes; electronic/thermal
Limitation of inductive shutdown voltage to	-0.8 V
Controlling a digital input	Yes
Digital output functions, parameterizable	
• Freely usable digital output	Yes
• PWM output	Yes
- Number, max.	2; 1 per channel
- Cycle duration, parameterizable	Yes; Max. 85 s
• Connection of a proportional valve	Yes
• Dithering	Yes
• Current measurement	Yes
• Current control	Yes
• Connection of a DC motor	Yes
• ON-delay	Yes
• OFF-delay	Yes
• Frequency output	Yes
• Pulse train	Yes
• Pulse output	Yes
Switching capacity of the outputs	
• with resistive load, max.	2 A
• on lamp load, max.	10 W; 1 W with High Speed output
Load resistance range	
• lower limit	12 Ω; 240 ohm with High Speed output
• upper limit	12 kΩ
Output voltage	
• Type of output voltage	DC
• for signal "0", max.	1 V
• for signal "1", min.	23.2 V; L+ (-0.8 V)
Output current	
• for signal "1" rated value	2 A; 0.1 A with High Speed output, observe derating
Output delay with resistive load	
• "0" to "1", typ.	0 µs; With High Speed output, 4.5 µs with Standard output
• "0" to "1", max.	0.8 µs; With High Speed output, 9 µs with Standard output
• "1" to "0", typ.	0 µs; With High Speed output, 4.5 µs with Standard output
• "1" to "0", max.	0.8 µs; With High Speed output, 9 µs with Standard output
Parallel switching of two outputs	
• for uprating	Yes

Article number	6ES7138-6DB00-0BB1 ET 200SP, TM Pulse 2x24V
Switching frequency	
• with resistive load, max.	100 kHz; With High Speed output, 10 kHz with standard output
• with inductive load, max.	100 kHz; With High Speed output, 10 kHz with standard output
• on lamp load, max.	10 Hz
Total current of the outputs	
• Current per channel, max.	2 A
• Current per group, max.	4 A
• Current per module, max.	4 A
Isochronous mode	
Isochronous operation (application synchronized up to terminal)	Yes
Bus cycle time (TDP), min.	250 µs; with 1 channel configuration, 375 µs with 2 channel configuration
Interrupts/diagnostics/ status information	
Diagnostics function	Yes
Substitute values connectable	Yes; Parameterizable
Alarms	
• Diagnostic alarm	Yes
Diagnostic messages	
• Monitoring the supply voltage	Yes
• Short-circuit	Yes
Diagnostics indication LED	
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
• Channel status display	Yes
• for module diagnostics	Yes; green/red DIAG LED
Potential separation	
Potential separation channels	
• between the channels	No
• between the channels and backplane bus	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-30 °C
• horizontal installation, max.	60 °C; Observe derating
• vertical installation, min.	-30 °C
• vertical installation, max.	50 °C; Observe derating
Decentralized operation	
to SIMATIC S7-300	Yes
to SIMATIC S7-400	Yes
to SIMATIC S7-1200	Yes
to SIMATIC S7-1500	Yes
to standard PROFIBUS master	Yes
to standard PROFINET controller	Yes
Dimensions	
Width	20 mm
Height	73 mm
Depth	58 mm
Weights	
Weight, approx.	50 g

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Ordering data

	Article No.
Pulse output module TM Pulse 2x24V	
PWM and pulse output, 2 channels of 2 A for proportional valves and DC motors	**6ES7138-6DB00-0BB1**
Usable BaseUnits	
BU20-P12+A0+4B	**6ES7193-6BP20-0BB1**
BU type B1; BaseUnit (dark); without AUX terminals; for continuing the load group	

	Article No.
Accessories	
Equipment labeling plate	**6ES7193-6LF30-0AW0**
10 sheets of 16 labels	
Labeling strips	
500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer	**6ES7193-6LR10-0AA0**
500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer	**6ES7193-6LR10-0AG0**
1000 labeling strips DIN A4, light gray, card, for inscription with laser printer	**6ES7193-6LA10-0AA0**
1000 labeling strips DIN A4, yellow, card, for inscription with laser printer	**6ES7193-6LA10-0AG0**
BU cover	
for covering empty slots (gaps); 5 units	
• 15 mm wide	**6ES7133-6CV15-1AM0**
• 20 mm wide	**6ES7133-6CV20-1AM0**

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Overview



The TM StepDrive module from Phytron is a high-precision stepper motor control with integrated power output stage for use in the SIMATIC ET 200SP distributed I/O system. It is the 1-step-drive successor model for the SIMATIC ET 200S.

The module can be used together with system and I/O components of the ET 200SP distributed I/O system. Operation is possible with the following head modules:

- IM PROFIBUS
- IM PROFINET
- ET 200SP CPU

Corresponding GSD files and an HSP are available.

The ET 200SP TM StepDrive 24...48V/5A is a product of our Phytron GmbH product partner and is only available from the Phytron GmbH company.

Note:

Product partners are external companies outside Siemens AG and its associated companies. Information about and descriptions of products made by product partners are non-binding, and are the responsibility of the product partners.
These products are manufactured independently and under the responsibility of the respective product partner, and are sold and supplied by it under its terms of business and delivery.

Unless compulsory by law, Siemens assumes no liability or warranty for these products or for connection with these products of the product partners. Please refer also to the note on exemption from liability/use of hyperlinks.

Application

High-precision control of stepper motors:

The technology of the StepDrive TM enables precise current settings which facilitate fine positioning down to 1/256 step with an absolute error of only ~0.003°. This corresponds to approx. 51 200 positions per revolution or 0.007°/step with a 200-step motor.

The module permits connection of a 2-phase stepper motor in the 350 W power range up to 5 A peak with a supply voltage of 24 to 48 V DC.

Sample function blocks are available for operation with SIMATIC and can be downloaded by the user from the Internet site specified below for modification.

The TM StepDrive features the following positioning functions:

- Absolute positioning
- Relative positioning
- Reference point approach
- Endless axes: Speed mode/frequency output
- Selection of feedback value

Particularly noteworthy is the use of TM StepDrive together with the TO Motion Control.

A list of possible BaseUnits with which the TM StepDrive can be operated can be found in the manufacturer's manual.

Technical specifications

- Suitable for bipolar control of 2-phase stepper motors of 4-, (6-) or 8-wire design (in 4-wire system)
- 5 A peak phase current with adjustable current steps
- Supply voltage from 24 to 48 V DC
- Up to 1/256 microstep (physical resolution: approx. 51 200 positions per revolution (0.007°/step)).
- Maximum stepping rate: 250 000 steps/s
- 2 digital inputs for limit and reference switches
- Diagnostics LEDs (overcurrent, overtemperature, traversing task or motor running ...)
- Short-circuit-proof, overload-proof
- Data record transfer for power output stage parameter assignment and diagnostics during runtime
- Overdrive: Current adaptation for higher clock frequencies
- Booster: Enhanced torque during acceleration or braking
- Adjustable response to CPU stop

Ordering data

TM StepDrive stepper motor control	Further information and ordering options via Phytron (company): http://www.phytron.com/tm-stepdrive
High-precision stepper motor control for ET 200SP	
Suitable BaseUnits	
BU20-P12+A0+4B	**6ES7193-6BP20-0BB1**
BU type B1; BaseUnit (dark); without AUX terminals; for continuing the load group	

More information

You can find more information about the module as well as contact information at:
http://www.phytron.com/tm-stepdrive

Here you will also find the manual, the data sheet, the HSP, a link to the GSD files as well as sample function blocks for SIMATIC.

Service and support:
http://www.phytron.com/support

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Overview



SIPLUS and SIMATIC Electrical Charge Controller are the key components in infrastructure solutions for the conductive charging of electric vehicles.

They perform the following functions:

- Detection of the charging cable and its permissible current carrying capacity
- Transfer of the maximum charging current from the charging station to the electric vehicle
- Evaluation of the status signals from the electric vehicle:
  - Ready for charging
  - Charging
  - Charging with ventilation
- Cost-optimized, space-saving charging infrastructure solutions due to compact design based on SIMATIC ET 200SP

AC module ET 200SP TM ECC 2xPWM ST

- Control of charging outputs according to IEC 61851 by parameterizable SIMATIC ET 200SP TM ECC 2xPWM ST charging controller
- Control of load tap-off
- Control of connector lock
- Evaluation of connector lock or load contactor status

DC module ET 200SP TM ECC PL ST

- Complete control of a DC charging process according to DIN 70121 by SIMATIC ET 200SP TM ECC PL ST charging controller.
- The following sequences are executed:
  - Session setup enter
  - Service discovery
  - Service and payment selection
  - Cable check
  - Charge parameter discovery
  - Contract authentication
  - PreCharge
  - Power delivery
  - Welding detection
  - Current demand
  - Session setup exit

Technical specifications

Article number	**6FE1242-6TM10-0BB1** SIMATIC ET 200SP TM ECC 2xPWM ST	**6FE1242-6TM20-0BB1** SIMATIC ET 200SP TM ECC PL ST
General information		
Product brand name	SIMATIC	SIMATIC
Product designation	ET 200SP, TM ECC 2xPWM ST	ET 200SP, TM ECC PL ST
Product description		Technology module for the conductive charging of electric vehicles according to DIN 70121
usable BaseUnits	BU type B0, B1	BU type B0, B1
Number of channels	2; Acc. to IEC 61851-1 Mode 3 and/or SAE J1772	1; Acc. to IEC 61851-1 Mode 4 and DIN SPEC 70121
Product function		
• I&M data	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3
• Isochronous mode	No	No
Engineering with		
• STEP 7 TIA Portal configurable/ integrated as of version	V14 SP1	V15
Installation type/mounting		
Mounting type	standard rail	standard rail
Mounting position	Horizontal	Horizontal, vertical
Supply voltage		
Type of supply voltage	DC	
Rated value (DC)	24 V	24 V
permissible range, lower limit (DC)	19.2 V	19.2 V
permissible range, upper limit (DC)	28.8 V	28.8 V
Reverse polarity protection	Yes; against destruction	Yes; against destruction

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Technical specifications (continued)

Article number	**6FE1242-6TM10-0BB1** SIMATIC ET 200SP TM ECC 2xPWM ST	**6FE1242-6TM20-0BB1** SIMATIC ET 200SP TM ECC PL ST
Load voltage L+		
• Rated value (DC)	24 V	24 V
• Reverse polarity protection		Yes
Input current		
Current consumption, typ.	40 mA	40 mA
Current consumption, max.	90 mA	100 mA
Digital inputs		
Number of digital inputs	2; 1 per channel	0
Digital inputs, parameterizable	Yes; 12 V / 24 V	No
Digital input functions, parameterizable		
• Freely usable digital input	No; Readback contact contactor / connector lock	
Input voltage		
• Type of input voltage	DC	
• for signal "0"	<0.2 V (nom)	
• for signal "1"	>0.6 V (nom)	
• permissible voltage at input, min.	0 V	
• permissible voltage at input, max.	30 V	
for technological functions		
- parameterizable	Yes	Yes
Cable length		
• shielded, max.		10 m
• unshielded, max.	30 m	
Digital outputs		
Type of digital output	Transistor	Transistor
Number of digital outputs	2; 1 per channel	2; 1x digital out TRIP function as open collector, 1x digital out (DQ P) as open collector
Current-sinking		Yes
short-circuit proof	Yes	Yes
Short-circuit protection	Yes; electronic/thermal	
Digital output functions, parameterizable		
• PWM output	Yes; According to IEC 61851	Yes; Acc. to DIN SPEC 70121
- Number, max.	2; 1 per channel	1; 1 per channel
• Connection of a DC motor	Yes; ACT p/n connector locking	No; Only fixed charging cables are permitted for DC charging systems
Switching capacity of the outputs		
• with resistive load, max.	1.3 A	0.6 A; Per digital output
Output voltage		
• Type of output voltage	DC	DC
• Output voltage, min.	24 V	24 V
Cable length		
• unshielded, max.	30 m	10 m
Analog outputs		
Number of analog outputs	2	1
Type of analog output	Control pilot acc. to IEC 61851-1 and/or SAE J1772	Control pilot including Powerline Green Phy, acc. to DIN SPEC 70121
Connection of a DC motor	Yes	No
Protocols		
Bus communication	Yes	Yes; Backplane bus
Vehicle communication according to IEC 61851	Yes; MODE 3	Yes; Mode 4

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Technical specifications (continued)

Article number	**6FE1242-6TM10-0BB1** SIMATIC ET 200SP TM ECC 2xPWM ST	**6FE1242-6TM20-0BB1** SIMATIC ET 200SP TM ECC PL ST
Interrupts/diagnostics/ status information		
Alarms		
• Diagnostic alarm	Yes	Yes
Diagnostic messages		
• Monitoring the supply voltage	No	No; Supply voltage diagnostics
• Wire-break		No
• Short-circuit	Yes	No
Diagnostics indication LED		
• ERROR LED	Yes; Red LED	No
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED	Yes; green PWR LED
• Channel status display	Yes; Green LED	Yes; Green LED
• for module diagnostics	Yes; green/red DIAG LED	Yes; green/red DIAG LED
Potential separation		
Potential separation channels		
• between the channels	No	No; Only one channel is available
• between the channels and backplane bus	Yes	Yes
Isolation		
Isolation tested with	707 V DC	707 V DC
Degree of pollution	2	2
EMC		
Electrostatic discharge acc. to IEC 61000-4-2	4 kV contact discharge / 8 kV air discharge	4 kV contact discharge / 8 kV air discharge
Field-related interference acc. to IEC 61000-4-3	10 V/m (80 ... 1 000 MHz), 3 V/m (1.4 ... 2.0 GHz), 1 V/m (2.0 ... 2.7 GHz)	10 V/m (80 ... 1 000 MHz), 3 V/m (1.4 ... 2.0 GHz), 1 V/m (2.0 ... 2.7 GHz)
Conducted interference due to burst acc. to IEC 61000-4-4	2 kV signal lines	2 kV signal lines
Conducted interference due to surge acc. to IEC 61000-4-5	On DC supply lines: 0.5 kV symmetrical and asymmetrical	On DC supply lines: 0.5 kV symmetrical and asymmetrical
Conducted interference due to high-frequency radiation acc. to IEC 61000-4-6	10 V (0.15 ... 80 MHz)	10 V (0.15 ... 80 MHz)
Degree and class of protection		
IP degree of protection	IP20	IP20
Standards, approvals, certificates		
Certificate of suitability	CE / RCM / EAC / UL	CE / RCM / EAC / UL
Ambient conditions		
Ambient temperature during operation		
• min.	-30 °C	-30 °C
• max.	60 °C	60 °C
• horizontal installation, min.	-30 °C	-30 °C
• horizontal installation, max.	60 °C	60 °C
• vertical installation, min.	-30 °C	-30 °C
• vertical installation, max.	50 °C	50 °C
Ambient temperature during storage/transportation		
• Storage, min.	-40 °C	-40 °C
• Storage, max.	70 °C	70 °C
• Transportation, min.	-40 °C	-40 °C
• Transportation, max.	70 °C	70 °C
Altitude during operation relating to sea level		
• Installation altitude above sea level, max.		2 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 080 hPa ... 795 hPa (-1 000 m ... +2 000 m)	Tmin ... Tmax at 1 080 hPa ... 795 hPa (-1 000 m ... +2 000 m)

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Technical specifications (continued)

Article number	**6FE1242-6TM10-0BB1** SIMATIC ET 200SP TM ECC 2xPWM ST	**6FE1242-6TM20-0BB1** SIMATIC ET 200SP TM ECC PL ST
Relative humidity		
• Operation, min.	5 %	5 %
• Operation, max.	95 %; no condensation	95 %; no condensation
Vibrations		
• Vibration resistance during operation acc. to IEC 60068-2-6	10 ... 58 Hz / 0.075 mm, 58 ... 150 Hz / 1 g	10 ... 58 Hz / 0.075 mm, 58 ... 150 Hz / 1 g
Shock testing		
• Shock resistance acc. to IEC 60068-2-27	15 g / 11 ms	15 g / 11 ms
Decentralized operation		
to SIMATIC S7-1500	Yes	Yes
Dimensions		
Width	20 mm	20 mm
Height	73 mm	73 mm
Depth	58 mm	58 mm
Weights		
Weight, approx.	32 g	51 g

Ordering data

	Article No.		Article No.
Charging controller SIMATIC ET200SP TM ECC 2xPWM S Designed for controlling charging outputs according to IEC 61851 and parameterizable, with 2 charging outputs, ambient temperature -30°C...60°C, 2x control pilot, 2x plug present, 2x DQ switching contact for load contactor as open collector, 2x DI for load contactor feedback or connector lock;	**6FE1242-6TM10-0BB1**	**Charging controller SIMATIC ET200SP TM ECC PL ST** Charging controller for conductive charging of electric vehicles according to DIN SPEC 70121, charging mode 4, ambient temperature -30 °C ... 60 °C, 1x control pilot including Powerline Green Phy, 1x Plug Present /Proximity Pilo, 1x Digital Out TRIP function as open collector, 1x Digital Out (DQ P) as open collector, suitable for BU type BU20-P12+A0+4B or BU type BU20-P12+A4+0B	**6FE1242-6TM20-0BB1**

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Overview



SIWAREX WP321 is a versatile and flexible weighing module for the seamless integration of a static scale into the SIMATIC automation environment.

The electronic weighing system is integrated in the SIMATIC ET 200SP series and uses all the features of a modern automation system, such as integrated communication, operator control and monitoring, diagnostic system and configuration tools in the TIA Portal, SIMATIC STEP 7, WinCC flexible and PCS7.

Technical specifications

SIWAREX WP321	
Integration in automation systems	
SIMATIC S7-300, S7-400, S7-1200 and S7-1500	Via SIMATIC ET 200SP interface module (PROFIBUS or PROFINET)
Other manufacturers (with restrictions)	Via SIMATIC ET 200SP interface module (PROFIBUS or PROFINET)
Communication interfaces	• SIMATIC ET 200SP backplane bus • RS 485 (SIWATOOL, Siebert remote display)
Commissioning options	• Using SIWATOOL V7 • Using function block in SIMATIC CPU / Touch Panel
Measuring accuracy	
according to DIN 1319-1 of full-scale value at 20 °C ± 10 K (68 °F ± 10 K)	0.05%
Internal resolution	± 2 million parts
Measuring frequency	100 / 120 / 600 Hz
Digital filter	Variable adjustable low-pass and average filter
Typical applications	• Non-automatic weighing instruments • Force measurements • Fill-level monitoring • Belt tension monitors
Weighing functions	
Weight values	• Gross • Net • Tare
Limit values	• 2 x min/max • Empty
Zeroing	Via command by controller or HMI
Tare	Via command by controller or HMI
External tare specification	Via command by controller or HMI
Calibration commands	Via command by controller or HMI
Load cells	Full-bridge strain gauges in 4-wire or 6-wire system

SIWAREX WP321	
Load cell powering	
Supply voltage (value applies at sensor, cable-related voltage drops of up to 5 V are controlled)	4.85 V DC ±2%
Permissible load resistance	
• R_{Lmin}	> 40 Ω
• R_{Lmax}	< 4100 Ω
With SIWAREX IS Ex interface	
• R_{Lmin}	> 50 Ω
• R_{Lmax}	< 4100 Ω
Load cell characteristic	1 … 4 mV/V
Permissible range of measuring signal (at greatest set characteristic value)	-21.3 ... +21.3 mV
Max. distance of load cells	1000 m (459.32 ft)
Connection to load cells in Ex zone 1	Optionally via SIWAREX IS Ex interface (compatibility of the load cells must be checked)
Approvals/certificates	• ATEX Zone 2 • UL • FM • EAC • KCC • IECEx • RCM
Auxiliary power supply	
Rated voltage	24 V DC
Max. power consumption	typ. 0.1 A @ 24 V DC (0.2 A max.)
Max. power consumption SIMATIC Bus	30 mA
IP degree of protection to EN 60529; IEC 60529	IP20
Climatic requirements	
$T_{min(IND)}$ ... $T_{max(IND)}$ (operating temperature)	
• Vertical installation in SIMATIC S7 [1]	-25 ... +50 °C (-13 ... 122 °F)
• Horizontal installation in SIMATIC S7 [1]	-25 ... +60 °C (-13 ... 140 °F)
EMC requirements	according to IEC 61000-6-2, IEC 61000-6-4, OIML-R76-1
Dimensions (width)	15 mm (0.6 in)

[1] The S7 standard modules may not be operated at temperatures below 0 °C (32 °F). For operating conditions below 0 °C (32 °F), SIMATIC modules from the SIPLUS series must be used.

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Ordering data	Article No.
TM SIWAREX WP321 weighing module Single-channel, for platform or hopper scales with analog load cells (1–4 mV/V), 1 x LC, 1 x RS 485.	**7MH4138-6AA00-0BA0**
SIWAREX WP321 manual Available in a range of languages Free download on the Internet at: http://www.siemens.com/weighing-technology	
SIWAREX WP321 "Ready for Use" TIA Portal and SIMATIC Manager sample configuration Free download on the Internet at: http://www.siemens.com/weighing-technology	
SIWATOOL V4 & V7 Service and commissioning software for SIWAREX weighing modules	**7MH4900-1AK01**
SIWAREX PCS7 AddOn Library for PCS7 V8.x and V9.0 • Supports PROFINET APL faceplates and function blocks for: • SIWAREX U • SIWAREX FTA • SIWAREX FTC_B (conveyor scales) • SIWAREX WP321 Classic faceplate and function block for: • SIWAREX FTC_L (loss in weight)	**7MH4900-1AK61**
Accessories (mandatory requirement)	
BaseUnit (Type A0 – one BaseUnit required for each WP321) • For opening a new potential group - BU15P-16+A0+2D or - BU15P-16+A10+2D • For continuing the potential group - BU15P-16+A0+2B - BU15P-16+A10+2B	 **6ES7193-6BP00-0DA0** **6ES7193-6BP20-0DA0** **6ES7193-6BP00-0BA0** **6ES7193-6BP20-0BA0**
Shielded connection for BaseUnit (5 units / for 5 scales) For laying the load cell cable	**6ES7193-6SC00-1AM0**
Accessories (optional)	
SIWAREX JB junction box, aluminum housing For connecting up to 4 load cells in parallel, and for connecting multiple junction boxes.	**7MH5001-0AA20**
SIWAREX JB junction box, stainless steel housing For connecting up to 4 load cells in parallel.	**7MH5001-0AA00**
SIWAREX JB junction box, stainless steel housing (ATEX) For parallel connection of up to 4 load cells (for zone allocation, see manual or type-examination certificate).	**7MH4710-1EA01**

	Article No.
SIWAREX IS Ex interface For intrinsically-safe connection of load cells. With ATEX approval (not UL/FM). Suitable for SIWAREX electronic weighing system. Compatibility of load cells must be checked separately. Approved for use in the EU • Short-circuit current < 199 mA DC • Short-circuit current < 137 mA DC	 **7MH4710-5BA** **7MH4710-5CA**
Cable (optional)	
Cable Li2Y 1 x 2 x 0.75 ST + 2 x (2 x 0.34 ST) – CY For connecting SIWAREX electronic weighing systems to junction box (JB), extension box (EB) and Ex interface or between two EBs. For permanent installation. Occasional bending is possible. External diameter: approx. 10.8 mm (0.43 in) Permissible ambient temperature -40 ... +80 °C (-40 ... +176 °F). Sold by the meter. • Sheath color: orange • For hazardous atmospheres. Sheath color: blue.	 **7MH4702-8AG** **7MH4702-8AF**
RS 485/USB interface converter Commercially available interface converter with FTDI chip, e.g. USB-Nano from CTI https://www.cti-shop.com/en/rs485-converter/usb-nano-485	
Remote display The Siebert S102 and S302 remote digital displays can be directly connected to the SIWAREX FTA via an RS 485 interface. Siebert Industrieelektronik GmbH Postfach 1180D-65565 Eppelborn, Germany Tel.: +49 6806/980-9 Fax: +49 6806/980-999 Internet: http://www.siebert.de Detailed information is available from the manufacturer.	
Commissioning	
Commissioning charge for one static scale with SIWAREX module (Travel and setup charge must be ordered separately) Scope: • Recording of data • Checking of mechanical installation of the scale • Checking of electrical wiring and function • Static adjustment of the scale Requirements: • Mechanical design functional • Modules electrically wired and tested • Calibration weights available • Free access to scale	**9LA1110-8SN50-0AA0**
Flat charge for travel and setup in Germany	**9LA1110-8RA10-0AA0**

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Overview



Technical properties

- Counter module for ET 200SP
- Interfaces:
  - 24 V encoder signals A, B and N from P, M or push-pull-switching encoders and sensors
  - 24 V encoder supply output, short-circuit proof
  - 3 digital inputs for controlling the count operation, for saving or for setting the count value
  - 2 digital outputs for fast reactions regardless of the counter status or measured value
- Counting frequency 200 kHz (800 kHz with quadruple evaluation)
- Counting range: +/- 31 bits
- Measurement function
- Parameterizable hardware interrupts
- Parameterizable input filters for suppressing interferences at sensor and digital inputs

Supported types of encoders/signals

- 24 V incremental encoder with and without signal N
- 24 V pulse encoder with direction signal
- 24 V pulse encoder without direction signal
- 24 V pulse encoder for pulse up and down respectively

Supported system functions

- Isochronous mode
- Firmware update
- Identification data I&M

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

Technical specifications

Article number	**6AG1138-6AA00-2BA0**
Based on	**6ES7138-6AA00-0BA0**
	SIPLUS ET 200SP TM COUNT 1X24V
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	60 °C; = Tmax
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance	
Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
Remark	
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A

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Ordering data

SIPLUS TM Count 1x24V counter module (Extended temperature range and medial exposure) With one channel, max. 200 kHz; for 24 V encoder	**6AG1138-6AA00-2BA0**
Usable BaseUnits (Extended temperature range and medial exposure)	
BU15-P16+A0+2D BU type A0; BaseUnit (light) with 16 push-in terminals to the module; for starting a new load group (max. 10 A)	**6AG1193-6BP00-7DA0**
BU15-P16+A0+2B BU type A0; BaseUnit (dark) with 16 push-in terminals to the module; for continuing the load group	**6AG1193-6BP00-7BA0**
BU15-P16+A10+2D BU type A0; BaseUnit (light) with 16 push-in terminals (1...16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)	**6AG1193-6BP20-7DA0**
BU15-P16+A10+2B BU type A0; BaseUnit (dark) with 16 push-in terminals (1...16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for continuing the load group	**6AG1193-6BP20-7BA0**

Further accessories	See SIMATIC TM Count 1x24V counter module, page 9/91

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Overview



Technical properties

- Counting and position detection module for ET 200SP
- Interfaces:
  - Encoder signals A, B and N for 5 V TTL or RS 422 differential signals
  - SSI interface with clock and data for RS 422 differential signals
  - 24 V encoder supply output, short-circuit proof
  - 2 digital inputs for controlling the counting process, for saving or setting the counter or position value
  - 2 digital outputs for fast reactions depending on the counter reading, position value or measured value
- Counter frequency 1 MHz (4 MHz with four-fold evaluation)
- Counting range: +/- 31 bits
- Measurement function
- Parameterizable hardware interrupts
- Parameterizable input filters for suppressing interferences at sensor and digital inputs

Supported types of encoders/signals

- Incremental encoders with or without N signal
- Pulse encoders with directional signal
- Pulse encoders without directional signal
- Pulse encoders for forward or reverse pulses
- SSI encoders with a frame length of 10 to 40 bits, of which up to 31 bits position value

Supported system functions

- Isochronous mode
- Firmware update
- Identification data I&M

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

Technical specifications

Article number	**6AG1138-6BA00-2BA0**
Based on	**6ES7138-6BA00-0BA0**
	SIPLUS ET 200SP TM POSINPUT 1
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	60 °C; = Tmax; see Derating BasedOn (e.g. manual)
• vertical installation, min.	-40 °C; = Tmin
• vertical installation, max.	50 °C; = Tmax; see Derating BasedOn (e.g. manual)
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance	
Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
Remark	
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A

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Ordering data	Article No.
SIPLUS TM PosInput 1 counting and position detection module (Extended temperature range and exposure to environmental substances) With one channel, max. 1 MHz for 5 V TTL or RS 422 differential signals or SSI absolute encoder	**6AG1138-6BA00-2BA0**
Usable BaseUnits (Extended temperature range and exposure to environmental substances)	
BU15-P16+A0+2D BU type A0; BaseUnit (light) with 16 push-in terminals to the module; for starting a new load group (max. 10 A)	**6AG1193-6BP00-7DA0**
BU15-P16+A0+2B BU type A0; BaseUnit (dark) with 16 push-in terminals to the module; for continuing the load group	**6AG1193-6BP00-7BA0**
BU15-P16+A10+2D BU type A0; BaseUnit (light) with 16 push-in terminals (1...16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)	**6AG1193-6BP20-7DA0**
BU15-P16+A10+2B BU type A0; BaseUnit (dark) with 16 push-in terminals (1...16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for continuing the load group	**6AG1193-6BP20-7BA0**

	Article No.
Other accessories	See TM PosInput 1 counting and position detection module, page 9/95

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Overview



- 4 digital inputs, 6 digital outputs
- Inputs for detecting the input edges with µs accuracy
- Outputs for outputting the switching signals with µs accuracy
- 32x oversampling
- PWM output
- Counter function
- Outputs can be switched between 0.5 A standard and especially fast 0.1 A high-speed mode

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

Technical specifications

Article number	**6AG1138-6CG00-2BA0**
Based on	**6ES7138-6CG00-0BA0**
	SIPLUS ET 200SP TM TIMER DIDQ 10x24V
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	60 °C; = Tmax; see Derating BasedOn (e.g. manual)
• vertical installation, min.	-40 °C; = Tmin
• vertical installation, max.	50 °C; = Tmax; see Derating BasedOn (e.g. manual)
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m

• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at
	1 140 hPa ... 795 hPa
	(-1 000 m ... +2 000 m) //
	Tmin ... (Tmax - 10 K) at
	795 hPa ... 658 hPa
	(+2 000 m ... +3 500 m) //
	Tmin ... (Tmax -20 K) at
	658 hPa ... 540 hPa
	(+3 500 m ... +5 000 m)

Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance	
Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
Remark	
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A

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Ordering data	Article No.
Time-based IO module SIPLUS TM timer DIDQ 10x24 V (Extended temperature range and exposure to environmental substances) 4 time-controlled inputs, 6 time-controlled outputs	**6AG1138-6CG00-2BA0**
Usable BaseUnits (Extended temperature range and exposure to environmental substances)	
BU15-P16+A0+2D BU type A0; BaseUnit (light) with 16 push-in terminals to the module; for starting a new load group (max. 10 A)	**6AG1193-6BP00-7DA0**
BU15-P16+A0+2B BU type A0; BaseUnit (dark) with 16 push-in terminals to the module; for continuing the load group	**6AG1193-6BP00-7BA0**
BU15-P16+A10+2D BU type A0; BaseUnit (light) with 16 push-in terminals (1...16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)	**6AG1193-6BP20-7DA0**
BU15-P16+A10+2B BU type A0; BaseUnit (dark) with 16 push-in terminals (1...16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for continuing the load group	**6AG1193-6BP20-7BA0**

Other accessories	Article No.
	See SIMATIC TM Timer DIDQ 10x24V time-based IO module, page 9/98

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Overview



2-channel pulse output module for SIPLUS ET 200SP

- Operating modes:
  - Single pulse with defined length
  - Pulse chain with defined number of pulses
  - Pulse width modulation (with flexible ON period, optional current control and dither function)
  - PWM signal for controlling a DC motor
  - On and OFF delay; rising and falling edge can be delayed separately to the microsecond
  - Frequency output with defined output frequency
- Hardware:
  - 2 24V channels, 2A output current can be switched in parallel to boost performance to 4 A of output current
  - Switching frequencies to 10 kHz; at reduced output current to 0.1 A up to 100 kHz
  - Push/pull output driver for especially steep edges at the outputs
  - Polarity change in DC motor operation for direction reversal
  - 1 high-speed 24 V digital input per channel with parameterizable input delay from 4 µs
- Channel functions:
  - HW enable;
    Start of signal output with the onboard digital input
  - Parameterizable ON delay;
    for precise deceleration between the HW enable and the start of output
  - Current measurement in the operating modes pulse-width modulation and pulse chain;
    enables control of the output current mean value over a period. Temperature influences can thus be balanced to the resistance of the actuator.
  - Cyclic control of the respective main setpoint from the PLC in every operating mode;
    other values can be modified flexibly from the user program.
- Supported system functions:
  - Isochronous mode;
    enables precision-timed connection of the setpoint output to a higher-level controller
  - Firmware update
  - Identification data I&M

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

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Technical specifications

Article number	**6AG1138-6DB00-2BB1**
Based on	**6ES7138-6DB00-0BB1**
	SIPLUS ET 200SP TM PULSE 2x24V
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/ frost); start-up @ -25 °C
• horizontal installation, max.	60 °C; Observe derating
• vertical installation, min.	-40 °C; = Tmin; Startup @ -25 °C
• vertical installation, max.	50 °C; Observe derating
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation

Article number	**6AG1138-6DB00-2BB1**
Based on	**6ES7138-6DB00-0BB1**
	SIPLUS ET 200SP TM PULSE 2x24V
Resistance	
Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *

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Technical specifications (continued)

Article number	6AG1138-6DB00-2BB1
Based on	6ES7138-6DB00-0BB1 SIPLUS ET 200SP TM PULSE 2x24V
Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
Remark	
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!

Article number	6AG1138-6DB00-2BB1
Based on	6ES7138-6DB00-0BB1 SIPLUS ET 200SP TM PULSE 2x24V
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A

Ordering data

	Article No.
SIPLUS TM Pulse 2x24V pulse output module (Extended temperature range and medial exposure) PWM and pulse output, 2 channels of 2 A for proportional valves and DC motors	**6AG1138-6DB00-2BB1**
Usable BaseUnits (Extended temperature range and medial exposure)	
BU20-P12+A0+4B BU type B1; BaseUnit (dark); without AUX terminals; for continuing the load group	**6AG1193-6BP20-7BB1**

	Article No.
Further accessories	See SIMATIC TM Pulse 2x24V pulse output module, page 9/101

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Overview



- CM PtP communication module;
  module for serial communication connections with RS 232 and RS 422 interfaces. RS 485 for the Freeport, 3964(R), Modbus RTU and USS protocols, max. 115.2 kbps, 2 KB frame length, 4 KB receive buffer

- Protocols supported
  - Freeport: User-parameterizable frame format for universal communication
  - 3964(R) for improved transmission reliability
  - Modbus RTU master (requires instructions in SIMATIC S7)
  - Modbus RTU slave (requires instructions in SIMATIC S7)
  - USS, implemented through instructions
- Interface properties
  - RS 232 with auxiliary signals
  - RS 422 for full-duplex connections
  - RS 485 for half-duplex and multi-point connections
  - Transmission rates from 300 to 115200 bps
- Can be plugged into Type A0 BaseUnits (BU) with automatic coding
- LED display for errors, operation and supply voltage
- Communication display for sending and receiving
- Clear labeling on front of module
  - Plain text identification of the module type and function class
  - 2D matrix code (order and serial number)
  - Connection diagram
  - Color coding of the CM module type: silver
  - Hardware and firmware version
  - Complete Article No.
- Optional labeling accessories
  - Labeling strips
  - Equipment labeling plate
- Optional system-integrated shield connection

Technical specifications

Article number	**6ES7137-6AA00-0BA0**
	ET 200SP, CM PTP
General information	
Product type designation	CM PtP
Product function	
• I&M data	Yes; I&M0 to I&M3
Engineering with	
• STEP 7 TIA Portal configurable/ integrated as of version	V12 / V12
• STEP 7 configurable/integrated as of version	V5.5 SP2 with GSD file
• PROFIBUS as of GSD version/ GSD revision	GSD as of Revision 5
• PROFINET as of GSD version/ GSD revision	GSDML V2.3
Supply voltage	
Rated value (DC)	24 V
Reverse polarity protection	Yes
1. Interface	
Interface types	
• RS 485	Yes
• RS 422	Yes
• RS 232	Yes
RS 232	
• Transmission rate, max.	115.2 kbit/s
• Cable length, max.	15 m
• RS 232 auxiliary signals	RTS, CTS, DTR, DSR, RI, DCD
RS 485	
• Transmission rate, max.	115.2 kbit/s
• Cable length, max.	1 200 m

Article number	**6ES7137-6AA00-0BA0**
	ET 200SP, CM PTP
RS 422	
• Transmission rate, max.	115.2 kbit/s
• Cable length, max.	1 200 m
• 4-wire full duplex connection	Yes
• 4-wire multipoint connection	Yes
Integrated protocols	
Freeport	
- Telegram length, max.	2 kbyte
- Bits per character	7 or 8
- Number of stop bits	1 or 2 bit
- Parity	None, even, odd, always 1, always 0, any
3964 (R)	
- Telegram length, max.	2 kbyte
- Bits per character	7 or 8
- Number of stop bits	1 or 2 bit
- Parity	None, even, odd, always 1, always 0, any
Modbus RTU master	
- Address area	1 to 247, extended 1 to 65535
- Number of slaves, max.	32
MODBUS RTU slave	
- Address area	1 to 247, extended 1 to 65535
Telegram buffer	
• Buffer memory for telegrams	4 kbyte
• Number of telegrams which can be buffered	255

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Technical specifications (continued)

Article number	6ES7137-6AA00-0BA0 ET 200SP, CM PTP
Interrupts/diagnostics/ status information	
Diagnostics function	Yes
Alarms	
• Diagnostic alarm	Yes
• Hardware interrupt	No
Diagnostic messages	
• Wire-break	Yes
Diagnostics indication LED	
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
• for module diagnostics	Yes; green/red DIAG LED
• Receive RxD	Yes; Green LED
• Transmit TxD	Yes; Green LED
Potential separation	
between backplane bus and interface	Yes

Article number	6ES7137-6AA00-0BA0 ET 200SP, CM PTP
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-30 °C; From FS03
• horizontal installation, max.	60 °C
• vertical installation, min.	-30 °C; From FS03
• vertical installation, max.	50 °C
Decentralized operation	
to SIMATIC S7-300	Yes
to SIMATIC S7-400	Yes
to SIMATIC S7-1200	Yes
to SIMATIC S7-1500	Yes
to standard PROFINET controller	Yes
Dimensions	
Width	15 mm
Height	73 mm
Depth	58 mm
Weights	
Weight, approx.	30 g

Ordering data

	Article No.
CM PtP communication module For serial communication connections with RS 232, RS 422, RS 485 interfaces, BU type A0, color code CC00	**6ES7137-6AA00-0BA0**
Accessories	
BU15-P16+A10+2D BU type A0; BaseUnit (light) with 16 push-in terminals (1 ... 16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)	
• 1 unit	**6ES7193-6BP20-0DA0**
• 10 units	**6ES7193-6BP20-2DA0**
BU15-P16+A0+2D BU type A0; BaseUnit (light) with 16 push-in terminals to the module; for starting a new load group (max. 10 A)	
• 1 unit	**6ES7193-6BP00-0DA0**
• 10 units	**6ES7193-6BP00-2DA0**
2BU15-P16+A0+2DB Double BaseUnit for holding 2 I/O modules; BU type A0; BaseUnit (light/dark) with 16 push-in terminals to the module; for starting a new load group (max. 10 A)	
• 1 unit	**6ES7193-6BP60-0DA0**
BU15-P16+A10+2B BU type A0; BaseUnit (dark) with 16 push-in terminals (1 ... 16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for continuing the load group	
• 1 unit	**6ES7193-6BP20-0BA0**
• 10 units	**6ES7193-6BP20-2BA0**
BU15-P16+A0+2B BU type A0; BaseUnit (dark) with 16 push-in terminals to the module; for continuing the load group	
• 1 unit	**6ES7193-6BP00-0BA0**
• 10 units	**6ES7193-6BP00-2BA0**
2BU15-P16+A0+2B Double BaseUnit for holding 2 I/O modules; BU type A0; BaseUnit (dark/dark) with 16 push-in terminals to the module; for continuing the load group	
• 1 unit	**6ES7193-6BP60-0BA0**
Equipment labeling plate 10 sheets of 16 labels	**6ES7193-6LF30-0AW0**
Labeling strips 500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer	**6ES7193-6LR10-0AA0**
Shield connection 5 shield supports and 5 shield terminals, for direct connection	**6ES7193-6SC00-1AM0**

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Overview



- CM 4x IO-Link communication module
  Serial communication module for connecting up to 4 IO-Link devices in accordance with IO-Link specification V1.0 and V1.1. The IO-Link parameters are configured using the Port Configuration Tool (PCT), version V3.0 and higher
- Time-based IO
  Time-based IO ensures that signals are output with a precisely defined response time. By combining inputs and outputs, for example, passing products can be accurately measured or fluids dosed in precise quantities
- Supported data transfer rates
  - COM1 (4.8 kbps)
  - COM2 (38.4 kbps)
  - COM3 (230.4 kbps)
- Expansion limits
  - Length of cable: Max. 20 m
  - Max. 32 bytes of input and output data per port
  - Max. 144 bytes of input data and 128 bytes of output data per module
- Supported ET 200SP system functions
  - Replacement without PG with automatic backup without the engineering tool of the IO-Link device parameters (V1.1 devices only) and the IO-Link master parameters by means of redundant saving of parameters on the e-coding element
  - Re-parameterization during operation
  - Identification data I&M
  - Firmware update
  - PROFIenergy
- Can be plugged into Type A0 BaseUnits (BU) with automatic e-coding
- LEDs
  - DIAG: Operating state indicator (green/red) of the module
  - C1..C4: Port status indicator (green) for Port 1, 2, 3 and 4
  - Q1..Q4: Channel status indicator (green) for Port 1, 2, 3 and 4
  - F1..F4: Port fault indicator (red) for Port 1, 2, 3 and 4
  - PWR: Supply voltage indicator (green)
- Clear labeling on front of module
  - Plain text identification of the module type and function class
  - 2D matrix code (order and serial number)
  - Connection diagram
  - Color-coding of the CM module class: silver
  - Hardware and firmware version
  - Complete Article No.
- Optional accessories
  - Labeling strips
  - Equipment labeling plate
  - Color-coding plate with color code CC04
- Optional system-integrated shield connection

Overview of CM 4 x IO-Link

Communication module	Article No.	CC Code	BU type	PU
CM 4 x IO-Link	6ES7137-6BD00-0BA0	CC04	A0	1

Overview of BaseUnits

BaseUnit	Article No.	CC Codes for push-in terminals	CC Codes for AUX terminals	PU
BU type A0 • New load group (light) • 16 push-in terminals • With 10 AUX terminals	6ES7193-6BP20-0DA0	CC01 to CC05	CC71 to CC73	1
BU type A0 • New load group (light) • 16 push-in terminals • With 10 AUX terminals	6ES7193-6BP20-2DA0	CC01 to CC05	CC71 to CC73	10
BU type A0 • New load group (light) • 16 push-in terminals • Without AUX terminals	6ES7193-6BP00-0DA0	CC01 to CC05	--	1
BU type A0 • New load group (light) • 16 push-in terminals • Without AUX terminals	6ES7193-6BP00-2DA0	CC01 to CC05	--	10
BU type A0 • Forwarding of load group (dark) • 16 push-in terminals • With 10 AUX terminals	6ES7193-6BP20-0BA0	CC01 to CC05	CC71 to CC73	1

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Overview (continued)

BaseUnit	Article No.	CC Codes for push-in terminals	CC Codes for AUX terminals	PU
BU type A0 • Forwarding of load group (dark) • 16 push-in terminals • With 10 AUX terminals	6ES7193-6BP20-2BA0	CC01 to CC05	CC71 to CC73	10
BU type A0 • Forwarding of load group (dark) • 16 push-in terminals • Without AUX terminals	6ES7193-6BP00-0BA0	CC01 to CC05	--	1
BU type A0 • Forwarding of load group (dark) • 16 push-in terminals • Without AUX terminals	6ES7193-6BP00-2BA0	CC01 to CC05	--	10

Technical specifications

Article number	**6ES7137-6BD00-0BA0** ET 200SP, CM 4 X IO-Link ST
General information	
Product type designation	CM 4 x IO-Link ST, PU 1
Product function	
• I&M data	Yes; I&M0 to I&M3
Engineering with	
• STEP 7 TIA Portal configurable/ integrated as of version	STEP 7 V15 or higher
• STEP 7 configurable/integrated as of version	STEP 7 V5.5 or higher
• PROFIBUS as of GSD version/ GSD revision	One GSD file each, Revision 3 and 5 and higher
• PROFINET as of GSD version/ GSD revision	GSDML V2.3
Supply voltage	
Rated value (DC)	24 V
Reverse polarity protection	Yes
Encoder supply	
Number of outputs	4
Output current	
• Rated value	200 mA; Per channel
24 V encoder supply	
• Short-circuit protection	Yes
IO-Link	
Number of ports	4
• of which simultaneously controllable	4
IO-Link protocol 1.0	Yes
IO-Link protocol 1.1	Yes
Transmission rate	4.8 kBaud (COM1); 38.4 kBaud (COM2), 230.4 kBaud (COM3)
Cycle time, min.	2 ms; dynamic, depending on user data length
Size of process data, input per port	32 byte; max.
Size of process data, input per module	144 byte; max.
Size of process data, output per port	32 byte; max.
Size of process data, output per module	128 byte; max.
Memory size for device parameter	2 kbyte; for each port
Master backup	Yes
Configuration without S7-PCT	Yes
Cable length unshielded, max.	20 m

Article number	**6ES7137-6BD00-0BA0** ET 200SP, CM 4 X IO-Link ST
Operating modes	
• IO-Link	Yes
• DI	Yes
• DQ	Yes; max. 100 mA per channel
Time Based IO	
- TIO IO-Link IN	No; Only for PROFINET and configuration as version with FW V2.0 or V2.1
- TIO IO-Link OUT	No; Only for PROFINET and configuration as version with FW V2.0 or V2.1
- TIO IO-Link IN/OUT	No; Only for PROFINET and configuration as version with FW V2.0 or V2.1
Connection of IO-Link devices	
• Port type A	Yes
• Port type B	Yes; 24 V DC via external terminal
• via three-wire connection	Yes
Interrupts/diagnostics/ status information	
Alarms	
• Diagnostic alarm	Yes; The port diagnosis is available in the IO-Link mode only.
Diagnostic messages	
• Monitoring the supply voltage	Yes
• Wire-break	Yes
• Short-circuit	Yes
• Group error	Yes
Diagnostics indication LED	
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
• Channel status display	Yes; one green LED for channel status Qn (SIO mode) and port status Cn (IO-Link mode) per channel
• for channel diagnostics	Yes; red Fn LED
• for module diagnostics	Yes; green/red DIAG LED

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Technical specifications (continued)

Article number	**6ES7137-6BD00-0BA0**
	ET 200SP, CM 4 X IO-Link ST
Potential separation	
Potential separation channels	
• between the channels	No
• between the channels and backplane bus	Yes
• between the channels and the power supply of the electronics	No

Article number	**6ES7137-6BD00-0BA0**
	ET 200SP, CM 4 X IO-Link ST
Dimensions	
Width	15 mm
Height	73 mm
Depth	58 mm
Weights	
Weight, approx.	30 g

Ordering data

	Article No.
CM 4x IO-Link Master V1.1 Standard communication module Serial communication module for connecting up to 4 IO-Link devices, time-based IO, BU type A0, color code CC04	**6ES7137-6BD00-0BA0**
Accessories	
Usable type A0 BaseUnits	
BU15-P16+A10+2D BU type A0; BaseUnit (light) with 16 push-in terminals (1 ... 16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)	
• 1 unit	**6ES7193-6BP20-0DA0**
• 10 units	**6ES7193-6BP20-2DA0**
BU15-P16+A0+2D BU type A0; BaseUnit (light) with 16 push-in terminals to the module; for starting a new load group (max. 10 A)	
• 1 unit	**6ES7193-6BP00-0DA0**
• 10 units	**6ES7193-6BP00-2DA0**
2BU15-P16+A0+2DB Double BaseUnit for holding 2 I/O modules; BU type A0; BaseUnit (light/dark) with 16 push-in terminals to the module; for starting a new load group (max. 10 A)	
• 1 unit	**6ES7193-6BP60-0DA0**
BU15-P16+A10+2B BU type A0; BaseUnit (dark) with 16 push-in terminals (1 ... 16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for continuing the load group	
• 1 unit	**6ES7193-6BP20-0BA0**
• 10 units	**6ES7193-6BP20-2BA0**
BU15-P16+A0+2B BU type A0; BaseUnit (dark) with 16 push-in terminals to the module; for continuing the load group	
• 1 unit	**6ES7193-6BP00-0BA0**
• 10 units	**6ES7193-6BP00-2BA0**

	Article No.
2BU15-P16+A0+2B Double BaseUnit for holding 2 I/O modules; BU type A0; BaseUnit (dark/dark) with 16 push-in terminals to the module; for continuing the load group	
• 1 unit	**6ES7193-6BP60-0BA0**
Equipment labeling plate 10 sheets of 16 labels, for printing with thermal transfer card printer or plotter	**6ES7193-6LF30-0AW0**
Labeling strips	
500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer	**6ES7193-6LR10-0AA0**
500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer	**6ES7193-6LR10-0AG0**
1000 labeling strips DIN A4, light gray, card, perforated, for inscription with laser printer	**6ES7193-6LA10-0AA0**
1000 labeling strips DIN A4, yellow, card, perforated, for inscription with laser printer	**6ES7193-6LA10-0AG0**
Color-coded labels	
Color code CC04, for 16 push-in terminals, BU type A0, A1, gray (terminals 1 to 8), red (terminals 9 to 12), blue (terminals 13 to 16); 10 units	**6ES7193-6CP04-2MA0**
Color code CC71, for 10 AUX terminals, BU type A0, yellow/green (terminals 1 A to 10 A); 10 units	**6ES7193-6CP71-2AA0**
Color code CC72, for 10 AUX terminals, BU type A0, red (terminals 1 A to 10 A); 10 units	**6ES7193-6CP72-2AA0**
Color code CC73, for 10 AUX terminals, BU type A0, blue (terminals 1 A to 10 A); 10 units	**6ES7193-6CP73-2AA0**
Spare parts	
Electronic coding element type H Pack of 5 units; included in scope of supply of CM 4x IO-Link module	**6ES7193-6EH00-1AA0**

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Overview



CM AS-i Master ST for SIMATIC ET 200SP

The CM AS-i Master ST communication module is designed for use in the SIMATIC ET 200SP distributed I/O system and has the following features:

- As many as 62 AS-Interface slaves can be connected
- Supports all AS-Interface master functions according to the AS-Interface Specification V3.0
- User-friendly configuration with graphic display of the AS-i line in TIA Portal V12 and higher, or via GSD in other systems
- Supply via AS-Interface cable
- Suitable for AS-Interface with 30-V voltage and AS-i Power24V
- Integrated ground-fault monitoring for the AS-Interface cable
- Through connection to AS-Interface, the number of digital inputs and outputs available for the control system is greatly increased (max. 496 DI/496 DQ on the AS-Interface per CM AS-i Master ST)
- Integrated analog value processing

ET 200SP Distributed I/O System

SIMATIC ET 200SP is a scalable and highly flexible distributed I/O system for connecting the process signals to a central control system via PROFIBUS or PROFINET.

Up to eight CM AS-i Master STs can be plugged into a SIMATIC ET 200SP with the IM 155-6 PN standard interface module.

More information,
see SIMATIC ET 200 SP Manual Collection.

Design

The CM AS-i Master ST module has an ET 200SP module enclosure with a width of 20 mm. A C0 type BaseUnit (BU) is required for use in the ET 200SP.

The communication module has LED indicators for diagnostics, operation, AS-i voltage and AS-i slave status and offers informative front-side module inscription for:

- Plain-text marking of the module type and function class
- 2D matrix code (Article No. and serial number)
- Connection diagram
- Color coding of the CM module type: light gray
- Hardware and firmware version
- Complete Article No.

Function

The CM AS-i Master ST supports all specified functions of the AS-Interface Specification V3.0.

The input/output values of the digital AS-i slaves can be activated via the cyclic process image. The values of the analog AS-i slaves can be attained via the cyclic process image (firmware V1.1 or higher) or via data record transfer.

If required, master calls can be performed with the command interface, e.g. read/write parameters, read/write configuration.

Changeover of the operating mode, automatic application of the slave configuration and the re-addressing of a connected AS-i slave can be implemented via the control panel of the CM AS-i Master ST in STEP 7.

Expansions from firmware version V1.1

In order to implement modular machine concepts, the AS-i slaves can be activated or deactivated via the PLC program (option handling). The configuration of AS-i slaves can be modified while being executed, thus enabling variable machine setups and tool changing with integrated input/output modules during ongoing operation. Without deactivating the controller, AS-i input/output modules can be added in the system.

An existing AS-i installation can be read into the STEP 7 hardware configuration and then adapted and documented in the project. Analog values are transmitted via the cyclic process image, the length of which is adjustable and extendable up to 288 bytes (depending on the interface module (IM) used).

Diagnostic information is accessed via automatic alarm indications, via the process image or data record reading in the user program or in the STEP 7 engineering system in a graphical overview matrix. The AS-i network's transmission quality can also be read out. To avoid configuration errors, duplicate addresses in the AS-i network can be detected.

The new functions are available with TIA Portal STEP 7 V13 SP1 or with STEP 7 V5.5 with HSP 2092 V3.0[1]. Configuration is possible with SIMATIC CPUs S7-300 up to S7-1500 and with a SINUMERIK 840D sl or other controller.

In the network view, the AS-i slaves' online diagnostics status can be displayed directly on the slaves (for S7-1500 CPUs with firmware version V2.0 or higher, with TIA Portal STEP 7 V14 or higher).

[1] HSP 2092, see https://support.industry.siemens.com/cs/ww/en/view/23183356.

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Overview (continued)

Notes on security

In order to protect plants, systems, machines and networks against cyber threats, it is necessary to implement – and continuously maintain – a holistic, state-of-the-art industrial security concept. Siemens products and solutions only represent one component of such a concept.

For more information on Industrial Security, see http:/www.siemens.com/industrialsecurity.

Configuration

The following software is required for configuration of the CM AS-i Master ST module:

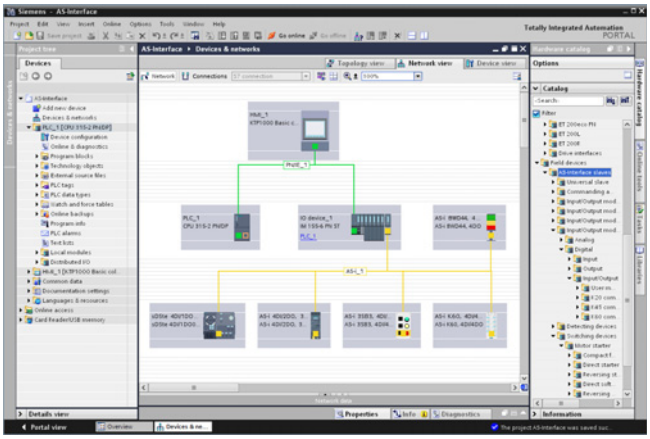
- STEP 7 (TIA Portal) V12 or higher or V13 SP1 or higher (for firmware V1.1) or
- STEP 7 (classic) V5.5 SP3 HF4 or higher with HSP 2092 or HSP 2092 V3.0 (for firmware V1.1) or
- the GSD file of the ET 200SP with STEP 7 or another engineering tool

STEP 7 enables user-friendly configuration and diagnostics of the AS-i master and any connected slaves.

Alternatively, you can also apply the AS-Interface ACTUAL configuration as the DESIRED configuration at the "touch of a button" via the control panel integrated in the TIA Portal or an optional expansion button. Configuration with the GSD file is possible only with the button.

The CM AS-i Master ST module occupies up to 288 input bytes and up to 288 output bytes in the I/O data of the ET 200SP station. The I/O assignment depends on the configuration in STEP 7.

Together with an ET 200SP CPU 1510SP / 1512SP (firmware V1.8 or higher) or 1515SP PC, preprocessing of safe AS-i signals directly in the ET 200SP station and setting up of an independent AS-i station without a higher-level CPU are possible (TIA Portal V13 SP1 Update 4 and higher).



Configuration of an AS-Interface network with CM AS-i Master ST via TIA Portal

Benefits

The CM AS-i Master ST communication module for ET 200SP enables modular, simple and high-performance expansion of AS-interface networks via engineering in the TIA Portal.

Up to eight CM AS-i Master ST units can be plugged into one ET 200SP station with IM 155-6 PN Standard. The maximum configuration depends on the interface module used.

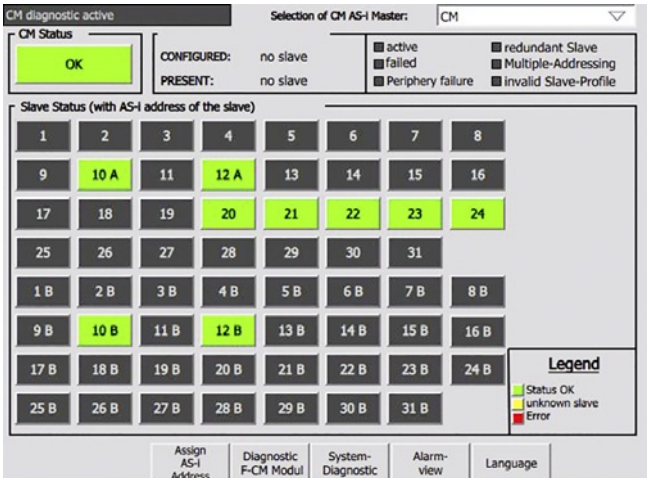
Multiple masters as well as single masters can thus be implemented in the ET 200SP depending on the number of modules.

Together with the interface module, a scalable PROFINET/ AS-i Link or PROFIBUS/AS-i Link can be assembled.

Using STEP 7, the AS-i network is consistently configured and programmed with only one configuration tool.

The PRONETA PC program (for ET 200SP with PROFINET interface module) is available for convenient input/output testing during the commissioning of an AS-i network without a CPU, see http://www.siemens.com/proneta.

For diagnostics during ongoing operation, diagnostics blocks with clearly arranged visualization on the SIMATIC HMI panel are available or can be downloaded free of charge via a web browser, see https://support.industry.siemens.com/cs/ww/en/view/109479103.



Diagnostics data call for CM AS-i Master

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Ordering data

	Article No.
CM AS-i Master ST communication module • AS-Interface master for SIMATIC ET 200SP, can be plugged onto BaseUnit type C0 • Corresponds to AS-Interface Specification V3.0 • Dimensions (W x H x D / mm): 20 x 73 x 58	**3RK7137-6SA00-0BC1**
Accessories	
BaseUnit BU20-P6+A2+4D • BaseUnit (light), BU type C0 • Suitable for the CM AS-i Master ST module • For connection of AS-Interface cable to the CM AS-i Master ST • Beginning of an AS-i network, disconnection of AS-i voltage to the left-hand module • For spring-type terminals	**6ES7193-6BP20-0DC0**
PROFINET IM 155-6 PN Basic interface module Max. 12 I/O modules, max. 32 bytes I/O data per station • Including server module and BusAdapter 2 x RJ45 ports (supplied without RJ45 plug)	**6ES7155-6AR00-0AN0**
PROFINET IM 155-6 PN Standard interface modules Max. 32 I/O modules, max. 256 bytes I/O data per station	
• Including server module and bus adapter 2 x RJ45 (supplied without RJ45 plug)	**6ES7155-6AA01-0BN0**
• Including server module (bus adapter must be ordered separately, see right)	**6ES7155-6AU01-0BN0**
PROFINET IM 155-6 PN High Feature interface modules Max. 64 I/O modules, max. 1 440 bytes I/O data per station	
• **IM 155-6 PN/2 High Feature** IM with a bus adapter slot including server module and optional strain relief (bus adapter must be ordered separately, see right)	**6ES7155-6AU01-0CN0**
• **IM 155-6 PN/3 High Feature** 3-port IM with two bus adapter slots including server module and optional strain relief (bus adapter must be ordered separately, see right)	**6ES7155-6AU30-0CN0**
PROFINET IM 155-6 PN High Speed interface module Max. 30 I/O modules, max. 1 440 bytes I/O data per station • Including server module (bus adapter must be ordered separately, see below)	**6ES7155-6AU00-0DN0**
PROFIBUS IM 155-6 DP High Feature interface module Max. 32 I/O modules, max. 244 bytes I/O data per station • Including server module and PROFIBUS connector	**6ES7155-6BA00-0CN0**
BusAdapters for PROFINET For connection of the Ethernet cable to the PROFINET IM 155-6 PN interface module	
• 2 x RJ45 connection (supplied without RJ45 plug)	**6ES7193-6AR00-0AA0**
• 2 x FC connection (FastConnect)	**6ES7193-6AF00-0AA0**
For more bus adapters with fiber-optic cable connection, see Catalog IK PI or the Industry Mall.	
AS-interface addressing unit V3.0 • For AS-Interface modules and sensors and actuators with integrated AS-Interface according to AS-i Specification V3.0 • For setting the AS-i address of standard slaves, and slaves with extended addressing mode (A/B slaves) • With input/output test function and many other commissioning functions • Battery operation with four batteries type AA (IEC LR6, NEDA 15) • Degree of protection IP40 • Dimensions (W x H x D) mm: 84 x 195 x 35 • Scope of supply: - Addressing unit with 4 batteries - Addressing cable, with M12 plug to addressing plug (hollow plug), length 1.5 m	**3RK1904-2AB02**

More information

SIMATIC ET200SP Manual Collection, see https://support.industry.siemens.com/cs/ww/en/view/84133942

Diagnostic blocks with visualization, see https://support.industry.siemens.com/cs/ww/en/view/109479103

AS-Interface block library for SIMATIC PCS 7 for simple connection of AS-Interface to PCS 7, see https://support.industry.siemens.com/cs/ww/en/view/109759605

Released combinations of the AS-i modules for ET 200SP, see https://support.industry.siemens.com/cs/ww/en/view/103624653

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Overview



- PROFIBUS DP master/slave with electrical interface for connecting the ET 200SP CPUs to PROFIBUS at up to 12 Mbps
- Expands the ET 200SP CPUs 1510SP-1 PN / 1512SP-1 PN by one PROFIBUS connection
- For communication with lower-level PROFIBUS devices at bandwidths of 9.6 Kbps to 12 Mbps
- Communication services:
  - PROFIBUS DP
  - PG/OP communication
  - S7 communication:
    This makes it possible to establish communication between the ET 200SP CPU and other devices, for example those from the SIMATIC S7-300/400/1500 range.
- Time synchronization
- Simple programming and configuration over PROFIBUS
- Cross-network PG communication using S7 routing
- Data set routing

Technical specifications

Article number	**6ES7545-5DA00-0AB0**
	ET 200SP, CM DP for ET 200SP CPU
General information	
Product type designation	CM PROFIBUS DP
Engineering with	
• STEP 7 TIA Portal configurable/ integrated as of version	V13 Update 3
Supply voltage	
Rated value (DC)	24 V
Reverse polarity protection	Yes
1. Interface	
Interface types	
• RS 485	Yes
Protocols	
• PROFIBUS DP master	Yes
• PROFIBUS DP slave	Yes
• SIMATIC communication	Yes
RS 485	
• Transmission rate, max.	12 Mbit/s
• Cable length, max.	100 m
Protocols	
PROFIBUS DP master	
Services	
- PG/OP communication	Yes
- S7 routing	Yes
- Data record routing	Yes
- Isochronous mode	No
- Equidistance	No
- Number of DP slaves	125
- Activation/deactivation of DP slaves	Yes
PROFIBUS DP slave	
• Transmission rate, max.	12 Mbit/s
• automatic baud rate search	Yes
• Address area, max.	120
• User data per address area, max.	128 byte

Article number	**6ES7545-5DA00-0AB0**
	ET 200SP, CM DP for ET 200SP CPU
Services	
- PG/OP communication	Yes; Only with active interface
- Routing	Yes; Only with active interface
- S7 communication	Yes; Only with active interface
- Direct data exchange (slave-to-slave communication)	Yes; No subscriber possible - only passive publisher
- DPV1	Yes
Transfer memory	
- Inputs	244 byte
- Outputs	244 byte
Interrupts/diagnostics/ status information	
Diagnostics function	Yes
Diagnostics indication LED	
• for module diagnostics	Yes; green/red DIAG LED
Potential separation	
between backplane bus and interface	Yes
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-25 °C; No condensation
• horizontal installation, max.	60 °C
• vertical installation, min.	-25 °C; No condensation
• vertical installation, max.	50 °C
Dimensions	
Width	35 mm
Height	117 mm
Depth	75 mm
Weights	
Weight, approx.	80 g

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Ordering data	Article No.
CM DP for ET 200SP CPU PROFIBUS DP master/slave with electrical interface for connecting the ET 200SP CPUs to PROFIBUS at up to 12 Mbps	**6ES7545-5DA00-0AB0**
Accessories	
Equipment labeling plate 10 sheets of 16 labels	**6ES7193-6LF30-0AW0**
Labeling strips	
500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer	**6ES7193-6LR10-0AA0**
500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer	**6ES7193-6LR10-0AG0**
1000 labeling strips DIN A4, light gray, card, for inscription with laser printer	**6ES7193-6LA10-0AA0**
1000 labeling strips DIN A4, yellow, card, for inscription with laser printer	**6ES7193-6LA10-0AG0**

	Article No.
PROFIBUS DP RS 485 bus connector	
With 90° cable outlet, max. transfer rate 12 Mbps	
• without PG interface	**6ES7972-0BA12-0XA0**
• with PG interface	**6ES7972-0BB12-0XA0**
With 90° cable outlet for FastConnect connection system, max. transfer rate 12 Mbps	
• without PG interface, 1 unit	**6ES7972-0BA52-0XA0**
• without PG interface, 100 units	**6ES7972-0BA52-0XB0**
• with PG interface, 1 unit	**6ES7972-0BB52-0XA0**
• with PG interface, 100 units	**6ES7972-0BB52-0XB0**
FastConnect bus cable Standard type with special design for quick mounting, 2-wire, shielded, sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	**6XV1830-0EH10**

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Overview



ISO	TCP/ UDP	PN	MRP	IT	IP-R	PG/OP	S7
	●			●		●	●

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The CP 1543SP-1 communications processor connects the ET 200SP Distributed Controller with Industrial Ethernet networks. By combining a variety of security features such as an SPI (Stateful Packet Inspection) firewall, VPN and data encryption protocols (e.g. SNMPv3), the communications processor protects individual ET 200SP distributed controllers or even entire automation cells against unauthorized access.

The module can also be used for integrating the ET 200SP Distributed Controller into an IPv6-based network. All functions can be configured with STEP 7 Professional, V14 (TIA Portal) and higher.

The CP 1543SP-1 supports the following communication services:

- PG/OP communication
- S7 communication
- Open communication (Open User Communication)
- IT communication
  - Sending emails via SMTP or ESMTP with "SMTP-Auth" for authentication on an email server (also with IPv6)
- Support of SINEMA Remote Connect with autoconfiguration
- Security Integrated
  - Stateful Packet Inspection Firewall
  - Secure communication via VPN (IPsec)
- Protocols for secure communication
  - Secure access to the web server of the CPU via the HTTPS protocol
  - Secure transfer of the time of day (NTP)
  - SNMPv3 for tap-proof transfer of network analysis information
- Integration of the ET 200SP Distributed Controller into IPv6-based networks

Technical specifications

Article number	**6GK7543-6WX00-0XE0**
Product type designation	CP 1543SP-1
Transmission rate	
Transfer rate	
• at the 1st interface	10 ... 100 Mbit/s
Interfaces	
Number of interfaces acc. to Industrial Ethernet	1
Number of electrical connections	
• at the 1st interface acc. to Industrial Ethernet	2
Type of electrical connection	
• at the 1st interface acc. to Industrial Ethernet	via ET 200SP bus adapter (RJ45, FC, SCRJ), integrated switch
Supply voltage, current consumption, power loss	
Type of voltage of the supply voltage	DC
Supply voltage	24 V
Supply voltage	19.2 ... 28.8 V
Power loss [W]	6 W
Permitted ambient conditions	
Ambient temperature	
• for vertical installation during operation	0 ... 50 °C
• for horizontally arranged busbars during operation	0 ... 60 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
Relative humidity at 25 °C without condensation during operation maximum	95 %
Protection class IP	IP20

Article number	**6GK7543-6WX00-0XE0**
Product type designation	CP 1543SP-1
Design, dimensions and weight	
Width	60 mm
Height	117 mm
Depth	74 mm
Net weight	0.18 kg
Mounting type	
• 35 mm DIN rail mounting	Yes
Product properties, functions, components general	
Number of units	
• per CPU maximum	2
• Note	2 CPs can be pluged in per CPU, simultaneous operation with BA Send and CM DP is possible
Performance data open communication	
Number of possible connections for open communication	
• by means of T blocks maximum	32
Amount of data	
• as user data per ISO on TCP connection for open communication by means of T blocks maximum	65 536 byte

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Technical specifications (continued)

Article number	6GK7543-6WX00-0XE0
Product type designation	CP 1543SP-1
Performance data S7 communication	
Number of possible connections for S7 communication	
• maximum	16
• with OP connections maximum	16
Performance data multi-protocol mode	
Number of active connections with multi-protocol mode	32
Performance data IT functions	
Number of possible connections	
• as e-mail client maximum	1
Product functions management, configuration	
Product function MIB support	Yes
Protocol is supported	
• SNMP v1	Yes
• SNMP v3	Yes
• DCP	Yes
• LLDP	Yes
Configuration software	
• required	STEP 7 Professional V14 (TIA Portal) or higher
Identification & maintenance function	
• I&M0 - device-specific information	Yes
• I&M1 – higher-level designation/ location designation	Yes
Product functions Diagnosis	
Product function Web-based diagnostics	Yes; yes, via ET 200SP CPU

Article number	6GK7543-6WX00-0XE0
Product type designation	CP 1543SP-1
Product functions Security	
Firewall version	stateful inspection
Product function with VPN connection	IPSec, SINEMA RC
Type of encryption algorithms with VPN connection	AES-256, AES-192, AES-128, 3DES-168, DES-56
Type of authentication procedure with VPN connection	Preshared key (PSK), X.509v3 certificates
Type of hashing algorithms with VPN connection	MD5, SHA-1
Number of possible connections with VPN connection	4
Product function	
• switch-off of non-required services	Yes
• Blocking of communication via physical ports	Yes
• log file for unauthorized access	Yes
Product functions Time	
Product function SICLOCK support	Yes
Product function pass on time synchronization	No
Protocol is supported	
• NTP	Yes
• NTP (secure)	Yes
time synchronization	
• from NTP-server	Yes

Ordering data

	Article No.
CP 1543SP-1 communications processor CP 1543SP-1 communications processor for connecting SIMATIC S7-ET 200SP to Industrial Ethernet, Security (firewall and VPN), open IE communication (TCP/IP, ISO-on-TCP, UDP) PG/OP, S7 routing, IP broadcast/multicast, SNMPV1/V3, DHCP, secure email, IPV4/IPV6, time synchronization via NTP, access to web server of CPU, bus adapter required	6GK7543-6WX00-0XE0
Accessories	
SIMATIC BusAdapter BA 2xRJ45 For PROFINET interface modules, standard function class or above; max. cable length 50 m	6ES7193-6AR00-0AA0
SIMATIC BusAdapter BA 2xFC For PROFINET interface modules, standard function class or above; for increased vibration and EMC loads; max. cable length 50 m	6ES7193-6AF00-0AA0
SIMATIC BusAdapter BA 2xSCRJ For PROFINET interface modules, High Feature function class or above; fiber-optic cable connection for POF or PCF; for increased vibration and EMC load capacity; max. cable length 50 m (POF) or 100 m (PCF)	6ES7193-6AP00-0AA0
SIMATIC BusAdapter BA SCRJ/RJ45 For PROFINET interface modules, High Feature function class or above; fiber-optic cable connection for POF or PCF; for increased vibration and EMC load capacity; max. cable length 50 m (POF) or 100 m (PCF)	6ES7193-6AP20-0AA0
SIMATIC BusAdapter BA SCRJ/FC For PROFINET interface modules, High Feature function class or above; with media converter FOC-cu; for increased vibration and EMC loads; max. cable length 50 m (POF, copper) or 100 m (PCF)	6ES7193-6AP40-0AA0

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Ordering data

	Article No.
IE FC RJ45 plug 180 2 x 2	
RJ45 plug-in connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface	
• 1 pack = 1 unit	**6GK1901-1BB10-2AA0**
• 1 pack = 10 units	**6GK1901-1BB10-2AB0**
• 1 pack = 50 units	**6GK1901-1BB10-2AE0**
IE FC RJ45 plug 4 x 2	
RJ45 plug connector for Industrial Ethernet (10/100/1 000 Mbps) with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; 180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface	
• 1 pack = 1 unit	**6GK1901-1BB11-2AA0**
• 1 pack = 10 units	**6GK1901-1BB11-2AB0**
• 1 pack = 50 units	**6GK1901-1BB11-2AE0**
IE FC TP standard cable GP 2 x 2 (Type A)	**6XV1840-2AH10**
4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/ IE FC RJ45 plug; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	
IE FC TP standard cable GP 4 x 2	
8-wire, shielded TP installation cable for connection to IE FC RJ45 modular outlet for universal applications; with UL approval; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	
• AWG22, for connection to IE FC RJ45 modular outlet	**6XV1870-2E**
• AWG24, for connection to IE FC RJ45 plug 4 x 2	**6XV1878-2A**

	Article No.
IE FC stripping tool	**6GK1901-1GA00**
Pre-adjusted stripping tool for fast stripping of Industrial Ethernet FC cables	
Labeling strips	
500 labeling strips on roll, light gray, for labeling with thermal transfer roll printer	**6ES7193-6LR10-0AA0**
500 labeling strips on roll, yellow, for labeling with thermal transfer roll printer	**6ES7193-6LR10-0AG0**
1000 labeling strips DIN A4, light gray, card, perforated, for labeling with laser printer	**6ES7193-6LA10-0AA0**
1000 labeling strips DIN A4, yellow, card, perforated, for labeling with laser printer	**6ES7193-6LA10-0AG0**
Equipment labeling plate	**6ES7193-6LF30-0AW0**
10 sheets of 16 labels, for printing with thermal transfer card printer or plotter	
Spare parts	
Server module	**6ES7193-6PA00-0AA0**
Terminates an ET 200SP station; included in the scope of supply of the interface modules	
PE connection element for standard rail 2000 mm	**6ES7590-5AA00-0AA0**
20 units	
Power supply connector	**6ES7193-4JB00-0AA0**
Spare part; for connecting the 24 V DC supply voltage; with push-in terminals	

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Overview



ISO	TCP/ UDP	PN	MRP	IT	IP-R	PG/OP	S7
	●			●		●	●

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The CP 1542SP-1 communications processor connects the ET 200SP Distributed Controller with Industrial Ethernet networks.

The module can also be used for integrating the ET 200SP Distributed Controller into an IPv6-based network. All functions are configured using STEP 7 Professional V14 (TIA Portal) or higher.

The CP 1542SP-1 supports the following communication services:

- PG/OP communication
- S7 communication
- Open communication (Open User Communication)
- IT communication
  - Sending emails via SMTP for authentication on an email server (also with IPv6)
  - SNMPv1 for transfer of network analysis information
- Integration of the ET 200SP Distributed Controller into IPv6-based networks

Technical specifications

Article number	**6GK7542-6UX00-0XE0**
Product type designation	CP 1542SP-1
Transmission rate	
Transfer rate	
• at the 1st interface	10 ... 100 Mbit/s
Interfaces	
Number of interfaces acc. to Industrial Ethernet	1
Number of electrical connections	
• at the 1st interface acc. to Industrial Ethernet	2
Type of electrical connection	
• at the 1st interface acc. to Industrial Ethernet	via ET 200SP bus adapter (RJ45, FC, SCRJ), integrated switch
Supply voltage, current consumption, power loss	
Type of voltage of the supply voltage	DC
Supply voltage	24 V
Supply voltage	19.2 ... 28.8 V
Power loss [W]	6 W
Permitted ambient conditions	
Ambient temperature	
• for vertical installation during operation	0 ... 50 °C
• for horizontally arranged busbars during operation	0 ... 60 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
Relative humidity at 25 °C without condensation during operation maximum	95 %
Protection class IP	IP20

Article number	**6GK7542-6UX00-0XE0**
Product type designation	CP 1542SP-1
Design, dimensions and weight	
Width	60 mm
Height	117 mm
Depth	74 mm
Net weight	0.18 kg
Mounting type	
• 35 mm DIN rail mounting	Yes
Product properties, functions, components general	
Number of units	
• per CPU maximum	2
• Note	2 CPs can be pluged in per CPU, simultaneous operation with BA Send and CM DP is possible
Performance data open communication	
Number of possible connections for open communication	
• by means of T blocks maximum	32
Amount of data	
• as user data per ISO on TCP connection for open communication by means of T blocks maximum	65 536 byte
Performance data S7 communication	
Number of possible connections for S7 communication	
• maximum	16
• with OP connections maximum	16
Performance data multi-protocol mode	
Number of active connections with multi-protocol mode	32

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Technical specifications (continued)

Article number	6GK7542-6UX00-0XE0
Product type designation	CP 1542SP-1
Product functions management, configuration	
Product function MIB support	Yes
Protocol is supported	
• SNMP v1	Yes
• SNMP v3	No
• DCP	Yes
• LLDP	Yes
Configuration software	
• required	STEP 7 Professional V14 (TIA Portal) or higher
Identification & maintenance function	
• I&M0 - device-specific information	Yes
• I&M1 – higher-level designation/ location designation	Yes

Article number	6GK7542-6UX00-0XE0
Product type designation	CP 1542SP-1
Product functions Diagnosis	
Product function Web-based diagnostics	Yes; yes, via ET 200SP CPU
Product functions Security	
Product function	
• Blocking of communication via physical ports	Yes
Product functions Time	
Product function SICLOCK support	Yes
Product function pass on time synchronization	No
Protocol is supported	
• NTP	Yes
• NTP (secure)	No
time synchronization	
• from NTP-server	Yes

Ordering data

	Article No.
CP 1542SP-1 communications processor For connection of SIMATIC S7 ET 200SP to Industrial Ethernet, open IE communication (TCP/ IP, ISO-ON-TCP, UDP), PG/OP, S7 routing, IP broadcast/multicast, SNMPV1, DHCP, email, IPv4/IPv6, time synchronization via NTP, access to web server of CPU, bus adapter required	**6GK7542-6UX00-0XE0**
Accessories	
SIMATIC BusAdapter BA 2xRJ45 For PROFINET interface modules, standard function class or above; max. cable length 50 m	**6ES7193-6AR00-0AA0**
SIMATIC BusAdapter BA 2xFC For PROFINET interface modules, standard function class or above; for increased vibration and EMC loads; max. cable length 50 m	**6ES7193-6AF00-0AA0**
SIMATIC BusAdapter BA 2xSCRJ For PROFINET interface modules, High Feature function class or above; fiber-optic cable connection for POF or PCF; for increased vibration and EMC load capacity; max. cable length 50 m (POF) or 100 m (PCF)	**6ES7193-6AP00-0AA0**
SIMATIC BusAdapter BA SCRJ/RJ45 For PROFINET interface modules, High Feature function class or above; fiber-optic cable connection for POF or PCF; for increased vibration and EMC load capacity; max. cable length 50 m (POF) or 100 m (PCF)	**6ES7193-6AP20-0AA0**

	Article No.
SIMATIC BusAdapter BA SCRJ/FC For PROFINET interface modules, High Feature function class or above; with media converter FOC-cu; for increased vibration and EMC loads; max. cable length 50 m (POF, copper) or 100 m (PCF)	**6ES7193-6AP40-0AA0**
IE FC RJ45 plug 180 2 x 2 RJ45 plug-in connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface	
• 1 pack = 1 unit	**6GK1901-1BB10-2AA0**
• 1 pack = 10 units	**6GK1901-1BB10-2AB0**
• 1 pack = 50 units	**6GK1901-1BB10-2AE0**
IE FC RJ45 plug 4 x 2 RJ45 plug connector for Industrial Ethernet (10/100/1 000 Mbps) with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; 180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface	
• 1 pack = 1 unit	**6GK1901-1BB11-2AA0**
• 1 pack = 10 units	**6GK1901-1BB11-2AB0**
• 1 pack = 50 units	**6GK1901-1BB11-2AE0**
IE FC TP standard cable GP 2 x 2 (Type A) 4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/ IE FC RJ45 plug; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	**6XV1840-2AH10**

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Ordering data	Article No.
IE FC TP standard cable GP 4 x 2	
8-wire, shielded TP installation cable for connection to IE FC RJ45 modular outlet for universal applications; with UL approval; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	
• AWG22, for connection to IE FC RJ45 modular outlet	**6XV1870-2E**
• AWG24, for connection to IE FC RJ45 plug 4 x 2	**6XV1878-2A**
IE FC stripping tool	**6GK1901-1GA00**
Pre-adjusted stripping tool for fast stripping of Industrial Ethernet FC cables	
Labeling strips	
500 labeling strips on roll, light gray, for labeling with thermal transfer roll printer	**6ES7193-6LR10-0AA0**
500 labeling strips on roll, yellow, for labeling with thermal transfer roll printer	**6ES7193-6LR10-0AG0**
1000 labeling strips DIN A4, light gray, card, perforated, for labeling with laser printer	**6ES7193-6LA10-0AA0**
1000 labeling strips DIN A4, yellow, card, perforated, for labeling with laser printer	**6ES7193-6LA10-0AG0**

	Article No.
Equipment labeling plate	**6ES7193-6LF30-0AW0**
10 sheets of 16 labels, for printing with thermal transfer card printer or plotter	
Spare parts	
Server module	**6ES7193-6PA00-0AA0**
Terminates an ET 200SP station; included in the scope of supply of the interface modules	
PE connection element for standard rail 2000 mm	**6ES7590-5AA00-0AA0**
20 units	
Power supply connector	**6ES7193-4JB00-0AA0**
Spare part; for connecting the 24 V DC supply voltage; with push-in terminals	

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Overview



ISO	TCP/ UDP	PN	MRP	IT	IP-R	PG/OP	S7
	●			●		●	●

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The CP 1542SP-1 IRC communications processor connects the ET 200SP Distributed Controller with Industrial Ethernet networks. In addition, control centers can be connected using various telecontrol protocols.

The CP is characterized by the following:

- Ethernet-based connection to TeleControl Server Basic, e.g. via Internet
- Ethernet-based connection to the control center via SINAUT ST7, IEC 60870-5-104 or DNP3 protocol
- Data transfer of measured values, control variable values or alarms optimized for telecontrol systems
- Automatic sending of alert emails
- Data buffering of up to 100,000 values ensures a secure database, even with temporary connection failures
- Clearly laid out LED signaling for fast and easy diagnostics
- Fast commissioning thanks to easy configuration using STEP 7

The module can also be used for integrating the ET 200SP Distributed Controller into an IPv6-based network. All functions are configured using STEP 7 Professional V14 (TIA Portal) or higher.

The CP 1542SP-1 IRC supports the following communication services:

- Support of multiple telecontrol protocols such as SINAUT ST7, DNP3, IEC 60870-5-104 and TeleControl Basic
- PG/OP communication
- S7 communication
- Open communication (Open User Communication)
- IT communication
  - Sending emails via SMTP or SMTPS with "SMTP-Auth" for authentication on an email server (also with IPv6)
  - Email transfer with addressing by program block
  - Email transfer via "Notifications" (alerts)
- Support of SINEMA Remote Connect with autoconfiguration

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Technical specifications

Article number	**6GK7542-6VX00-0XE0**
Product type designation	CP 1542SP-1 IRC
Transmission rate	
Transfer rate	
• at the 1st interface	10 ... 100 Mbit/s
Interfaces	
Number of interfaces acc. to Industrial Ethernet	1
Number of electrical connections	
• at the 1st interface acc. to Industrial Ethernet	2
Type of electrical connection	
• at the 1st interface acc. to Industrial Ethernet	via ET 200SP bus adapter (RJ45, FC, SCRJ), integrated switch
Supply voltage, current consumption, power loss	
Type of voltage of the supply voltage	DC
Supply voltage	24 V
Supply voltage	19.2 ... 28.8 V
Power loss [W]	6 W
Permitted ambient conditions	
Ambient temperature	
• for vertical installation during operation	0 ... 50 °C
• for horizontally arranged busbars during operation	0 ... 60 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
Relative humidity at 25 °C without condensation during operation maximum	95 %
Protection class IP	IP20
Design, dimensions and weight	
Width	60 mm
Height	117 mm
Depth	74 mm
Net weight	0.18 kg
Mounting type	
• 35 mm DIN rail mounting	Yes
Product properties, functions, components general	
Number of units	
• per CPU maximum	2
• Note	2 CPs can be pluged in per CPU, simultaneous operation with BA Send and CM DP is possible
Performance data open communication	
Number of possible connections for open communication	
• by means of T blocks maximum	32
Amount of data	
• as user data per ISO on TCP connection for open communication by means of T blocks maximum	65 536 byte
Performance data S7 communication	
Number of possible connections for S7 communication	
• maximum	16
• with OP connections maximum	16

Article number	**6GK7542-6VX00-0XE0**
Product type designation	CP 1542SP-1 IRC
Performance data multi-protocol mode	
Number of active connections with multi-protocol mode	32
Performance data IT functions	
Number of possible connections	
• as e-mail client maximum	1
Performance data telecontrol	
Suitability for use	
• Node station	No
• substation	Yes
• TIM control center	No
Control center connection	IEC 60870-5, DNP3, (Modbus TCP by block solutions of the CPU) capable control stations, connection to Telecontrol Server Basic and ST7 capable control station
• by means of a permanent connection	supported
• by means of demand-oriented connection	supported
• Note	Connection to SCADA system by IEC 60870-5 104, DNP3, Telecontrol Server Basic and ST7 capable control center
Protocol is supported	
• DNP3	Yes
• IEC 60870-5	Yes
• SINAUT ST7 protocol	Yes
Product function data buffering if connection is aborted	Yes
Number of data points per station maximum	500
Number of stations for direct communication with Telecontrol Server Basic	
• in send direction maximum	3
• in receive direction maximum	15
Product functions management, configuration	
Product function MIB support	Yes
Protocol is supported	
• SNMP v1	Yes
• SNMP v3	No
• DCP	Yes
• LLDP	Yes
Configuration software	
• required	STEP 7 Professional V14 (TIA Portal) or higher
Identification & maintenance function	
• I&M0 - device-specific information	Yes
• I&M1 – higher-level designation/ location designation	Yes

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Technical specifications (continued)

Article number	6GK7542-6VX00-0XE0
Product type designation	CP 1542SP-1 IRC
Product functions Diagnosis	
Product function Web-based diagnostics	Yes; yes, via ET 200SP CPU
Product functions Security	
Product function with VPN connection	SINEMA RC
Product function	
• Blocking of communication via physical ports	Yes

Article number	6GK7542-6VX00-0XE0
Product type designation	CP 1542SP-1 IRC
Product functions Time	
Product function SICLOCK support	Yes
Product function pass on time synchronization	Yes
Protocol is supported	
• NTP	Yes
• NTP (secure)	No
time synchronization	
• from NTP-server	Yes
• from control center	Yes

Ordering data

	Article No.
CP 1542SP-1 IRC communications processor CP 1542SP-1 IRC communications processor for connection of SIMATIC S7 ET 200SP to Industrial Ethernet, TeleControl Server Basic, IEC 60870-5-104 or DNP3 protocol to a control center; open IE communication (TCP/IP, ISO-on-TCP, UDP), IP broadcast/multicast, SNMPV1, DHCP, secure email, IPV4/IPV6, time synchronization via NTP, access to web server of CPU, bus adapter required	**6GK7542-6VX00-0XE0**
Accessories	
SIMATIC BusAdapter BA 2xRJ45 For PROFINET interface modules, standard function class or above; max. cable length 50 m	**6ES7193-6AR00-0AA0**
SIMATIC BusAdapter BA 2xFC For PROFINET interface modules, standard function class or above; for increased vibration and EMC loads; max. cable length 50 m	**6ES7193-6AF00-0AA0**
SIMATIC BusAdapter BA 2xSCRJ For PROFINET interface modules, High Feature function class or above; fiber-optic cable connection for POF or PCF; for increased vibration and EMC load capacity; max. cable length 50 m (POF) or 100 m (PCF)	**6ES7193-6AP00-0AA0**

	Article No.
SIMATIC BusAdapter BA SCRJ/RJ45 For PROFINET interface modules, High Feature function class or above; fiber-optic cable connection for POF or PCF; for increased vibration and EMC load capacity; max. cable length 50 m (POF) or 100 m (PCF)	**6ES7193-6AP20-0AA0**
SIMATIC BusAdapter BA SCRJ/FC For PROFINET interface modules, High Feature function class or above; with media converter FOC-cu; for increased vibration and EMC loads; max. cable length 50 m (POF, copper) or 100 m (PCF)	**6ES7193-6AP40-0AA0**
IE FC RJ45 plug 180 2 x 2 RJ45 plug-in connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface	
• 1 pack = 1 unit	**6GK1901-1BB10-2AA0**
• 1 pack = 10 units	**6GK1901-1BB10-2AB0**
• 1 pack = 50 units	**6GK1901-1BB10-2AE0**

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Ordering data	Article No.
IE FC RJ45 plug 4 x 2	
RJ45 plug connector for Industrial Ethernet (10/100/1 000 Mbps) with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; 180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface	
• 1 pack = 1 unit	**6GK1901-1BB11-2AA0**
• 1 pack = 10 units	**6GK1901-1BB11-2AB0**
• 1 pack = 50 units	**6GK1901-1BB11-2AE0**
IE FC TP standard cable GP 2 x 2 (Type A)	**6XV1840-2AH10**
4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/ IE FC RJ45 plug; PROFINET-compatible; with UL approval; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	
IE FC TP standard cable GP 4 x 2	
8-wire, shielded TP installation cable for connection to IE FC RJ45 modular outlet for universal applications; with UL approval; sold by the meter; max. delivery unit 1 000 m, minimum order quantity 20 m	
• AWG22, for connection to IE FC RJ45 modular outlet	**6XV1870-2E**
• AWG24, for connection to IE FC RJ45 plug 4 x 2	**6XV1878-2A**
IE FC stripping tool	**6GK1901-1GA00**
Pre-adjusted stripping tool for fast stripping of Industrial Ethernet FC cables	

	Article No.
Labeling strips	
500 labeling strips on roll, light gray, for labeling with thermal transfer roll printer	**6ES7193-6LR10-0AA0**
500 labeling strips on roll, yellow, for labeling with thermal transfer roll printer	**6ES7193-6LR10-0AG0**
1000 labeling strips DIN A4, light gray, card, perforated, for labeling with laser printer	**6ES7193-6LA10-0AA0**
1000 labeling strips DIN A4, yellow, card, perforated, for labeling with laser printer	**6ES7193-6LA10-0AG0**
Equipment labeling plate	**6ES7193-6LF30-0AW0**
10 sheets of 16 labels, for printing with thermal transfer card printer or plotter	
Spare parts	
Server module	**6ES7193-6PA00-0AA0**
Terminates an ET 200SP station; included in the scope of supply of the interface modules	
PE connection element for standard rail 2000 mm	**6ES7590-5AA00-0AA0**
20 units	
Power supply connector	**6ES7193-4JB00-0AA0**
Spare part; for connecting the 24 V DC supply voltage; with push-in terminals	

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Overview



Space-saving access point, suitable for applications where the device is to be mounted in the control cabinet

Technical specifications

Article number	**6GK5761-1FC00-0AA0**
	6GK5761-1FC00-0AB0 [1]
Product type designation	SCALANCE W761-1 RJ45
Transmission rate	
Transfer rate	
• with WLAN maximum	150 Mbit/s
• for Industrial Ethernet	10, 100 Mbit/s
Transfer rate for Industrial Ethernet	
• minimum	10 Mbit/s
• maximum	100 Mbit/s
Interfaces	
Number of electrical connections	
• for network components or terminal equipment	1
• for power supply	1
• for redundant voltage supply	0
Type of electrical connection	
• for network components or terminal equipment	RJ45 socket
• for power supply	3-pole screw terminal
design of the removable storage	
• C-PLUG	No
• KEY-PLUG	No
Interfaces wireless	
Number of radio cards permanently installed	1
Number of electrical connections for external antenna(s)	1
Type of electrical connection for external antenna(s)	R-SMA (socket)
Product feature external antenna can be mounted directly on device	Yes

Article number	**6GK5761-1FC00-0AA0**
	6GK5761-1FC00-0AB0 [1]
Product type designation	SCALANCE W761-1 RJ45
Supply voltage, current consumption, power loss	
Type of voltage of the supply voltage	DC
Supply voltage 1	
• from terminal block	19.2 V
Supply voltage 2	
• from terminal block	28.8 V
Consumed current	
• at DC at 24 V typical	0.15 A
Power loss [W]	
• at DC at 24 V typical	3.6 W
Permitted ambient conditions	
Ambient temperature	
• during operation	0 ... 55 °C
• during storage	-40 ... +85 °C
• during transport	-40 ... +85 °C
Relative humidity at 25 °C without condensation during operation maximum	95 %
Ambient condition for operation	When used under hazardous conditions (Zone 2), the SCALANCE W761-1 RJ45 or W72x-1 RJ45 product must be installed in an enclosure. To comply with EN 50021, this enclosure must meet the requirements of at least IP 54 in compliance with EN 60529.
Protection class IP	IP20

[1] Wireless approval in the USA

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Technical specifications (continued)

Article number	6GK5761-1FC00-0AA0
	6GK5761-1FC00-0AB0 [1]
Product type designation	SCALANCE W761-1 RJ45
Design, dimensions and weight	
Width	50 mm
Height	114 mm
Depth	74 mm
Width of the enclosure without antenna	50 mm
Height of the enclosure without antenna	114 mm
Depth of the enclosure without antenna	74 mm
Net weight	0.13 kg
Mounting type	
• S7-300 rail mounting	No
• S7-1500 rail mounting	No
• 35 mm DIN rail mounting	Yes
• wall mounting	No
Wireless frequencies	
Operating frequency	
• for WLAN in 2.4 GHz frequency band	2.41 ... 2.48 GHz
• for WLAN in 5 GHz frequency band	4.9 ... 5.8 GHz
Product properties, functions, components general	
Product function Access Point Mode	Yes
Product function Client Mode	Yes
Number of SSIDs	1
Product function	
• iPCF Access Point	No
• iPCF client	No
• iPCF-MC Access Point	No
• iPCF-MC client	No
Product function iREF	No
Product function iPRP	No
Product functions management, configuration	
Number of manageable IP addresses in client	4
Product function	
• CLI	Yes
• web-based management	Yes
• MIB support	Yes
• TRAPs via email	Yes
• Configuration with STEP 7	Yes
• configuration with STEP 7 in the TIA Portal	Yes
• operation with IWLAN controller	No
• operation with Enterasys WLAN controller	No
• forced roaming on IP down with IWLAN	Yes
• forced roaming on link down with IWLAN	Yes
• WDS	Yes
Protocol is supported	
• Address Resolution Protocol (ARP)	Yes
• ICMP	Yes
• Telnet	Yes
• HTTP	Yes
• HTTPS	Yes
• TFTP	Yes
• DCP	Yes
• LLDP	Yes

Article number	6GK5761-1FC00-0AA0
	6GK5761-1FC00-0AB0 [1]
Product type designation	SCALANCE W761-1 RJ45
Identification & maintenance function	
• I&M0 - device-specific information	Yes
• I&M1 – higher-level designation/ location designation	Yes
Product functions Diagnosis	
Product function	
• PROFINET IO diagnosis	No
• Link Check	No
• connection monitoring IP-Alive	No
• localization via Aeroscout	No
• SysLog	Yes
Protocol is supported	
• SNMP v1	Yes
• SNMP v2	Yes
• SNMP v3	Yes
Product functions VLAN	
Product function	
• function VLAN with IWLAN	Yes
Product functions DHCP	
Product function	
• DHCP client	Yes
• in Client Mode DHCP server via LAN	Yes
• DHCP Option 82	Yes
Product functions Redundancy	
Protocol is supported	
• STP/RSTP	Yes
• MSTP	Yes
• RSTP	Yes
Product functions Security	
Product function	
• ACL - MAC-based	Yes
• Management security, ACL-IP based	Yes
• IEEE 802.1x (radius)	Yes
• NAT/NAPT	No
• access protection according to IEEE802.11i	Yes
• WPA/WPA2	Yes
• TKIP/AES	Yes
Protocol is supported	
• SSH	Yes
• RADIUS	Yes
Product functions Time	
Protocol is supported	
• NTP	Yes
• SNTP	Yes
• SIMATIC Time	Yes

[1] Wireless approval in the USA

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Technical specifications (continued)

Article number	6GK5761-1FC00-0AA0
	6GK5761-1FC00-0AB0 [1]
Product type designation	SCALANCE W761-1 RJ45
Standards, specifications, approvals	
Standard	
• for FM	FM 3611: Class I, Division 2, Groups A,B,C,D, T4 / Class 1, Zone 2, Group IIC, T4
• for hazardous zone	EN 60079-15:2005, EN 60079-0:2006, II 3 G Ex nA II T4 KEMA 07 ATEX 0145X
• for safety from CSA and UL	UL 60950-1 CSA C22.2 No. 60950-1
Certificate of suitability	
• EC declaration of conformity	Yes
• CE marking	Yes
• C-Tick	Yes
• E1 approval	No
• Railway application in accordance with EN 50155	No
• Railway application in accordance with EN 50121-4	No
• NEMA TS2	No
• IEC 61375	No
• IEC 61850-3	No
• NEMA4X	No
• Power-over-Ethernet according IEEE802.3at for type 1 and IEEE802.3af	No
• Power-over-Ethernet according to IEEE802.3at for type 2	No

Article number	6GK5761-1FC00-0AA0
	6GK5761-1FC00-0AB0 [1]
Product type designation	SCALANCE W761-1 RJ45
Standard for wireless communication	
• IEEE 802.11a	Yes
• IEEE 802.11b	Yes
• IEEE 802.11e	Yes
• IEEE 802.11g	Yes
• IEEE 802.11h	Yes
• IEEE 802.11i	Yes
• IEEE 802.11n	Yes
Wireless approval	You will find the current list of countries at: www.siemens.com/wireless-approvals
Marine classification association	
• American Bureau of Shipping Europe Ltd. (ABS)	No
• Bureau Veritas (BV)	No
• DNV GL	No
• Lloyds Register of Shipping (LRS)	No
• Nippon Kaiji Kyokai (NK)	No
• Polski Rejestr Statkow (PRS)	No
• Royal Institution of Naval Architects (RINA)	No
Accessories	
accessories	24 V DC screw terminal included in scope of delivery

[1] Wireless approval in the USA

Ordering data

	Article No.
Access Points SCALANCE W761	
IWLAN Access Point with built-in wireless interface; wireless networks IEEE 802.11a/b/g/h/n at 2.4/5 GHz up to 150 Mbps; WPA2/AES; IP20 degree of protection (0 °C to +55 °C); scope of supply: Mounting hardware, 3-pin screw terminal for 24 V DC; manual on CD-ROM; German/English	
SCALANCE W761-1 RJ45	
IWLAN Access Point with one built-in wireless interface	
• National approvals for operation outside the USA	**6GK5761-1FC00-0AA0**
• National approvals for operation within the USA [1]	**6GK5761-1FC00-0AB0**
Accessories	
IE FC RJ45 plug 180 2 x 2	
RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation-displacement contacts for connecting Industrial Ethernet FC installation cables; with a 180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface	
• 1 pack = 1 unit	**6GK1901-1BB10-2AA0**
• 1 pack = 10 units	**6GK1901-1BB10-2AB0**
• 1 pack = 50 units	**6GK1901-1BB10-2AE0**

	Article No.
IE FC TP standard cable GP 2 x 2	**6XV1840-2AH10**
4-wire, shielded TP installation cable for connection to IE FC outlet RJ45 plug / IE FC RJ45 plug; PROFINET-compliant; with UL approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	
IE FC stripping tool	**6GK1901-1GA00**
Pre-adjusted stripping tool for fast stripping of Industrial Ethernet FC cables	
Antennas and miscellaneous IWLAN accessories	See Industry Mall

[1] Please note national approvals under http://www.siemens.com/wireless-approvals

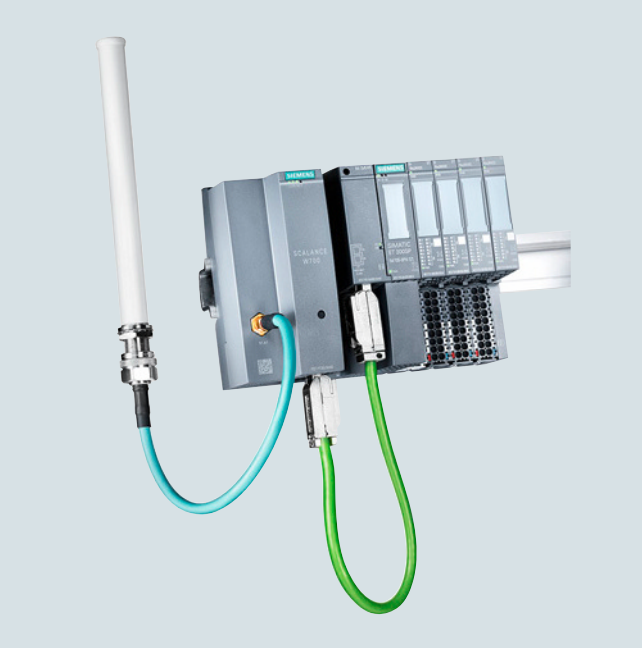
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Overview



- Space-saving client module, suitable for applications where the device is to be mounted in the control cabinet
- Equipped with iFeatures



ET 200SP station with SCALANCE W722 RJ45

Technical specifications

Article number	**6GK5722-1FC00-0AA0**
	6GK5722-1FC00-0AB0 [1]
	6GK5722-1FC00-0AC0 [2]
Product type designation	SCALANCE W722-1 RJ45
Transmission rate	
Transfer rate	
• with WLAN maximum	150 Mbit/s
• for Industrial Ethernet	10, 100 Mbit/s
Transfer rate for Industrial Ethernet	
• minimum	10 Mbit/s
• maximum	100 Mbit/s
Interfaces	
Number of electrical connections	
• for network components or terminal equipment	1
• for power supply	1
• for redundant voltage supply	0
Type of electrical connection	
• for network components or terminal equipment	RJ45 socket
• for power supply	3-pole screw terminal
design of the removable storage	
• C-PLUG	No
• KEY-PLUG	No

Article number	**6GK5722-1FC00-0AA0**
	6GK5722-1FC00-0AB0 [1]
	6GK5722-1FC00-0AC0 [2]
Product type designation	SCALANCE W722-1 RJ45
Interfaces wireless	
Number of radio cards permanently installed	1
Number of electrical connections for external antenna(s)	1
Type of electrical connection for external antenna(s)	R-SMA (socket)
Product feature external antenna can be mounted directly on device	Yes
Supply voltage, current consumption, power loss	
Type of voltage of the supply voltage	DC
Supply voltage 1	
• from terminal block	19.2 V
Supply voltage 2	
• from terminal block	28.8 V
Consumed current	
• at DC at 24 V typical	0.15 A
Power loss [W]	
• at DC at 24 V typical	3.6 W

[1] Wireless approval in the USA
[2] Wireless approval in Israel

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Technical specifications (continued)

Article number	**6GK5722-1FC00-0AA0**
	6GK5722-1FC00-0AB0 [1]
	6GK5722-1FC00-0AC0 [2]
Product type designation	SCALANCE W722-1 RJ45
Permitted ambient conditions	
Ambient temperature	
• during operation	0 ... 55 °C
• during storage	-40 ... +85 °C
• during transport	-40 ... +85 °C
Relative humidity at 25 °C without condensation during operation maximum	95 %
Ambient condition for operation	When used under hazardous conditions (Zone 2), the SCALANCE W761-1 RJ45 or W72x-1 RJ45 product must be installed in an enclosure. To comply with EN 50021, this enclosure must meet the requirements of at least IP 54 in compliance with EN 60529.
Protection class IP	IP20
Design, dimensions and weight	
Width	50 mm
Height	114 mm
Depth	74 mm
Width of the enclosure without antenna	50 mm
Height of the enclosure without antenna	114 mm
Depth of the enclosure without antenna	74 mm
Net weight	0.13 kg
Mounting type	
• S7-300 rail mounting	No
• S7-1500 rail mounting	No
• 35 mm DIN rail mounting	Yes
• wall mounting	No
Wireless frequencies	
Operating frequency	
• for WLAN in 2.4 GHz frequency band	2.41 ... 2.48 GHz
• for WLAN in 5 GHz frequency band	4.9 ... 5.8 GHz
Product properties, functions, components general	
Product function Access Point Mode	No
Product function Client Mode	Yes
Product function	
• iPCF client	Yes
• iPCF-MC client	Yes
Number of iPCF-capable radio modules	1
Product function iPRP	Yes

Article number	**6GK5722-1FC00-0AA0**
	6GK5722-1FC00-0AB0 [1]
	6GK5722-1FC00-0AC0 [2]
Product type designation	SCALANCE W722-1 RJ45
Product functions management, configuration	
Number of manageable IP addresses in client	4
Product function	
• CLI	Yes
• web-based management	Yes
• MIB support	Yes
• TRAPs via email	Yes
• Configuration with STEP 7	Yes
• configuration with STEP 7 in the TIA Portal	Yes
• WDS	No
Protocol is supported	
• Address Resolution Protocol (ARP)	Yes
• ICMP	Yes
• Telnet	Yes
• HTTP	Yes
• HTTPS	Yes
• TFTP	Yes
• DCP	Yes
• LLDP	No
Identification & maintenance function	
• I&M0 - device-specific information	Yes
• I&M1 – higher-level designation/ location designation	Yes
Product functions Diagnosis	
Product function	
• PROFINET IO diagnosis	Yes
• Link Check	No
• connection monitoring IP-Alive	No
• SysLog	Yes
Protocol is supported	
• SNMP v1	Yes
• SNMP v2	Yes
• SNMP v3	Yes
Product functions VLAN	
Product function	
• function VLAN with IWLAN	No

[1] Wireless approval in the USA
[2] Wireless approval in Israel

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Technical specifications (continued)

Article number	6GK5722-1FC00-0AA0	6GK5722-1FC00-0AB0 [1]	6GK5722-1FC00-0AC0 [2]
Product type designation	SCALANCE W722-1 RJ45	SCALANCE W722-1 RJ45	SCALANCE W722-1 RJ45
Product functions DHCP			
Product function			
• DHCP client	Yes	Yes	Yes
• in Client Mode DHCP server via LAN	Yes	Yes	Yes
• DHCP Option 82	Yes	Yes	Yes
Product functions Redundancy			
Protocol is supported			
• STP/RSTP	Yes	Yes	Yes
• MSTP	Yes	Yes	Yes
• RSTP	Yes	Yes	Yes
Product functions Security			
Product function			
• ACL - MAC-based	Yes	Yes	Yes
• Management security, ACL-IP based	Yes	Yes	Yes
• IEEE 802.1x (radius)	Yes	Yes	Yes
• NAT/NAPT	Yes	Yes	Yes
• access protection according to IEEE802.11i	Yes	Yes	Yes
• WPA/WPA2	Yes	Yes	Yes
• TKIP/AES	Yes	Yes	Yes
Protocol is supported			
• SSH	Yes	Yes	Yes
• RADIUS	Yes	Yes	Yes
Product functions Time			
Protocol is supported			
• NTP	Yes	Yes	Yes
• SNTP	Yes	Yes	Yes
• SIMATIC Time	Yes	Yes	Yes

Article number	6GK5722-1FC00-0AA0	6GK5722-1FC00-0AB0 [1]	6GK5722-1FC00-0AC0 [2]
Product type designation	SCALANCE W722-1 RJ45	SCALANCE W722-1 RJ45	SCALANCE W722-1 RJ45
Standards, specifications, approvals			
Standard			
• for FM	FM 3611: Class I, Division 2, Groups A,B,C,D, T4 / Class 1, Zone 2, Group IIC, T4		
• for hazardous zone	EN 60079-15:2005, EN 60079-0:2006, II 3 G Ex nA II T4 KEMA 07 ATEX 0145X		
• for safety from CSA and UL	UL 60950-1 CSA C22.2 No. 60950-1		
Certificate of suitability			
• EC declaration of conformity	Yes		
• CE marking	Yes		
• C-Tick	Yes		
• E1 approval	No		
• Railway application in accordance with EN 50155	No		
• NEMA TS2	No		
• IEC 61375	No		
• IEC 61850-3	No		
• NEMA4X	No		
• Power-over-Ethernet according IEEE802.3at for type 1 and IEEE802.3af	No		
• Power-over-Ethernet according to IEEE802.3at for type 2	No		
Standard for wireless communication			
• IEEE 802.11a	Yes		
• IEEE 802.11b	Yes		
• IEEE 802.11e	Yes		
• IEEE 802.11g	Yes		
• IEEE 802.11h	Yes		
• IEEE 802.11i	Yes		
• IEEE 802.11n	Yes		
Wireless approval	You will find the current list of countries at: www.siemens.com/wireless-approvals		
Marine classification association			
• American Bureau of Shipping Europe Ltd. (ABS)	No		
• Bureau Veritas (BV)	No		
• DNV GL	No		
• Lloyds Register of Shipping (LRS)	No		
• Nippon Kaiji Kyokai (NK)	No		
• Polski Rejestr Statkow (PRS)	No		
• Royal Institution of Naval Architects (RINA)	No		
Accessories			
accessories	24 V DC screw terminal included in scope of delivery		

[1] Wireless approval in the USA
[2] Wireless approval in Israel

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Ordering data

	Article No.
SCALANCE W722 client modules	
IWLAN Ethernet client modules with iFeatures support and built-in wireless interface; wireless networks IEEE 802.11a/b/g/h/n at 2.4/5 GHz up to 150 Mbps; WPA2/AES; IP20 degree of protection (0 °C to +55 °C); scope of supply: Mounting hardware, 3-pin screw terminal for 24 V DC; manual on CD-ROM; German/English	
SCALANCE W722-1 RJ45	
For administration of the wireless connection with iFeatures from a connected device with Industrial Ethernet connection	
• National approvals for operation outside the USA	**6GK5722-1FC00-0AA0**
• National approvals for operation within the USA[1]	**6GK5722-1FC00-0AB0**
• National approvals for operation in Israel[2]	**6GK5722-1FC00-0AC0**

	Article No.
Accessories	
IE FC RJ45 plug 180 2 x 2	
RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation-displacement contacts for connecting Industrial Ethernet FC installation cables; with a 180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface	
• 1 pack = 1 unit	**6GK1901-1BB10-2AA0**
• 1 pack = 10 units	**6GK1901-1BB10-2AB0**
• 1 pack = 50 units	**6GK1901-1BB10-2AE0**
IE FC TP standard cable GP 2 x 2	**6XV1840-2AH10**
4-wire, shielded TP installation cable for connection to IE FC outlet RJ45 plug / IE FC RJ45 plug; PROFINET-compliant; with UL approval; sold by the meter; max. delivery unit 1000 m, minimum order quantity 20 m	
IE FC stripping tool	**6GK1901-1GA00**
Pre-adjusted stripping tool for fast stripping of Industrial Ethernet FC cables	
Antennas and miscellaneous IWLAN accessories	See Industry Mall

[1] Please note national approvals under http://www.siemens.com/wireless-approvals

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Overview



Space-saving client module, suitable for applications where the device is to be mounted in the control cabinet

Technical specifications

Article number	**6GK5721-1FC00-0AA0**
	6GK5721-1FC00-0AB0 [1]
Product type designation	SCALANCE W721-1 RJ45
Transmission rate	
Transfer rate	
• with WLAN maximum	150 Mbit/s
• for Industrial Ethernet	10, 100 Mbit/s
Transfer rate for Industrial Ethernet	
• minimum	10 Mbit/s
• maximum	100 Mbit/s
Interfaces	
Number of electrical connections	
• for network components or terminal equipment	1
• for power supply	1
• for redundant voltage supply	0
Type of electrical connection	
• for network components or terminal equipment	RJ45 socket
• for power supply	3-pole screw terminal
design of the removable storage	
• C-PLUG	No
• KEY-PLUG	No
Interfaces wireless	
Number of radio cards permanently installed	1
Number of electrical connections for external antenna(s)	1
Type of electrical connection for external antenna(s)	R-SMA (socket)
Product feature external antenna can be mounted directly on device	Yes

Article number	**6GK5721-1FC00-0AA0**
	6GK5721-1FC00-0AB0 [1]
Product type designation	SCALANCE W721-1 RJ45
Supply voltage, current consumption, power loss	
Type of voltage of the supply voltage	DC
Supply voltage 1	
• from terminal block	19.2 V
Supply voltage 2	
• from terminal block	28.8 V
Consumed current	
• at DC at 24 V typical	0.15 A
Power loss [W]	
• at DC at 24 V typical	3.6 W
Permitted ambient conditions	
Ambient temperature	
• during operation	0 ... 55 °C
• during storage	-40 ... +85 °C
• during transport	-40 ... +85 °C
Relative humidity at 25 °C without condensation during operation maximum	95 %
Ambient condition for operation	When used under hazardous conditions (Zone 2), the SCALANCE W761-1 RJ45 or W72x-1 RJ45 product must be installed in an enclosure. To comply with EN 50021, this enclosure must meet the requirements of at least IP 54 in compliance with EN 60529.
Protection class IP	IP20

[1] Wireless approval in the USA

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Technical specifications (continued)

Article number	**6GK5721-1FC00-0AA0**
	6GK5721-1FC00-0AB0 [1]
Product type designation	SCALANCE W721-1 RJ45
Design, dimensions and weight	
Width	50 mm
Height	114 mm
Depth	74 mm
Width of the enclosure without antenna	50 mm
Height of the enclosure without antenna	114 mm
Depth of the enclosure without antenna	74 mm
Net weight	0.13 kg
Mounting type	
• S7-300 rail mounting	No
• S7-1500 rail mounting	No
• 35 mm DIN rail mounting	Yes
• wall mounting	No
Wireless frequencies	
Operating frequency	
• for WLAN in 2.4 GHz frequency band	2.41 ... 2.48 GHz
• for WLAN in 5 GHz frequency band	4.9 ... 5.8 GHz
Product properties, functions, components general	
Product function Access Point Mode	No
Product function Client Mode	Yes
Product function	
• iPCF client	No
• iPCF-MC client	No
Product function iREF	No
Product function iPRP	No
Product functions management, configuration	
Number of manageable IP addresses in client	4
Product function	
• CLI	Yes
• web-based management	Yes
• MIB support	Yes
• TRAPs via email	Yes
• Configuration with STEP 7	Yes
• configuration with STEP 7 in the TIA Portal	Yes
• WDS	No
Protocol is supported	
• Address Resolution Protocol (ARP)	Yes
• ICMP	Yes
• Telnet	Yes
• HTTP	Yes
• HTTPS	Yes
• TFTP	Yes
• DCP	Yes
• LLDP	No
Identification & maintenance function	
• I&M0 - device-specific information	Yes
• I&M1 – higher-level designation/ location designation	Yes

Article number	**6GK5721-1FC00-0AA0**
	6GK5721-1FC00-0AB0 [1]
Product type designation	SCALANCE W721-1 RJ45
Product functions Diagnosis	
Product function	
• PROFINET IO diagnosis	No
• Link Check	No
• connection monitoring IP-Alive	No
• SysLog	Yes
Protocol is supported	
• SNMP v1	Yes
• SNMP v2	Yes
• SNMP v3	Yes
Product functions VLAN	
Product function	
• function VLAN with IWLAN	No
Product functions DHCP	
Product function	
• DHCP client	Yes
• in Client Mode DHCP server via LAN	Yes
• DHCP Option 82	Yes
Product functions Redundancy	
Protocol is supported	
• STP/RSTP	Yes
• MSTP	Yes
• RSTP	Yes
Product functions Security	
Product function	
• ACL - MAC-based	Yes
• Management security, ACL-IP based	Yes
• IEEE 802.1x (radius)	Yes
• NAT/NAPT	No
• access protection according to IEEE802.11i	Yes
• WPA/WPA2	Yes
• TKIP/AES	Yes
Protocol is supported	
• SSH	Yes
• RADIUS	Yes
Product functions Time	
Protocol is supported	
• NTP	Yes
• SNTP	Yes
• SIMATIC Time	Yes

[1] Wireless approval in the USA

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Technical specifications (continued)

Article number	6GK5721-1FC00-0AA0
	6GK5721-1FC00-0AB0 [1]
Product type designation	SCALANCE W721-1 RJ45
Standards, specifications, approvals	
Standard	
• for FM	FM 3611: Class I, Division 2, Groups A,B,C,D, T4 / Class 1, Zone 2, Group IIC, T4
• for hazardous zone	EN 60079-15:2005, EN 60079-0:2006, II 3 G Ex nA II T4 KEMA 07 ATEX 0145X
• for safety from CSA and UL	UL 60950-1 CSA C22.2 No. 60950-1
Certificate of suitability	
• EC declaration of conformity	Yes
• CE marking	Yes
• C-Tick	Yes
• E1 approval	No
• Railway application in accordance with EN 50155	No
• NEMA TS2	No
• IEC 61375	No
• IEC 61850-3	No
• NEMA4X	No
• Power-over-Ethernet according IEEE802.3at for type 1 and IEEE802.3af	No
• Power-over-Ethernet according to IEEE802.3at for type 2	No

Article number	6GK5721-1FC00-0AA0
	6GK5721-1FC00-0AB0 [1]
Product type designation	SCALANCE W721-1 RJ45
Standard for wireless communication	
• IEEE 802.11a	Yes
• IEEE 802.11b	Yes
• IEEE 802.11e	Yes
• IEEE 802.11g	Yes
• IEEE 802.11h	Yes
• IEEE 802.11i	Yes
• IEEE 802.11n	Yes
Wireless approval	You will find the current list of countries at: www.siemens.com/wireless-approvals
Marine classification association	
• American Bureau of Shipping Europe Ltd. (ABS)	No
• Bureau Veritas (BV)	No
• DNV GL	No
• Lloyds Register of Shipping (LRS)	No
• Nippon Kaiji Kyokai (NK)	No
• Polski Rejestr Statkow (PRS)	No
• Royal Institution of Naval Architects (RINA)	No
Accessories	
accessories	24 V DC screw terminal included in scope of delivery

[1] Wireless approval in the USA

Ordering data

	Article No.
SCALANCE W721 client modules	
IWLAN Ethernet client modules with built-in wireless interface; wireless networks IEEE 802.11a/b/g/h/n at 2.4/5 GHz up to 150 Mbps; WPA2/AES; IP20 degree of protection (0 °C to +55 °C); scope of supply: Mounting hardware, 3-pin screw terminal for 24V DC; manual on CD-ROM; German/English	
SCALANCE W721-1 RJ45	
For administration of the wireless connection from a connected device with Industrial Ethernet connection	
• National approvals for operation outside the USA	**6GK5721-1FC00-0AA0**
• National approvals for operation within the USA [1]	**6GK5721-1FC00-0AB0**

	Article No.
Accessories	
IE FC RJ45 plug 180 2 x 2	
RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation-displacement contacts for connecting Industrial Ethernet FC installation cables; with a 180° cable outlet; for network components and CPs/CPUs with Industrial Ethernet interface	
• 1 pack = 1 unit	**6GK1901-1BB10-2AA0**
• 1 pack = 10 units	**6GK1901-1BB10-2AB0**
• 1 pack = 50 units	**6GK1901-1BB10-2AE0**
IE FC TP standard cable GP 2 x 2	**6XV1840-2AH10**
4-wire, shielded TP installation cable for connection to IE FC outlet RJ45 plug / IE FC RJ45 plug; PROFINET-compliant; with UL approval; sold by the meter; max. delivery unit 1000 m, minimum order 20 m	
IE FC stripping tool	**6GK1901-1GA00**
Preadjusted stripping tool for fast stripping of the Industrial Ethernet FC cables	
Antennas and miscellaneous IWLAN accessories	See Industry Mall

[1] Please note national approvals under http://www.siemens.com/wireless-approvals

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Overview



- CM PtP communication module;
  module for serial communication connections with RS 232 and RS 422 interfaces. RS 485 for the Freeport, 3964(R), Modbus RTU, and USS protocols, max. 115.2 Kbps, 2 KB frame length, 4 KB receive buffer.
- Protocols supported
  - Freeport: User-parameterizable frame format for universal communication
  - 3964(R) for improved transmission reliability
  - Modbus RTU master (requires instructions in SIMATIC S7)
  - Modbus RTU slave (requires instructions in SIMATIC S7)
  - USS, implemented through instructions
- Interface properties
  - RS 232 with auxiliary signals
  - RS 422 for full-duplex connections
  - RS 485 for half-duplex and multi-point connections
  - Transmission rates from 300 to 115200 bps
- Can be plugged into Type A0 BaseUnits (BU) with automatic coding
- LED display for errors, operation, and supply voltage
- Communication display for sending and receiving
- Clear labeling on front of module
  - Plain text identification of the module type and function class
  - 2D matrix code (order and serial number)
  - Connection diagram
  - Color coding of the CM module type: silver
  - Hardware and firmware version
  - Complete Article No.
- Optional labeling accessories
  - Labeling strips
  - Equipment labeling plate
- Optional system-integrated shield connection

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

Technical specifications

Article number	**6AG1137-6AA00-2BA0**
Based on	**6ES7137-6AA00-0BA0**
	SIPLUS ET 200SP CM PTP
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/ frost); start-up @ -25 °C
• horizontal installation, max.	60 °C; = Tmax
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance	
Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
Remark	
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A

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Ordering data	Article No.
SIPLUS CM PtP communication module (Extended temperature range and medial exposure) PROFIBUS DP master/slave with electrical interface for connecting the ET 200SP CPUs to PROFIBUS at up to 12 Mbps for serial communication connections with the interfaces RS 232, RS 422, RS 485, BU type A0, color code CC00	**6AG1137-6AA00-2BA0**
Accessories	
SIPLUS BaseUnits type A0 (Extended temperature range and medial exposure)	
BU15-P16+A0+2D BU type A0; BaseUnit (light) with 16 push-in terminals to the module; for starting a new load group (max. 10 A)	**6AG1193-6BP00-7DA0**
BU15-P16+A0+2B BU type A0; BaseUnit (dark) with 16 push-in terminals to the module; for continuing the load group	**6AG1193-6BP00-7BA0**
BU15-P16+A10+2D BU type A0; BaseUnit (light) with 16 push-in terminals (1 ... 16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)	**6AG1193-6BP20-7DA0**
BU15-P16+A10+2B BU type A0; BaseUnit (dark) with 16 push-in terminals (1...16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for continuing the load group	**6AG1193-6BP20-7BA0**

Further accessories	Article No.
	See SIMATIC CM PtP, page 9/118

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Overview



- SIPLUS CM 4x IO-Link communication module
  Serial communication module for connecting up to 4 IO-Link devices in accordance with IO-Link specification V1.0 and V1.1. The IO-Link parameters are configured using the Port Configuration Tool (PCT), version V3.0 and higher.
- Time-based IO
  Time-based IO ensures that signals are output with a precisely defined response time. By combining inputs and outputs, for example, passing products can be accurately measured or fluids dosed in precise quantities.
- Supported data transfer rates
  - COM1 (4.8 kBd)
  - COM2 (38.4 kBd)
  - COM3 (230.4 kBd)
- Expansion limits
  - Length of cable: Max. 20 m
  - Max. 32 bytes of input and output data per port
  - Max. 144 bytes of input data and 128 bytes of output data per module
- Supported ET 200SP system functions
  - Replacement without PG with automatic backup without the engineering tool of the IO-Link Device Parameter (V1.1 devices only) and the IO-Link master parameters by means of redundant saving of parameters on the e-coding element
  - Re-parameterization during operation
  - Identification data I&M
  - Firmware update
  - PROFIenergy
- Can be plugged into Type A0 BaseUnits (BU) with automatic e-coding
- LED indicators
  - DIAG: Operating state indicator (green/red) of the module
  - C1..C4: Port status indicator (green) for Port 1, 2, 3 and 4
  - Q1..Q4: Channel status indicator (green) for Port 1, 2, 3 and 4
  - F1..F4: Port fault indicator (red) for Port 1, 2, 3 and 4
  - PWR: Supply voltage indicator (green)
- Clear labeling on front of module
  - Plain text identification of the module type and function class
  - 2D matrix code (order and serial number)
  - Connection diagram
  - Color-coding of the module class CM: silver
  - Hardware and firmware version
  - Complete Article No.
- Optional accessories
  - Labeling strips
  - Equipment labeling plate
  - Color-coded label with color code CC04
- Optional system-integrated shield connection

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

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Technical specifications

Article number	**6AG1137-6BD00-2BA0**
Based on	**6ES7137-6BD00-0BA0**
	SIPLUS ET 200SP CM 4XIO-LINK
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/ frost); start-up @ -25 °C
• horizontal installation, max.	60 °C; = Tmax
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance	
Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
Remark	
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A

Ordering data

	Article No.
SIPLUS CM 4x IO-Link Master V1.1 Standard communication module (Extended temperature range and exposure to media) Serial communication module for connecting up to 4 IO-Link devices, time-based IO, BU type A0, color code CC04	**6AG1137-6BD00-2BA0**
Usable type A0 BaseUnits	
BU15-P16+A10+2D (Extended temperature range and exposure to media) BU type A0; BaseUnit (light) with 16 push-in terminals (1...16) to the module and additionally 10 internally jumpered AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)	**6AG1193-6BP20-7DA0**
BU15-P16+A0+2D (Extended temperature range and exposure to media) BU type A0; BaseUnit (light) with 16 push-in terminals to the module; for starting a new load group (max. 10 A)	**6AG1193-6BP00-7DA0**
BU15-P16+A10+2B (Extended temperature range and exposure to media) BU type A0; BaseUnit (dark) with 16 push-in terminals (1...16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for continuing the load group	**6AG1193-6BP20-7BA0**
BU15-P16+A0+2B (Extended temperature range and exposure to media) BU type A0; BaseUnit (dark) with 16 push-in terminals to the module; for continuing the load group	**6AG1193-6BP00-7BA0**
Accessories	See SIMATC CM 4x IO-Link, page 9/121

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Overview



- PROFIBUS DP master/slave with electrical interface for connecting the ET 200SP CPUs to PROFIBUS at up to 12 Mbps
- Expands the ET 200SP CPUs 1510SP-1 PN / 1512SP-1 PN by one PROFIBUS connection
- For communication with lower-level PROFIBUS devices at bandwidths of 9.6 kbps to 12 Mbps
- Communication services:
  - PROFIBUS DP
  - PG/OP communication
  - S7 communication:
    This makes it possible to establish communication between the ET 200SP CPU and other devices, for example those from the SIMATIC S7-300/400/1500 range.
- Time synchronization
- Simple programming and configuration over PROFIBUS
- Cross-network PG communication using S7 routing
- Data set routing

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

Technical specifications

Article number	**6AG1545-5DA00-2AB0**
Based on	**6ES7545-5DA00-0AB0**
	SIPLUS ET 200SP CM DP
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/ frost); start-up @ -25 °C
• horizontal installation, max.	60 °C; = Tmax
• vertical installation, min.	-40 °C; = Tmin; Startup @ -25 °C
• vertical installation, max.	50 °C; = Tmax
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)

Article number	**6AG1545-5DA00-2AB0**
Based on	**6ES7545-5DA00-0AB0**
	SIPLUS ET 200SP CM DP
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance	
Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *

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Technical specifications (continued)

Article number	6AG1545-5DA00-2AB0
Based on	6ES7545-5DA00-0AB0
	SIPLUS ET 200SP CM DP
Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
Remark	
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!

Article number	6AG1545-5DA00-2AB0
Based on	6ES7545-5DA00-0AB0
	SIPLUS ET 200SP CM DP
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A

Ordering data

	Article No.
SIPLUS CM DP for ET 200SP CPU (Extended temperature range and medial exposure) PROFIBUS DP master/slave with electrical interface for connecting the ET 200SP CPUs to PROFIBUS at up to 12 Mbps	**6AG1545-5DA00-2AB0**

	Article No.
Accessories	see SIMATIC CM DP, page 9/126

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Overview



Digital fail-safe input module:
F-DI 8x24 V DC High Feature for BU type A0, color code CC01

Important features:

- 8-channel digital fail-safe input module for the ET 200SP
- For fail-safe reading of sensor information (1 or 2 channels)
- Provides integral discrepancy evaluation for 2-out-of-2 signals
- 8 internal sensor supplies (incl. test function) onboard
- Certified up to SIL 3 (IEC 61508), PL e (ISO 13849)
- Can be plugged into type A0 BaseUnits (BU) with automatic coding
- LED display for error, operation, supply voltage and status
- Clear labeling on front of module
  - Plain text identification of the module type and function class
  - 2D matrix code (order and serial number)
  - Connection diagram
  - Color coding of the module type DI: white
  - Hardware and firmware version
  - Color code CC for module-specific color coding of the potentials at the terminals of the BU
  - Complete Article No.
- Optional labeling accessories
  - Labeling strips
  - Equipment labeling plate
- Optional module-specific color identification of the terminals according to the color code CC
- Optional system-integrated shield connection
- The modules support PROFIsafe in both PROFIBUS and PROFINET configurations. They can be used with all fail-safe SIMATIC S7 CPUs

Technical specifications

Article number	**6ES7136-6BA00-0CA0** ET 200SP, EI-Mod., F-DI 8x24VDC HF
General information	
Product type designation	F-DI 8x24VDC HF
Engineering with	
• STEP 7 TIA Portal configurable/ integrated as of version	V12
• STEP 7 configurable/integrated as of version	V5.5 SP3 / -
Supply voltage	
Rated value (DC)	24 V
Reverse polarity protection	Yes
Encoder supply	
Number of outputs	8
Short-circuit protection	Yes; Electronic (response threshold 0.7 A to 1.8 A)
Output current	
• up to 60 °C, max.	0.3 A
24 V encoder supply	
• 24 V	Yes; min. L+ (-1.5 V)
• Short-circuit protection	Yes
• Output current, max.	800 mA; Total current of all encoders

Article number	**6ES7136-6BA00-0CA0** ET 200SP, EI-Mod., F-DI 8x24VDC HF
Digital inputs	
Number of digital inputs	8
Source/sink input	Yes; P-reading
Input characteristic curve in accordance with IEC 61131, type 1	Yes
Input voltage	
• Rated value (DC)	24 V
• for signal "0"	-30 to +5V
• for signal "1"	+15 to +30V
Input current	
• for signal "1", typ.	3.7 mA
Input delay (for rated value of input voltage)	
for standard inputs	
- parameterizable	Yes
for technological functions	
- parameterizable	No

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Technical specifications (continued)

Article number	**6ES7136-6BA00-0CA0** ET 200SP, EI-Mod., F-DI 8x24VDC HF
Interrupts/diagnostics/ status information	
Diagnostics function	Yes, "Alarms/diagnostic messages" section in the manual
Alarms	
• Diagnostic alarm	Yes
• Hardware interrupt	No
Diagnostics indication LED	
• RUN LED	Yes; Green LED
• ERROR LED	Yes; Red LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
• Channel status display	Yes; Green LED
• for channel diagnostics	Yes; Red LED
• for module diagnostics	Yes; green/red DIAG LED
Potential separation	
Potential separation channels	
• between the channels and backplane bus	Yes

Article number	**6ES7136-6BA00-0CA0** ET 200SP, EI-Mod., F-DI 8x24VDC HF
Standards, approvals, certificates	
Suitable for safety functions	Yes
Highest safety class achievable in safety mode	
• Performance level according to ISO 13849-1	PLe
• SIL acc. to IEC 61508	SIL 3
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	0 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	0 °C
• vertical installation, max.	50 °C
Dimensions	
Width	15 mm
Height	73 mm
Depth	58 mm
Weights	
Weight, approx.	49 g

Ordering data

	Article No.
Digital F-input modules	
F-DI 8x24 V DC High Feature, BU type A0, color code CC01	**6ES7136-6BA00-0CA0**
Suitable BaseUnits	
BU15-P16+A10+2D	
BU type A0; BaseUnit (light) with 16 push-in terminals (1 ... 16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)	
• 1 unit	**6ES7193-6BP20-0DA0**
• 10 units	**6ES7193-6BP20-2DA0**
BU15-P16+A0+2D	
BU type A0; BaseUnit (light) with 16 push-in terminals to the module; for starting a new load group (max. 10 A)	
• 1 unit	**6ES7193-6BP00-0DA0**
• 10 units	**6ES7193-6BP00-2DA0**
2BU15-P16+A0+2DB	
Double BaseUnit for holding 2 I/O modules; BU type A0; BaseUnit (light/dark) with 16 push-in terminals to the module; for starting a new load group (max. 10 A)	
• 1 unit	**6ES7193-6BP60-0DA0**
BU15-P16+A10+2B	
BU type A0; BaseUnit (dark) with 16 push-in terminals (1 ... 16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for continuing the load group	
• 1 unit	**6ES7193-6BP20-0BA0**
• 10 units	**6ES7193-6BP20-2BA0**
BU15-P16+A0+2B	
BU type A0; BaseUnit (dark) with 16 push-in terminals to the module; for continuing the load group	
• 1 unit	**6ES7193-6BP00-0BA0**
• 10 units	**6ES7193-6BP00-2BA0**
2BU15-P16+A0+2B	
Double BaseUnit for holding 2 I/O modules; BU type A0; BaseUnit (dark/dark) with 16 push-in terminals to the module; for continuing the load group	
• 1 unit	**6ES7193-6BP60-0BA0**

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Ordering data

	Article No.
Accessories	
S7 Distributed Safety V5.4 SP5 Update 2 programming tool Task: Configuration software for configuring fail-safe user programs for SIMATIC S7-300F, S7-400F, WinAC RTX F, ET 200S, ET 200M, ET 200iSP, ET 200pro, ET 200eco, ET 200SP Requirement: Windows 7 SP1 (64-bit), Windows 10 Professional/Enterprise (64-bit), Windows Server 2008 R2 SP1 (64-bit), Windows Server 2012 R2 (64-bit), Windows Server 2016 (64-bit); STEP 7 as of V5.5 SP1 Please also consider the operating systems that have been released for the used STEP 7 version	
Floating license for 1 user; software and documentation on DVD; license key on USB flash drive	**6ES7833-1FC02-0YA5**
Floating license for 1 user; software, documentation and license key for download[1]; email address required for delivery	**6ES7833-1FC02-0YH5**
S7 Distributed Safety Upgrade	
From V5.x to V5.4; floating license for 1 user; software and documentation on DVD; license key on USB flash drive	**6ES7833-1FC02-0YE5**
STEP 7 Safety Advanced V15.1 Task: Engineering tool for configuring and programming fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-1500F Software Controller, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller and the fail-safe ET 200SP, ET 200MP, ET 200S, ET 200M, ET 200iSP, ET 200pro and ET 200eco I/O Requirement: STEP 7 Professional V15.1	
Floating license for 1 user, software and documentation on DVD; license key on USB flash drive	**6ES7833-1FA15-0YA5**
Floating license for 1 user, software, documentation and license key for download[1]; email address required for delivery	**6ES7833-1FA15-0YH5**

	Article No.
Equipment labeling plate 10 sheets of 16 labels	**6ES7193-6LF30-0AW0**
Labeling strips	
500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer	**6ES7193-6LR10-0AA0**
500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer	**6ES7193-6LR10-0AG0**
1000 labeling strips DIN A4, light gray, card, for inscription with laser printer	**6ES7193-6LA10-0AA0**
1000 labeling strips DIN A4, yellow, card, for inscription with laser printer	**6ES7193-6LA10-0AG0**
BU cover For covering empty slots (gaps); 5 units	
• 15 mm wide	**6ES7133-6CV15-1AM0**
• 20 mm wide	**6ES7133-6CV20-1AM0**
Shield connection 5 shield supports and 5 shield terminals	**6ES7193-6SC00-1AM0**
Color-coded labels	
• Color code CC01, module-specific, for 16 push-in terminals; for BaseUnit type A0, A1; 10 units	**6ES7193-6CP01-2MA0**
• Color code CC01, module-specific, for 16 push-in terminals; for BaseUnit type A0, A1; 50 units	**6ES7193-6CP01-4MA0**
• Color code CC71, for 10 AUX terminals 1 A to 10 A, for BU type A0, yellow/green, with push-in terminals; 10 units	**6ES7193-6CP71-2AA0**
• Color code CC72, for 10 AUX terminals 1 A to 10 A, for BU type A0, red, with push-in terminals; 10 units	**6ES7193-6CP72-2AA0**
• Color code CC73, for 10 AUX terminals 1 A to 10 A, for BU type A0, blue, with push-in terminals; 10 units	**6ES7193-6CP73-2AA0**
E-coding element type F 5 units, spare part	**6ES7193-6EF00-1AA0**

[1] For up-to-date information and download availability, see: http://www.siemens.com/tia-online-software-delivery

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Overview



Digital fail-safe output modules:

- F-DQ 4x24VDC/2A PM High Feature
- F-DQ 8x24VDC/0.5A PP High Feature

Important features:

- 4 and 8-channel digital fail-safe output modules for the ET 200SP
- Fail-safe 2-channel activation (sink/source or source/source output) of actuators
- Actuators can be controlled up to 2 A or 0.5 A
- Certified up to SIL 3 (IEC 61508), PL e (ISO 13849)
- Can be plugged into type A0 BaseUnits (BU) with automatic coding
- LED display for error, operation, supply voltage and status
- Clear labeling on front of module
  - Plain text identification of the module type and function class
  - 2D matrix code (order and serial number)
  - Connection diagram
  - Color coding of the DQ module type: black
  - Hardware and firmware version
  - Color code CC for module-specific color coding of the potentials at the terminals of the BU
  - Complete Article No.
- Optional labeling accessories
  - Labeling strips
  - Equipment labeling plate
- Optional system-integrated shield connection
- The modules support PROFIsafe in both PROFIBUS and PROFINET configurations
- They can be used with all fail-safe SIMATIC S7 CPUs

Technical specifications

Article number	**6ES7136-6DB00-0CA0** ET 200SP, EI-Mod., F-DQ 4xDC 24V/2A	**6ES7136-6DC00-0CA0** ET 200SP, F-DQ 8x 24VDC/0.5A PP
General information		
Product type designation	F-DQ 4x24 V DC/2 A PM HF	F-DQ 8x24 V DC/0.5 A PP HF
Engineering with		
• STEP 7 TIA Portal configurable/ integrated as of version	V12	V14 SP1 with HSP 202
• STEP 7 configurable/integrated as of version	V5.5 SP3 / -	V5.5 SP4 HF5
• PROFINET as of GSD version/ GSD revision	V2.31	
Supply voltage		
Rated value (DC)	24 V	24 V
Reverse polarity protection	Yes	Yes
Digital outputs		
Number of digital outputs	4	8
Digital outputs, parameterizable	Yes	Yes
Short-circuit protection	Yes	Yes
Open-circuit detection	Yes	No
Overload protection	Yes	
Limitation of inductive shutdown voltage to	Typ. -2x 47 V	Typ. -39 V
Controlling a digital input		Yes
Switching capacity of the outputs		
• with resistive load, max.	2 A	0.5 A
• on lamp load, max.	10 W	2 W

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Technical specifications (continued)

Article number	**6ES7136-6DB00-0CA0** ET 200SP, El-Mod., F-DQ 4xDC 24V/2A	**6ES7136-6DC00-0CA0** ET 200SP, F-DQ 8x 24VDC/0.5A PP
Load resistance range		
• lower limit	12 Ω	48 Ω
• upper limit	2 000 Ω	12 000 Ω
Output voltage		
• for signal "1", min.	24 V; L+ (-0.5 V)	24 V; L+ (-0.5 V)
Output current		
• for signal "1" rated value	2 A	0.5 A
• for signal "0" residual current, max.	0.5 mA	0.5 mA
Switching frequency		
• with resistive load, max.	30 Hz; Symmetrical	30 Hz; Symmetrical
• with inductive load, max.	0.1 Hz; according to IEC 60947-5-1, DC-13, symmetrical	0.1 Hz; according to IEC 60947-5-1, DC-13, symmetrical
• with capacitive load, max.		2 Hz; Symmetrical
• on lamp load, max.	10 Hz; Symmetrical	10 Hz; Symmetrical
Total current of the outputs		
• Current per channel, max.	2 A; Note derating data in the manual	0.5 A; Note derating data in the manual
• Current per module, max.	6 A; Note derating data in the manual	3 A; Note derating data in the manual
Total current of the outputs (per module)		
horizontal installation		
- up to 40 °C, max.		3 A
- up to 50 °C, max.		2.5 A
- up to 60 °C, max.		2 A
vertical installation		
- up to 50 °C, max.		2 A
Cable length		
• shielded, max.	1 000 m	100 m
• unshielded, max.	500 m	100 m
Interrupts/diagnostics/ status information		
Diagnostics function	Yes, "Alarms/diagnostic messages" section in the manual	Yes, "Alarms/diagnostic messages" section in the manual
Substitute values connectable	No	No
Alarms		
• Diagnostic alarm	Yes	Yes
Diagnostics indication LED		
• RUN LED	Yes; Green LED	Yes; Green LED
• ERROR LED	Yes; Red LED	Yes; Red LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED	Yes; green PWR LED
• Channel status display	Yes; Green LED	Yes; Green LED
• for channel diagnostics	Yes; Red LED	Yes; Red LED
• for module diagnostics	Yes; green/red DIAG LED	Yes; green/red DIAG LED
Potential separation		
Potential separation channels		
• between the channels and backplane bus	Yes	Yes
Standards, approvals, certificates		
Suitable for safety functions	Yes	Yes
Highest safety class achievable in safety mode		
• Performance level according to ISO 13849-1	PLe	PLe
• Category according to ISO 13849-1		Cat. 4
• SIL acc. to IEC 61508	SIL 3	SIL 3

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Technical specifications (continued)

Article number	**6ES7136-6DB00-0CA0** ET 200SP, El-Mod., F-DQ 4xDC 24V/2A	**6ES7136-6DC00-0CA0** ET 200SP, F-DQ 8x 24VDC/0.5A PP
Ambient conditions		
Ambient temperature during operation		
• horizontal installation, min.	0 °C	0 °C
• horizontal installation, max.	60 °C	60 °C
• vertical installation, min.	0 °C	0 °C
• vertical installation, max.	50 °C	50 °C
Dimensions		
Width	15 mm	15 mm
Height	73 mm	73 mm
Depth	58 mm	58 mm
Weights		
Weight, approx.	57 g	48 g

Ordering data

	Article No.
Digital F-output modules	
F-DQ 4x24 V DC High Feature, BU type A0, color code CC01	**6ES7136-6DB00-0CA0**
F-DQ 8x24 V DC High Feature, PP-switching, BU type A0, color code CC01	**6ES7136-6DC00-0CA0**
Suitable BaseUnits	
BU15-P16+A10+2D	
BU type A0; BaseUnit (light) with 16 push-in terminals (1 ... 16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)	
• 1 unit	**6ES7193-6BP20-0DA0**
• 10 units	**6ES7193-6BP20-2DA0**
BU15-P16+A0+2D	
BU type A0; BaseUnit (light) with 16 push-in terminals to the module; for starting a new load group (max. 10 A)	
• 1 unit	**6ES7193-6BP00-0DA0**
• 10 units	**6ES7193-6BP00-2DA0**
2BU15-P16+A0+2DB	
Double BaseUnit for holding 2 I/O modules; BU type A0; BaseUnit (light/dark) with 16 push-in terminals to the module; for starting a new load group (max. 10 A)	
• 1 unit	**6ES7193-6BP60-0DA0**
BU15-P16+A10+2B	
BU type A0; BaseUnit (dark) with 16 push-in terminals (1 ... 16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for continuing the load group	
• 1 unit	**6ES7193-6BP20-0BA0**
• 10 units	**6ES7193-6BP20-2BA0**
BU15-P16+A0+2B	
BU type A0; BaseUnit (dark) with 16 push-in terminals to the module; for continuing the load group	
• 1 unit	**6ES7193-6BP00-0BA0**
• 10 units	**6ES7193-6BP00-2BA0**
2BU15-P16+A0+2B	
Double BaseUnit for holding 2 I/O modules; BU type A0; BaseUnit (dark/dark) with 16 push-in terminals to the module; for continuing the load group	
• 1 unit	**6ES7193-6BP60-0BA0**
BU20-P12+A4+0B	**6ES7193-6BP20-0BB0**
BU type B0; BaseUnit (dark) with 12 push-in terminals (1 ... 12) to the module and an additional 4 internally jumpered AUX terminals (1 A to 4 A); for continuing the load group	
Accessories	
S7 Distributed Safety V5.4 SP5 Update 2 programming tool	
Task: Configuration software for configuring fail-safe user programs for SIMATIC S7-300F, S7-400F, WinAC RTX F, ET 200S, ET 200M, ET 200iSP, ET 200pro, ET 200eco, ET 200SP Requirement: Windows 7 SP1 (64-bit), Windows 10 Professional/Enterprise (64-bit), Windows Server 2008 R2 SP1 (64-bit), Windows Server 2012 R2 (64-bit), Windows Server 2016 (64-bit); STEP 7 as of V5.5 SP1 Please also consider the operating systems that have been released for the used STEP 7 version	
Floating license for 1 user; software and documentation on DVD; license key on USB flash drive	**6ES7833-1FC02-0YA5**
Floating license for 1 user; software, documentation and license key for download[1]; email address required for delivery	**6ES7833-1FC02-0YH5**

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Ordering data	Article No.
S7 Distributed Safety Upgrade	
From V5.x to V5.4; floating license for 1 user; software and documentation on DVD; license key on USB flash drive	**6ES7833-1FC02-0YE5**
STEP 7 Safety Advanced V15.1	
Task: Engineering tool for configuring and programming fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-1500F Software Controller, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller and the fail-safe ET 200SP, ET 200MP, ET 200S, ET 200M, ET 200iSP, ET 200pro and ET 200eco I/O Requirement: STEP 7 Professional V15.1	
Floating license for 1 user, software and documentation on DVD; license key on USB flash drive	**6ES7833-1FA15-0YA5**
Floating license for 1 user, software, documentation and license key for download[1]; email address required for delivery	**6ES7833-1FA15-0YH5**
Equipment labeling plate	**6ES7193-6LF30-0AW0**
10 sheets of 16 labels	
Labeling strips	
500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer	**6ES7193-6LR10-0AA0**
500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer	**6ES7193-6LR10-0AG0**
1000 labeling strips DIN A4, light gray, card, for inscription with laser printer	**6ES7193-6LA10-0AA0**
1000 labeling strips DIN A4, yellow, card, for inscription with laser printer	**6ES7193-6LA10-0AG0**
BU cover	
For covering empty slots (gaps); 5 units	
• 15 mm wide	**6ES7133-6CV15-1AM0**
• 20 mm wide	**6ES7133-6CV20-1AM0**

	Article No.
Shield connection	**6ES7193-6SC00-1AM0**
5 shield supports and 5 shield terminals	
Color-coded labels	
• Color code CC02, module-specific, for 16 push-in terminals; for BaseUnit type A0, A1; 10 units	**6ES7193-6CP02-2MA0**
• Color code CC02, module-specific, for 16 push-in terminals; for BaseUnit type A0, A1; 50 units	**6ES7193-6CP02-4MA0**
• Color code CC71, for 10 AUX terminals 1 A to 10 A, for BU type A0, yellow/green, with push-in terminals; 10 units	**6ES7193-6CP71-2AA0**
• Color code CC72, for 10 AUX terminals 1 A to 10 A, for BU type A0, red, with push-in terminals; 10 units	**6ES7193-6CP72-2AA0**
• Color code CC73, for 10 AUX terminals 1 A to 10 A, for BU type A0, blue, with push-in terminals; 10 units	**6ES7193-6CP73-2AA0**
E-coding element type F	**6ES7193-6EF00-1AA0**
5 units, spare part	

[1] For up-to-date information and download availability, see: http://www.siemens.com/tia-online-software-delivery

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Overview



The digital F electronic module relay 1 F-RQ DC 24VDC/ 24.230VAC/5 A has the following characteristics:

- 1 relay output (2 NO)
- Total output current 5 A
- Rated load voltage 24 V DC and 24...230 V AC
- The control circuit of the two safety relays must be routed from the outside to the respective terminals.

The attainable safety integrity level is SIL 3 (IEC 61508) when the control of the F-RQ module is implemented via a fail-safe output (e.g. ET 200SP 4F-DQ 24 V DC/2 A PROFIsafe).

Technical specifications

Article number	**6ES7136-6RA00-0BF0** ET 200SP, F-RQ 1x24VDC/ 24..230VAC/5A ST
General information	
Product type designation	F-RQ 1x24 V DC/24 ... 230 V AC/5 A
Engineering with	
• STEP 7 TIA Portal configurable/ integrated as of version	V13
• STEP 7 configurable/integrated as of version	V5.5 SP4 and higher
Supply voltage	
Rated value (DC)	24 V; Coil voltage
Digital outputs	
Number of digital outputs	1
Limitation of inductive shutdown voltage to	No
Controlling a digital input	Yes
Switching capacity of the outputs	
• with resistive load, max.	5 A
• on lamp load, max.	25 W
Switching frequency	
• with resistive load, max.	2 Hz
• with inductive load, max.	0.1 Hz; See data in manual
• with inductive load (acc. to IEC 60947-5-1, DC13), max.	0.1 Hz
• with inductive load (acc. to IEC 60947-5-1, AC15), max.	2 Hz
Total current of the outputs (per module)	
horizontal installation	
- up to 40 °C, max.	5 A; Note derating data in the manual
- up to 50 °C, max.	4 A; Note derating data in the manual
- up to 60 °C, max.	3 A; Note derating data in the manual
vertical installation	
- up to 50 °C, max.	3 A; Note derating data in the manual

Article number	**6ES7136-6RA00-0BF0** ET 200SP, F-RQ 1x24VDC/ 24..230VAC/5A ST
Relay outputs	
• Number of relay outputs	1; 2 NO contacts
• Rated supply voltage of relay coil L+ (DC)	24 V
• Current consumption of relays (coil current of all relays), max.	70 mA
• external protection for relay outputs	yes; 6 A, see data in manual
• Relay approved acc. to UL 508	Yes; Pilot Duty B300, R300
Switching capacity of contacts	
- with inductive load, max.	see additional description in the manual
- with resistive load, max.	see additional description in the manual
- Thermal continuous current, max.	5 A
- Switching current, min.	1 mA
- Switching current after exceeding 300 mA, min.	10 mA
- Switching current after exceeding 300 mA, max.	5 A
- Rated switching voltage (DC)	24 V
- Rated switching voltage (AC)	230 V
Cable length	
• shielded, max.	500 m; for load contacts
• unshielded, max.	300 m; for load contacts
• Control cable (input), max.	10 m
Interrupts/diagnostics/ status information	
Diagnostics function	yes, firmware update
Diagnostics indication LED	
• RUN LED	Yes; green/red DIAG LED
• Channel status display	Yes; Green LED
Potential separation	
Potential separation channels	
• between the channels and backplane bus	Yes

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Technical specifications (continued)

Article number	**6ES7136-6RA00-0BF0**
	ET 200SP, F-RQ 1x24VDC/ 24..230VAC/5A ST
Standards, approvals, certificates	
Suitable for safety functions	Yes
Highest safety class achievable in safety mode	
• Performance level according to ISO 13849-1	PLe
• Category according to ISO 13849-1	4
• SIL acc. to IEC 61508	SIL 3

Article number	**6ES7136-6RA00-0BF0**
	ET 200SP, F-RQ 1x24VDC/ 24..230VAC/5A ST
Dimensions	
Width	20 mm
Height	73 mm
Depth	58 mm
Weights	
Weight, approx.	56 g

Ordering data

	Article No.
Digital F-output module relay 1 F-RQ	
BU type F0, relay output (2 NO contacts), total output current 5 A, load voltages 24 V DC and 24 ... 230 V AC; can be used up to SIL3/Cat.4/PL e if controlled via F-DQ	**6ES7136-6RA00-0BF0**
Usable BaseUnits	
BU20-P8+A4+0B	**6ES7193-6BP20-0BF0**
BU type F0; BaseUnit (dark) with 8 push-in terminals to the module and an additional 4 internally jumpered AUX terminals (1 A to 4 A); for continuing the load group	
Accessories	
S7 Distributed Safety V5.4 SP5 Update 2 programming tool Task: Configuration software for configuring fail-safe user programs for SIMATIC S7-300F, S7-400F, WinAC RTX F, ET 200S, ET 200M, ET 200iSP, ET 200pro, ET 200eco, ET 200SP Requirement: Windows 7 SP1 (64-bit), Windows 10 Professional/Enterprise (64-bit), Windows Server 2008 R2 SP1 (64-bit), Windows Server 2012 R2 (64-bit), Windows Server 2016 (64-bit); STEP 7 as of V5.5 SP1 Please also consider the operating systems that have been released for the used STEP 7 version	
Floating license for 1 user; software and documentation on DVD; license key on USB flash drive	**6ES7833-1FC02-0YA5**
Floating license for 1 user; software, documentation and license key for download[1]; email address required for delivery	**6ES7833-1FC02-0YH5**
S7 Distributed Safety Upgrade	
From V5.x to V5.4; floating license for 1 user; software and documentation on DVD; license key on USB flash drive	**6ES7833-1FC02-0YE5**

	Article No.
STEP 7 Safety Advanced V15.1 Task: Engineering tool for configuring and programming fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-1500F Software Controller, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller and the fail-safe ET 200SP, ET 200MP, ET 200S, ET 200M, ET 200iSP, ET 200pro and ET 200eco I/O Requirement: STEP 7 Professional V15.1	
Floating license for 1 user, software and documentation on DVD; license key on USB flash drive	**6ES7833-1FA15-0YA5**
Floating license for 1 user, software, documentation and license key for download[1]; email address required for delivery	**6ES7833-1FA15-0YH5**
Equipment labeling plate 10 sheets of 16 labels	**6ES7193-6LF30-0AW0**
Labeling strips	
500 labeling strips on roll, light gray	**6ES7193-6LR10-0AA0**
500 labeling strips on roll, yellow	**6ES7193-6LR10-0AG0**
1000 labeling strips DIN A4, light gray	**6ES7193-6LA10-0AA0**
1000 labeling strips DIN A4, yellow	**6ES7193-6LA10-0AG0**
BU cover For covering empty slots (gaps); 5 units • 20 mm wide	**6ES7133-6CV15-1AM0**
Shield connection 5 shield supports and 5 shield terminals	**6ES7193-6SC00-1AM0**
Color-coded labels • Color code CC42, module-specific; for BaseUnit type F0; 10 units	**6ES7193-6CP42-2MB0**

[1] For up-to-date information and download availability, see: http://www.siemens.com/tia-online-software-delivery

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Overview



Analog fail-safe input module:
F-AI 4xI 0(4) ... 20 mA 2/4-wire High Feature for BU type A0 and A1, color code CC00

Important properties:

- 4 analog inputs with galvanic isolation between channels and backplane bus (up to SIL 3/Cat. 4/PLd)
- Short-circuit-proof power supply of 2 or 4-wire transducers
- Measuring ranges: 0 ... 20 mA and 4 ... 20 mA
- Resolution: 16 bits including sign
- Certified up to SIL 3 (IEC 61508), PL e (ISO 13849)
- Can be plugged onto type A0 and A1 BaseUnits (BU)
- LED display for errors, operation, supply voltage and status
- Clear labeling on front of module
  - Plain text identification of the module type and function class
  - 2D matrix code (order and serial number)
  - Connection diagram
  - Color coding of the module type DI: white
  - Hardware and firmware version
  - Color code CC for module-specific color coding of the potentials at the BU terminals
  - Complete Article No.
- Optional labeling accessories
  - Labeling strips
  - Equipment labeling plate
- Optional module-specific color identification of the terminals according to the color code CC
- Optional system-integrated shield connection
- The modules support PROFIsafe in both PROFIBUS and PROFINET configurations. They can be used with all fail-safe SIMATIC S7 CPUs.

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Technical specifications

Article number	**6ES7136-6AA00-0CA1** ET 200SP, F-AI 4XI (0)4..20mA HF
General information	
Product type designation	F-AI 4xI 0(4) ... 20 mA 2/4-wire HF
Product function	
• I&M data	Yes; I&M0 to I&M3
Engineering with	
• STEP 7 TIA Portal configurable/ integrated as of version	V15 with HSP 203
Supply voltage	
Rated value (DC)	24 V
Reverse polarity protection	Yes
Analog inputs	
Number of analog inputs	4
• For current measurement	4
permissible input current for current input (destruction limit), max.	35 mA
Input ranges (rated values), currents	
• 0 to 20 mA	Yes
• 4 mA to 20 mA	Yes
Cable length	
• shielded, max.	1 000 m
Analog value generation for the inputs	
Measurement principle	Sigma Delta
Integration and conversion time/ resolution per channel	
• Resolution with overrange (bit including sign), max.	16 bit
• Integration time, parameterizable	Yes
• Integration time (ms)	20 / 16,667
• Interference voltage suppression for interference frequency f1 in Hz	50 / 60 Hz
Smoothing of measured values	
• Number of smoothing levels	7
• parameterizable	Yes
Encoder	
Connection of signal encoders	
• for current measurement as 2-wire transducer	Yes
- Burden of 2-wire transmitter, max.	650 Ω
• for current measurement as 4-wire transducer	Yes
Errors/accuracies	
Basic error limit (operational limit at 25 °C)	
• Current, relative to input range, (+/-)	0.1 %
Interference voltage suppression for f = n x (f1 +/- 1 %), f1 = interference frequency	
• Series mode interference (peak value of interference < rated value of input range), min.	40 dB
• Common mode interference, min.	70 dB

Article number	**6ES7136-6AA00-0CA1** ET 200SP, F-AI 4XI (0)4..20mA HF
Interrupts/diagnostics/ status information	
Diagnostics function	Yes, "Alarms/diagnostic messages" section in the manual
Alarms	
• Diagnostic alarm	Yes
• Limit value alarm	Yes
Diagnostic messages	
• Monitoring the supply voltage	Yes
• Wire-break	Yes; Measuring range 4 to 20 mA only
• Short-circuit	Yes
Diagnostics indication LED	
• RUN LED	Yes; Green LED
• ERROR LED	Yes; Red LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
• Channel status display	Yes; Green LED
• for channel diagnostics	Yes; Red LED
• for module diagnostics	Yes; Green/red LED
Potential separation	
Potential separation channels	
• between the channels and backplane bus	Yes
Standards, approvals, certificates	
Highest safety class achievable in safety mode	
• Performance level according to ISO 13849-1	PLe
• Category according to ISO 13849-1	Cat. 4
• SIL acc. to IEC 61508	SIL 3
Probability of failure (for service life of 20 years and repair time of 100 hours)	
- Low demand mode: PFDavg in accordance with SIL3	< 5.00E-05
- High demand/continuous mode: PFH in accordance with SIL3	< 1.00E-09 1/h
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	0 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	0 °C
• vertical installation, max.	50 °C
Dimensions	
Width	15 mm
Height	73 mm
Depth	58 mm
Weights	
Weight, approx.	48 g

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Ordering data	Article No.
Analog fail-safe input module	
F-AI 4xI 0(4) ... 20 mA 2/4-wire High Feature, BU type A0, A1, color code CC00	**6ES7136-6AA00-0CA1**
Suitable BaseUnits	
BU15-P16+A10+2D	
BU type A0; BaseUnit (light) with 16 push-in terminals (1 ... 16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)	
• 1 unit	**6ES7193-6BP20-0DA0**
• 10 units	**6ES7193-6BP20-2DA0**
BU15-P16+A0+2D	
BU type A0; BaseUnit (light) with 16 push-in terminals to the module; for starting a new load group (max. 10 A)	
• 1 unit	**6ES7193-6BP00-0DA0**
• 10 units	**6ES7193-6BP00-2DA0**
2BU15-P16+A0+2DB	
Double BaseUnit for holding 2 I/O modules; BU type A0; BaseUnit (light/dark) with 16 push-in terminals to the module; for starting a new load group (max. 10 A)	
• 1 unit	**6ES7193-6BP60-0DA0**
BU15-P16+A10+2B	
BU type A0; BaseUnit (dark) with 16 push-in terminals (1 ... 16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for continuing the load group	
• 1 unit	**6ES7193-6BP20-0BA0**
• 10 units	**6ES7193-6BP20-2BA0**
BU15-P16+A0+2B	
BU type A0; BaseUnit (dark) with 16 push-in terminals to the module; for continuing the load group	
• 1 unit	**6ES7193-6BP00-0BA0**
• 10 units	**6ES7193-6BP00-2BA0**
2BU15-P16+A0+2B	
Double BaseUnit for holding 2 I/O modules; BU type A0; BaseUnit (dark/dark) with 16 push-in terminals to the module; for continuing the load group	
• 1 unit	**6ES7193-6BP60-0BA0**
BU15-P16+A0+12D/T	**6ES7193-6BP40-0DA1**
BU type A1; BaseUnit (light) with 16 push-in terminals (1 ... 16) to the module and 2x5 internally jumpered additional terminals (1 B to 5 B and 1 C to 5 C); for starting a new load group (max. 10 A)	
BU15-P16+A0+2D/T	**6ES7193-6BP00-0DA1**
BU type A1; BaseUnit (light) with 16 push-in terminals to the module; for starting a new load group (max. 10 A)	
BU15-P16+A0+12B/T	**6ES7193-6BP40-0BA1**
BU type A1; BaseUnit (dark) with 16 push-in terminals (1 ... 16) to the module and 2x5 internally jumpered additional terminals (1 B to 5 B and 1 C to 5 C); for continuing the load group	
BU15-P16+A0+2B/T	**6ES7193-6BP00-0BA1**
BU type A1; BaseUnit (dark) with 16 push-in terminals to the module; for continuing the load group	
Accessories	
STEP 7 Safety Advanced V15.1	
Task: Engineering tool for configuring and programming fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-1500F Software Controller, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller and the fail-safe ET 200SP, ET 200MP, ET 200S, ET 200M, ET 200iSP, ET 200pro and ET 200eco I/O Requirement: STEP 7 Professional V15.1	
Floating license for 1 user, software and documentation on DVD; license key on USB flash drive	**6ES7833-1FA15-0YA5**
Floating license for 1 user, software, documentation and license key for download[1]; email address required for delivery	**6ES7833-1FA15-0YH5**
Equipment labeling plate	**6ES7193-6LF30-0AW0**
10 sheets of 16 labels	
Labeling strips	
500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer	**6ES7193-6LR10-0AA0**
500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer	**6ES7193-6LR10-0AG0**
1000 labeling strips DIN A4, light gray, card, for inscription with laser printer	**6ES7193-6LA10-0AA0**
1000 labeling strips DIN A4, yellow, card, for inscription with laser printer	**6ES7193-6LA10-0AG0**
BU cover	
For covering empty slots (gaps); 5 units	
• 15 mm wide	**6ES7133-6CV15-1AM0**
Shield connection	**6ES7193-6SC00-1AM0**
5 shield supports and 5 shield terminals	
Color-coded labels	
• Color code CC00, for 16 push-in terminals, BU type A0, A1, gray (terminals 1 to 8), red (terminals 9 to 16); A1; 10 units	**6ES7193-6CP00-2MA0**

[1] For up-to-date information and download availability, see: http://www.siemens.com/tia-online-software-delivery

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Overview



Digital fail-safe power module:
F-PM-E PPM 24 V DC/8 A for BU type C0,
color code CC52

Important features:

- Certified up to SIL 3 (IEC 61508), PL e (ISO 13849)
- Safety-related shutdown of output modules within the potential group of the F-PM-E
- Two fail-safe digital inputs, for reading of sensor information (1 or 2 channels)
- One fail-safe digital output onboard (ppm switching, up to 2 A, up to SIL 3/PL e)
- Fail-safe digital output and potential supply pp or pm switching can be parameterized
- Parameterizable onboard evaluation of the fail-safe inputs for control of the fail-safe digital outputs and of the potential group
- Digital standard output modules can be shut down up to PL d (ISO 13849) and SIL 2 (IEC61508) (up to 8 A).
- Can be plugged into type C0 BaseUnits (BU) with automatic coding
- LED display for error, operation, supply voltage and status
- Clear labeling on front of module
  - Plain text identification of the module type and function class
  - 2D matrix code (order and serial number)
  - Connection diagram
  - Color coding of the module type DI: white
  - Hardware and firmware version
  - Color code CC for module-specific color coding of the potentials at the terminals of the BU
  - Complete Article No.
- Optional labeling accessories
  - Labeling strips
  - Equipment labeling plate
- Optional module-specific color identification of the terminals according to the color code CC
- Optional system-integrated shield connection
- The modules support PROFIsafe in both PROFIBUS and PROFINET configurations. They can be used with all fail-safe SIMATIC S7 CPUs

Technical specifications

Article number	**6ES7136-6PA00-0BC0** ET 200SP, Power mod. F-PM-E PPM, 24V DC
General information	
Product type designation	F-PM-E 24 V DC/8 A PPM ST
Product function	
• I&M data	Yes; I&M0 to I&M3
Engineering with	
• STEP 7 TIA Portal configurable/ integrated as of version	V12
• STEP 7 configurable/integrated as of version	V5.5 SP3 / -
• PROFIBUS as of GSD version/ GSD revision	V2.3
• PROFINET as of GSD version/ GSD revision	V2.31
Supply voltage	
Rated value (DC)	24 V
Reverse polarity protection	Yes
Encoder supply	
Number of outputs	2
Short-circuit protection	Yes; Electronic (response threshold 0.7 A to 2.1 A)
Output current	
• up to 60 °C, max.	0.3 A
24 V encoder supply	
• 24 V	Yes; min. L+ (-1.5 V)
• Short-circuit protection	Yes
• Output current, max.	600 mA; Total current of all encoders

Article number	**6ES7136-6PA00-0BC0** ET 200SP, Power mod. F-PM-E PPM, 24V DC
Digital inputs	
Number of digital inputs	2
Source/sink input	Yes; P-reading
Input characteristic curve in accordance with IEC 61131, type 1	Yes
Input voltage	
• Type of input voltage	DC
• Rated value (DC)	24 V
• for signal "0"	-30 to +5V
• for signal "1"	+15 to +30V
Input current	
• for signal "1", typ.	3.7 mA
Input delay (for rated value of input voltage)	
for standard inputs	
- parameterizable	Yes
for technological functions	
- parameterizable	No
Cable length	
• shielded, max.	1 000 m
• unshielded, max.	500 m

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Technical specifications (continued)

Article number	6ES7136-6PA00-0BC0 ET 200SP, Power mod. F-PM-E PPM, 24V DC
Digital outputs	
Number of digital outputs	1
Digital outputs, parameterizable	Yes
Short-circuit protection	Yes
Open-circuit detection	Yes
Overload protection	Yes
Limitation of inductive shutdown voltage to	Max. -1.5 V
Switching capacity of the outputs	
• with resistive load, max.	8 A
• on lamp load, max.	100 W
Load resistance range	
• lower limit	3 Ω
• upper limit	2 000 Ω
Output voltage	
• for signal "1", min.	24 V; L+ (-0.5 V)
Output current	
• for signal "1" rated value	8 A
• for signal "0" residual current, max.	1.5 mA; PP-switching: max. 1.5 mA; PM-switching: max. 1 mA
Switching frequency	
• with resistive load, max.	10 Hz; Symmetrical
• with inductive load, max.	0.1 Hz; according to IEC 60947-5-1, DC-13, symmetrical
• on lamp load, max.	4 Hz; Symmetrical
Total current of the outputs	
• Current per channel, max.	8 A; Note derating data in the manual
• Current per module, max.	8 A; Note derating data in the manual
Cable length	
• shielded, max.	1 000 m
• unshielded, max.	500 m
Interrupts/diagnostics/ status information	
Diagnostics function	Yes, "Alarms/diagnostic messages" section in the manual
Substitute values connectable	No
Alarms	
• Diagnostic alarm	Yes
• Hardware interrupt	No

Article number	6ES7136-6PA00-0BC0 ET 200SP, Power mod. F-PM-E PPM, 24V DC
Diagnostics indication LED	
• RUN LED	Yes; Green LED
• ERROR LED	Yes; Red LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
• Channel status display	Yes; Green LED
• for channel diagnostics	Yes; Red LED
• for module diagnostics	Yes; green/red DIAG LED
Potential separation	
Potential separation channels	
• between the channels and backplane bus	Yes
Standards, approvals, certificates	
Suitable for safety functions	Yes
Highest safety class achievable in safety mode	
• Performance level according to ISO 13849-1	PLe
• SIL acc. to IEC 61508	SIL 3
Probability of failure (for service life of 20 years and repair time of 100 hours)	
- Low demand mode: PFDavg in accordance with SIL3	< 2.00E-05
- High demand/continuous mode: PFH in accordance with SIL3	< 1.00E-09 1/h
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	0 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	0 °C
• vertical installation, max.	50 °C
Dimensions	
Width	20 mm
Height	73 mm
Depth	55 mm
Weights	
Weight, approx.	70 g

Ordering data

	Article No.
Digital F power module F-PM-E 24 V DC/8 A PPM Standard BU type C0, color code CC52. 2 inputs, 1 output, SIL3/Cat.4/PLe	**6ES7136-6PA00-0BC0**
Type C0 BaseUnits	
BU20-P6+A2+4D BU type C0; BaseUnit (light) with 6 push-in terminals (1...6) to the module and an additional 2 AUX terminals; new load group	**6ES7193-6BP20-0DC0**
Accessories	
Equipment labeling plate 10 sheets of 16 labels	**6ES7193-6LF30-0AW0**
Labeling strips 1000 labeling strips DIN A4, yellow, card, for inscription with laser printer	**6ES7193-6LA10-0AG0**
BU cover for covering empty slots (gaps); 5 units	
• 20 mm wide	**6ES7133-6CV20-1AM0**
Shield connection 5 shield supports and 5 shield terminals	**6ES7193-6SC00-1AM0**
Color-coding plates	
• Color code CC52, module-specific, for 8 push-in terminals; 10 units	**6ES7193-6CP52-2MC0**
E-coding element type F 5 units, spare part	**6ES7193-6EF00-1AA0**

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Overview



Digital fail-safe input module:
F-DI 8x24 V DC High Feature for BU type A0, color code CC01

Important features:

- 8-channel digital fail-safe input module for the ET 200SP
- For fail-safe reading of sensor information (1 or 2 channels)
- Provides integral discrepancy evaluation for 2-out-of-2 signals
- 8 internal sensor supplies (incl. test function) onboard
- Certified up to SIL 3 (IEC 61508), PL e (ISO 13849)
- Can be plugged into type A0 BaseUnits (BU) with automatic coding
- LED display for error, operation, supply voltage and status
- Clear labeling on front of module
  - Plain text identification of the module type and function class
  - 2D matrix code (order and serial number)
  - Connection diagram
  - Color coding of the module type DI: white
  - Hardware and firmware version
  - Color code CC for module-specific color coding of the potentials at the terminals of the BU
  - Complete Article No.
- Optional labeling accessories
  - Labeling strips
  - Equipment labeling plate
- Optional module-specific color identification of the terminals according to the color code CC
- Optional system-integrated shield connection
- The modules support PROFIsafe in both PROFIBUS and PROFINET configurations. They can be used with all fail-safe SIMATIC S7 CPUs

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

Technical specifications

Article number	**6AG1136-6BA00-2CA0**
Based on	**6ES7136-6BA00-0CA0** SIPLUS ET 200SP F-DI 4/8x24VDC HF
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-25 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	-25 °C
• vertical installation, max.	50 °C
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	2 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance	
Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *

Article number	**6AG1136-6BA00-2CA0**
Based on	**6ES7136-6BA00-0CA0** SIPLUS ET 200SP F-DI 4/8x24VDC HF
Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
Remark	
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A

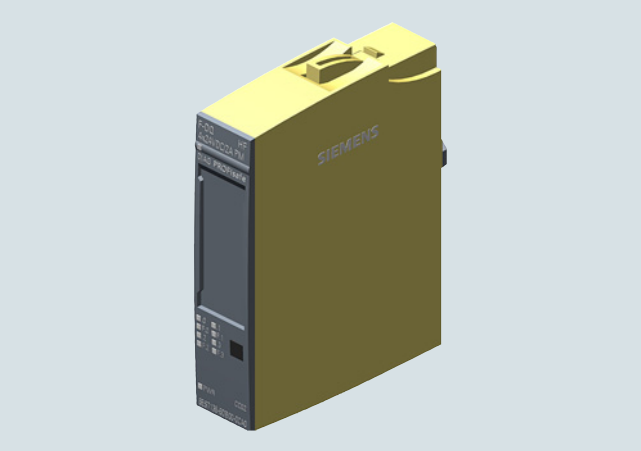
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Ordering data	Article No.
SIPLUS digital fail-safe input modules	
(Extended temperature range and exposure to media)	
F-DI 8x24 V DC High Feature, BU type A0, color code CC01	**6AG1136-6BA00-2CA0**
Usable BaseUnits	
BU15-P16+A0+2D	**6AG1193-6BP00-7DA0**
(Extended temperature range and exposure to media)	
BU type A0; BaseUnit (light) with 16 push-in terminals to the module; for starting a new load group (max. 10 A)	
BU15-P16+A0+2B	**6AG1193-6BP00-7BA0**
(Extended temperature range and exposure to media)	
BU type A0; BaseUnit (dark) with 16 push-in terminals to the module; for continuing the load group	
BU15-P16+A10+2D	**6AG1193-6BP20-7DA0**
(Extended temperature range and exposure to media)	
BU type A0; BaseUnit (light) with 16 push-in terminals (1...16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)	
BU15-P16+A10+2B	**6AG1193-6BP20-7BA0**
(Extended temperature range and exposure to media)	
BU type A0; BaseUnit (dark) with 16 push-in terminals (1...16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for continuing the load group	

	Article No.
Accessories	See SIMATIC ET 200SP, digital fail-safe input modules, page 9/155

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Overview



Digital fail-safe output module:
F-DQ 4x24VDC High Feature, BU type A0, color code CC01

Important features:

- 4-channel digital fail-safe output module for the ET 200SP
- Fail-safe 2-channel activation (sink/source output) of actuators
- Actuators can be controlled up to 2 A
- Certified up to SIL 3 (IEC 61508), PL e (ISO 13849)
- Can be plugged into type A0 BaseUnits (BU) with automatic coding
- LED display for error, operation, supply voltage and status
- Clear labeling on front of module
  - Plain text identification of the module type and function class
  - 2D matrix code (order and serial number)
  - Connection diagram
  - Color coding of the module type DI: white
  - Hardware and firmware version
  - Color code CC for module-specific color coding of the potentials at the terminals of the BU
  - Complete article number
- Optional labeling accessories
  - Labeling strips
  - Equipment labeling plate
- Optional module-specific color identification of the terminals according to the color code CC
- Optional system-integrated shield connection
- The modules support PROFIsafe in both PROFIBUS and PROFINET configurations
- They can be used with all fail-safe SIMATIC S7 CPUs

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

Technical specifications

Article number	**6AG1136-6DB00-2CA0**	**6AG1136-6DC00-2CA0**
Based on	**6ES7136-6DB00-0CA0**	**6ES7136-6DC00-0CA0**
	SIPLUS ET 200SP F-DQ 4x24VDC/2A PM HF	SIPLUS ET 200SP F-DQ 8x24VDC/0.5A PP HF
Ambient conditions		
Ambient temperature during operation		
• horizontal installation, min.	-25 °C	-25 °C; = Tmin
• horizontal installation, max.	60 °C	60 °C; = Tmax
• vertical installation, min.	-25 °C	-25 °C
• vertical installation, max.	50 °C	50 °C
Altitude during operation relating to sea level		
• Installation altitude above sea level, max.	2 000 m	2 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)
Relative humidity		
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; incl. condensation / frost permitted (no commissioning under condensation conditions)
Resistance		
Coolants and lubricants		
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems		
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *

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Technical specifications (continued)

Article number	6AG1136-6DB00-2CA0	6AG1136-6DC00-2CA0
Based on	6ES7136-6DB00-0CA0	6ES7136-6DC00-0CA0
	SIPLUS ET 200SP F-DQ 4x24VDC/2A PM HF	SIPLUS ET 200SP F-DQ 8x24VDC/0.5A PP HF
Use on ships/at sea		
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Remark		
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating		
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability	Yes; Class 2 for high availability
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A
Dimensions		
Width	15 mm	15 mm
Height	73 mm	73 mm
Depth	58 mm	58 mm
Weights		
Weight, approx.	57 g	48 g

Ordering data

	Article No.
SIPLUS digital fail-safe output modules	
(Extended temperature range and exposure to environmental substances)	
F-DQ 4x24 V DC High Feature, BU type A0, color code CC01	**6AG1136-6DB00-2CA0**
F-DQ 8x24 V DC High Feature, PP-switching, BU type A0, color code CC01	**6AG1136-6DC00-2CA0**
Usable BaseUnits	
BU15-P16+A0+2D	**6AG1193-6BP00-7DA0**
(Extended temperature range and exposure to environmental substances)	
BU type A0; BaseUnit (light) with 16 push-in terminals to the module; for starting a new load group (max. 10 A)	
BU15-P16+A0+2B	**6AG1193-6BP00-7BA0**
(Extended temperature range and exposure to environmental substances)	
BU type A0; BaseUnit (dark) with 16 push-in terminals to the module; for continuing the load group	
BU15-P16+A10+2D	**6AG1193-6BP20-7DA0**
(Extended temperature range and exposure to environmental substances)	
BU type A0; BaseUnit (light) with 16 push-in terminals (1 ... 16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)	
BU15-P16+A10+2B	**6AG1193-6BP20-7BA0**
(Extended temperature range and exposure to environmental substances)	
BU type A0; BaseUnit (dark) with 16 push-in terminals (1 ... 16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for continuing the load group	
BU20-P12+A4+0B	**6AG1193-6BP20-7BB0**
(Extended temperature range and exposure to environmental substances)	
BU type B0; BaseUnit (dark) with 12 push-in terminals (1...12) to the module and an additional 4 internally jumpered AUX terminals (1 A to 4 A); for continuing the load group; 1 unit	
Accessories	See SIMATIC ET 200SP, digital F-output modules, page 9/158

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Overview



The digital F electronic module relay 1 F-RQ DC 24VDC/ 24.230VAC/5 A has the following characteristics:

- 1 relay output (2 NO contacts)
- Total output current 5 A
- Rated load voltage 24 V DC and 24 ... 230 V AC
- The control circuit of the two safety relays must be routed from the outside to the respective terminals.

The attainable safety integrity level is SIL 3 (IEC 61508) when the control of the F-RQ module is implemented via a fail-safe output (e.g. ET 200SP 4F-DQ 24 V DC/2 A PROFIsafe).

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

Technical specifications

Article number	**6AG1136-6RA00-2BF0**
Based on	**6ES7136-6RA00-0BF0** SIPLUS ET 200SP F-RQ 24VDC/24-230VAC/5A
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-25 °C; = Tmin
• horizontal installation, max.	60 °C; = Tmax
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	2 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance	
Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
Article number	**6AG1136-6RA00-2BF0**
Based on	**6ES7136-6RA00-0BF0** SIPLUS ET 200SP F-RQ 24VDC/24-230VAC/5A
Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
Remark	
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A

Ordering data

	Article No.
SIPLUS digital F-output module relay 1 F-RQ (Extended temperature range and exposure to media)	
BU type F0, relay output (2 NO contacts), total output current 5 A, load voltages 24 V DC and 24 ... 230 V AC; can be used up to SIL3/Category 4/PL e if controlled via F-DQ	**6AG1136-6RA00-2BF0**
Usable BaseUnits	
BU20-P8+A4+0B (Extended temperature range and exposure to media)	**6AG1193-6BP20-2BF0**
BU type F0; BaseUnit (dark) with 8 push-in terminals to the module and an additional 4 internally jumpered AUX terminals (1 A to 4 A); for continuing the load group	
Accessories	See SIMATIC ET 200SP, digital F-output module relay, page 9/161

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Overview



Digital fail-safe power module:
F-PM-E PPM 24VDC/8A for BU type C0,
color code CC52

Important features:

- Certified up to SIL 3 (IEC 61508), PL e (ISO 13849)
- Safety-related shutdown of output modules within the potential group of the F-PM-E
- Two fail-safe digital inputs, for reading of sensor information (1 or 2 channels)
- One fail-safe digital output onboard (ppm switching, up to 2 A, up to SIL 3/PL e)
- Fail-safe digital output and potential supply pp or pm switching can be configured
- Configurable onboard evaluation of the fail-safe inputs for control of the fail-safe digital output and of the potential group
- Digital standard output modules can be shut down up to PL d (ISO 13849) and SIL 2 (IEC61508) (up to 8 A).
- Can be plugged into type C0 BaseUnits (BU) with automatic coding
- LED display for error, operation, supply voltage and status
- Clear labeling on front of module
  - Plain text identification of the module type and function class
  - 2D matrix code (order and serial number)
  - Connection diagram
  - Color coding of the module type DI: white
  - Hardware and firmware version
  - Color code CC for module-specific color coding of the potentials at the terminals of the BU
  - Complete article No.
- Optional labeling accessories
  - Labeling strips
  - Equipment labeling plate
- Optional module-specific color identification of the terminals according to the color code CC
- Optional system-integrated shield connection
- The modules support PROFIsafe in both PROFIBUS and PROFINET configurations.
- They can be used with all fail-safe SIMATIC S7 CPUs.

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were adopted from the respective standard products. SIPLUS extreme specific information was added.

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Technical specifications

Article number	**6AG1136-6PA00-2BC0**
Based on	**6ES7136-6PA00-0BC0** SIPLUS ET 200SP F-PM-E 24VDC/8A PPM
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-25 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	-25 °C
• vertical installation, max.	50 °C
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	2 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance	
Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *

Article number	**6AG1136-6PA00-2BC0**
Based on	**6ES7136-6PA00-0BC0** SIPLUS ET 200SP F-PM-E 24VDC/8A PPM
Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
Remark	
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A

Ordering data

	Article No.
SIPLUS digital F power module F-PM-E 24 V DC/8 A PPM Standard (Extended temperature range and exposure to media) BU type C0, color code CC52. 2 inputs, 1 output, SIL3/Cat.4/PLe	**6AG1136-6PA00-2BC0**
Type C0 BaseUnits	
BU20-P6+A2+4D (Extended temperature range and exposure to media) BU type C0; BaseUnit (light) with 6 push-in terminals (1...6) to the module and an additional 2 AUX terminals; new load group	**6AG1193-6BP20-7DC0**

	Article No.
Accessories	See SIMATIC ET 200SP, special fail-safe modules, page 9/166

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Overview



F-CM AS-i Safety ST for SIMATIC ET 200SP

The FCM AS-i Safety ST fail-safe communication module supplements an AS-Interface network without additional wiring to produce a safety-related AS-i network.

Important features:

- Fail-safe communication module for the ET 200SP
  - 31 fail-safe input channels in the process image
  - 16 fail-safe output channels in the process image
  - Certified up to SIL 3 (IEC 61508/EN 62061), PL e (EN ISO 13849-1)
  - Parameterization conforms with other fail-safe I/O modules of the ET 200SP
- The communication module supports PROFIsafe in PROFINET and PROFIBUS configurations. It can be used with fail-safe SIMATIC S7-300F/S7-400F CPUs and S7-1500F CPUs and also the fail-safe versions of the ET 200SP station with ET 200SP F-CPU 1510SP F / 1512SP F (firmware V1.8 or higher) or 1515SP PC F.
- For reading up to 31 fail-safe AS-i input slaves
  - Two sensor inputs/signals for each fail-safe AS-i input slave
  - Adjustable evaluation of sensor signals: two-channel or 2 x single-channel
  - Integrated discrepancy evaluation in the case of two-channel signals
  - Integrated AND operation in the case of 2 x single-channel signals
  - Input delay can be parameterized
  - Start-up test can be set
  - Sequence monitoring can be activated
- For control of up to 16 fail-safe AS-i output circuit groups
  - The output circuit groups are controlled independently of one another
  - One output circuit group can act on one or more actuators (e.g. to switch drives simultaneously)
  - An actuator (e.g. a contactor) is interfaced via an AS-i safety output module (e.g. SlimLine S45F safety module, Article No. 3RK1405-1SE15-0AA2; see https://mall.industry.siemens.com/mall/en/WW/Catalog/Products/10011823?tree=CatalogTree).
  - Simple fault acknowledgment via the process image
- Simple module replacement thanks to automatic importing of the safety parameters from the coding element
- Comprehensive diagnostic options
- Can be plugged onto type C1 or type C0 BaseUnits (BU)
- Informative automatic alarm indications (firmware V1.0.1 or higher)
- Supply via AS-Interface voltage
- Eight LED indicators for diagnostics, operating state, fault indication and supply voltage
- Informative front-side module inscription
  - Plain-text marking of the module type and function class
  - 2D matrix code (Article No. and serial number)
  - Connection diagram
  - Color coding of the CM module type: light gray
  - Hardware and firmware version
  - Complete Article No.
- Optional labeling accessories
  - Labeling strips
  - Equipment labeling plate

Design

The fail-safe F-CM AS-i Safety ST module has an ET 200SP module enclosure with a width of 20 mm.

One AS-i master according to the AS-i Specification V3.0, as well as fail-safe AS-i input slaves and/or AS-i safety output modules are needed for operation. The CM AS-i Master ST communication module (Article No. 3RK7137-6SA00-0BC1) is recommended as the AS-i master for the ET 200SP, see page 9/122.

Simple combination of the CM AS-i Master ST and F-CM AS-i Safety ST modules in one ET 200SP station results in a powerful, safety-oriented router between PROFINET (or PROFIBUS) and AS-Interface, which can be expanded further in a modular fashion.



Combination of an ET 200SP interface module, CM AS-i Master ST and F-CM AS-i Safety ST

With the digital and analog I/O modules of the ET 200SP, additional local inputs and outputs can be realized so as to ensure that the modular AS-i router complies precisely with customer requirements. Expansion variants for almost every application are possible thanks to the selection of standard and fail-safe I/O modules.

Besides the single AS-i master, double, triple or generally multiple masters can be realized with or without fail-safe functionality.

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Overview (continued)

Supported BaseUnits

With the combination of the CM AS-i Master ST and F-CM AS-i Safety ST modules, the CM module is plugged onto a light type C0 BaseUnit and, directly to the right of it, the F-CM module is plugged onto a dark type C1 BaseUnit. The AS-i cable is connected only on the light BaseUnit of the CM module.

Notes on security

In order to protect plants, systems, machines and networks against cyber threats, it is necessary to implement – and continuously maintain – a holistic, state-of-the-art industrial security concept. Siemens products and solutions only represent one component of such a concept.

For more information on Industrial Security, see http://www.siemens.com/industrialsecurity.

Configuration

The following software is required for configuration of the F-CM AS-i Safety ST module:

- STEP 7 (TIA Portal) V13 and higher with HSP 0070[1)] and Safety Advanced.
  For connection to S7-1500F you require STEP 7 V13 SP1. When configuring with STEP 7 V13 SP1, the latest version of HSP 0070 V2.0 (or higher) is an essential prerequisite. STEP 7 Safety V13 SP1 Update 4 and HSP 0070 V3.0 (or higher) are needed for configuration of the F-CM AS-i Safety ST module in an ET 200SP station with ET 200SP F-CPU 1510SP F / 1512SP F (firmware V1.8 or higher) or 1515SP PC F.

or

- STEP 7 (classic) V5.5 SP3 HF4 or higher with HSP 2093[2)] and Distributed Safety V5.4 SP5 or F-Configuration Pack SP11 or SIMATIC S7 F/FH Systems

Configuration and programming are done entirely in the STEP 7 user interface. No additional configuration software is needed for commissioning.

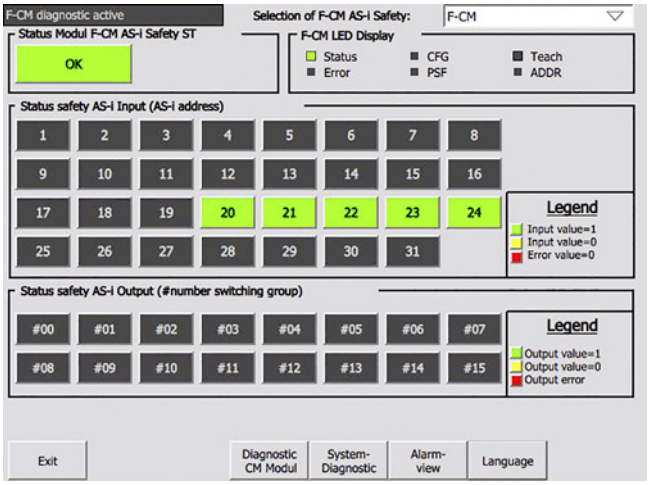
Data management – together with all other configuration data of the SIMATIC – is realized completely in the S7 project.

The input and output channels are assigned to the process image automatically and manual linking via configuration function blocks is not necessary.

If the F-CM AS-i Safety ST module is replaced, all necessary settings are automatically imported into the new module.

The F-CM AS-i Safety ST module occupies 16 input bytes and 8 output bytes in the I/O data of the ET 200SP station.

For diagnostics during ongoing operation, diagnostics blocks with clearly arranged visualization on the SIMATIC HMI panel are available or can be downloaded free of charge via a web browser, see https://support.industry.siemens.com/cs/ww/en/view/109479103.



Diagnostic block for F-CM AS-i Safety ST

1) HSP 0070 see https://support.industry.siemens.com/cs/ww/en/view/72341852.

2) HSP 2093 see https://support.industry.siemens.com/cs/ww/en/view/23183356.

Application

Thanks to use of the fail-safe module in the ET 200SP, it is possible to fulfill the safety-related application requirements in a manner that is integrated in the overall automation solution.

The safety functions required for fail-safe operation are integrated in the modules. Communication with the fail-safe SIMATIC S7 CPUs is realized via PROFIsafe.

The safety application is programmed in the SIMATIC S7 F-CPU with Distributed Safety / S7 F/FH Systems / Safety Advanced. The fail-safe input signals of the ASIsafe slave modules are read via the AS-i bus line and are combined with any chosen further signals in the fail-safe program.

The fail-safe output signals can be output via safe SIMATIC output modules or also directly via AS-i – with the help of safe AS-i output modules, e.g. SlimLine S45F safety modules, article number 3RK1405-1SE15-0AA2 (see https://mall.industry.siemens.com/mall/en/WW/Catalog/Products/10011823?tree=CatalogTree).
No special functions are required for this in the program.

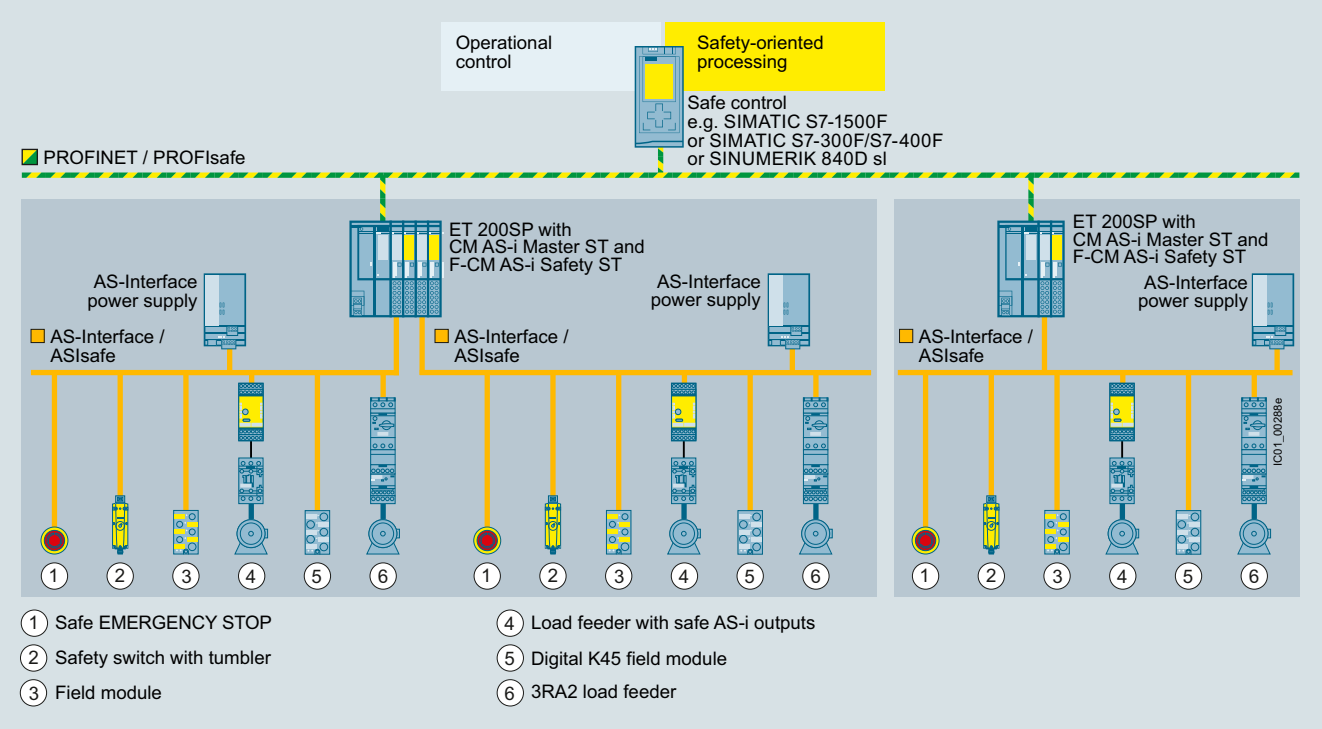
Operation with SINUMERIK 840D sl is possible with SINUMERIK software version V4.7 SP2 HF1 or higher.

Together with an ET 200SP F-CPU 1510SP F / 1512SP F (firmware V1.8 and higher) or 1515SP PC F, pre-processing of safe AS-i signals directly in the ET 200SP station is possible, as well as the configuration of an autonomous AS-i Safety station without a higher-level CPU.

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Application (continued)

Configuration examples of AS-Interface networks with CM AS-i Master ST and F-CM AS-i Safety ST for SIMATIC ET 200SP



AS-Interface configuration comprising an ET 200SP station with CM AS-i Master ST and F-CM AS-i Safety ST modules

9

Ordering data

	Article No.
F-CM AS-i Safety ST communication module • Fail-safe module for SIMATIC ET 200SP, can be plugged onto BaseUnit type C1 (alternatively type C0) • Operation requires an AS-i master, e.g. CM AS-i Master ST • Can be used up to SIL 3 (IEC 62061/IEC 61508), PL e (EN ISO 13849-1) • Coding element type H (included in scope of supply) • Dimensions (W x H x D / mm): 20 x 73 x 58	**3RK7136-6SC00-0BC1**
Accessories	
BaseUnit BU20-P6+A2+4B • BaseUnit (dark), BU type C1 • Suitable for the F-CM AS-i Safety ST fail-safe module • Continuation of an AS-i network, connection with the AS-i voltage of the left-hand module • Spring-type terminals	**6ES7193-6BP20-0BC1**
Coding element type H (spare part) • For the ET 200SP modules F-CM AS-i Safety ST and CM 4xIO-Link • Packing unit 5 items	**6ES7193-6EH00-1AA0**
More accessories,	see CM AS-i Master ST communication modules, page 9/124

More information

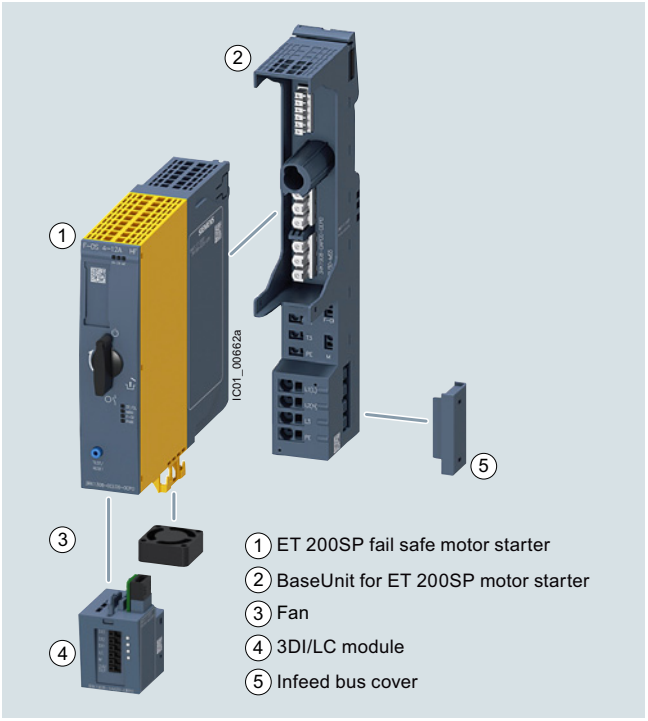
SIMATIC ET200SP Manual Collection, see https://support.industry.siemens.com/cs/ww/en/view/84133942

Diagnostic blocks with visualization, see https://support.industry.siemens.com/cs/ww/en/view/109479103

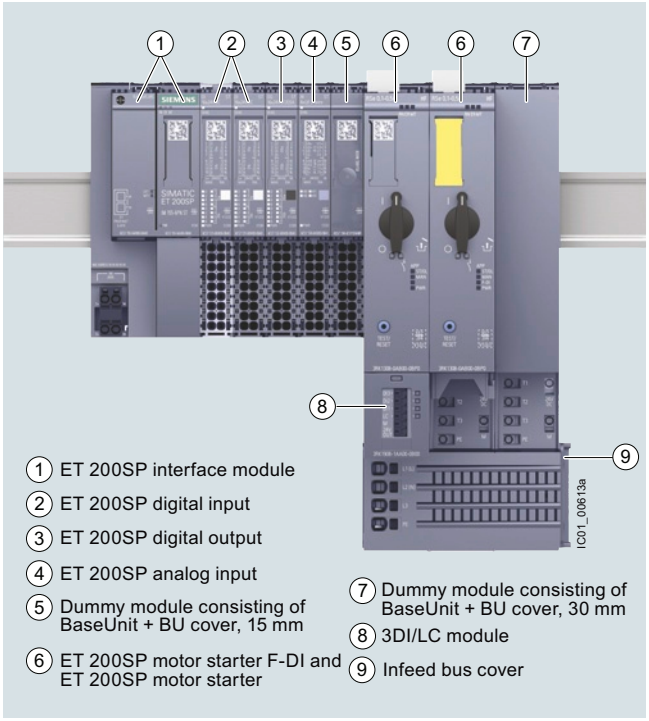
Released combinations of the AS-i modules for ET 200SP, see https://support.industry.siemens.com/cs/ww/en/view/103624653

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Overview



Motor starter, BaseUnit, fan and 3DI/LC control module



3RK1308 motor starter in the ET 200SP I/O system

More information

Homepage, see www.siemens.com/ET200SP-motorstarter
Industry Mall, see www.siemens.com/product?3RK1308
TIA Selection Tool, see www.siemens.com/TST

Further components in the ET 200SP distributed I/O system, see Industry Mall, www.siemens.com/product?ET200SP

ET 200SP motor starters

ET 200SP is a scalable and extremely flexible modular I/O system with IP20 degree of protection.

As I/O modules, the ET 200SP motor starters are an integral part of this I/O system. They are switching and protection devices for single- and three-phase loads and are available as direct-on-line or reversing starters.

Basic functionality

All versions of the ET 200SP motor starter feature the following functionality:

- Fully pre-wired motor starters for switching and protecting any AC loads up to 5.5 kW from 48 V AC to 500 V AC
- Disconnection possible via fail-safe motor starters up to SIL 3 and PL e Cat. 4
- With self-assembling 32 A power bus, i.e. the load voltage is only fed in once for a group of motor starters
- All control supply voltages connected only once, i.e. when modules are added they are automatically connected to the next module
- Hot swapping is permissible
- Digital inputs can optionally be used via a 3DI/LC module
- Control of the motor starter from the control system and extensive diagnostics status via the cyclic process image
- Diagnostics capability for active monitoring of the switching and protection functions
- The signal states in the process image of the motor starter provide information about protective devices (short circuit or overload), the switching states of the motor starter, and system faults.

Use of fan

For motor starters with a 12 A rated current, the 3RW4928-8VB00 fan is included in the scope of supply.

This fan can also be ordered as an option for motor starters with lower rated currents, if the boundary conditions demand this. For information on the ambient conditions for the use of motor starters, see chapter "Product overview" in the manual.

Designing interference-free motor starters

For interference-free operation of the ET 200SP station in accordance with IEC 60947-4-2 standard, use a dummy module before the first motor starter. The dummy module consists of the 6ES7193-6BP00-0BA0 or 6ES7193-6BP00-0DA0 BaseUnit and the 6ES7133-6CV15-1AM0 BU cover 15 mm.

The 15 mm BU cover protects the plug contacts of the BaseUnit against dirt.

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Electromechanical switching devices in series with hybrid motor starters

Switching an inductive load - in particular of motors <1 kW with high inductance - with an electromechanical switching device (e.g. contactor) can cause high and steep voltage edges.

The resulting faults/damage can be prevented by first disconnecting with the hybrid motor starter or by using EMC suppression modules:

- For 3RT2916-1P.. EMC suppression modules for direct mounting on the contactor, see https://mall.industry.siemens.com/mall/en/WW/Catalog/Products/10047575
- For motor suppression modules that are fitted in the main circuit, see page 9/186

Note:

For more information, see https://support.industry.siemens.com/cs/ww/en/view/109758696.

BaseUnits for motor starters

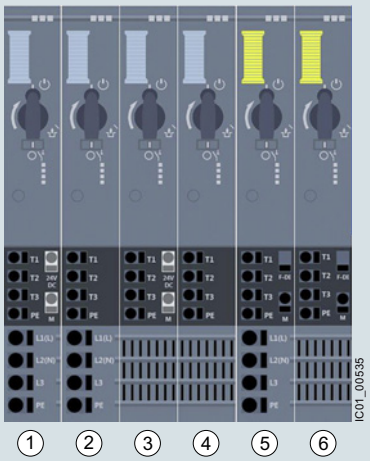
BaseUnits are components for accommodating the ET 200SP I/O modules.

The self-assembling voltage buses integrated into the terminal modules reduce wiring outlay to the single infeed (both of auxiliary and load voltage).

All modules following on the right are automatically supplied upon plugging the BaseUnits together, if BaseUnits are inserted with routing.

The rugged design and keyed connection technology enables use in harsh industrial conditions.

The BaseUnits are available with various infeeds for the motor starters.



View of the BaseUnit infeeds for the motor starters

3DI/LC control module

This is a digital input module with three inputs for local motor starter functions such as "manual local control", "implementation of fast inputs" or "end position disconnection". For a list of all the functions permitted by the 3DI/LC module, see chapter "Overview of functions" in the manual.

The module is plugged into the front of the motor starter from which it is supplied with a 24 V DC operating voltage.

Article No. scheme

Product versions		Article number												
Motor starters		**3RK1308 – 0**	**□**	**□**	**0**	**0**	**–**	**0**	**C**	**P**	**0**			
Product function	Direct-on-line starter		**A**											for motor standard output 0.12 ... 5.5 kW[1]
	Reversing starters		**B**											for motor standard output 0.12 ... 5.5 kW[1]
	Fail-safe direct-on-line starters		**C**											for motor standard output 0.12 ... 5.5 kW[1]
	Fail-safe reversing starters		**D**											for motor standard output 0.12 ... 5.5 kW[1]
Current range	0.3 ... 1 A			**B**										maximum current-carrying capacity when starting 10 A
	0.9 ... 3 A			**C**										maximum current-carrying capacity when starting 30 A
	2.8 ... 9 A			**D**										maximum current-carrying capacity when starting 90 A
	4 ... 12 A			**E**										including fan (3RW4928-8VB00), maximum current-carrying capacity when starting 100 A
Example		**3RK1308 – 0**	**A**	**D**	**0**	**0**	**–**	**0**	**C**	**P**	**0**			

[1] For standard motors: Single- or three-phase asynchronous motors, single-phase AC motors, single-phase asynchronous motors, at 400 V AC and 500 V AC; the actual startup characteristics of the motor as well as its rated data are important factors here.

Product versions		Article number												
BaseUnit		**3RK1908 – 0**	**A**	**P**	**0**	**0**	**–**	**0**	**□**	**P**	**0**			
BU infeed	24 V DC and 500 V AC								**A**					
	24 V DC								**B**					
	500 V AC								**C**					
	without infeed								**D**					
	500 V AC								**E**					with F-DI for fail-safe motor starters
	without infeed								**F**					with F-DI for fail-safe motor starters
Example		**3RK1908 – 0**	**A**	**P**	**0**	**0**	**–**	**0**	**A**	**P**	**0**			

Note:

The article number schemes show an overview of product versions for better understanding of the logic behind the article numbers.

For your orders, please use the article numbers quoted in the selection and ordering data.

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Benefits

Product advantages

The ET 200SP motor starters offer a number of advantages:

- Fully integrated into the ET 200SP I/O system (including TIA Selection Tool and TIA Portal)
- High degree of flexibility when it comes to safety applications via SIMATIC F-CPU or 3SK safety relays up to SIL 3 and PL e Cat. 4.
- Simple, integrated current value transmission
- Extensive parameterization by means of TIA Portal
- Increase of plant availability through fast replacement of units (easy mounting and plug-in technology)
- Greater endurance and reduced heat losses thanks to hybrid technology
- Less space required in the control cabinet (20 to 80%) as a result of greater functional density (direct-on-line and reversing starters in same width)
- Extensive diagnostics and information for preventive maintenance
- Parameterizable inputs via 3DI/LC control module
- Less wiring and testing required as a result of integrating several functions into a single device
- Lower overheads for stock keeping and configuration as a result of the wide setting range of the electronic overload release (up to 1:3)
- Technology has lower inherent power losses than speed-controlled drive systems, so that less cooling (and smaller footprint) are possible (and enabling a more compact design)
- The ET 200SP motor starters can be used with highly energy-efficient IE3/IE4 motors, see Application Manual.
  Take the current characteristics of the connected motor and motor starter into account when dimensioning.
  In addition to the rated current, the maximum permissible current range of the motor starter and the ratio of the rated current to the starting current of the motor are relevant.
  For more information on IE3/IE4, see www.siemens.com/IE3ready.

Standards and approvals

- IEC/EN 60947-4-2
- UL 60947-4-2
- CSA
- ATEX
- IEC 61508-1: SIL 3
- ISO 13849: PL e
- CCC approval for China

Application

The ET 200SP motor starters are suitable for the following applications:

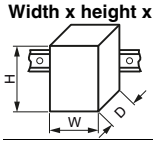
- Switching and monitoring of
  - three-phase motors with overload and short-circuit protection (e.g. 400 V asynchronous motors for secondary drives in conveyor systems)
  - single-phase motors with overload and short-circuit protection (e.g. 230 V motors for pump applications)
  - resistive loads by means of current value and diagnosis via the maintenance function (e.g. for heaters)
- Plant monitoring and energy management in conveyor systems:
  By means of the phase asymmetry and zero current detection during current measurement, for example, drive belt monitoring and blocking monitoring are possible.
- Track switching and lifting table control in conveyor systems:
  Track switches can be implemented using the quick stop function and lifting table controls by means of the "immediate end position disconnection" function without any laborious programming.
- Safe isolation of the drive from main power supply:
  The isolating functions according to IEC 60947-1 offer protection against inadvertent activation during plant maintenance.

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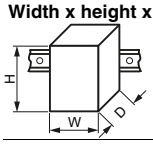
Technical specifications

More information	
Industry Mall, see www.siemens.com/product?3RK1308	FAQs, see https://support.industry.siemens.com/cs/ww/en/ps/21800/faq
Manual, see https://support.industry.siemens.com/cs/ww/en/view/109479973	

ET 200SP motor starters

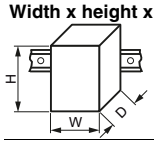
Article number		3RK1308-0AB00-0CP0 3RK1308-0BB00-0CP0	3RK1308-0AC00-0CP0 3RK1308-0BC00-0CP0	3RK1308-0AD00-0CP0 3RK1308-0BD00-0CP0	3RK1308-0AE00-0CP0 3RK1308-0BE00-0CP0
Product designation		**Motor starters**			
General technical specifications:					
Width x height x depth 	mm	30 × 142 × 150			
Design of the switch contact		Hybrid			
Design of the motor protection		Electronic			
Installation altitude at height above sea level, maximum	m	4 000			
Mounting position		Vertical, horizontal, flat (observe derating)			
Type of mounting		Can be plugged into BaseUnit			
Ambient temperature					
• During operation	°C	-25 ... +60			
• During transport	°C	-40 ... +70			
• During storage	°C	-40 ... +70			
Relative humidity during operation	%	10 ... 95			
Vibration resistance		15 mm up to 6 Hz; 2 *g* up to 500 Hz			
Shock resistance		6 *g* / 11 ms			
Degree of protection		IP20			
Type of coordination		1			
Electrical data:					
Supply voltage at DC rated value	V	24			
Operational power for AC-53a at 400 V rated value	kW	0.25	1.1	4	5.5
Operating frequency, rated value	Hz	50 ... 60			
Ultimate short-circuit current breaking capacity (I_{cu})					
• at 400 V rated value	kA	55			
• at 500 V rated value	kA	55			
Adjustable current response value of the inverse-time delayed overload release	A	0.3 ... 1	0.9 ... 3	2.8 ... 9	4 ... 12
Max. current carrying capacity at startup	A	10	30	90	100
Max. permissible voltage for protective separation between main and auxiliary circuit	V	500			
Insulation voltage, rated value	V	500			
Trip class		CLASS 5 and 10 adjustable			

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Article number		3RK1308-0CB00-0CP0 3RK1308-0DB00-0CP0	3RK1308-0CC00-0CP0 3RK1308-0DC00-0CP0	3RK1308-0CD00-0CP0 3RK1308-0DD00-0CP0	3RK1308-0CE00-0CP0 3RK1308-0DE00-0CP0
Product designation		**Fail-safe motor starter**			
General technical specifications:					
Width x height x depth	mm	30 × 142 × 150			
					
Design of the switch contact		Hybrid			
Design of the motor protection		Electronic			
Installation altitude at height above sea level, maximum	m	2 000			
Mounting position		Vertical, horizontal, flat (observe derating)			
Type of mounting		Can be plugged into BaseUnit			
Ambient temperature					
• During operation	°C	-25 ... +60			
• During transport	°C	-40 ... +70			
• During storage	°C	-40 ... +70			
Relative humidity during operation	%	10 ... 95			
Vibration resistance		15 mm up to 6 Hz; 2 *g* up to 500 Hz			
Shock resistance		6 *g* / 11 ms			
Degree of protection		IP20			
Type of coordination		1			
Electrical data:					
Supply voltage at DC rated value	V	24			
Operational power for AC-53a at 400 V rated value	kW	0.25	1.1	4	5.5
Operating frequency, rated value	Hz	50 ... 60			
Ultimate short-circuit current breaking capacity (I_{cu})					
• at 400 V rated value	kA	55			
• at 500 V rated value	kA	55			
Adjustable current response value of the inverse-time delayed overload release	A	0.3 ... 1	0.9 ... 3	2.8 ... 9	4 ... 12
Max. current carrying capacity at startup	A	10	30	90	100
Max. permissible voltage for protective separation between main and auxiliary circuit	V	500			
Insulation voltage, rated value	V	500			
Trip class		CLASS 5 and 10 adjustable			

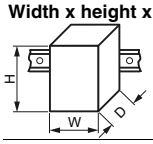
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BaseUnits for motor starters

Article number		3RK1908-0AP00-0AP0	3RK1908-0AP00-0BP0	3RK1908-0AP00-0CP0	3RK1908-0AP00-0DP0	3RK1908-0AP00-0EP0	3RK1908-0AP00-0FP0
Product designation		**BaseUnit**					
General technical specifications:							
Width x height x depth	mm	30 × 215 × 75					
							
Ambient temperature							
• During operation	°C	-25 ... +60					
• During transport	°C	-40 ... +70					
• During storage	°C	-40 ... +70					
Degree of protection		IP20					
Touch protection against electric shock		Finger-safe					
Connections/terminals:							
Type of connectable conductor cross-sections							
• at the inputs for supply voltage							
- Solid		1 x 0.5 ... 2.5 mm^2		--			
- Finely stranded with end sleeve		1 x 0.5 ... 2.5 mm^2		--			
- Finely stranded without end sleeve		1 x 0.5 ... 2.5 mm^2		--			
- Solid for AWG cables		1 x 20 ... 12		--			
• For infeed							
- Solid		1 x 1 ... 6 mm^2	--	1 x 1 ... 6 mm^2	--	1 x 1 ... 6 mm^2	--
- Finely stranded with end sleeve		1 x 1 ... 6 mm^2	--	1 x 1 ... 6 mm^2	--	1 x 1 ... 6 mm^2	--
- Finely stranded without end sleeve		1 x 1 ... 6 mm^2	--	1 x 1 ... 6 mm^2	--	1 x 1 ... 6 mm^2	--
- Solid for AWG cables		1 x 18 ... 10	--	1 x 18 ... 10	--	1 x 18 ... 10	--
• For load-side outgoing feeder							
- Solid		1 x 0.5 ... 2.5 mm^2					
- Finely stranded with end sleeve		1 x 0.5 ... 2.5 mm^2					
- Finely stranded without end sleeve		1 x 0.5 ... 2.5 mm^2					
- Solid for AWG cables		1 x 20 ... 12					
Type of electrical connection for auxiliary and control circuits		Spring-type terminals (push-in)					
Miscellaneous:							
Type of screwdriver tip		Slotted					
Size of screwdriver tip		Standard screwdriver 0.6 mm x 3.5 mm					

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3DI/LC control module

Article number		**3RK1908-1AA00-0BP0**
Product designation		**3DI/LC control module**
General technical specifications:		
Width x height x depth	mm	30 × 54.5 × 42.3
		
Type of product		Accessories
Number of digital inputs		4
Installation altitude at height above sea level, maximum	m	2 000
Mounting position		Vertical, horizontal, flat
Type of mounting		Can be plugged onto motor starter
Ambient temperature		
• During operation	°C	-25 ... +60
• During transport	°C	-40 ... +70
• During storage	°C	-40 ... +70
Connections/terminals:		
Connectable conductor cross-section for auxiliary contacts		
• Solid or stranded	mm^2	0.2 ... 1.5
• Finely stranded with end sleeve	mm^2	0.25 ... 1.5
• Finely stranded without end sleeve	mm^2	0.2 ... 1.5
AWG number as coded connectable conductor cross-section for auxiliary contacts		24 ... 16
Type of electrical connection for auxiliary and control circuits		Spring-type terminals (push-in)
Electrical data:		
Type of voltage of the control supply voltage		DC
Control supply voltage at DC rated value	V	20.4 ... 28.8
Miscellaneous:		
Type of screwdriver tip		Slotted
Size of screwdriver tip		Standard screwdriver 0.6 mm x 3.5 mm

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Selection and ordering data

	Adjustable current response value of the inverse-time delayed overload release	Max. current carrying capacity at startup	Article No.
	A	A	
Motor starters			
	Direct-on-line starters		
 3RK1308-0AB00-0CP0	0.3 ... 1 0.9 ... 3 2.8 ... 9 4 ... 12	10 30 90 100	**3RK1308-0AB00-0CP0** **3RK1308-0AC00-0CP0** **3RK1308-0AD00-0CP0** **3RK1308-0AE00-0CP0**
	Reversing starters		
 3RK1308-0BB00-0CP0	0.3 ... 1 0.9 ... 3 2.8 ... 9 4 ... 12	10 30 90 100	**3RK1308-0BB00-0CP0** **3RK1308-0BC00-0CP0** **3RK1308-0BD00-0CP0** **3RK1308-0BE00-0CP0**
Fail-safe motor starters			
	Fail-safe direct-on-line starters		
 3RK1308-0CE00-0CP0	0.3 ... 1 0.9 ... 3 2.8 ... 9 4 ... 12	10 30 90 100	**3RK1308-0CB00-0CP0** **3RK1308-0CC00-0CP0** **3RK1308-0CD00-0CP0** **3RK1308-0CE00-0CP0**
	Fail-safe reversing starters		
 3RK1308-0DE00-0CP0	0.3 ... 1 0.9 ... 3 2.8 ... 9 4 ... 12	10 30 90 100	**3RK1308-0DB00-0CP0** **3RK1308-0DC00-0CP0** **3RK1308-0DD00-0CP0** **3RK1308-0DE00-0CP0**

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Type of product	Operational voltage of the AC infeed	Supply voltage of the DC infeed	Push-in terminals Article No.
	V	V	
BaseUnits[1]			
For motor starters			
with AC/DC infeed	500	24	**3RK1908-0AP00-0AP0**
with DC infeed	--	24	**3RK1908-0AP00-0BP0**
with AC infeed	500	--	**3RK1908-0AP00-0CP0**
without infeed	--	--	**3RK1908-0AP00-0DP0**
with AC infeed, with F-DI for fail-safe motor starters	500	--	**3RK1908-0AP00-0EP0**
without AC infeed, with F-DI for fail-safe motor starters	--	--	**3RK1908-0AP00-0FP0**



3RK1908-0AP00-0AP0

[1] The voltage is looped-through from BaseUnits with infeed to subsequent BaseUnits.

Type of product	Supply voltage at DC rated value	Loop through the potential group from the left	Push-in terminals Article No.
	V		
BaseUnits			
For dummy modules			
dark, looping through the potential group	24	Yes	**6ES7193-6BP00-0BA0**
light, opening a new potential group	24	No	**6ES7193-6BP00-0DA0**



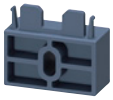
6ES7193-6BP00-0BA0

Control supply voltage at DC rated value	Product function		Push-in terminals Article No.
	Local control	Digital inputs parameterizable	
V			
3DI/LC control module			
20.4 ... 28.8	Yes	Yes	**3RK1908-1AA00-0BP0**



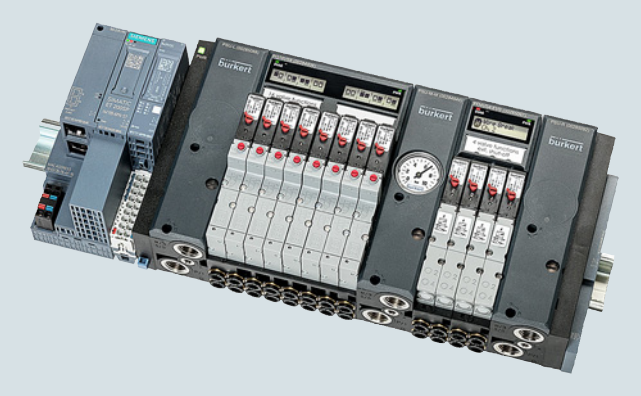
3RK1908-1AA00-0BP0

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	Product designation	Type of product	Article No.
Accessories			
 6ES7133-6CV15-1AM0	**BU cover 15 mm**	for BaseUnits Type A0 or A1	**6ES7133-6CV15-1AM0**
 3RK1908-1CA00-0BP0	**BU cover 30 mm**	For protection of empty slots, 30 mm	**3RK1908-1CA00-0BP0**
 3RK1908-1DA00-2BP0	**Infeed bus cover** (1 bag containing 10 covers)	For ET 200SP	**3RK1908-1DA00-2BP0**
 3RK1908-1EA00-1BP0	**Mechanical bracket** (1 bag containing 5 mechanical brackets)	Mechanical, for ET 200SP	**3RK1908-1EA00-1BP0**
 3RW4928-8VB00	**Fan**	Can be used for 3RK1308	**3RW4928-8VB00**
	Motor suppression module NEW		
 3RK1911-6EA00	• Square		**3RK1911-6EA00**
 3RK1911-6EB00	• Round		**3RK1911-6EB00**

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Overview



- For pneumatic control of actuators with ET 200SP
- Can be used together with system and IO components of the ET 200SP distributed I/O system.
- Product of the product partners Bürkert Fluid Control Systems, and can only be obtained from Bürkert Fluid Control Systems.

Note:

Product partners are external companies outside Siemens AG and its associated companies. Information and descriptions of products made by product partners are non-binding, and are the responsibility of the product partners. These products are manufactured independently and under the responsibility of the particular product partner, and are sold and supplied by it under its terms of business and delivery.

Unless compulsory by law, Siemens assumes no liability and makes no guarantee for for these products or for the connection with these products of the product partners. Please refer also to the note on exemption from liability/use of hyperlinks.

Benefits

- High process safety by using non-return valves and pneumatic infeed modules with pressure monitoring.
- System-wide detailed diagnostics in plain text, and also locally on an LC display
- Quick and easy valve change during operation (hot swapping)
- Reduced number of components in the control cabinet (compact control cabinet is possible)
- Quick installation & configuration of the pneumatic connections

Application

Valve terminals are widely used in industrial automation, and serve as pilot valves for controlling actuators in the food, pharmaceutical and water treatment industries. In combination with the AirLINE SP, type 8647 from the Bürkert Co., the ET 200SP forms a universal interface between process and plant control, and enables the flexible, modular structure of pilot valves and I/O modules. The valve terminal can also be attached to a control cabinet floor with an AirLINE Quick Adapter, which further reduces the space required in the control cabinet, and significantly simplifies the pneumatic installation.

More information

For more detailed information about the AirLINE SP, type 8647 (e.g. data sheet, operating manual) please contact Bürkert directly:

http://www.burkert.com/en/type/8647

Disclaimer of liability

This information and the descriptions have been compiled with great care. However, it is not possible for Siemens to verify that the data supplied by product partners is complete, correct and up-to-date. The possibility that individual items of information might be incorrect, incomplete, or not up-to-date cannot therefore be ruled out. Unless compulsory by law, Siemens accepts no liability for the usability of the data or of the products for the user per se.

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Overview



In terms of design and functionality, the SIMATIC ET 200SP PS single-phase load power supply with automatic range switching of the input voltage is perfectly matched to the SIMATIC ET 200SP. The SIMATIC component and the power supply are wired by means of uniform push-in terminal technology.
The 24 V supply provides power to the ET 200SP system components such as the interface module, technology module and communication module, as well as the digital or analog inputs/outputs. Comprehensive certifications, such as UL or GL, facilitate universal use. Its extremely flat design also makes this power supply ideally suited for installation in compact on-site control boxes.

Technical specifications

Article number	**6EP7133-6AB00-0BN0**	**6EP7133-6AE00-0BN0**
Product	SIMATIC ET 200SP PS	SIMATIC ET 200SP PS
Power supply, type	24 V/5 A	24 V/10 A
Input		
Input	1-phase AC	1-phase AC
• Note	Automatic range selection	Automatic range selection
Supply voltage		
• 1 at AC Rated value	120 V	120 V
• 2 at AC Rated value	230 V	230 V
Input voltage		
• 1 at AC	85 ... 132 V	85 ... 132 V
• 2 at AC	170 ... 264 V	170 ... 264 V
Wide-range input	No	No
Overvoltage resistance	2.3 × $V_{in\ rated}$, 1.3 ms	2.3 × $V_{in\ rated}$, 1.3 ms
Mains buffering at $I_{out\ rated}$, min.	20 ms; at V_{in} = 93/187 V	20 ms; at V_{in} = 93/187 V
Rated line frequency 1	50 Hz	50 Hz
Rated line frequency 2	60 Hz	60 Hz
Rated line range	47 ... 63 Hz	47 ... 63 Hz
Input current		
• at rated input voltage 120 V	2.16 A	4.34 A
• at rated input voltage 230 V	1.22 A	1.92 A
Switch-on current limiting (+25 °C), max.	45 A	60 A
I^2t, max.	3.15 $A^2 \cdot s$	6.3 $A^2 \cdot s$
Built-in incoming fuse	T 3,15 A/250 V (not accessible)	T 6.3 A/250 V (not accessible)
Protection in the mains power input (IEC 898)	recommended LS switch: B/C 6 A/3 A	recommended LS switch: B/C 10 A/6 A

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Technical specifications (continued)

Article number	**6EP7133-6AB00-0BN0**	**6EP7133-6AE00-0BN0**
Product	SIMATIC ET 200SP PS	SIMATIC ET 200SP PS
Power supply, type	24 V/5 A	24 V/10 A
Output		
Output	Controlled, isolated DC voltage	Controlled, isolated DC voltage
Rated voltage V_{out} DC	24 V	24 V
Total tolerance, static ±	3 %	3 %
Static mains compensation, approx.	0.1 %	0.1 %
Static load balancing, approx.	1 %	1 %
Residual ripple peak-peak, max.	150 mV	150 mV
Residual ripple peak-peak, typ.	50 mV	50 mV
Spikes peak-peak, max. (bandwidth: 20 MHz)	240 mV	240 mV
Spikes peak-peak, typ. (bandwidth: 20 MHz)	150 mV	150 mV
Adjustment range	22.8 ... 28 V	22.8 ... 28 V
Product function Output voltage adjustable	Yes	Yes
Output voltage setting	via potentiometer	via potentiometer
Status display	Green LED for 24 V OK	Green LED for 24 V OK
Signaling	Relay contact (NO contact, rating 60 V DC/ 0.3 A) for "24 V OK"	Relay contact (NO contact, rating 60 V DC/ 0.3 A) for "24 V OK"
On/off behavior	Overshoot of V_{out} < 3 %	Overshoot of V_{out} < 3 %
Startup delay, max.	0.3 s	0.3 s
Voltage rise, typ.	30 ms	30 ms
Rated current value $I_{out\ rated}$	5 A	10 A
Current range	0 ... 6 A	0 ... 12 A
• Note	5 A up to +60°C; +60 ... +70 °C: Derating 3%/K	10 A up to +60°C; +60 ... +70 °C: Derating 3%/K
Supplied active power typical	120 W	240 W
Short-term overload current		
• on short-circuiting during the start-up typical	15 A	30 A
• at short-circuit during operation typical	15 A	30 A
Duration of overloading capability for excess current		
• on short-circuiting during the start-up	800 ms	750 ms
• at short-circuit during operation	800 ms	800 ms
Parallel switching for enhanced performance	Yes	Yes
Numbers of parallel switchable units for enhanced performance	2	2
Efficiency		
Efficiency at $V_{out\ rated}$, $I_{out\ rated}$, approx.	88 %	90 %
Power loss at $V_{out\ rated}$, $I_{out\ rated}$, approx.	17 W	26 W
Power loss [W] during no-load operation maximum	2.7 W	2.8 W
Closed-loop control		
Dynamic mains compensation ($V_{in\ rated}$ ±15 %), max.	0.3 %	0.3 %
Dynamic load smoothing (I_{out}: 10/90/10 %), U_{out} ± typ.	3 %	3 %
Load step setting time 10 to 90%, typ.	1 ms	1 ms
Load step setting time 90 to 10%, typ.	1 ms	1 ms

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Technical specifications (continued)

Article number	6EP7133-6AB00-0BN0	6EP7133-6AE00-0BN0
Product	SIMATIC ET 200SP PS	SIMATIC ET 200SP PS
Power supply, type	24 V/5 A	24 V/10 A
Protection and monitoring		
Output overvoltage protection	protection against overvoltage in case of internal fault V_{out} < 31.8 V	protection against overvoltage in case of internal fault V_{out} < 31.8 V
Current limitation	7 ... 7.5 A	14 ... 15 A
Property of the output Short-circuit proof	Yes	Yes
Short-circuit protection	Constant current characteristic	Constant current characteristic
Enduring short circuit current RMS value		
• typical	7 A	14.1 A
Overcurrent overload capability in normal operation	overload capability 150 % I_{out} rated up to 5 s/min	overload capability 150 % I_{out} rated up to 5 s/min
Overload/short-circuit indicator	-	-
Safety		
Primary/secondary isolation	Yes	Yes
(galvanic isolation)	Safety extra-low output voltage U_{out} acc. to EN 60950-1 and EN 50178	Safety extra-low output voltage U_{out} acc. to EN 60950-1 and EN 50178
Protection class	Class I	Class I
Leakage current		
• maximum	3.5 mA	3.5 mA
• typical	1 mA	1 mA
CE mark	Yes	Yes
UL/cUL (CSA) approval	cULus-Listed (UL61010-2-201, CSA C22.2 No.142), cCSAus (CSA C22.2 No. 60950-1, UL 60950-1)	cULus-Listed (UL61010-2-201, CSA C22.2 No.142), cCSAus (CSA C22.2 No. 60950-1, UL 60950-1)
CB approval	Yes	Yes
Marine approval	BV, DNV GL	BV, DNV GL
Degree of protection (EN 60529)	IP20	IP20
EMC		
Emitted interference	EN 61000-6-3 Class B	EN 61000-6-3 Class B
Supply harmonics limitation	EN 61000-3-2	EN 61000-3-2
Noise immunity	EN 61000-6-2	EN 61000-6-2
Operating data		
Ambient temperature		
• during operation	-30 ... +70 °C	-30 ... +70 °C
- Note	with natural convection	with natural convection
• during transport	-40 ... +85 °C	-40 ... +85 °C
• during storage	-40 ... +85 °C	-40 ... +85 °C
Humidity class according to EN 60721	Climate class 3K3, no condensation	Climate class 3K3, no condensation
Mechanics		
Connection technology	Push-in terminals	Push-in terminals
Connections		
• Supply input	L, N, PE: 1 push-in terminal each for 0.2 ... 2.5 mm² single-core/finely stranded	L, N, PE: 1 push-in terminal each for 0.2 ... 2.5 mm² single-core/finely stranded
• Output	+, -: 2 push-in terminals each for 0.2 ... 2.5 mm²	+, -: 2 push-in terminals each for 0.2 ... 2.5 mm²
• Auxiliary	Signaling contact: 2 push-in terminals for 0.2 ... 2.5 mm²	Signaling contact: 2 push-in terminals for 0.2 ... 2.5 mm²
Connections signaling contact	2 push-in terminals for 0.2 ... 2.5 mm²	2 push-in terminals for 0.2 ... 2.5 mm²
Product function		
• removable terminal at input	Yes	Yes
• removable terminal at output	Yes	Yes

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Technical specifications (continued)

Article number	**6EP7133-6AB00-0BN0**	**6EP7133-6AE00-0BN0**
Product	SIMATIC ET 200SP PS	SIMATIC ET 200SP PS
Power supply, type	24 V/5 A	24 V/10 A
Width of the enclosure	160 mm	160 mm
Height of the enclosure	117 mm	117 mm
Depth of the enclosure	74 mm	74 mm
Required spacing		
• top	50 mm	50 mm
• bottom	50 mm	50 mm
• left	0 mm	0 mm
• right	0 mm	0 mm
Weight, approx.	0.5 kg	0.7 kg
Product feature of the enclosure housing for side-by-side mounting	Yes	Yes
Installation	Snaps onto DIN rail EN 60715 35x7.5/15	Snaps onto DIN rail EN 60715 35x7.5/15
Electrical accessories	Redundancy module, buffer module, selectivity module, DC UPS	Redundancy module, buffer module, selectivity module, DC UPS
MTBF at 40 °C	1 598 441 h	1 114 510 h
Other information	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)

Ordering data

	Article No.		Article No.
SIMATIC ET 200SP PS	**6EP7133-6AB00-0BN0**	**SIMATIC ET 200SP PS**	**6EP7133-6AE00-0BN0**
Stabilized power supply for SIMATIC ET 200SP Input: 120/230 V AC Output: 24 V DC/5 A		Stabilized power supply for SIMATIC ET 200SP Input: 120/230 V AC Output: 24 V DC/10 A	

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Overview



With the BaseUnits (BUs), the ET 200SP offers a rugged and service-friendly design with permanent wiring:

- No tools needed for one-handed wiring using push-in terminals
- Actuation of the spring NC contacts with a standard screwdriver, with a blade width up to 3.5 mm
- Outstanding access due to arrangement of measuring tap, spring NC contacts and cable entry in columns, while at the same time reducing the space required by 64%
- Fault-proof color coding of the spring NC contacts for better orientation in the terminal panel
- Replacement of I/O modules during operation without affecting the wiring
- Operation with module gaps (gaps without I/O module)
- Automatic coding of the I/O modules prevents destruction of the electronics if a module is accidentally inserted in the wrong slot during replacement
- High EMC interference immunity:
  - self-assembling shielded backplane bus
  - multi-layer conductor plate with shield levels for interference-free signal transmission from the terminal to the I/O module
  - system-integrated, space-saving shield connection for quick installation
- Self-assembling potential groups without external wiring or jumpers
- Replaceable terminal box
- Side-by-side latching of the BUs for high mechanical and EMC loads
- Optional module-specific color identification of the terminals according to the color code CC
- Optional equipment marking using slide-in equipment labeling plates

An ET 200SP station can be expanded via one 'BU-Send' BaseUnit with a “BA-Send” BusAdapter plugged onto it with up to 16 modules from the ET 200AL series of I/O devices with IP67 protection.

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Technical specifications

Article number	**6ES7193-6BP20-0DA0**	**6ES7193-6BP00-0DA0**	**6ES7193-6BP60-0DA0**	**6ES7193-6BP20-0BA0**	**6ES7193-6BP00-0BA0**	**6ES7193-6BP60-0BA0**
	BaseUnit Type A0, BU15-P16+A10+2D	BaseUnit Type A0, BU15-P16+A0+2D	2x BU Type A0, 2BU15-P16+A0+2DB, PU 1	BaseUnit Type A0, BU15-P16+A10+2B	BaseUnit Type A0, BU15-P16+A0+2B	2x BU Type A0, 2BU15-P16+A0+2B, PU 1
General information						
Product type designation	BU type A0	BU type A0	BU type A0	BU type A0	BU type A0	BU type A0
Ambient conditions						
Ambient temperature during operation						
• horizontal installation, min.	-30 °C	-30 °C	-30 °C	-30 °C	-30 °C	-30 °C
• horizontal installation, max.	60 °C	60 °C	60 °C	60 °C	60 °C	60 °C
• vertical installation, min.	-30 °C	-30 °C	-30 °C	-30 °C	-30 °C	-30 °C
• vertical installation, max.	50 °C	50 °C	50 °C	50 °C	50 °C	50 °C
Altitude during operation relating to sea level						
• Installation altitude above sea level, max.	2 000 m; On request: Installation altitudes greater than 2 000 m	2 000 m; On request: Installation altitudes greater than 2 000 m	2 000 m; On request: Installation altitudes greater than 2 000 m	2 000 m; On request: Installation altitudes greater than 2 000 m	2 000 m; On request: Installation altitudes greater than 2 000 m	2 000 m; On request: Installation altitudes greater than 2 000 m
Connection method						
Terminals						
• Terminal type	Push-in terminal	Push-in terminal	Push-in terminal	Push-in terminal	Push-in terminal	Push-in terminal
• Conductor cross-section, min.	0.14 mm^2; AWG 26	0.14 mm^2; AWG 26	0.14 mm^2; AWG 26	0.14 mm^2; AWG 26	0.14 mm^2; AWG 26	0.14 mm^2; AWG 26
• Conductor cross-section, max.	2.5 mm^2; AWG 14	2.5 mm^2; AWG 14	2.5 mm^2; AWG 14	2.5 mm^2; AWG 14	2.5 mm^2; AWG 14	2.5 mm^2; AWG 14
• Number of process terminals to I/O module	16	16	16; Pro slot	16	16; Pro slot	16; Pro slot
• Number of terminals to AUX bus	10	0	0	10	0	0
• Number of add-on terminals	0	0	0	0	0	0
• Number of terminals with connection to P1 and P2 bus	2	2	2; Pro slot	2	2; Pro slot	2; Pro slot
Dimensions						
Width	15 mm	15 mm	30 mm	15 mm	15 mm	30 mm
Height	141 mm	117 mm	117 mm	141 mm	117 mm	117 mm
Depth	35 mm	35 mm	35 mm	35 mm	35 mm	35 mm
Weights						
Weight, approx.	50 g	40 g	80 g	50 g	40 g	80 g

Article number	**6ES7193-6BP20-0BB0**	**6ES7193-6BP20-0BB1**	**6ES7193-6BP20-0DC0**	**6ES7193-6BP20-0BC1**	**6ES7193-6BP00-0BD0**	**6ES7193-6BP20-0BF0**
	BaseUnit Type B0, BU20-P12+A4+0B	BaseUnit Type B1, BU20-P12+A0+4B, PU 1	BaseUnit Type C0, BU20-P6+A2+4D	BaseUnit Type C1, BU20-P6+A2+4B	BaseUnit Type D0, BU20-P12+A0+0B	BaseUnit Type F0, BU20-P8+A4+0B
General information						
Product type designation	BU type B0	BU type B1	BU type C0	BU type C1	BU type D0	BU type F0
Dimensions						
Width	20 mm	20 mm	20 mm	20 mm	20 mm	20 mm
Height	117 mm	117 mm	117 mm	117 mm	117 mm	117 mm
Depth	35 mm	35 mm	35 mm	35 mm	35 mm	35 mm
Weights						
Weight, approx.	48 g	48 g	47 g	47 g	47 g	48 g

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Technical specifications (continued)

Article number	6ES7193-6BP40-0DA1	6ES7193-6BP00-0DA1	6ES7193-6BP40-0BA1	6ES7193-6BP00-0BA1
	BaseUnit Type A1, BU15-P16+A0+12D/T	BaseUnit Type A1, BU15-P16+A0+2D/T	BaseUnit Type A1, BU15-P16+A0+12B/T	BaseUnit Type A1, BU15-P16+A0+2B/T
General information				
Product type designation	BU type A1	BU type A1	BU type A1	BU type A1
Connection method				
Terminals				
• Terminal type	Push-in terminal	Push-in terminal	Push-in terminal	Push-in terminal
• Conductor cross-section, min.	0.14 mm^2; AWG 26	0.14 mm^2; AWG 26	0.14 mm^2; AWG 26	0.14 mm^2; AWG 26
• Conductor cross-section, max.	2.5 mm^2; AWG 14	2.5 mm^2; AWG 14	2.5 mm^2; AWG 14	2.5 mm^2; AWG 14
• Number of process terminals to I/O module	16	16	16	16
• Number of terminals to AUX bus	0	0	0	0
• Number of add-on terminals	0	0	0	0
• Number of terminals with connection to P1 and P2 bus	2	2	2	2
Dimensions				
Width	15 mm	15 mm	15 mm	15 mm
Height	141 mm	117 mm	141 mm	117 mm
Depth	35 mm	35 mm	35 mm	35 mm
Weights				
Weight, approx.	50 g	40 g	50 g	40 g

Article number	6ES7193-6BP00-0DU0	6ES7193-6BP00-0BU0
	BaseUnit Type U0, BU20-P16+A0+2D, PU 1	BaseUnit Type U0, BU20-P16+A0+2B, PU 1
General information		
Product type designation	BU type U0	BU type U0
Connection method		
Terminals		
• Terminal type	Push-in terminal	Push-in terminal
• Conductor cross-section, min.	0.14 mm^2; 0.2 mm^2 without wire end ferrule	0.14 mm^2; 0.2 mm^2 without wire end ferrule
• Conductor cross-section, max.	2.5 mm^2; 1.5 mm^2 with wire end ferrule	2.5 mm^2; 1.5 mm^2 with wire end ferrule
• Number of process terminals to I/O module	16	16
• Number of terminals to AUX bus	0	0
• Number of add-on terminals	0	0
• Number of terminals with connection to P1 and P2 bus	2	2
Dimensions		
Width	20 mm	20 mm
Height	117 mm	117 mm
Depth	35 mm	35 mm
Weights		
Weight, approx.	50 g	50 g

Article number	6ES7193-6BN00-0NE0
	ET 200SP, BaseUnit BU-Send
Dimensions	
Width	20 mm
Height	117 mm
Depth	35 mm
Weights	
Weight, approx.	30 g

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Ordering data	Article No.
Type A0 BaseUnits	
BU15-P16+A10+2D	
BU type A0; BaseUnit (light) with 16 push-in terminals (1 ... 16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)	
• 1 unit	**6ES7193-6BP20-0DA0**
• 10 units	**6ES7193-6BP20-2DA0**
BU15-P16+A0+2D	
BU type A0; BaseUnit (light) with 16 push-in terminals to the module; for starting a new load group (max. 10 A)	
• 1 unit	**6ES7193-6BP00-0DA0**
• 10 units	**6ES7193-6BP00-2DA0**
2BU15-P16+A0+2DB	
Double BaseUnit for holding 2 I/O modules; BU type A0; BaseUnit (light/dark) with 16 push-in terminals to the module; for starting a new load group (max. 10 A)	
• 1 unit	**6ES7193-6BP60-0DA0**
BU15-P16+A10+2B	
BU type A0; BaseUnit (dark) with 16 push-in terminals (1 ... 16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for continuing the load group	
• 1 unit	**6ES7193-6BP20-0BA0**
• 10 units	**6ES7193-6BP20-2BA0**
BU15-P16+A0+2B	
BU type A0; BaseUnit (dark) with 16 push-in terminals to the module; for continuing the load group	
• 1 unit	**6ES7193-6BP00-0BA0**
• 10 units	**6ES7193-6BP00-2BA0**
2BU15-P16+A0+2B	
Double BaseUnit for holding 2 I/O modules; BU type A0; BaseUnit (dark/dark) with 16 push-in terminals to the module; for continuing the load group	
• 1 unit	**6ES7193-6BP60-0BA0**
Type B0 BaseUnits	
BU20-P12+A4+0B	
BU type B0; BaseUnit (dark) with 12 push-in terminals (1...12) to the module and an additional 4 internally jumpered AUX terminals (1 A to 4 A); for continuing the load group; 1 unit	
• 1 unit	**6ES7193-6BP20-0BB0**
• 10 units	**6ES7193-6BP20-2BB0**
Type B1 BaseUnits	
BU20-P12+A0+4B	
BU type B1; BaseUnit (dark) with 12 push-in terminals to the module; for continuing the load group; 1 unit	
• 1 unit	**6ES7193-6BP20-0BB1**
• 10 units	**6ES7193-6BP20-2BB1**

Ordering data	Article No.
Type C0 BaseUnits	
BU20-P6+A2+4D	**6ES7193-6BP20-0DC0**
BU type C0; BaseUnit (light) with 6 push-in terminals (1 ... 6) to the module and an additional 2 AUX terminals; new load group	
Type C1 BaseUnits	
BU20-P6+A2+4B	**6ES7193-6BP20-0BC1**
BU type C1; BaseUnit (dark) with 6 push-in terminals (1 ... 6) to the module and an additional 2 AUX terminals; bridged to the left	
Type D0 BaseUnits	
BU20-P12+A0+0B	**6ES7193-6BP00-0BD0**
BU type D0; BaseUnit (dark) with 12 push-in terminals, without AUX terminals, bridged to the left	
Type A1 BaseUnits (with temperature detection)	
BU15-P16+A0+12D/T	**6ES7193-6BP40-0DA1**
BU type A1; BaseUnit (light) with 16 push-in terminals (1 ... 16) to the module and 2x5 internally jumpered additional terminals (1 B to 5 B and 1 C to 5 C); for starting a new load group (max. 10 A)	
BU15-P16+A0+2D/T	**6ES7193-6BP00-0DA1**
BU type A1; BaseUnit (light) with 16 push-in terminals to the module; for starting a new load group (max. 10 A)	
BU15-P16+A0+12B/T	**6ES7193-6BP40-0BA1**
BU type A1; BaseUnit (dark) with 16 push-in terminals (1 ... 16) to the module and 2x5 internally jumpered additional terminals (1 B to 5 B and 1 C to 5 C); for continuing the load group	
BU15-P16+A0+2B/T	**6ES7193-6BP00-0BA1**
BU type A1; BaseUnit (dark) with 16 push-in terminals to the module; for continuing the load group	
Type F0 BaseUnits	
BU20-P8+A4+0B	**6ES7193-6BP20-0BF0**
BU type F0; BaseUnit (dark) with 8 push-in terminals to the module and an additional 4 internally jumpered AUX terminals (1 A to 4 A); for continuing the load group	
BaseUnits type U0	
BU20-P16+A0+2D	
BU type U0; BaseUnit (light) with 16 push-in terminals to the module; for starting a new load group (max. 10 A)	
• 1 unit	**6ES7193-6BP00-0DU0**
• 10 units	**6ES7193-6BP00-2DU0**
BU20-P16+A0+2B	
BU type U0; BaseUnit (dark) with 16 push-in terminals to the module; for continuing the load group	
• 1 unit	**6ES7193-6BP00-0BU0**
• 10 units	**6ES7193-6BP00-2BU0**

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Ordering data

	Article No.
Station expansion with IP67 I/O system ET 200AL	
BaseUnit BU-Send	**6ES7193-6BN00-0NE0**
ET 200SP BusAdapter BA-Send 1 x FC	**6ES7193-6AS00-0AA0**
Accessories	
Equipment labeling plate	**6ES7193-6LF30-0AW0**
10 sheets of 16 labels	
BU cover	
For covering empty slots (gaps); 5 units	
• 15 mm wide	**6ES7133-6CV15-1AM0**
• 20 mm wide	**6ES7133-6CV20-1AM0**
Shield connection	**6ES7193-6SC00-1AM0**
5 shield supports and 5 shield terminals	

	Article No.
Color-coded labels	
• Color code CC01, module-specific, for 16 push-in terminals; for BaseUnit type A0, A1; 10 units	**6ES7193-6CP01-2MA0**
• Color code CC01, module-specific, for 16 push-in terminals; for BaseUnit type A0, A1; 50 units	**6ES7193-6CP01-4MA0**
• Color code CC02, module-specific, for 16 push-in terminals; for BaseUnit type A0, A1; 10 units	**6ES7193-6CP02-2MA0**
• Color code CC02, module-specific, for 16 push-in terminals; for BaseUnit type A0, A1; 50 units	**6ES7193-6CP02-4MA0**
• Color code CC03, module-specific, for 16 push-in terminals; for BaseUnit type A0, A1; 10 units	**6ES7193-6CP03-2MA0**
• Color code CC04, module-specific, for 16 push-in terminals; for BaseUnit type A0, A1; 10 units	**6ES7193-6CP04-2MA0**
• Color code CC71, for 10 AUX terminals 1 A to 10 A, for BU type A0, yellow/green, with push-in terminals; 10 units	**6ES7193-6CP71-2AA0**
• Color code CC72, for 10 AUX terminals 1 A to 10 A, for BU type A0, red, with push-in terminals; 10 units	**6ES7193-6CP72-2AA0**
• Color code CC73, for 10 AUX terminals 1 A to 10 A, for BU type A0, blue, with push-in terminals; 10 units	**6ES7193-6CP73-2AA0**
• Color code CC74, for 2x5 additional terminals, 5 x red, 5 x blue, BU type A1 with push-in terminals; 10 units	**6ES7193-6CP74-2AA0**
• Color code CC81, for 4 AUX terminals 1 A to 4 A, yellow/green, for BaseUnit type B0; 10 units	**6ES7193-6CP81-2AB0**
• Color code CC82, for 4 AUX terminals 1 A to 4 A, red, for BaseUnit type B0; 10 units	**6ES7193-6CP82-2AB0**
• Color code CC83, for 4 AUX terminals 1 A to 4 A, blue, for BaseUnit type B0; 10 units	**6ES7193-6CP83-2AB0**
• Color code CC41, module-specific, for 12 push-in terminals; for BaseUnit type B1; 10 units	**6ES7193-6CP41-2MB0**
• Color code CC84, for 2 AUX terminals 1 A to 2 A, yellow/green, for BaseUnit type C0; 10 units	**6ES7193-6CP84-2AC0**
• Color code CC85, for 2 AUX terminals 1 A to 2 A, red, for BaseUnit type C0; 10 units	**6ES7193-6CP85-2AC0**
• Color code CC86, for 2 AUX terminals 1 A to 2 A, blue, for BaseUnit type C0; 10 units	**6ES7193-6CP86-2AC0**

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Overview



With the BaseUnits, the ET 200SP offers a rugged and service-friendly design with permanent wiring:

- No tools needed for one-handed wiring using push-in terminals
- Outstanding access due to arrangement of measuring tap, spring NC contacts and cable entry in columns, while at the same time reducing the space required by 64%
- Fault-proof color coding of the spring NC contacts for better orientation in the terminal panel
- Replacement of I/O modules during operation without affecting the wiring
- Operation with module gaps (missing I/O module)
- Automatic coding of the I/O modules prevents destruction of the electronics if a module is accidentally inserted in the wrong slot during replacement
- High immunity to electromagnetic interference due to
  - self-assembling shielded backplane bus
  - multi-layer conductor plate with shield levels for interference-free signal transmission from the terminal to the I/O module
  - system-integrated, space-saving shield connection for quick installation
- Self-assembling potential groups without external wiring or jumpers
- Replaceable terminal box
- Side-by-side latching of the BUs for high mechanical load capacity
- Optional module-specific color identification of the terminals according to the color code CC
- Actuation of the spring NC contacts with a standard screwdriver, with a blade width up to 3.5 mm

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

Technical specifications

Article number	**6AG1193-6BP00-7BA0**	**6AG1193-6BP00-7DA0**	**6AG1193-6BP20-7BA0**	**6AG1193-6BP20-7DA0**
Based on	**6ES7193-6BP00-0BA0**	**6ES7193-6BP00-0DA0**	**6ES7193-6BP20-0BA0**	**6ES7193-6BP20-0DA0**
	SIPLUS ET 200SP BU15-P16+A0+2B	SIPLUS ET 200SP BU15-P16+A0+2D	SIPLUS ET 200SP BU15-P16+A10+2B	SIPLUS ET 200SP BU15-P16+A10+2D
Ambient conditions				
Ambient temperature during operation				
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	70 °C; = Tmax	70 °C; = Tmax	70 °C; = Tmax	70 °C; = Tmax
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity				
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation

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Technical specifications (continued)

Article number	6AG1193-6BP00-7BA0	6AG1193-6BP00-7DA0	6AG1193-6BP20-7BA0	6AG1193-6BP20-7DA0
Based on	6ES7193-6BP00-0BA0	6ES7193-6BP00-0DA0	6ES7193-6BP20-0BA0	6ES7193-6BP20-0DA0
	SIPLUS ET 200SP BU15-P16+A0+2B	SIPLUS ET 200SP BU15-P16+A0+2D	SIPLUS ET 200SP BU15-P16+A10+2B	SIPLUS ET 200SP BU15-P16+A10+2D
Resistance				
Coolants and lubricants				
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
Use on ships/at sea				
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Remark				
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating				
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability	Yes; Class 2 for high availability	Yes; Class 2 for high availability	Yes; Class 2 for high availability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

Article number	6AG1193-6BP00-7BA1	6AG1193-6BP00-7DA1	6AG1193-6BP40-7BA1	6AG1193-6BP40-7DA1
Based on	6ES7193-6BP00-0BA1	6ES7193-6BP00-0DA1	6ES7193-6BP40-0BA1	6ES7193-6BP40-0DA1
	SIPLUS ET 200SP BU15-P16+A0+2B/T	SIPLUS ET 200SP BU15-P16+A0+2D/T	SIPLUS ET 200SP BU15-P16+A0+12B/T	SIPLUS ET 200SP BU15-P16+A0+12D/T
Ambient conditions				
Ambient temperature during operation				
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C
• horizontal installation, max.	70 °C; = Tmax	70 °C; = Tmax	70 °C; = Tmax	70 °C; = Tmax
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)

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Technical specifications (continued)

Article number	**6AG1193-6BP00-7BA1**	**6AG1193-6BP00-7DA1**	**6AG1193-6BP40-7BA1**	**6AG1193-6BP40-7DA1**
Based on	**6ES7193-6BP00-0BA1**	**6ES7193-6BP00-0DA1**	**6ES7193-6BP40-0BA1**	**6ES7193-6BP40-0DA1**
	SIPLUS ET 200SP BU15-P16+A0+2B/T	SIPLUS ET 200SP BU15-P16+A0+2D/T	SIPLUS ET 200SP BU15-P16+A0+12B/T	SIPLUS ET 200SP BU15-P16+A0+12D/T
Relative humidity				
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance				
Coolants and lubricants				
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
Use on ships/at sea				
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Remark				
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating				
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability	Yes; Class 2 for high availability	Yes; Class 2 for high availability	Yes; Class 2 for high availability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

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Technical specifications (continued)

Article number	6AG1193-6BP20-7BB0	6AG1193-6BP20-7BB1	6AG1193-6BP20-7DC0	6AG1193-6BP00-7BD0
Based on	6ES7193-6BP20-0BB0	6ES7193-6BP20-0BB1	6ES7193-6BP20-0DC0	6ES7193-6BP00-0BD0
	SIPLUS ET 200SP BU20-P12+A4+0B	SIPLUS ET 200SP BU20-P12+A0+4B TYPE B1	SIPLUS ET 200SP BU20-P6+A2+4D	SIPLUS ET 200SP BU20-P12+A0+0B
General information				
Product type designation	BU type B0	BU type B1	BU type C0	BU type D0
Ambient conditions				
Ambient temperature during operation				
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	70 °C; = Tmax	70 °C; = Tmax	60 °C; = Tmax	70 °C; = Tmax
• vertical installation, min.	-40 °C		-40 °C; = Tmin	-40 °C
• vertical installation, max.	50 °C		50 °C; = Tmax	50 °C
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.	3 000 m	3 000 m	3 000 m	3 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... Tmax -5K) at 795 hPa ... 701 hPa (+2 000 m ... +3 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... Tmax -5K) at 795 hPa ... 701 hPa (+2 000 m ... +3 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... Tmax -5K) at 795 hPa ... 701 hPa (+2 000 m ... +3 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... Tmax -5K) at 795 hPa ... 701 hPa (+2 000 m ... +3 000 m)
Relative humidity				
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance				
Coolants and lubricants				
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
Use on ships/at sea				
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Remark				
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating				
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability	Yes; Class 2 for high availability	Yes; Class 2 for high availability	Yes; Class 2 for high availability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

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Technical specifications (continued)

Article number	**6AG1193-6BP20-2BF0**	**6AG1193-6BP00-7BU0**	**6AG1193-6BP00-7DU0**
Based on	**6ES7193-6BP20-0BF0**	**6ES7193-6BP00-0BU0**	**6ES7193-6BP00-0DU0**
	SIPLUS ET 200SP BU20-P8+A4+0B	SIPLUS ET 200SP BU20-P16+A0+2B	SIPLUS ET 200SP BU20-P16+A0+2D
Ambient conditions			
Ambient temperature during operation			
• horizontal installation, min.	-25 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)
• horizontal installation, max.	60 °C; = Tmax	70 °C; = Tmax	70 °C; = Tmax
• vertical installation, min.	-25 °C; = Tmin		
• vertical installation, max.	50 °C; = Tmax		
Altitude during operation relating to sea level			
• Installation altitude above sea level, max.	5 000 m	2 000 m	2 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m)
Relative humidity			
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance			
Coolants and lubricants			
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems			
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
Use on ships/at sea			
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)	Yes; Class 6B2 mold, fungal and dry rot spores (excluding fauna)
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Remark			
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating			
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability	Yes; Class 2 for high availability	Yes; Class 2 for high availability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

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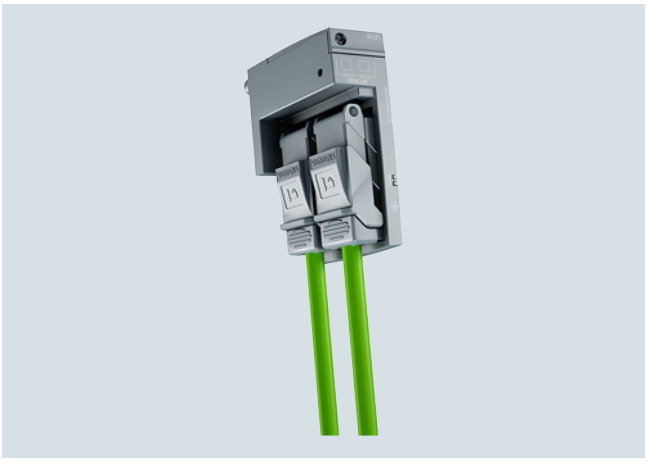
SIPLUS BaseUnits

Ordering data	Article No.
SIPLUS BaseUnits type A0	
BU15-P16+A10+2D (Extended temperature range and exposure to media) BU type A0; BaseUnit (light) with 16 push-in terminals (1...16) to the module and additionally 10 internally jumpered AUX terminals (1 A to 10 A); for starting a new load group (max. 10 A)	**6AG1193-6BP20-7DA0**
BU15-P16+A0+2D (Extended temperature range and exposure to media) BU type A0; BaseUnit (light) with 16 push-in terminals to the module; for starting a new load group (max. 10 A)	**6AG1193-6BP00-7DA0**
BU15-P16+A10+2B (Extended temperature range and exposure to media) BU type A0; BaseUnit (dark) with 16 push-in terminals (1...16) to the module and an additional 10 internally jumpered AUX terminals (1 A to 10 A); for continuing the load group	**6AG1193-6BP20-7BA0**
BU15-P16+A0+2B (Extended temperature range and exposure to media) BU type A0; BaseUnit (dark) with 16 push-in terminals to the module; for continuing the load group	**6AG1193-6BP00-7BA0**
SIPLUS BaseUnits type A1 (with temperature detection)	
BU15-P16+A0+12D/T (Extended temperature range and exposure to media) BU type A1; BaseUnit (light) with 16 push-in terminals (1...16) to the module and 2x5 internally jumpered additional terminals (1 B to 5 B and 1 C to 5 C); for starting a new load group (max. 10 A)	**6AG1193-6BP40-7DA1**
BU15-P16+A0+2D/T (Extended temperature range and exposure to media) BU type A1; BaseUnit (light) with 16 push-in terminals to the module; for starting a new load group (max. 10 A)	**6AG1193-6BP00-7DA1**
BU15-P16+A0+12B/T (Extended temperature range and exposure to media) BU type A1; BaseUnit (dark) with 16 push-in terminals (1...16) to the module and 2x5 internally jumpered additional terminals (1 B to 5 B and 1 C to 5 C); for continuing the load group	**6AG1193-6BP40-7BA1**
BU15-P16+A0+2B/T (Extended temperature range and exposure to media) BU type A1; BaseUnit (dark) with 16 push-in terminals to the module; for continuing the load group	**6AG1193-6BP00-7BA1**

	Article No.
SIPLUS BaseUnits type B0	
BU20-P12+A4+0B (Extended temperature range and exposure to media) BU type B0; BaseUnit (dark) with 12 push-in terminals (1...12) to the module and an additional 4 internally jumpered add-on terminals (1 A to 4 A); for continuing the load group; 1 unit	**6AG1193-6BP20-7BB0**
SIPLUS BaseUnits type B1	
BU20-P12+A0+4B (Extended temperature range and exposure to media) BU type B1; BaseUnit (dark) with 12 push-in terminals to the module; for continuing the load group; 1 unit	**6AG1193-6BP20-7BB1**
SIPLUS BaseUnits type C0	
BU20-P6+A2+4D (Extended temperature range and exposure to media) BU type C0; BaseUnit (light) with 6 push-in terminals (1...6) to the module and an additional 2 AUX terminals; new load group	**6AG1193-6BP20-7DC0**
SIPLUS BaseUnits type D0	
BU20-P12+A0+0B (Extended temperature range and exposure to media) BU type D0; BaseUnit (dark) with 12 push-in terminals, without AUX terminals, bridged to the left	**6AG1193-6BP00-7BD0**
SIPLUS BaseUnits type F0	
BU20-P8+A4+0B (Extended temperature range and exposure to media) BU type F0; BaseUnit (dark) with 8 push-in terminals to the module and an additional 4 internally jumpered AUX terminals (1 A to 4 A); for continuing the load group	**6AG1193-6BP20-2BF0**
SIPLUS BaseUnits type U0	
BU20-P16+A0+2D (Extended temperature range and exposure to media) BU type U0; BaseUnit (light) with 16 push-in terminals to the module; for starting a new load group (max. 10 A)	**6AG1193-6BP00-7DU0**
BU20-P16+A0+2B (Extended temperature range and exposure to media) BU type U0; BaseUnit (dark) with 16 push-in terminals to the module; for continuing the load group	**6AG1193-6BP00-7BU0**
Accessories	See SIMATIC ET 200SP BaseUnits, page 9/196

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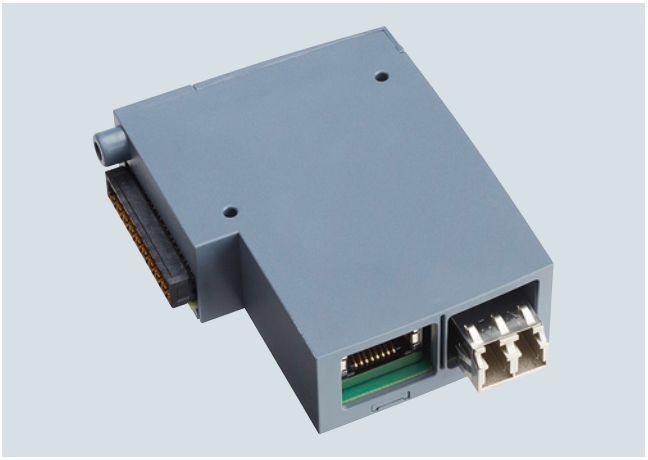
Overview



SIMATIC BusAdapter BA 2xFC for direct laying of the PROFINET cable via FastConnect connection



ET 200SP BusAdapter BA-Send for expansion of an ET 200SP station with ET 200AL modules



SIMATIC BusAdapter BA LC/RJ45 for use as a system-integrated media converter from copper (RJ45) to glass fiber (LC)

For the SIMATIC ET 200SP, two types of BusAdapter (BA) are available for selection:

- ET 200SP BusAdapter "BA-Send"
  for expansion of an ET 200SP station with up to 16 modules from the ET 200AL I/O series with IP67 protection via an ET connection
- SIMATIC BusAdapter
  for the free selection of the connection system (pluggable or direct connection) and physical PROFINET connection (copper, POF, HCS or glass fiber) to devices with a SIMATIC BusAdapter interface.
  One further advantage of the SIMATIC BusAdapter: only the adapter needs to be replaced for subsequent conversion to the rugged FastConnect technology or a fiber-optic connection, or to repair defective RJ45 sockets.

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Technical specifications

Article number	6ES7193-6AR00-0AA0 ET 200SP, Busadapter BA 2xRJ45	6ES7193-6AF00-0AA0 ET 200SP, Busadapter BA 2XFC	6ES7193-6AP00-0AA0 ET 200SP, Busadapter BA 2xSCRJ	6ES7193-6AP20-0AA0 ET 200SP, Busadapter BA SCRJ/RJ45
General information				
Product type designation	BA 2x RJ45	BA 2xFC	BA 2xSCRJ	BA SCRJ/RJ45
Interfaces				
Number of PROFINET interfaces	1	1	1; 2 ports (switch) SCRJ FO	1; 2 ports (SCRJ + RJ45)
Supports protocol for PROFINET IO				
• Number of RJ45 ports	2			1
• Number of FC (FastConnect) connections		2		
• Number of SCRJ ports	0		2	1
• Number of LC ports	0		0	0
Cable length				
- PCF			100 m	100 m
- Plastic FOC (POF)			50 m	50 m
- PCF-GI			250 m	250 m
- Cu conductors	100 m	100 m		100 m
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.			2 000 m; On request: Installation altitudes greater than 2 000 m	2 000 m; On request: Installation altitudes greater than 2 000 m
Dimensions				
Width	20 mm	20 mm	20 mm	20 mm
Height	69.5 mm	69.5 mm	69.5 mm	
Depth	59 mm	59 mm	59 mm	
Weights				
Weight, approx.	46 g	53 g	50 g	50 g

Article number	6ES7193-6AP40-0AA0 ET 200SP, Bus adapter BA SCRJ/FC	6ES7193-6AG00-0AA0 SIMATIC Busadapter BA 2XLC	6ES7193-6AG20-0AA0 SIMATIC Busadapter BA LC/RJ45	6ES7193-6AG40-0AA0 SIMATIC Bus adapter BA LC/FC
General information				
Product type designation	BA SCRJ/FC	BA 2xLC	BA LC/RJ45	BA LC/FC
Interfaces				
Number of PROFINET interfaces	1; 2 ports (SCRJ + FC)	1; 2 ports (switch) LC Multimode Glass Fibre	1; 2 ports (switch) LC / RJ45	1
Supports protocol for PROFINET IO				
• Number of RJ45 ports			1	
• Number of FC (FastConnect) connections	1			1
• Number of SCRJ ports	1	0	0	0
• Number of LC ports	0	2; Wavelength of 1 270 ... 1 380 nm, corresponds to 100BASE-FX	1; Wavelength of 1 270 ... 1 380 nm, corresponds to 100BASE-FX	1; Wavelength of 1 270 ... 1 380 nm, corresponds to 100BASE-FX
Cable length				
- PCF	100 m			
- Plastic FOC (POF)	50 m			
- PCF-GI	250 m			
- Cu conductors	100 m		100 m	100 m
- Multimode graded-index fiber 50/125 µm		3 km	3 km	3 km
- Multimode graded-index fiber 62.5/125 µm		3 km	3 km	3 km
Ambient conditions				
Ambient temperature during operation				
• min.		0 °C		
• max.		60 °C		
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.	2 000 m; On request: Installation altitudes greater than 2 000 m		2 000 m; On request: Installation altitudes greater than 2 000 m	2 000 m; On request: Installation altitudes greater than 2 000 m

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Technical specifications (continued)

Article number	6ES7193-6AP40-0AA0 ET 200SP, Bus adapter BA SCRJ/FC	6ES7193-6AG00-0AA0 SIMATIC Busadapter BA 2XLC	6ES7193-6AG20-0AA0 SIMATIC Busadapter BA LC/RJ45	6ES7193-6AG40-0AA0 SIMATIC Bus adapter BA LC/FC
Dimensions				
Width	20 mm	20 mm	20 mm	20 mm
Height	69.5 mm	69.5 mm	69.5 mm	69.5 mm
Depth	59 mm	59 mm	59 mm	59 mm
Weights				
Weight, approx.	50 g	40 g	32 g	50 g

Article number	6ES7193-6AS00-0AA0 ET 200SP, Busadapter BA-Send BA1XFC
General information	
Product type designation	BA-Send 1xFC
Interfaces	
Supports protocol for PROFINET IO	
Cable length	
- Cu conductors	15 m; from IM firmware V3.3: between BA-send and the first ET-CONNECTION bus node and between all other bus nodes
ET-Connection	
• Number of interfaces ET connection	1
• FC (FastConnect)	Yes

Article number	6ES7193-6AS00-0AA0 ET 200SP, Busadapter BA-Send BA1XFC
Ambient conditions	
Ambient temperature during operation	
• min.	0 °C
• max.	60 °C
Dimensions	
Width	20 mm
Weights	
Weight, approx.	44 g

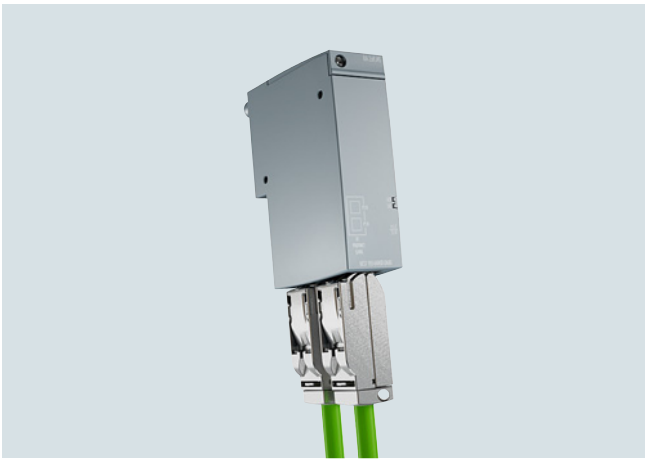
Ordering data

	Article No.
BA 2xRJ45 BusAdapter For IM 155-6PN ST, HF	**6ES7193-6AR00-0AA0**
BA 2xFC BusAdapter For IM 155-6PN ST, HF; for increased resistance to vibration and EMC loads	**6ES7193-6AF00-0AA0**
BA 2xSCRJ BusAdapter For IM 155-6PN HF; fiber-optic connection for POF or PCF cables up to 250 m, with monitoring of damping	**6ES7193-6AP00-0AA0**
BA SCRJ/RJ45 BusAdapter For IM 155-6PN HF; with media converter FOC-Cu; 1 x SCRJ FO connection, 1 x RJ45 connection	**6ES7193-6AP20-0AA0**
BA SCRJ/FC BusAdapter For IM 155-6PN HF; with media converter FOC-Cu; 1 x SCRJ FO connection, 1 x FastConnect connection	**6ES7193-6AP40-0AA0**
BA 2XLC BusAdapter For IM 155-6PN HF; 2 glass FO connections	**6ES7193-6AG00-0AA0**
BA LC/RJ45 BusAdapter For IM 155-6PN HF; with media converter glass FO - copper; 1 x LC connection, 1 x RJ45 connection	**6ES7193-6AG20-0AA0**
BA LC/FC BusAdapter For IM 155-6PN HF; with media converter glass FO - copper; 1 x LC connection, 1 x FastConnect connection	**6ES7193-6AG40-0AA0**

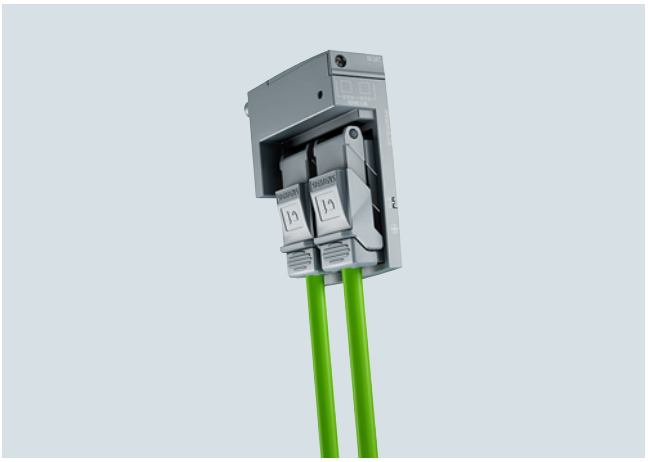
	Article No.
Station expansion with IP67 I/O system ET 200AL	
ET 200SP BA-Send 1 x FC BusAdapter	**6ES7193-6AS00-0AA0**
BaseUnit BU-Send	**6ES7193-6BN00-0NE0**
Accessories	
Equipment labeling plate 10 sheets of 16 labels, for printing with thermal transfer card printer or plotter	**6ES7193-6LF30-0AW0**

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Overview



ET 200SP BusAdapter (RJ45)



BA 2xFC BusAdapter

Some interface modules of the SIPLUS ET 200SP have a universal PROFINET interface for BusAdapters. With the appropriate bus adapter, the type of connection can be adapted to the requirements of the respective application:

- For standard applications with a moderate mechanical and EMC load, the BA 2xRJ45 BusAdapter is used. It offers two sockets for standard RJ45 plugs.
- For machines and systems in which higher mechanical and/or EMC loads act on the devices, the BA 2xFC BusAdapter is recommended. In this case, the bus cables are connected directly by means of FastConnect terminals – similar to the PROFIBUS connector, proven in millions of applications. The technology is extremely quick to assemble and achieves 5 times better vibration resistance and also 5 times greater resistance to electromagnetic interference, when compared to RJ45 plug connectors.
- BusAdapters with connections for fiber-optic cables can be used to cover high potential differences between two stations and/or high EMC loads.

Another advantage of the BusAdapters: In order to repair defective RJ45 sockets or for subsequent conversion to the rugged FastConnect technology or a fiber-optic connection, only the adapter needs to be replaced.

The following interface modules offer a PROFINET connection via BusAdapter:

- SIPLUS IM 155-6PN Standard
- SIPLUS IM 155-6PN High Feature

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

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Technical specifications

Article number	**6AG1193-6AR00-7AA0**	**6AG1193-6AF00-7AA0**	**6AG1193-6AP00-2AA0**	**6AG1193-6AG00-2AA0**
Based on	**6ES7193-6AR00-0AA0**	**6ES7193-6AF00-0AA0**	**6ES7193-6AP00-0AA0**	**6ES7193-6AG00-0AA0**
	SIPLUS ET 200SP BA 2xRJ45	SIPLUS ET 200SP BA 2XFC PN	SIPLUS ET 200SP BA 2XSCRJ PN	SIPLUS ET 200SP BA 2XLC
Ambient conditions				
Ambient temperature during operation				
• min.	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost)	-40 °C; = Tmin (incl. condensation/frost); start-up @ -25 °C	-40 °C; = Tmin (incl. condensation/frost)
• max.	70 °C; = Tmax	70 °C; = Tmax	60 °C; = Tmax	60 °C; = Tmax
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity				
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance				
Coolants and lubricants				
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
Use on ships/at sea				
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Remark				
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating				
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability	Yes; Class 2 for high availability	Yes; Class 2 for high availability	Yes; Class 2 for high availability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A	Yes; Conformal coating, Class A

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SIPLUS BusAdapters

Ordering data	Article No.
SIPLUS BA 2xRJ45 BusAdapter (Extended temperature range and exposure to environmental substances) for IM 155-6PN ST, HF	**6AG1193-6AR00-7AA0**
SIPLUS BA 2xFC BusAdapter (Extended temperature range and exposure to environmental substances) for IM 155-6PN ST, HF; for increased resistance to vibration and EMC loads	**6AG1193-6AF00-7AA0**
SIPLUS BA 2xSCRJ BusAdapter (Extended temperature range and exposure to environmental substances) for IM 155-6PN HF; fiber-optic connection for POF or PCF cables up to 250 m, with monitoring of damping	**6AG1193-6AP00-2AA0**
SIPLUS BA 2xLC BusAdapter (Extended temperature range and exposure to environmental substances) For IM 155-6PN HF; 2 glass FO connections	**6AG1193-6AG00-2AA0**
Equipment labeling plate 10 sheets of 16 labels, for printing with thermal transfer card printer or plotter	**6ES7193-6LF30-0AW0**

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Overview Labeling strips

The head-end stations and I/O modules can optionally be equipped with labeling strips (13 x 31 mm) for system-specific marking. The labeling strips can be inscribed mechanically. Labeling strips are available in two versions in the colors light gray and yellow:

- 500 strips on the roll, for printing on thermal transfer printers. Core diameter 40 mm, external diameter 70 mm, width 62 mm
- 10 DIN A4 sheets with 100 strips each, 180 g/sm card, perforated, for printing using a laser printer direct from TIA Portal or via print templates

Overview Equipment labeling plates



Optionally, one equipment labeling plate each can be plugged onto head-end stations, BusAdapters, BaseUnits, and I/O modules. Equipment labeling plates are supplied in packs of 10 sheets with 16 labels each. The labels can be printed with thermal-transfer card printers or plotters, or stickers can be attached to them. Advantages compared to labels that are attached directly:

- The inscription on the front is not covered
- Simple label replacement when replacing a module
- No parallax errors when marking the BaseUnits on the mounting plate

The size of the labels is 14.8 x 10.5 mm (W x H)

Overview BU cover

The ET 200SP system can be operated with any number of slot gaps (BU slot without inserted I/O module). Applications for this include:

- Partial commissioning
- Prewired but unequipped options

To protect against damage, such slot gaps must be covered by a BU cover.

Within the BU cover, an equipment labeling plate for identification of the I/O module planned for this slot can be stored.

Versions:

- For BaseUnits with a width of 15 mm (pack containing 5 BU covers)
- For BaseUnits with a width of 20 mm (pack containing 5 BU covers)

Overview Shield connection

The shield connection permits the low-cost connection of cable shields. Compared to external shield supports, the system offers the following advantages:

- Quick installation without tools by plugging the shield connection element onto the BaseUnit
- Automatic low-impedance connection to the functional ground (mounting rail)
- Optimized EMC properties by separating the signal lines from the voltage supply lines
- Short unshielded cable lengths
- Requires little space

Overview Color-coded labels

The I/O modules that are plugged onto the BaseUnits determine the potentials connected at the push-in terminals.
The +/- potentials can optionally be identified using module-specific color-coded labels. The potentials of the AUX and add-on terminals can also be marked using color-coded labels. Advantages of the color-coded labels:

- Quick installation (one label for marking 16 terminals)
- Printed terminal numbers
- Avoidance of wiring errors
- Simple detection of potentials during servicing

Overview Server module

The server module is included in the scope of supply of all head-end stations (interface module, CPU, Open Controller). It concludes the setup of an ET 200SP station.

Overview e-coding elements

The operation of selected modules requires an electronic coding element that is always included in the scope of supply of the I/O module. Apart from the mechanical coding function, this contains a re-writable memory for the redundant storage of module-specific configuration data (e.g. F target address for fail-safe modules or parameter data in the case of the IO-Link master). In this way, this data is automatically backed up during a module replacement. This saves the user from having to set addresses manually or back up data when replacing modules.

At present, there are two types of electronic coding element:

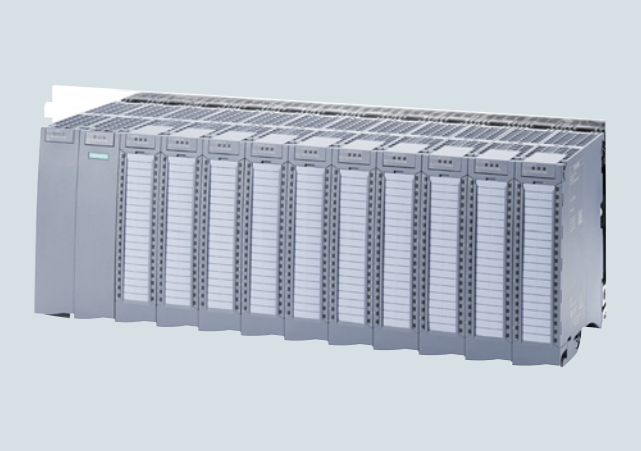
- e-coding element (Type H), which can be used in the I/O modules:
  - CM IO-Link master
  - F-CM AS-i Safety
- e-coding element (Type F), which can be used in the I/O modules:
  - F-DI 8x24VDC HF
  - F-DQ 4x24VDC/2A PM HF
  - F-PM-E 24VDC/8A PPM ST

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Ordering data	Article No.
Labeling strips	
500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer	**6ES7193-6LR10-0AA0**
500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer	**6ES7193-6LR10-0AG0**
1000 labeling strips DIN A4, light gray, card, for inscription with laser printer	**6ES7193-6LA10-0AA0**
1000 labeling strips DIN A4, yellow, card, for inscription with laser printer	**6ES7193-6LA10-0AG0**
Equipment labeling plate	**6ES7193-6LF30-0AW0**
10 sheets of 16 labels	
BU cover	
For covering empty slots (gaps); 5 units	
• 15 mm wide	**6ES7133-6CV15-1AM0**
• 20 mm wide	**6ES7133-6CV20-1AM0**
Shield connection	**6ES7193-6SC00-1AM0**
5 shield supports and 5 shield terminals each for plugging onto BaseUnits with automatic low-impedance connection to functional ground	
Module-specific color-coded labels	
(pack containing 10 labels)	
Color code CC00, for 16 push-in terminals, for BU type A0, A1, gray (terminals 1 to 8), red (terminals 9 to 16)	**6ES7193-6CP00-2MA0**
Color code CC01, for 16 push-in terminals, for BU type A0, A1, gray (terminals 1 to 8), red (terminals 9 to 16)	**6ES7193-6CP01-2MA0**
Color code CC02, for 16 push-in terminals, for BU type A0, A1, gray (terminals 1 to 8), blue (terminals 9 to 16)	**6ES7193-6CP02-2MA0**
Color code CC03, for 16 push-in terminals, for BU type A0, A1 gray (terminals 1 to 8), red (terminals 9 to 12), gray (terminals 13 to 16)	**6ES7193-6CP03-2MA0**
Color code CC04, for 16 push-in terminals, BU type A0, A1, gray (terminals 1 to 8), red (terminals 9 to 12), blue (terminals 13 to 16)	**6ES7193-6CP04-2MA0**
Color code CC05, for 16 push-in terminals, for BU type A0, A1, gray (terminals 1 to 12), red (terminals 13 to 14), blue (terminals 15 to 16)	**6ES7193-6CP05-2MA0**
Color code CC41, for 16 push-in terminals; for BU type B1, gray (terminals 1 to 4), red (terminals 5 to 8), blue (terminals 9 to 12)	**6ES7193-6CP41-2MB0**
Color code CC42, for 12 push-in terminals, BU type F0, gray (terminals 1 to 8), red (terminals 9 to 10), blue (terminals 11 to 12)	**6ES7193-6CP42-2MB0**
Color code CC51, for 6 push-in terminals, for BU type C0, C1, gray (terminals 1 to 4), red (terminal 5), blue (terminal 6)	**6ES7193-6CP51-2MC0**
Color code CC51, for 6 push-in terminals, for BU type C0, gray (terminals 1, 2 and 5), red (terminals 3 and 4), blue (terminal 6)	**6ES7193-6CP52-2MC0**
(pack containing 50 labels)	
Color code CC01, for 16 push-in terminals, for BU type A0, A1, gray (terminals 1 to 8), red (terminals 9 to 16)	**6ES7193-6CP01-4MA0**
Color code CC02, for 16 push-in terminals, for BU type A0, A1, gray (terminals 1 to 8), blue (terminals 9 to 16)	**6ES7193-6CP02-4MA0**
Color-coded labels for additional terminals	
(pack containing 10 labels)	
Color code CC71, for 10 AUX terminals, BU type A0, yellow/green (terminals 1 A to 10 A)	**6ES7193-6CP71-2AA0**
Color code CC72, for 10 AUX terminals, BU type A0, red (terminals 1 A to 10 A)	**6ES7193-6CP72-2AA0**
Color code CC73, for 10 AUX terminals, BU type A0, blue (terminals 1 A to 10 A)	**6ES7193-6CP73-2AA0**
Color code CC74, for 2x5 additional terminals, BU type A1, red (terminals 1B to 5B), blue (terminals 1C to 5C)	**6ES7193-6CP74-2AA0**
Color code CC81, for 4 AUX terminals, BU type B0, yellow/green (terminals 1 A to 4 A)	**6ES7193-6CP81-2AB0**
Color code CC82, for 4 AUX terminals, BU type B0, red (terminals 1 A to 4 A)	**6ES7193-6CP82-2AB0**
Color code CC83, for 4 AUX terminals, BU type B0, blue (terminals 1 A to 4 A)	**6ES7193-6CP83-2AB0**
Color code CC84, for 2 AUX terminals, BU type C0, C1, yellow/green (terminals 1 A to 2 A)	**6ES7193-6CP84-2AC0**
Color code CC85, for 2 AUX terminals, for BU type C0, C1, red (terminals 1 A to 2 A)	**6ES7193-6CP85-2AC0**
Color code CC86, for 2 AUX terminals, for BU type C0, C1, blue (terminals 1 A to 2 A)	**6ES7193-6CP86-2AC0**
Server module	**6ES7193-6PA00-0AA0**
Spare parts	
e-coding element	
Type H; pack containing 5 e-coding elements	**6ES7193-6EH00-1AA0**
Type F; pack containing 5 e-coding elements	**6ES7193-6EF00-1AA0**

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Overview



The SIMATIC ET 200MP is a modular and scalable I/O system with IP20 degree of protection for universal use, and offers the same system advantages as the S7-1500. The SIMATIC ET 200MP permits extremely short bus cycles and very fast response times, even with large quantity structures.

SIMATIC ET 200MP consists of the following components:

- Interface module for connecting S7-1500 I/O modules to PROFINET; up to 30 modules can be connected to one interface module
- Interface module for connecting S7-1500 I/O modules to PROFIBUS; up to 12 modules can be connected to one interface module

The SIMATIC ET 200MP distributed I/O system is particularly easy to install, wire, and commission.

Highlights:

- Modular I/O system with IP20 degree of protection for PROFINET or alternatively for PROFIBUS
- Compact dimensions and high channel density
- High degree of user-friendliness due to the following design features:
  - Uniform 40-pin front connector simplifies ordering, logistics, and warehousing
  - Uniform pin assignment per module type simplifies wiring and helps avoid errors
  - Integrated potential bridges simplify wiring and allow flexible subsequent modification
  - The cable storage space grows along with the requirements and allows a uniform appearance even with insulated conductors with a large cross-section and/or thick insulation
  - The pre-wiring position for the front connector allows convenient wiring both when commissioning and making changes during operation
  - The top hat rail integrated in the S7-1500 standard rail allows snapping-on of many standard components such as additional terminals, miniature circuit breakers or small relays
  - The 1:1 allocation of channel status and diagnostics LED, terminal and inscription allows fast location and elimination of errors. Assistance is provided by the wiring diagram printed on the inside of the front panels
  - The integrated shielding concept for analog and technology modules allows reliable and rugged operation, in particular with high-speed applications. Installation does not require any tools
  - Particularly space-saving and simple design with slim 25 mm modules;
    the maximum possible station configuration with power supply (PS), interface module (IM) and 30 I/O modules can be accommodated on a 830 mm-wide S7-1500 standard rail
- Comprehensive product portfolio comprising digital and analog input or output modules, technology modules, and communication modules for point-to-point communication; further modules, e.g. F-modules, will be available soon.
  - Integrated technological functions in selected modules, such as counting, pulse width modulation (PWM) or integrated switching cycle counters, make cost-effective and convenient solutions possible.
  - Selected digital output modules enable safety-related load group shutdown in accordance with SILCL 2 via an external safety relay.
- Extensive system functions
  - Integrated system diagnostics when operated with an S7-1500 and the TIA Portal
  - Increased communication availability by using Media Redundancy Protocol (MRP) on the PROFINET;
    in addition, the IM 155-5 PN HF High Feature interface module can be operated on an S7-400H. Configuration is carried out with STEP 7 V5.5 SP3 and a GSDML file. The IM 155-5 PN HF also supports operation on an S7-400H CPU (system redundancy)
  - Consistent use of identification and maintenance data IM0 to IM3 for fast electronic and unambiguous identification of individual modules (Article No., serial number, etc.)
  - Uniform firmware update for the interface module and all I/O modules for subsequent expansion of functions (investment security)
  - Bus cycle time ≥ 250 µs and coupling to the isochronous task permit implementation of applications with high performance requirements with PROFINET
  - Up to 30 I/O modules (PROFINET) or 12 I/O modules (PROFIBUS) within a station save on interface modules and installation time
  - MMC not required with PROFINET; automatic address assignment via LLDP or manually via TIA Portal or PST tool
  - Shared device on up to two (IM 155-5 PN BA and IM 155-5 PN ST) or four (IM 155-5 PN HF) IO Controllers
  - Module shared input/module shared output as system function for all S7-1500 I/O modules

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Overview



- Interface modules for linking the ET 200MP to PROFINET
- These handle data exchange with the PROFINET IO controller in the PLC
- Integrated 2-port switch for line topology

IM 155-5 PN BA

- Max. 30 I/O modules
- Shortest bus cycle time 1 ms
- Media redundancy (MRP)
- Shared device on up to 2 IO controllers
- Omission of SIMATIC Memory Card (SMC); IM replacement without PG using LLDP

IM 155-5 PN ST, IM 155-5 PN HF

- Interface modules for linking the ET 200MP to PROFINET
- These handle data exchange with the PROFINET IO controller in the PLC
- Integrated 2-port switch for line topology
- Max. 30 I/O modules
- Shortest bus cycle 250 µs
- Linking to the isochronous task of the CPU
- Prioritized fast startup (FSU) with max. 12 I/O modules
- Media Redundancy Protocol (MRP)
- Shared device on up to two IO controllers (when configuring using GSD file; depends on the respective configuration tool)
- Omission of SIMATIC Memory Card (SMC); IM replacement without PG using LLDP
- Operation of F-modules and PROFIsafe

Starting from FW version V2.0.0, the IM155-5 PN ST interface module supports the following new functions:

- Submodule-granular shared device with up to two IO controllers
- Configuration control (option handling)
- Module shared input and module shared output (MSI/MSO), i.e. the inputs or outputs of a module can be made available simultaneously to up to two IO controllers

The IM155-5 PN HF interface module has the following additional functions:

- Shared device on up to 4 IO controllers
- Module shared input and module shared output (MSI/MSO) on up to four IO controllers
- Operation on a highly available SIMATIC S7-400H
- Support for the MRPD function (media redundancy with planned duplication)

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Overview (continued)

	IM 155-5 PN BA	IM 155-5 PN ST	IM 155-5 PN HF
Article No.	6ES7155-5AA00-0AA0	6ES7155-5AA01-0AB0	6ES7155-5AA00-0AC0
Specifications			
IO modules	All except PROFIsafe	All	All
Max. number IO modules / IM	12	30	30
Max. number of bytes / slot	64 inputs 64 outputs	256 inputs 256 outputs	256 inputs 256 outputs
Max. number bytes / station	64 inputs 64 outputs	512 inputs 512 outputs	512 inputs 512 outputs
Update time	1 ms	250 µs	250 µs
Configuration			
GSDML	Yes	Yes	Yes
STEP 7	GSDML	GSDML	GSDML
TIA Portal	Yes	Yes	Yes
PCS 7	No	No	No
General functions			
Reset to factory settings	TIA Portal	TIA Portal	TIA Portal
Device replacement: without PG	LLDP	LLDP	LLDP
Configuration management (option handling)	No	Yes	Yes
I&M data	IM 0 … 3	IM 0 … 3	IM 0 … 3
Isochronous mode	No	Yes	Yes
PROFIsafe	No	Yes	Yes
PROFINET functions			
RT	Yes	Yes	Yes
IRT	No	Yes	Yes
MRP	Yes	Yes	Yes
MRPD	No	No	No
S2 redundancy	No	No	Yes
Fast startup	No	Yes	Yes
Shared device	Yes; up to 2 ctrl.	Yes; up to 2 ctrl.	Yes; up to 4 ctrl.
MSI / MSO	Yes	Yes	Yes
Submodules	Yes	Yes	Yes

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Technical specifications

Article number	**6ES7155-5AA00-0AA0** ET 200MP, IM 155-5 PN BA	**6ES7155-5AA00-0AC0** ET 200MP, IM 155-5 PN HF	**6ES7155-5AA01-0AB0** ET 200MP, IM 155-5 PN ST
General information			
Product type designation	IM 155-5 PN BA	IM 155-5 PN HF	IM 155-5 PN ST
Product function			
• I&M data	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3	Yes; I&M0 to I&M3
Engineering with			
• STEP 7 TIA Portal configurable/ integrated as of version	V14 with HSP 0187	V13 / V13	V14 or higher with HSP 0223 / integrated with V15 or higher
• STEP 7 configurable/integrated as of version	V5.5 SP3 / -	V5.5 SP3 / -	GSDML V2.32
• PROFINET as of GSD version/ GSD revision	V2.3 / -	V2.3 / -	V2.3 / -
Supply voltage			
Rated value (DC)	24 V	24 V	24 V
Reverse polarity protection	Yes	Yes	Yes
Short-circuit protection	Yes	Yes	Yes
Input current			
Current consumption (rated value)	1 A	0.2 A	0.2 A
Power loss			
Power loss, typ.	3 W	4.5 W	4.5 W
Address area			
Address space per station			
• Address space per station, max.	64 byte; per input / output	512 byte; per input / output	512 byte; per input / output
Hardware configuration			
Integrated power supply	Yes	Yes	Yes
Rack			
• Modules per rack, max.	12; I/O modules	30; I/O modules	30; I/O modules
Submodules			
• Number of submodules per station, max.	108; 9 submodules / I/O modules	256	
Interfaces			
Number of PROFINET interfaces	1; 2 ports (switch) RJ45	1	1
1. Interface			
Interface types			
• Number of ports	2	2	2
• integrated switch	Yes	Yes	Yes
• RJ 45 (Ethernet)	Yes	Yes	Yes
• BusAdapter (PROFINET)	No		
Protocols			
• PROFINET IO Device	Yes	Yes	Yes
• Media redundancy	Yes	Yes	Yes; PROFINET MRP
Interface types			
RJ 45 (Ethernet)			
• Transmission procedure	PROFINET with 100 Mbit/s full duplex (100BASE-TX)	PROFINET with 100 Mbit/s full duplex (100BASE-TX)	PROFINET with 100 Mbit/s full duplex (100BASE-TX)
• 100 Mbps	Yes	Yes	Yes
• Autonegotiation	Yes	Yes	Yes
• Autocrossing	Yes	Yes	Yes
Protocols			
PROFINET IO Device			
Services			
- Isochronous mode	No	Yes	Yes
- Open IE communication	Yes		
- IRT	No	Yes	Yes
- PROFIenergy	No	No	No
- Prioritized startup	No	Yes	Yes
- Shared device	Yes	Yes	Yes
- Number of IO Controllers with shared device, max.	2	4	2

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Technical specifications (continued)

Article number	**6ES7155-5AA00-0AA0**	**6ES7155-5AA00-0AC0**	**6ES7155-5AA01-0AB0**
	ET 200MP, IM 155-5 PN BA	ET 200MP, IM 155-5 PN HF	ET 200MP, IM 155-5 PN ST
Redundancy mode			
• MRP	Yes	Yes	Yes
• MRPD	No	Yes	No
• PROFINET system redundancy (S2)	No	Yes	No
- on S7-1500R/H		Yes	
- on S7-400H		Yes; With GSDML file as of STEP 7 V5.5 SP3	
• Redundant PROFINET configuration (R1)		No	
• H-Sync forwarding		Yes	
Open IE communication			
• TCP/IP	Yes	Yes	Yes
• SNMP	Yes	Yes	Yes
• LLDP	Yes	Yes	Yes
Isochronous mode			
Isochronous operation (application synchronized up to terminal)	No	Yes	Yes
Equidistance	No	Yes	Yes
shortest clock pulse		250 µs	250 µs
max. cycle		4 ms	4 ms
Interrupts/diagnostics/status information			
Status indicator	Yes	Yes	Yes
Alarms	Yes	Yes	Yes
Diagnostics function	Yes	Yes	Yes
Diagnostics indication LED			
• RUN LED	Yes; Green LED	Yes; Green LED	Yes; Green LED
• ERROR LED	Yes; Red LED	Yes; Red LED	Yes; Red LED
• MAINT LED	Yes; yellow LED	Yes; yellow LED	Yes; yellow LED
• Connection display LINK TX/RX	Yes; 2x green-yellow LEDs	Yes; yellow LED	Yes; 2x green-yellow LEDs
Standards, approvals, certificates			
Network loading class	2		
Ambient conditions			
Ambient temperature during operation			
• horizontal installation, min.	0 °C	0 °C	0 °C
• horizontal installation, max.	60 °C	60 °C	60 °C
• vertical installation, min.	0 °C	0 °C	0 °C
• vertical installation, max.	40 °C	40 °C	40 °C
Altitude during operation relating to sea level			
• Installation altitude above sea level, max.		2 000 mm	
Dimensions			
Width	35 mm	35 mm	35 mm
Height	147 mm	147 mm	147 mm
Depth	129 mm	129 mm	129 mm
Weights			
Weight, approx.	236 g	350 g	

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Ordering data	Article No.
IM 155-5 PN interface module	
IP 20 degree of protection, module width 35 mm, installation on S7-1500 standard rail	
IM 155-5 PN BA, Basic version	**6ES7155-5AA00-0AA0**
IM 155-5 PN ST, Standard version	**6ES7155-5AA01-0AB0**
IM 155-5 PN HF, High Feature version with additional functions	**6ES7155-5AA00-0AC0**
Accessories	
Front flap for IM 155-5 PN (spare part), 5 units	**6ES7528-0AA70-7AA0**
SIMATIC S7-1500 mounting rail	
Fixed lengths, with grounding elements	
• 160 mm	**6ES7590-1AB60-0AA0**
• 245 mm	**6ES7590-1AC40-0AA0**
• 482 mm	**6ES7590-1AE80-0AA0**
• 530 mm	**6ES7590-1AF30-0AA0**
• 830 mm	**6ES7590-1AJ30-0AA0**
For cutting to length by customer, without drill holes; grounding elements must be ordered separately	
• 2000 mm	**6ES7590-1BC00-0AA0**
PE connection element for mounting rail 2000 mm	**6ES7590-5AA00-0AA0**
20 units	
Power supply	
For supplying the backplane bus of the S7-1500	
24 V DC input voltage, power 25 W	**6ES7505-0KA00-0AB0**
24/48/60 V DC input voltage, power 60 W	**6ES7505-0RA00-0AB0**
24/48/60 V DC input voltage, power 60 W, buffering functionality	**6ES7505-0RB00-0AB0**
120/230 V AC input voltage, power 60 W	**6ES7507-0RA00-0AB0**
Power connector	**6ES7590-8AA00-0AA0**
With coding element for power supply module; spare part, 10 units	
Load power supply	
24 V DC/3 A	**6EP1332-4BA00**
24 V DC/8 A	**6EP1333-4BA00**

	Article No.
Power supply connector	
Spare part; for connecting the 24 V DC supply voltage	
• With push-in terminals	**6ES7193-4JB00-0AA0**
IE FC RJ45 plugs	
RJ45 plug connector for Industrial Ethernet with a rugged metal enclosure and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables	
IE FC RJ45 plug 180	
180° cable outlet	
1 unit	**6GK1901-1BB10-2AA0**
10 units	**6GK1901-1BB10-2AB0**
50 units	**6GK1901-1BB10-2AE0**
IE FC TP standard cable GP 2x2	**6XV1840-2AH10**
4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/ IE FC RJ45 plug; PROFINET-compatible; with UL approval;	
Sold by the meter; max. delivery unit 1000 m; minimum order quantity 20 m	
IE FC TP trailing cable 2 x 2 (Type C)	**6XV1840-3AH10**
4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/ IE FC RJ45 plug 180/90 for trailing cable use; PROFINET-compatible; with UL approval;	
Sold by the meter; max. delivery unit 1000 m; minimum order quantity 20 m	
IE FC TP marine cable 2 x 2 (Type B)	**6XV1840-4AH10**
4-wire, shielded TP installation cable for connection to IE FC RJ45 outlet/ IE FC RJ45 plug 180/90 marine certified;	
Sold by the meter; max. delivery unit 1000 m; minimum order quantity 20 m	
IE FC stripping tool	**6GK1901-1GA00**
Preadjusted stripping tool for fast stripping of Industrial Ethernet FC cables	

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Overview



- Interface module for linking the ET 200MP to PROFIBUS
- Handles data exchange with the PROFIBUS master in the PLC
- Max. 12 I/O modules
- Automatic detection of baud rate 9.6 kBd ... 12 MBd
- PROFIBUS addresses 1 ... 125; adjustable using DIP switches
- Identification and maintenance data IM0 ... IM3

Technical specifications

Article number	**6ES7155-5BA00-0AB0** ET 200MP, IM155-5 DP ST
General information	
Product type designation	IM 155-5 DP ST
Product function	
• I&M data	Yes; I&M0 to I&M3
Engineering with	
• STEP 7 TIA Portal configurable/ integrated as of version	V13 / V13
• STEP 7 configurable/integrated as of version	V5.5 SP3 / -
• PROFIBUS as of GSD version/ GSD revision	V1.0 / V5.1
Supply voltage	
Rated value (DC)	24 V
Reverse polarity protection	Yes
Short-circuit protection	Yes
Input current	
Current consumption (rated value)	0.2 A; at 24 V DC and without load
Power loss	
Power loss, typ.	4 W
Address area	
Address space per station	
• Address space per station, max.	244 byte; per input / output
Hardware configuration	
Integrated power supply	Yes
Rack	
• Modules per rack, max.	12; I/O modules
Interfaces	
Number of PROFIBUS interfaces	1

Article number	**6ES7155-5BA00-0AB0** ET 200MP, IM155-5 DP ST
1. Interface	
Interface types	
• RS 485	Yes
Protocols	
• PROFIBUS DP slave	Yes
RS 485	
• Transmission rate, max.	12 Mbit/s
PROFIBUS DP	
Services	
- SYNC capability	Yes
- FREEZE capability	Yes
- DPV1	Yes
Isochronous mode	
Isochronous operation (application synchronized up to terminal)	No
Interrupts/diagnostics/ status information	
Status indicator	Yes
Alarms	Yes
Diagnostics function	Yes
Diagnostics indication LED	
• RUN LED	Yes; Green LED
• ERROR LED	Yes; Red LED
• MAINT LED	Yes; yellow LED
• Connection display DP	Yes; Green LED
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	0 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	0 °C
• vertical installation, max.	40 °C
Dimensions	
Width	35 mm
Height	147 mm
Depth	129 mm
Weights	
Weight, approx.	360 g

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Ordering data	Article No.
IM 155-5 DP ST interface module IP 20 degree of protection, module width 35 mm, installation on S7-1500 mounting rail	**6ES7155-5BA00-0AB0**
Accessories	
Front flap for IM 155-5 PN (spare part), 5 units	**6ES7528-0AA70-7AA0**
SIMATIC S7-1500 standard rail Fixed lengths, with grounding elements	
• 160 mm	**6ES7590-1AB60-0AA0**
• 245 mm	**6ES7590-1AC40-0AA0**
• 482 mm	**6ES7590-1AE80-0AA0**
• 530 mm	**6ES7590-1AF30-0AA0**
• 830 mm	**6ES7590-1AJ30-0AA0**
For cutting to length by customer, without drill holes; grounding elements must be ordered separately	
• 2000 mm	**6ES7590-1BC00-0AA0**
PE connection element for standard rail 2000 mm 20 units	**6ES7590-5AA00-0AA0**
Load power supply	
24 V DC/3 A	**6EP1332-4BA00**
24 V DC/8 A	**6EP1333-4BA00**
Power supply connector Spare part; for connecting the 24 V DC supply voltage	
• With push-in terminals	**6ES7193-4JB00-0AA0**
PROFIBUS connector	
• Connector for PROFIBUS, up to 12 Mbps, 90° cable outlet, insulation displacement system, without PG socket	**6ES7972-0BA70-0XA0**
• Connector for PROFIBUS, up to 12 Mbps, 90° cable outlet, insulation displacement system, with PG socket	**6ES7972-0BB70-0XA0**
PROFIBUS stripping tool Stripping tool for fast stripping of the PROFIBUS	**6GK1905-6AA00**
PROFIBUS FastConnect bus cable	
• Standard type with special design for quick mounting, 2-wire, shielded, sold by the meter, max. delivery unit 1000 m, minimum order quantity 20 m	**6XV1830-0EH10**
• 20 m	**6XV1830-0EN20**
• 50 m	**6XV1830-0EN50**
• 100 m	**6XV1830-0ET10**
• 200 m	**6XV1830-0ET20**
• 500 m	**6XV1830-0ET50**
• 1000 m	**6XV1830-0EU10**

	Article No.
FC robust cable Bus cable with PUR sheath for use under conditions of extreme mechanical stress or aggressive chemicals, 2-wire, shielded, sold by the meter, max. delivery unit 1 000 m, minimum order quantity 20 m	**6XV1830-0JH10**
FC flexible cable PROFIBUS bus cable, flexible, with special design for quick mounting, 2-wire, shielded, sold by the meter, max. delivery unit 1000 m, minimum order quantity 20 m	**6XV1831-2K**
FC trailing cable PROFIBUS trailing cable, at least 3 million bending cycles, min. bending radius approx. 120 mm, 2-wire, shielded, sold by the meter, max. delivery unit 1000 m, minimum order quantity 20 m	**6XV1830-3EH10**
FC bus cable PROFIBUS Food bus cable with PE sheath for use in the food and beverages industry, 2-wire, shielded, sold by the meter, max. delivery unit 1 000 m, minimum order quantity 20 m	**6XV1830-0GH10**
FC underground cable PROFIBUS underground cable, 2-wire, shielded, sold by the meter, max. delivery unit 1 000 m, minimum order quantity 20 m	**6XV1830-3FH10**
FC FRNC cable PROFIBUS bus cable, flame-retardant and halogen-free, with copolymer sheath FRNC, sold by the meter, max. delivery unit 1000 m, minimum order quantity 20 m	**6XV1830-0LH10**
FC trailing cable PROFIBUS trailing cable, at least 3 million bending cycles, min. bending radius approx. 120 mm, 2-wire, shielded, sold by the meter, max. delivery unit 1000 m, minimum order quantity 20 m	**6XV1831-2L**
IE FC stripping tool Preadjusted stripping tool for fast stripping of Industrial Ethernet FC cables	**6GK1901-1GA00**

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Overview



- Interface module for linking the ET 200MP to PROFINET
- Handles data exchange with the PROFINET I/O controller in the PLC
- Integrated 2-port switch for line topology
- Max. 30 I/O modules
- Shortest bus cycle 250 µs
- Linking to the isochronous task of the CPU
- Prioritized fast startup (FSU) with 500 ms (max. 12 I/O modules)
- Media Redundancy Protocol (MRP)
- Shared device on up to two I/O controllers (when configuring using GSD file; depends on the respective configuration tool)
- Omission of SIMATIC memory card (SMC); IM replacement without PG using LLDP

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

Ordering data

	Article No.
SIPLUS IM 155-5 PN interface module (Extended temperature range and exposure to environmental substances) IP 20 degree of protection, module width 35 mm, installation on S7-1500 mounting rail	**6AG1155-5AA01-7AB0**
Accessories	See SIMATIC ET 200MP, IM 155-5 PN interface module, page 9/216

Technical specifications

Article number	**6AG1155-5AA01-7AB0**
Based on	**6ES7155-5AA01-0AB0**
	SIPLUS ET 200MP IM 155-5 PN ST
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-40 °C; = Tmin (incl. condensation/ frost)
• horizontal installation, max.	70 °C; = Tmax; at > +60 °C no module permissible left of the IM
• vertical installation, min.	-40 °C; = Tmin
• vertical installation, max.	40 °C
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 080 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax - 20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m); from 2 000 m max. 132 V AC
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation / frost (no commissioning in bedewed state), horizontal installation
Resistance	
Coolants and lubricants	
- Resistant to commercially available coolants and lubricants	Yes; Incl. diesel and oil droplets in the air
Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
Remark	
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A

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Overview



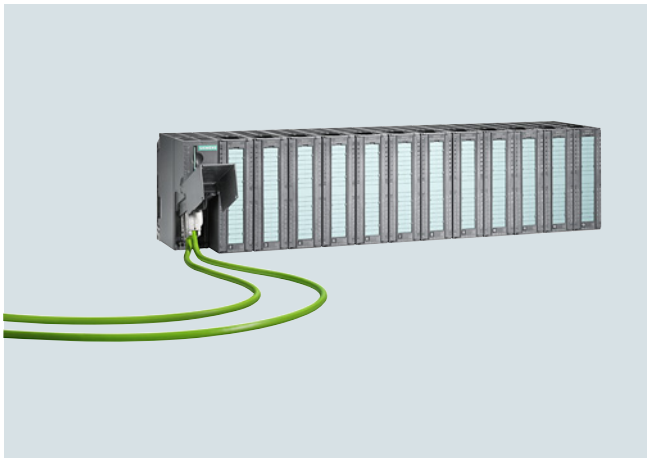
I/O modules constitute the interface of the SIMATIC ET 200MP to the process:

- Digital and analog modules provide exactly the inputs/outputs required for each task
- Technology modules for SIMATIC S7-1500 and ET 200MP
  - With integrated functions for high-speed counting and position detection
  - With integrated inputs and outputs for tasks at the process level and short response times
- Communication modules for SIMATIC S7-1500 and ET 200MP
  - For data exchange using point-to-point coupling
  - For connecting to PROFIBUS
  - For connecting to Industrial Ethernet
- Connection system for user-friendly, low-overhead wiring of the S7-1500 and ET 200MP modules

You can find additional information under SIMATIC S7-1500, catalog section 4.

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Overview



- Modular I/O system with IP20 degree of protection, particularly suitable for user-specific and complex automation tasks
- Consists of a PROFIBUS DP or PROFINET interface module IM 153, up to 8 or 12 I/O modules of the S7-300 automation system (structure with bus connection or with active bus modules), and a power supply if applicable
- Can be expanded with S7-300 automation system signal, communication and function modules
- Applicable Ex analog input or output modules with HART optimize the ET 200M for use in process engineering
- Can be used in redundant systems (S7-400H, S7-400F/FH)
- Modules can be replaced during operation (hot swapping) with the bus modules active
- Transmission rates up to 12 Mbps
- Ex approval to Cat. 3 for Zone 2 acc. to ATEX 100 a
- Fail-safe digital in/outputs as well as analog inputs for safety-oriented signal processing in accordance with PROFIsafe
- Supports modules with expanded user data, e.g. HART modules with HART minor variables

Availability

As part of our established product portfolio, the SIMATIC S7-300 / ET 200M system families will generally be available until 2023. Following the product phase-out declaration, products will be available as spare parts for another ten years.

Technical specifications

General technical data ET 200M	
Cables and connections	Screw and spring-loaded connections in permanent wiring
Degree of protection	IP20
Ambient temperature on vertical wall (preferred mounting position)	
• with horizontal assembly	0 to +60 °C
• with other assembly	0 to +40 °C
Relative humidity	5 to 95% (RH stress level 2 according to IEC 1131-2)
Atmospheric pressure	795 to 1080 hPa
Mechanical stress	
• Vibrations	IEC 68, parts 2 – 6: 10 - 57 Hz (const.amplitude 0.075 mm) 57 - 150 Hz (constant acceleration 1 g)
• Shock	IEC 68, parts 2 – 27 half-sine, 15 g, 11 ms

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Overview



The ET 200M system with various interface modules is available for the distributed use of S7-300 I/O modules. Depending on the application purpose, the best suited IM in terms of costs and functions can be selected:

IM153-1 Standard

The IM153-1 is one reasonably priced variant that is excellently suited for most applications in the manufacturing environment. It permits the use of up to 8 S7-300 I/O modules.

IM153-2 High Feature

For higher requirements in manufacturing technology, such as the use of F technology or the highest performance in conjunction with clock synchronization, the IM153-2 High Feature is available. This IM is also designed for use with the PCS7 in the field of process-oriented applications. This IM can be redundantly used and supports typical functions as they are required in the control field. These include, for example, clock synchronization or time stamping with an accuracy of up to 1 ms.

Technical specifications

Article number	**6ES7153-1AA03-0XB0**	**6ES7153-2BA10-0XB0**	**6ES7153-2BA70-0XB0**
	ET200M, Interface Module IM153-1	ET200M, Interface Module IM153-2 HF	ET200M, INTERFACE MODULE IM153-2 HF OUTDOOR
General information			
Product type designation	IM 153-1 DP ST	IM 153-2 DP HF	IM 153-2 HF
Supply voltage			
Rated value (DC)	24 V	24 V	
• 24 V DC	Yes	Yes	Yes
external protection for power supply lines (recommendation)	not necessary	2,5 A	2,5 A
Input current			
Current consumption, max.	350 mA; at 24 V DC	650 mA; with 24 V DC supply	650 mA
Output voltage			
Rated value (DC)	5 V		
Output current			
for backplane bus (5 V DC), max.	1 A	1.5 A	1.5 A
Power loss			
Power loss, typ.	3 W	5.5 W	5.5 W
Address area			
Addressing volume			
• Inputs	128 byte	244 byte	244 byte
• Outputs	128 byte	244 byte	244 byte
Hardware configuration			
Number of modules per DP slave interface, max.	8	12	12
Time stamping			
Accuracy		1 ms; 1ms at up to 8 modules; 10ms at up to 12 modules	1 ms; 1ms at up to 8 modules; 10ms at up to 12 modules
Number of message buffers		15	15
Messages per message buffer		20	20
Number of stampable digital inputs, max.		128; Max. 128 signals/station; max. 32 signals/slot	128; Max. 128 signals/station; max. 32 signals/slot
Time format		RFC 1119	RFC 1119
Time resolution		0.466 ns	0.466 ns
Time interval for transmitting the message buffer if a message is present		1 000 ms	1 000 ms
Time stamp on signal change		rising / falling edge as signal entering or exiting	rising / falling edge as signal entering or exiting

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Technical specifications (continued)

Article number	**6ES7153-1AA03-0XB0**	**6ES7153-2BA10-0XB0**	**6ES7153-2BA70-0XB0**
	ET200M, Interface Module IM153-1	ET200M, Interface Module IM153-2 HF	ET200M, INTERFACE MODULE IM153-2 HF OUTDOOR
Interfaces			
Transmission procedure	RS 485	RS 485	RS 485
PROFIBUS DP			
• Node addresses	1 to 125 permitted	1 to 125 permitted	1 to 125 permitted
• automatic detection of transmission rate	Yes	Yes	Yes
• Output current, max.	90 mA	70 mA	70 mA
• Transmission rate, max.	12 Mbit/s	12 Mbit/s	12 Mbit/s
• SYNC capability	Yes	Yes	Yes
• FREEZE capability	Yes	Yes	Yes
• Direct data exchange (slave-to-slave communication)	Yes; Sender	Yes; as publisher with all IO, as subscriber with F-IO only	Yes; as publisher with all IO, as subscriber with F-IO only
• Design of electrical connection of PROFIBUS interface	9-pin sub D socket	9-pin sub D	9-pin sub D
1. Interface			
PROFIBUS DP slave			
• GSD file	(for DPV1) SIEM801D.GSD; SI01801D.GSG	SI05801E.GSG	SI05801E.GSG
• automatic baud rate search	Yes	Yes	Yes
Protocols			
Bus protocol/transmission protocol	PROFIBUS DP to EN 50170	PROFIBUS DP to EN 50170	PROFIBUS DP to EN 50170
Protocols (Ethernet)			
• TCP/IP	No	No	
Potential separation			
Potential separation exists	Yes	Yes	Yes
Isolation			
Isolation tested with	Isolation voltage 500 V	Isolation voltage 500 V	Isolation voltage 500 V
Degree and class of protection			
IP degree of protection	IP20	IP20	IP20
Ambient conditions			
Ambient temperature during operation			
• min.	0 °C	0 °C	
• max.	60 °C	60 °C	
Altitude during operation relating to sea level			
• Installation altitude above sea level, max.	3 000 m	3 000 m	3 000 m
Configuration			
Configuration software			
• STEP 7	STEP 7 / COM PROFIBUS / non-Siemens tools via GSD file	Yes; STEP 7 / COM PROFIBUS / non-Siemens tools via GSD file	Yes; STEP 7 / COM PROFIBUS / non-Siemens tools via GSD file
Dimensions			
Width	40 mm	40 mm	40 mm
Height	125 mm	125 mm	125 mm
Depth	117 mm	117 mm	117 mm
Weights			
Weight, approx.	360 g	360 g	360 g

Article number	**6ES7195-7HD10-0XA0**
	ET200M, Bus Unit f. 2 IM 153-2 red.
Dimensions	
Width	97 mm
Height	92 mm
Depth	30 mm
Weights	
Weight, approx.	133 g

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Technical specifications (continued)

Article number	6ES7195-7HA00-0XA0 ET200M, Bus Module f. PS and IM 153	6ES7195-7HB00-0XA0 ET200M, Bus Module f. 2 40mm I/O Modules	6ES7195-7HC00-0XA0 ET200M, Bus Module f. 1 80mm I/O Module
Dimensions			
Width	97 mm	97 mm; 80 mm when installed	97 mm; 80 mm when installed
Height	92 mm	92 mm	92 mm
Depth	30 mm	30 mm	30 mm
Weights			
Weight, approx.	111 g	140 g	127 g

Ordering data

	Article No.
IM 153-1 interface module	
Slave interface for connecting an ET 200M to PROFIBUS DP	
• Standard temperature range	**6ES7153-1AA03-0XB0**
IM 153-2 interface module	
Slave interface for connecting an ET 200M to PROFIBUS DP; also for use in redundant systems	
• High Feature	**6ES7153-2BA10-0XB0**
• High Feature with extended temperature range	**6ES7153-2BA70-0XB0**
Active IM 153/IM 153 bus module	**6ES7195-7HD10-0XA0**
For two IM 153-2 High Feature modules for designing redundant systems	
Bus module for ET 200M	
• For accommodating a power supply and an IM 153 module for the hot-swapping function during RUN, incl. bus module cover	**6ES7195-7HA00-0XA0**
• For accommodating two 40 mm-wide I/O modules for the hot-swapping function	**6ES7195-7HB00-0XA0**
• For accommodating one 80 mm-wide I/O module for the hot-swapping function	**6ES7195-7HC00-0XA0**
ET 200M redundancy bundle	**6ES7153-2AR04-0XA0**
Comprising two IM 153-2 High Feature modules and one IM 153/IM 153 bus module	

	Article No.
Accessories	
PROFIBUS bus connector	
90° outgoing cable, terminating resistor with disconnecting function, up to 12 Mbps, FastConnect	
Without PG interface	
• 1 unit	**6ES7972-0BA52-0XA0**
• 100 units	**6ES7972-0BA52-0XB0**
With PG interface	
• 1 unit	**6ES7972-0BB52-0XA0**
• 100 units	**6ES7972-0BB52-0XB0**
SIMATIC DP standard rail for ET 200M	
Accommodates up to 5 bus modules; for hot-swapping function	
• Length: 483 mm (19")	**6ES7195-1GA00-0XA0**
• Length: 530 mm	**6ES7195-1GF30-0XA0**
• Length: 620 mm	**6ES7195-1GG30-0XA0**
• Length: 2000 mm	**6ES7195-1GC00-0XA0**
SIMATIC S7-300 standard rail	
• Length: 160 mm	**6ES7390-1AB60-0AA0**
• Length: 480 mm (19")	**6ES7390-1AE80-0AA0**
• Length: 530 mm	**6ES7390-1AF30-0AA0**
• Length: 830 mm	**6ES7390-1AJ30-0AA0**
• Length: 2000 mm	**6ES7390-1BC00-0AA0**
S7 Manual Collection	**6ES7998-8XC01-8YE0**
Electronic manuals on DVD, multi-language: S7-200, TD 200, S7-300, M7-300, C7, S7-400, M7-400, STEP 7, Engineering Tools, Runtime Software, SIMATIC DP (Distributed I/O), SIMATIC HMI (Human Machine Interface), SIMATIC NET (Industrial Communication)	
S7 Manual Collection update service for 1 year	**6ES7998-8XC01-8YE2**
Scope of supply: Current DVD "S7 Manual Collection" and the three subsequent updates	

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Overview



- For connecting ET 200M to PROFINET IO (via copper line, RJ45) as an IO device
- 2 versions:
  - IM 153-4 PN Standard
  - IM 153-4 PN High Feature:
    supports, in contrast to the Standard version, the operation of PROFIsafe F and HART modules. The operation of an S7-400H (system redundancy) is likewise possible.
- Integrated 2-port switch
- 12 modules per station
- Usable I/O capacity: 192 bytes each
- Active bus backplane to hot-swap modules available as an option
- Baud rate 10 Mbps / 100 Mbps (autonegotiation / full duplex)
- I&M functions according to PNO Guideline Order No. 3.502, Version V1.1

Note:

Micro Memory Card with at least 64 KB required if not all the stations in the network support LLDP (Link Layer Discovery Protocol; proximity detection).

Technical specifications

Article number	**6ES7153-4AA01-0XB0** IM153-4 PN IO for 12 Modules S7-300	**6ES7153-4BA00-0XB0** IM153-4 PN IO HF for 12 Modules S7-300
General information		
Product type designation	IM 153-4 PN ST	IM 153-4 PN HF
Supply voltage		
Rated value (DC)	24 V	24 V
• 24 V DC	Yes	Yes
external protection for power supply lines (recommendation)	In a construction with grounded reference potential, a fuse is necessary for redundant interface modules (Recommendation: 2.5 A)	In a construction with grounded reference potential, a fuse is necessary for redundant interface modules (Recommendation: 2.5 A)
Input current		
Current consumption, max.	600 mA; with 24 V DC supply	600 mA; with 24 V DC supply
Output voltage		
Rated value (DC)	5 V	5 V
Output current		
for backplane bus (5 V DC), max.	1.5 A	1.5 A
Power loss		
Power loss, typ.	6 W	6 W
Address area		
Addressing volume		
• Inputs	192 byte	672 byte; Extended HART user data
• Outputs	192 byte	192 byte
Hardware configuration		
Number of modules per DP slave interface, max.	12	12

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Technical specifications (continued)

Article number	**6ES7153-4AA01-0XB0** IM153-4 PN IO for 12 Modules S7-300	**6ES7153-4BA00-0XB0** IM153-4 PN IO HF for 12 Modules S7-300
Protocols		
Bus protocol/transmission protocol	PROFINET IO	PROFINET IO
Protocols (Ethernet)		
• TCP/IP	No	Yes
• SNMP		Yes
• LLDP		Yes
• ping		Yes
• ARP		Yes
PROFINET IO Device		
Services		
- Isochronous mode		Yes
- IRT		Yes
- PROFIenergy		No
- Prioritized startup		Yes
- Shared device		Yes
- Number of IO Controllers with shared device, max.		2
Redundancy mode		
• MRP	Yes	Yes
• PROFINET system redundancy (S2)	No	Yes
Interrupts/diagnostics/ status information		
Diagnostics indication LED		
• for module diagnostics	Yes	Yes
• Connection to network LINK (green)	Yes	Yes
• Transmit/receive RX/TX (yellow)	Yes	Yes
Potential separation		
Potential separation exists	Yes	Yes; Only direction PROFINET, RWB is not separated
Isolation		
Isolation tested with	500 V DC	Between PROFINET and 24 V supply: 1 500 V AC, between functional grounding and 24 V supply: 500 V DC
Degree and class of protection		
IP degree of protection	IP20	IP20
Ambient conditions		
Ambient temperature during operation		
• min.	0 °C	0 °C
• max.	60 °C	60 °C
Altitude during operation relating to sea level		
• Installation altitude above sea level, max.	2 000 m	2 000 m
Dimensions		
Width	40 mm	40 mm
Height	125 mm	125 mm
Depth	118 mm	118 mm
Weights		
Weight, approx.	215 g	215 g

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Ordering data

	Article No.
IM 153-4 PN interface module	
I/O device to connect an ET 200M to PROFINET	
Standard	**6ES7153-4AA01-0XB0**
High Feature	**6ES7153-4BA00-0XB0**
Accessories	
Bus modules for ET 200M	
• For accommodating a power supply and an IM 153 module for the hot-swapping function during RUN, incl. bus module cover	**6ES7195-7HA00-0XA0**
• For accommodating two 40 mm-wide I/O modules for the hot-swapping function	**6ES7195-7HB00-0XA0**
• For accommodating one 80 mm-wide I/O module for the hot-swapping function	**6ES7195-7HC00-0XA0**
SIMATIC Micro Memory Card	
64 KB[1)]	**6ES7953-8LF31-0AA0**
SIMATIC DP standard rail for ET 200M	
Accommodates bus modules; for hot-swapping function	
• Length: 483 mm (19")	**6ES7195-1GA00-0XA0**
• Length: 530 mm	**6ES7195-1GF30-0XA0**
• Length: 620 mm	**6ES7195-1GG30-0XA0**
• Length: 2 000 mm	**6ES7195-1GC00-0XA0**
SIMATIC S7-300 mounting rail	
Length: 160 mm	**6ES7390-1AB60-0AA0**
Length: 480 mm (19")	**6ES7390-1AE80-0AA0**
Length: 530 mm	**6ES7390-1AF30-0AA0**
Length: 830 mm	**6ES7390-1AJ30-0AA0**
Length: 2000 mm	**6ES7390-1BC00-0AA0**
Power supply connector	
For connection of the 24 V DC power supply; spare part, 1 pack containing 10 units	
Spring-loaded connections	**6ES7193-4JB00-0AA0**
Screw terminal connections	**6ES7193-4JB50-0AA0**

	Article No.
S7 Manual Collection	**6ES7998-8XC01-8YE0**
Electronic manuals on DVD, multi-language: S7-200, TD 200, S7-300, M7-300, C7, S7-400, M7-400, STEP 7, Engineering Tools, Runtime Software, SIMATIC DP (Distributed I/O), SIMATIC HMI (Human Machine Interface), SIMATIC NET (Industrial Communication)	
S7 Manual Collection update service for 1 year	**6ES7998-8XC01-8YE2**
Scope of supply: Current DVD "S7 Manual Collection" and the three subsequent updates	
Industrial Ethernet FC RJ45 plug 180	
RJ45 plug connector for Industrial Ethernet with a rugged metal housing and integrated insulation displacement contacts for connecting Industrial Ethernet FC installation cables; with 180° cable outlet	
1 unit	**6GK1901-1BB10-2AA0**
10 units	**6GK1901-1BB10-2AB0**
50 units	**6GK1901-1BB10-2AE0**
Industrial Ethernet FastConnect installation cables	
• FastConnect standard cable	**6XV1840-2AH10**
• FastConnect trailing cable	**6XV1840-3AH10**
• FastConnect marine cable	**6XV1840-4AH10**
Industrial Ethernet FastConnect	
Stripping tool	**6GK1901-1GA00**

[1)] To operate the IM153-4, an MMC is required with at least 64 KB memory. Cards with higher memory capacity may also be used.

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Overview



Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

For technical documentation on SIPLUS, see:

http://www.siemens.com/siplus-extreme

Technical specifications

Article number	**6AG1153-1AA03-2XB0**	**6AG1153-2BA10-2XY0**	**6AG1153-2BA10-7XB0**
Based on	**6ES7153-1AA03-0XB0**	**6ES7153-2BA10-0XY0**	**6ES7153-2BA10-0XB0**
	SIPLUS IM153-1	SIPLUS ET200M IM153-2 EN50155	SIPLUS ET200M IM153-2 HF
Ambient conditions			
Ambient temperature during operation			
• min.	-40 °C; = Tmin	-25 °C; = Tmin	-40 °C; = Tmin; Startup @ -25 °C
• max.	70 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use	60 °C; = Tmax; the rated temperature range of -25 ... +55 °C (T1) applies for the use on railway vehicles according to EN50155	70 °C; = Tmax
• At cold restart, min.	-25 °C	-25 °C	-25 °C
Ambient temperature during storage/transportation			
• min.	-40 °C	-40 °C	-40 °C
• max.	70 °C	70 °C	70 °C
Altitude during operation relating to sea level			
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m

• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at
	1 140 hPa ... 795 hPa
	(-1 000 m ... +2 000 m) //
	Tmin ... (Tmax - 10 K) at
	795 hPa ... 658 hPa
	(+2 000 m ... +3 500 m) //
	Tmin ... (Tmax -20 K) at
	658 hPa ... 540 hPa
	(+3 500 m ... +5 000 m)
		Tmin ... Tmax at
		1 140 hPa ... 795 hPa
		(-1 000 m ... +2 000 m) //
		Tmin ... (Tmax - 10 K) at
		795 hPa ... 658 hPa
		(+2 000 m ... +3 500 m) //
		Tmin ... (Tmax -20 K) at
		658 hPa ... 540 hPa
		(+3 500 m ... +5 000 m)
			Tmin ... Tmax at
			1 140 hPa ... 795 hPa
			(-1 000 m ... +2 000 m) //
			Tmin ... (Tmax - 10 K) at
			795 hPa ... 658 hPa
			(+2 000 m ... +3 500 m) //
			Tmin ... (Tmax -20 K) at
			658 hPa ... 540 hPa
			(+3 500 m ... +5 000 m)

Relative humidity			
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)

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Technical specifications (continued)

Article number	**6AG1153-1AA03-2XB0**	**6AG1153-2BA10-2XY0**	**6AG1153-2BA10-7XB0**
Based on	**6ES7153-1AA03-0XB0**	**6ES7153-2BA10-0XY0**	**6ES7153-2BA10-0XB0**
	SIPLUS IM153-1	SIPLUS ET200M IM153-2 EN50155	SIPLUS ET200M IM153-2 HF
Resistance			
Use in stationary industrial systems			
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
Use on land craft, rail vehicles and special-purpose vehicles			
- to biologically active substances according to EN 60721-3-5		Yes; Class 5B2 mold, fungus and dry rot spores (with the exception of fauna); Class 5B3 on request	
- to chemically active substances according to EN 60721-3-5		Yes; Class 5C3 (RH < 75 %) incl. salt spray acc. to EN 50155 (ST2); *	
- to mechanically active substances according to EN 60721-3-5		Yes; Class 5S3 incl. sand, dust; *	
Use on ships/at sea			
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request		Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *		Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *		Yes; Class 6S3 incl. sand, dust; *
Remark			
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!

Article number	**6AG1195-7HA00-2XA0**	**6AG1195-7HB00-7XA0**	**6AG1195-7HC00-2XA0**	**6AG1195-7HD10-2XA0**
Based on	**6ES7195-7HA00-0XA0**	**6ES7195-7HB00-0XA0**	**6ES7195-7HC00-0XA0**	**6ES7195-7HD10-0XA0**
	SIPLUS ET200M DP bus module	SIPLUS DP bus module ET200M 2X40	SIPLUS ET200M bus module	SIPLUS ET 200M DP bus module
Ambient conditions				
Ambient temperature during operation				
• min.	-40 °C; = Tmin	-40 °C; = Tmin	-40 °C; = Tmin	-40 °C; = Tmin
• max.	70 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use	70 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use	70 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use	70 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use
Ambient temperature during storage/transportation				
• min.	-40 °C	-40 °C	-40 °C	-40 °C
• max.	70 °C	70 °C	70 °C	70 °C
Altitude during operation relating to sea level				
• Installation altitude above sea level, max.	5 000 m	5 000 m	5 000 m	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity				
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)

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Technical specifications (continued)

Article number	6AG1195-7HA00-2XA0	6AG1195-7HB00-7XA0	6AG1195-7HC00-2XA0	6AG1195-7HD10-2XA0
Based on	6ES7195-7HA00-0XA0	6ES7195-7HB00-0XA0	6ES7195-7HC00-0XA0	6ES7195-7HD10-0XA0
	SIPLUS ET200M DP bus module	SIPLUS DP bus module ET200M 2X40	SIPLUS ET200M bus module	SIPLUS ET 200M DP bus module
Resistance				
Use in stationary industrial systems				
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *	Yes; Class 3S4 incl. sand, dust, *
Use on ships/at sea				
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *	Yes; Class 6S3 incl. sand, dust; *
Remark				
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!	* The supplied plug covers must remain in place over the unused interfaces during operation!

Ordering data

	Article No.
SIPLUS ET 200M IM 153-1	
Slave interface for connecting an ET 200M to PROFIBUS DP for a maximum of 8 S7-300 modules	
• Extended temperature range and exposure to media	**6AG1153-1AA03-2XB0**
SIPLUS ET 200M IM 153-2 High Feature	
Slave interface for connecting an ET 200M to PROFIBUS DP for a maximum of 12 S7-300 modules; also for use in redundant systems	
• Extended temperature range and exposure to media	**6AG1153-2BA10-7XB0**
• Conforms to EN 50155	**6AG1153-2BA10-2XY0**

	Article No.
Bus module for SIPLUS ET 200M	
Bus module for accommodating a power supply and an IM 153 module for the hot-swapping function during RUN, incl. bus module cover	
• Extended temperature range and exposure to media	**6AG1195-7HA00-2XA0**
Bus module for accommodating two 40 mm-wide I/O modules for the hot-swapping function	
• Extended temperature range and exposure to media	**6AG1195-7HB00-7XA0**
Bus module for accommodating one 80 mm-wide I/O module for the hot-swapping function	
• Extended temperature range and exposure to media	**6AG1195-7HC00-2XA0**
Bus module for accommodating two IM 153 modules for the hot-swapping function; for setting up redundant systems	
• Extended temperature range and exposure to media	**6AG1195-7HD10-2XA0**
RS 485 bus connector with 90° cable outlet	
Max. transfer rate 12 Mbps	
Extended temperature range and exposure to media	
• without PG interface	**6AG1972-0BA12-2XA0**
• with PG interface	**6AG1972-0BB12-2XA0**
Additional accessories	see SIMATIC ET 200M IM 153-1/153-2, page 9/224

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Overview



- For connection of ET 200M as IO Device to PROFINET IO (copper, RJ45)
- 2 versions:
  - IM 153-4 PN STANDARD
  - IM 153-4 PN HIGH FEATURE:
    additionally to the STANDARD version, operation of PROFIsafe F and HART modules
- Integrated 2-port switch
- 12 modules per station
- Usable I/O quantity structure: 192 bytes each
- Active backplane bus for hot swapping of modules optionally available
- Baud rate 10 Mbps / 100 Mbps (Autonegotiation/Full Duplex)
- I&M functions according to PNO-Guideline Order-No. 3.502, Version V1.1

Notes:

Micro Memory Card with min. 64 KB required if not all participants in the network support LLDP (Link Layer Discovery Protocol; neighbor detection).

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

For technical documentation on SIPLUS, see:
http://www.siemens.com/siplus-extreme

Technical specifications

Article number	**6AG1153-4AA01-7XB0**
Based on	**6ES7153-4AA01-0XB0**
	SIPLUS ET200M IM 153-4 PN IO
Ambient conditions	
Ambient temperature during operation	
• min.	-25 °C; = Tmin
• max.	70 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use
Ambient temperature during storage/transportation	
• min.	-40 °C
• max.	70 °C
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance	
Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
Remark	
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!

Ordering data

	Article No.
SIPLUS ET 200M IM 153-4 PN	
Slave interface for connecting an ET 200M to PROFINET for a maximum of 12 S7-300 modules	
• Extended temperature range and exposure to media	**6AG1153-4AA01-7XB0**
Accessories	
IE FC RJ45 plug 180	**6AG1901-1BB10-7AA0**
180° cable outlet; 1 unit	
Additional accessories	See SIMATIC ET 200M IM 153-4 PN interface module, page 9/227

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Overview Digital modules



- Digital inputs and outputs
- For flexible adaptation of the controller to the respective task
- For connecting digital sensors and actuators

For further information, see SIMATIC S7-300, chapter 5.

Overview Analog modules



- Analog inputs and outputs
- For solving even complex tasks with analog process signals
- For connecting analog actuators and sensors without additional measuring amplifiers

HART modules

- For the use of HART (**H**ighway **A**ddressable **R**emote **T**ransducer) devices in the SIMATIC S7 and PCS 7 automation systems
- All transducers or HART sensors/actuators which are certified for communication using the HART protocol can be connected
- In addition, conventional transducers with 4 to 20 mA technology without HART protocol can also be connected
- Can only be plugged into ET 200M with IM153-2

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Overview



- Can only be plugged into ET 200M with IM 153-2 and IM 153-2 FO
- 8 AI HART
- Redundancy switching
- Firmware update
- HART minor variables

Technical specifications

Article number	**6ES7331-7TF01-0AB0**
	SM331, 8AI, 0/4-20MA HART
Supply voltage	
Load voltage L+	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes
Input current	
from load voltage L+ (without load), max.	20 mA
from backplane bus 5 V DC, max.	120 mA
Output voltage	
Power supply to the transmitters	
• present	Yes
• Rated value (DC)	24 V
• short-circuit proof	Yes
• Supply current, max.	60 mA
Analog inputs	
Number of analog inputs	8
permissible input current for current input (destruction limit), max.	40 mA
Input ranges (rated values), currents	
• 0 to 20 mA	Yes
Cable length	
• shielded, max.	800 m
Analog value generation for the inputs	
Measurement principle	Sigma Delta
Integration and conversion time/ resolution per channel	
• Resolution with overrange (bit including sign), max.	16 bit
• Integration time, parameterizable	Yes
• Integration time (ms)	20 ms at 50 Hz; 16.6 ms at 60 Hz; 100 ms at 100 Hz
• Basic conversion time, including integration time (ms)	55 ms @ 60 Hz, 65 ms @ 50 Hz, 305 ms @ 100 Hz
• Interference voltage suppression for interference frequency f1 in Hz	10 / 50 / 60 Hz
Smoothing of measured values	
• parameterizable	Yes

Article number	**6ES7331-7TF01-0AB0**
	SM331, 8AI, 0/4-20MA HART
Encoder	
Connection of signal encoders	
• for current measurement as 2-wire transducer	Yes
• for current measurement as 4-wire transducer	Yes
Errors/accuracies	
Linearity error (relative to input range), (+/-)	0.01 %
Temperature error (relative to input range), (+/-)	0.001 %/K
Crosstalk between the inputs, min.	70 dB
Repeat accuracy in steady state at 25 °C (relative to input range), (+/-)	0.1 %
Operational error limit in overall temperature range	
• Current, relative to input range, (+/-)	0.15 %
Basic error limit (operational limit at 25 °C)	
• Current, relative to input range, (+/-)	0.1 %
Interference voltage suppression for f = n x (f1 +/- 1 %), f1 = interference frequency	
• Series mode interference (peak value of interference < rated value of input range), min.	40 dB
• Common mode interference, min.	100 dB
Isochronous mode	
Isochronous operation (application synchronized up to terminal)	No

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Technical specifications (continued)

Article number	**6ES7331-7TF01-0AB0**
	SM331, 8AI, 0/4-20MA HART
Interrupts/diagnostics/ status information	
Diagnostics function	Yes
Alarms	
• Diagnostic alarm	Yes
• Limit value alarm	Yes
Diagnostic messages	
• Diagnostic information readable	Yes
Diagnostics indication LED	
• Group error SF (red)	Yes
• Channel fault indicator F (red)	Yes
Potential separation	
Potential separation analog inputs	
• between the channels	No
• between the channels and backplane bus	Yes
Degree and class of protection	
IP degree of protection	IP20
Connection method	
required front connector	20-pin
Dimensions	
Width	40 mm
Height	125 mm
Depth	117 mm
Weights	
Weight, approx.	205 g

Ordering data

	Article No.
SM 331 HART analog input module	**6ES7331-7TF01-0AB0**
8 inputs, 0/4 – 20 mA, HART for ET 200M with IM 153-2 interface module	
Accessories	
Front connectors	
• 20-pin, with screw contacts	
- 1 unit	**6ES7392-1AJ00-0AA0**
- 100 units	**6ES7392-1AJ00-1AB0**
• 20-pin, with spring-loaded contacts	
- 1 unit	**6ES7392-1BJ00-0AA0**
- 100 units	**6ES7392-1BJ00-1AB0**
LK 393 cable guide	**6ES7393-4AA00-0AA0**
Mandatory for operation in hazardous areas	
SIMATIC DP mounting rail for ET 200M	
For mounting of up to 5 bus modules for	
• Length: 483 mm (19")	**6ES7195-1GA00-0XA0**
• Length: 530 mm	**6ES7195-1GF30-0XA0**
SIMATIC S7-300 mounting rail	
• Length: 160 mm	**6ES7390-1AB60-0AA0**
• Length: 480 mm (19")	**6ES7390-1AE80-0AA0**
• Length: 530 mm	**6ES7390-1AF30-0AA0**
• Length: 830 mm	**6ES7390-1AJ30-0AA0**
• Length: 2000 mm	**6ES7390-1BC00-0AA0**
Label cover	**6ES7392-2XY00-0AA0**
(10 units, spare part) for signal modules (not 32-channel modules), function modules and CPU 312 IFM	
Labeling strips	**6ES7392-2XX00-0AA0**
(10 units, spare part) for signal modules (not 32-channel modules), function modules and CPU 312 IFM	
Labeling sheets for machine printing	
For modules with 20-pin front connector, DIN A4, for printing with laser printer; 10 units	
Petrol	**6ES7392-2AX00-0AA0**
Light beige	**6ES7392-2BX00-0AA0**
Yellow	**6ES7392-2CX00-0AA0**
Red	**6ES7392-2DX00-0AA0**

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Overview



- For plugging into ET 200M exclusively with IM 153-2 and IM 153-2 FO
- 8 AO HART
- Redundancy switching
- Firmware update
- HART minor variables

Technical specifications

Article number	**6ES7332-8TF01-0AB0**
	SM332, 8AO, 0/4 - 20MA HART
Supply voltage	
Load voltage L+	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes
Input current	
from load voltage L+ (without load), max.	350 mA
from backplane bus 5 V DC, max.	110 mA
Analog outputs	
Number of analog outputs	8
Current output, no-load voltage, max.	24 V
Output ranges, current	
• 0 to 20 mA	Yes
• -20 mA to +20 mA	No
• 4 mA to 20 mA	Yes
Connection of actuators	
• for current output two-wire connection	Yes
Load impedance (in rated range of output)	
• with current outputs, max.	750 Ω
• with current outputs, inductive load, max.	10 mH
Destruction limits against externally applied voltages and currents	
• Voltages at the outputs towards MANA	+60/-0.5 V
Cable length	
• shielded, max.	800 m

Article number	**6ES7332-8TF01-0AB0**
	SM332, 8AO, 0/4 - 20MA HART
Analog value generation for the outputs	
Integration and conversion time/ resolution per channel	
• Resolution with overrange (bit including sign), max.	16 bit
• Basic execution time of the module (all channels released)	10 ms; 10 ms in AO mode 50 ms in HART-AO mode
Settling time	
• for resistive load	0.1 ms
• for inductive load	0.5 ms
Errors/accuracies	
Output ripple (relative to output range, bandwidth 0 to 50 kHz), (+/-)	0.02 %
Linearity error (relative to output range), (+/-)	0.01 %
Temperature error (relative to output range), (+/-)	0.002 %/K
Crosstalk between the outputs, min.	70 dB
Repeat accuracy in steady state at 25 °C (relative to output range), (+/-)	0.05 %
Operational error limit in overall temperature range	
• Current, relative to output range, (+/-)	0.2 %
Basic error limit (operational limit at 25 °C)	
• Current, relative to output range, (+/-)	0.1 %

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Technical specifications (continued)

Article number	**6ES7332-8TF01-0AB0** SM332, 8AO, 0/4 - 20MA HART
Isochronous mode	
Isochronous operation (application synchronized up to terminal)	No
Interrupts/diagnostics/ status information	
Diagnostics function	Yes
Substitute values connectable	Yes
Alarms	
• Diagnostic alarm	Yes
Diagnostic messages	
• Diagnostic information readable	Yes
Diagnostics indication LED	
• Group error SF (red)	Yes
Potential separation	
Potential separation analog outputs	
• between the channels	No
• between the channels and backplane bus	Yes
• Between the channels and load voltage L+	Yes
Degree and class of protection	
IP degree of protection	IP20
Connection method	
required front connector	20-pin
Dimensions	
Width	40 mm
Height	125 mm
Depth	117 mm
Weights	
Weight, approx.	220 g

Ordering data

	Article No.
SM 332 HART analog output module HART analog output, 8 outputs, 0/4 – 20 mA, HART for ET 200M with IM 153-2	**6ES7332-8TF01-0AB0**
Accessories	
Front connector (1 unit) 20-pin, with screw contacts	**6ES7392-1AJ00-0AA0**
LK 393 cable guide Mandatory for operation in hazardous areas	**6ES7393-4AA00-0AA0**
SIMATIC DP standard rail for ET 200M For mounting of up to 5 bus modules for	
• Length: 483 mm (19")	**6ES7195-1GA00-0XA0**
• Length: 530 mm	**6ES7195-1GF30-0XA0**
SIMATIC S7-300 mounting rail	
• Length: 160 mm	**6ES7390-1AB60-0AA0**
• Length: 480 mm (19")	**6ES7390-1AE80-0AA0**
• Length: 530 mm	**6ES7390-1AF30-0AA0**
• Length: 830 mm	**6ES7390-1AJ30-0AA0**
• Length: 2000 mm	**6ES7390-1BC00-0AA0**
Label cover (10 units, spare part) for signal modules (not 32-channel modules), function modules and CPU 312 IFM	**6ES7392-2XY00-0AA0**
Labeling strips (10 units, spare part) for signal modules (not 32-channel modules), function modules and CPU 312 IFM	**6ES7392-2XX00-0AA0**
S7 Manual Collection Electronic manuals on DVD, multi-language: S7-200, TD 200, S7-300, M7-300, C7, S7-400, M7-400, STEP 7, Engineering Tools, Runtime Software, SIMATIC DP (Distributed I/O), SIMATIC HMI (Human Machine Interface), SIMATIC NET (Industrial Communication)	**6ES7998-8XC01-8YE0**
S7 Manual Collection update service for 1 year Scope of supply: Current DVD "S7 Manual Collection" and the three subsequent updates	**6ES7998-8XC01-8YE2**
Labeling sheets for machine printing For modules with 20-pin front connector, DIN A4, for printing with laser printer; 10 units	
Petrol	**6ES7392-2AX00-0AA0**
Light beige	**6ES7392-2BX00-0AA0**
Yellow	**6ES7392-2CX00-0AA0**
Red	**6ES7392-2DX00-0AA0**

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Overview



- For connecting HART devices in hazardous areas.
- Can only be plugged into ET 200M
- 2 AI HART, Ex
- 2 inputs in 2 channel groups (single-channel isolation)
- Measurement type and range can be selected for each channel
- Diagnostics and diagnostic alarm parameterizable

Technical specifications

Article number	**6ES7331-7TB10-0AB0**
	SM331, 2AI, 0/4-20MA HART
Supply voltage	
Load voltage L+	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes
Input current	
from load voltage L+ (without load), max.	180 mA
from backplane bus 5 V DC, max.	100 mA
Output voltage	
Power supply to the transmitters	
• present	Yes
• Rated value (DC)	15 V; at 22 mA
• short-circuit proof	Yes; approx. 30 mA
• No-load voltage (DC)	29.6 V
Analog inputs	
Number of analog inputs	2
permissible input current for current input (destruction limit), max.	40 mA
Input ranges (rated values), currents	
• 0 to 20 mA	Yes
• 4 mA to 20 mA	Yes
Cable length	
• shielded, max.	400 m
Analog value generation for the inputs	
Measurement principle	Sigma Delta
Integration and conversion time/ resolution per channel	
• Resolution with overrange (bit including sign), max.	16 bit; 10 bit to 15 bit + sign
• Integration time, parameterizable	Yes
• Integration time (ms)	2,5 / 16,67 / 20 / 100 ms
• Basic conversion time, including integration time (ms)	2.5 / 16.67 / 20 / 100 (1 channel enabled); 7.5 / 50 / 60 / 300 (2 channels enabled)
• Interference voltage suppression for interference frequency f1 in Hz	10 / 50 / 60 / 400 Hz

Article number	**6ES7331-7TB10-0AB0**
	SM331, 2AI, 0/4-20MA HART
Encoder	
Connection of signal encoders	
• for current measurement as 2-wire transducer	Yes
• for current measurement as 4-wire transducer	Yes
Errors/accuracies	
Linearity error (relative to input range), (+/-)	0.01 %
Temperature error (relative to input range), (+/-)	0.01 %/K
Crosstalk between the inputs, min.	130 dB
Repeat accuracy in steady state at 25 °C (relative to input range), (+/-)	0.05 %
Operational error limit in overall temperature range	
• Current, relative to input range, (+/-)	0.45 %; From 0/4 to 20 mA
Basic error limit (operational limit at 25 °C)	
• Current, relative to input range, (+/-)	0.1 %; From 0/4 to 20 mA
Interference voltage suppression for f = n x (f1 +/- 1 %), f1 = interference frequency	
• Series mode interference (peak value of interference < rated value of input range), min.	60 dB
• Common mode interference, min.	130 dB
Interrupts/diagnostics/ status information	
Diagnostics function	Yes; Parameterizable
Alarms	
• Diagnostic alarm	Yes; Parameterizable
• Limit value alarm	Yes; Parameterizable, channels 0 and 1
Diagnostic messages	
• Diagnostic information readable	Yes; possible
• Overrange	Yes; Red LED, signal
• Wire-break in signal transmitter cable	Yes; Red LED, signal
• Short-circuit of the signal encoder cable	Yes; Red LED, signal
• HART communication active	Yes; green LED (H)
Diagnostics indication LED	
• Group error SF (red)	Yes
• Channel fault indicator F (red)	Yes

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Technical specifications (continued)

Article number	**6ES7331-7TB10-0AB0**
	SM331, 2AI, 0/4-20MA HART
Ex(i) characteristics	
Module for Ex(i) protection	Yes
Maximum values of input circuits (per channel)	
• Co (permissible external capacity), max.	62 nF
• Io (short-circuit current), max.	96.1 mA
• Lo (permissible external inductivity), max.	3 mH
• Po (power of load), max.	511 mW
• Uo (output no-load voltage), max.	26 V
• Um (fault voltage), max.	250 V; DC
• Ta (permissible ambient temperature), max.	60 °C
Potential separation	
Potential separation analog inputs	
• between the channels	Yes
• between the channels and backplane bus	Yes
Standards, approvals, certificates	
CE mark	Yes
UL approval	Yes
FM approval	Yes
RCM (formerly C-TICK)	Yes
KC approval	Yes
EAC (formerly Gost-R)	Yes
Use in hazardous areas	
• Type of protection acc. to FM	Class I, Division 2, Group A, B, C, D T4; Class I, Zone 2, Group IIC T4
• Type of protection acc. to KEMA	ATEX II 3 G (2) GD Ex nA [ib Gb] [ib IIIC Db] IIC T4 Gc
• Test number KEMA	DEKRA 14 ATEX 0052X
Ambient conditions	
Ambient temperature during operation	
• min.	0 °C
• max.	60 °C
Connection method	
required front connector	1x 20-pin
Dimensions	
Width	40 mm
Height	125 mm
Depth	120 mm
Weights	
Weight, approx.	260 g

Ordering data

	Article No.
SM 331 HART analog input module	
2 inputs, 0/4 – 20 mA, HART for ET 200M with IM 153-2 interface module	
For HART protocol V5.0 and higher	**6ES7331-7TB10-0AB0**
Accessories	
Front connector[1]	
20-pin, with screw contacts	
• 1 unit	**6ES7392-1AJ00-0AA0**
• 100 units	**6ES7392-1AJ00-1AB0**
LK 393 cable guide	**6ES7393-4AA00-0AA0**
Mandatory for operation in hazardous areas	
SIMATIC DP mounting rail for ET 200M	
For mounting of up to 5 bus modules for	
• Length: 483 mm	**6ES7195-1GA00-0XA0**
• Length: 530 mm	**6ES7195-1GF30-0XA0**
SIMATIC S7-300 mounting rail	
• Length: 160 mm	**6ES7390-1AB60-0AA0**
• Length: 480 mm (19")	**6ES7390-1AE80-0AA0**
• Length: 530 mm	**6ES7390-1AF30-0AA0**
• Length: 830 mm	**6ES7390-1AJ30-0AA0**
• Length: 2000 mm	**6ES7390-1BC00-0AA0**
Label cover	**6ES7392-2XY00-0AA0**
(10 units, spare part) for signal modules (not 32-channel modules), function modules and CPU 312 IFM	
Labeling strips	**6ES7392-2XX00-0AA0**
(10 units, spare part) for signal modules (not 32-channel modules), function modules and CPU 312 IFM	
Labeling sheets for machine printing	
for modules with 20-pin front connector, DIN A4, for printing with laser printer; 10 units	
Petrol	**6ES7392-2AX00-0AA0**
Light beige	**6ES7392-2BX00-0AA0**
Yellow	**6ES7392-2CX00-0AA0**
Red	**6ES7392-2DX00-0AA0**

[1] A connector with spring-loaded terminals cannot be used if the cable guide is used.

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Overview



- For using HART devices in hazardous areas
- Can only be plugged into ET 200M
- 2 AO HART, Ex
- 2 current outputs in 2 channel groups (single-channel isolation)
- Output type and range can be selected for each channel
- Diagnostics and diagnostic alarm parameterizable
- Read-back capability of the analog outputs

Technical specifications

Article number	**6ES7332-5TB10-0AB0**
	SM332, 2AO, 0/4 - 20MA HART
Supply voltage	
Load voltage L+	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes
Input current	
from load voltage L+ (without load), max.	150 mA
from backplane bus 5 V DC, max.	100 mA
Analog outputs	
Number of analog outputs	2
Current output, no-load voltage, max.	19 V
Cycle time (all channels) max.	5 ms
Output ranges, current	
• 0 to 20 mA	Yes
• -20 mA to +20 mA	No
• 4 mA to 20 mA	Yes
Connection of actuators	
• for current output two-wire connection	Yes
Load impedance (in rated range of output)	
• with current outputs, max.	650 Ω
• with current outputs, inductive load, max.	7.5 mH
Destruction limits against externally applied voltages and currents	
• Voltages at the outputs towards MANA	max. 17 V / -0.5 V
• Current, max.	60 mA / -1 A
Cable length	
• shielded, max.	400 m

Article number	**6ES7332-5TB10-0AB0**
	SM332, 2AO, 0/4 - 20MA HART
Analog value generation for the outputs	
Integration and conversion time/ resolution per channel	
• Resolution with overrange (bit including sign), max.	12 bit; + sign
• Conversion time (per channel)	40 ms
Settling time	
• for resistive load	2.5 ms
• for capacitive load	4 ms
• for inductive load	2.5 ms
Errors/accuracies	
Output ripple (relative to output range, bandwidth 0 to 50 kHz), (+/-)	0.02 %
Linearity error (relative to output range), (+/-)	0.03 %
Temperature error (relative to output range), (+/-)	0.01 %/K
Crosstalk between the outputs, min.	130 dB
Repeat accuracy in steady state at 25 °C (relative to output range), (+/-)	0.005 %
Operational error limit in overall temperature range	
• Current, relative to output range, (+/-)	0.55 %
Basic error limit (operational limit at 25 °C)	
• Current, relative to output range, (+/-)	0.15 %

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Technical specifications (continued)

Article number	**6ES7332-5TB10-0AB0**
	SM332, 2AO, 0/4 - 20MA HART
Interrupts/diagnostics/ status information	
Diagnostics function	Yes; Parameterizable
Substitute values connectable	Yes; Parameterizable
Alarms	
• Diagnostic alarm	Yes; Parameterizable
Diagnostic messages	
• Diagnostic information readable	Yes; possible
• Overrange	Yes
• Wire-break	Yes; as of output value > 0.5 mA
• HART communication active	Yes; green LED (H)
Diagnostics indication LED	
• Group error SF (red)	Yes; Red LED
• Channel fault indicator F (red)	Yes; per channel
Ex(i) characteristics	
Module for Ex(i) protection	Yes
Maximum values of output circuits (per channel)	
• Co (permissible external capacity), max.	230 nF
• Io (short-circuit current), max.	66 mA
• Lo (permissible external inductivity), max.	7.5 mH
• Po (power of load), max.	506 mW
• Uo (output no-load voltage), max.	19 V
• Um (fault voltage), max.	60 V; DC
• Ta (permissible ambient temperature), max.	60 °C
Potential separation	
Potential separation analog outputs	
• between the channels	Yes
• between the channels and backplane bus	Yes
• Between the channels and load voltage L+	Yes
Degree and class of protection	
IP degree of protection	IP20
Standards, approvals, certificates	
FM approval	Yes
Use in hazardous areas	
• Type of protection acc. to FM	Class I, Division 2, Group A, B, C, D T4; Class I, Zone 2, Group IIC T4
• Type of protection acc. to KEMA	ATEX II 3 G (2) GD Ex nA [ib Gb] [ib IIIC Db] IIC T4 Gc
• Test number KEMA	DEKRA 14 ATEX 0053X
Connection method	
required front connector	20-pin
Dimensions	
Width	40 mm
Height	125 mm
Depth	120 mm
Weights	
Weight, approx.	290 g

Ordering data

	Article No.
SM 332 HART analog output module	
HART analog output, 8 outputs, 0/4 – 20 mA, HART for ET 200M with IM 153-2	
For HART protocol V5.0 and higher	**6ES7332-5TB10-0AB0**
Accessories	
Front connectors	
20-pin, with screw contacts	
• 1 unit	**6ES7392-1AJ00-0AA0**
• 100 units	**6ES7392-1AJ00-1AB0**
LK 393 cable guide	**6ES7393-4AA00-0AA0**
Mandatory for operation in hazardous areas	
SIMATIC DP mounting rail for ET 200M	
For mounting of up to 5 bus modules for	
• Length: 483 mm (19")	**6ES7195-1GA00-0XA0**
• Length: 530 mm	**6ES7195-1GF30-0XA0**
SIMATIC S7-300 mounting rail	
• Length: 160 mm	**6ES7390-1AB60-0AA0**
• Length: 480 mm (19")	**6ES7390-1AE80-0AA0**
• Length: 530 mm	**6ES7390-1AF30-0AA0**
• Length: 830 mm	**6ES7390-1AJ30-0AA0**
• Length: 2000 mm	**6ES7390-1BC00-0AA0**
Label cover	**6ES7392-2XY00-0AA0**
(10 units, spare part) for signal modules (not 32-channel modules), function modules and CPU 312 IFM	
Labeling strips	**6ES7392-2XX00-0AA0**
(10 units, spare part) for signal modules (not 32-channel modules), function modules and CPU 312 IFM	
Software for machine labeling of modules directly from the STEP 7 project	
Labeling sheets for machine printing	
for modules with 20-pin front connector, DIN A4, for printing with laser printer; 10 units	
Petrol	**6ES7392-2AX00-0AA0**
Light beige	**6ES7392-2BX00-0AA0**
Yellow	**6ES7392-2CX00-0AA0**
Red	**6ES7392-2DX00-0AA0**
S7 Manual Collection	**6ES7998-8XC01-8YE0**
Electronic manuals on DVD, multi-language: S7-200, TD 200, S7-300, M7-300, C7, S7-400, M7-400, STEP 7, Engineering Tools, Runtime Software, SIMATIC DP (Distributed I/O), SIMATIC HMI (Human Machine Interface), SIMATIC NET (Industrial Communication)	
S7 Manual Collection update service for 1 year	**6ES7998-8XC01-8YE2**
Scope of supply: Current DVD "S7 Manual Collection" and the three subsequent updates	

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Overview



- Can only be plugged into ET 200M with IM 153-2 and IM 153-2 FO
- 8 AI HART
- Redundant connection
- Firmware update
- HART secondary variables

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

For technical documentation on SIPLUS, see:

http://www.siemens.com/siplus-extreme

Technical specifications

Article number	**6AG1331-7TF01-7AB0**
Based on	**6ES7331-7TF01-0AB0**
	SIPLUS SM331 AI 8 x 0/4...20mA HART
Ambient conditions	
Ambient temperature during operation	
• min.	-25 °C; = Tmin
• max.	70 °C; = Tmax; 60 °C @ UL/cUL use
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m

• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at
	1 140 hPa ... 795 hPa
	(-1 000 m ... +2 000 m) //
	Tmin ... (Tmax - 10 K) at
	795 hPa ... 658 hPa
	(+2 000 m ... +3 500 m) //
	Tmin ... (Tmax -20 K) at
	658 hPa ... 540 hPa
	(+3 500 m ... +5 000 m)

Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance	
Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
Remark	
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!

Ordering data

	Article No.
SIPLUS SM 331 analog input module with HART	
8 inputs, 0/4 – 20 mA, HART for ET 200M with IM 153-2 interface module	
Extended temperature range and exposure to media	**6AG1331-7TF01-7AB0**
Accessories	See SIMATIC ET 200M analog input module with HART, page 9/234

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Overview



- Can only be plugged onto ET 200M with IM 153-2 and IM 153-2 FO
- 8 AO HART
- Redundant connection
- Firmware update
- HART secondary variables

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

For technical documentation on SIPLUS, see:

http://www.siemens.com/siplus-extreme

Technical specifications

Article number	**6AG1332-8TF01-2AB0**
Based on	**6ES7332-8TF01-0AB0**
	SIPLUS SM332 8AO HART
Ambient conditions	
Ambient temperature during operation	
• min.	-25 °C; = Tmin
• max.	60 °C; = Tmax
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance	
Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
Remark	
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!

Ordering data

	Article No.
SIPLUS SM 332 analog output module with HART	
8 outputs, 0/4 ... 20 mA HART, for ET 200M with IM 153-2 interface module	
Extended temperature range and exposure to media	**6AG1332-8TF01-2AB0**
Accessories	See SIMATIC SM 332 analog output module with HART, page 9/236

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Overview



- For connecting HART devices in hazardous areas.
- Can only be plugged into ET 200M
- 2 AI HART, Ex
- 2 inputs in 2 channel groups (single-channel isolation)
- Measurement type and range can be selected for each channel
- Programmable diagnostics and diagnostic interrupt

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

For technical documentation on SIPLUS, see:

http://www.siemens.com/siplus-extreme

Technical specifications

Article number	**6AG1331-7TB00-7AB0**
Based on	**6ES7331-7TB00-0AB0**
	SIPLUS S7-300 SM331 2AI HART
Ambient conditions	
Ambient temperature during operation	
• min.	-25 °C; = Tmin
• max.	70 °C; = Tmax; 60 °C @ UL/cUL, ATEX and FM use
Ambient temperature during storage/transportation	
• min.	-40 °C
• max.	70 °C
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance	
Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
Remark	
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!

Ordering data

	Article No.
SIPLUS SM 331 Ex analog input module with HART	
2 inputs, 0/4 ... 20 mA, HART for ET 200M with IM 153-2 interface module	
Extended temperature range and exposure to media	**6AG1331-7TB00-7AB0**
Accessories	See SIMATIC ET 200M Ex-analog input module with HART, page 9/238

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Overview F digital/analog modules



The fail-safe SIMATIC S7 CPUs and the fail-safe signal modules of SIMATIC ET 200S, ET 200pro, ET 200eco and ET 200M have been specially developed for distributed, safety-related applications in production engineering. Thanks to the discreetly modular structure of the fail-safe I/Os, safety technology only has to be applied where actually required. The new system replaces conventional electromechanical components, such as:

- Freely programmable, safe linking of sensors to actuators
- Selective safe shutdown of actuators
- Mixed configuration of F-modules and standard modules in a station
- Single-bus concept;
  fail-safe signals and standard signals are transferred over a single bus medium (PROFIBUS DP, PROFINET)

Totally Integrated Automation (TIA)

Safety technology (Safety Integrated) is a component of Totally Integrated Automation which provides total integration of safety automation and standard automation (SIMATIC S7).

Whereas standard automation (classical PLCs) and safety automation (electromechanics) are still separate today, these two worlds are growing together into a uniform, integrated overall system.

Siemens can therefore present itself as a complete supplier for automation technology in which safety engineering is part of standard automation and system-wide integration exists.

For further information, see SIMATIC S7-300, chapter 5.

Overview Ex modules



- Input/output modules for applications in chemical plants with explosion hazards
- For connecting sensors and actuators from zones 1 and 2 of plants with explosion hazards
- Associated electrical equipment Ex [ib] [ibD] IIC
- For separating the non-intrinsically-safe electrical circuits of the automation system and the intrinsically-safe electrical circuits of the process

For further information, see SIMATIC S7-300, chapter 5.

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Overview



Function modules unburden the CPU of work-intensive tasks such as counting, positioning and controlling

Module spectrum

- Counter modules
- Positioning modules for rapid traverse and creep speed drives
- Positioning modules for stepper motors
- Positioning modules for servo motors
- Positioning and continuous path modules
- SSI position detection modules
- Electronic cam controllers
- High-speed Boolean processor
- Controller modules

Function modules	
Counting	FM 350-1 counter module
	FM 350-2 counter module
Positioning • of rapid traverse and creep speed drives	FM 351 positioning module
Position and path control	FM 357-2 path and position control module[1)]
SSI position detection	SM 338 POS input modules
Electronic cam control	FM 352 electronic cam controller
High speed logic operation	FM 352-5 high-speed Boolean processor
Controlling	FM 355 controller module
	FM 355-2 temperature controller module
Weighing and proportioning electronics	SIWAREX

1) Not for ET 200M

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Overview (continued)

Applicability with ET 200M distributed I/O device

Almost all function modules can be used in the ET 200M distributed I/O device. In doing so, the following details must be observed:

		For plugging in behind IM 153-1 (6ES7153-1AA03-0XB0)		For plugging in behind IM 153-2 (6ES7153-2BA02-0XB0)		For plugging in behind IM 153-2 FO (6ES7153-2BB00-0XB0)		For plugging in behind IM 153-4 PN (6ES7153-4AA00-0XB0)
		configurable with						
Module	**Article No.**	**STEP 7[1]**	**GSD[2]**	**STEP 7[1]**	**GSD[2]**	**STEP 7[1]**	**GSD[2]**	**STEP 7[1]**
FM 350-1 counter module	6ES7350-1AH03-0AE0	❑	--	❑	--	❑	--	❑
FM 350-2 counter module	6ES7350-2AH01-0AE0	❑	--	❑	--	❑	--	❑
FM 351 positioning module	6ES7351-1AH01-0AE0	❑	--	❑	--	❑	--	❑
FM 352 cam controller	6ES7352-1AH02-0AE0	❑	--	❑	--	❑	--	❑
FM 352-5 high-speed Boolean processor	6ES7352-5AH00-0AE0	❑[3]	❑	❑[3]	❑	❑[3]	❑	❑
FM 352-5 high-speed Boolean processor	6ES7352-5AH10-0AE0	❑[3]	❑	❑[3]	❑	❑[3]	❑	❑
FM 355 C controller module	6ES7355-0VH10-0AE0	--	--	❑	--	❑	--	❑
FM 355 S controller module	6ES7355-1VH10-0AE0	--	--	❑	--	❑	--	❑
FM 355-2 C temperature controller module	6ES7355-2CH00-0AE0	❑	--	❑	--	❑	--	❑
FM 355-2 S temperature controller module	6ES7355-2SH00-0AE0	❑	--	❑	--	❑	--	❑
SM 338 POS input module	6ES7338-4BC01-0AB0	❑	❑	❑	❑	❑	❑	❑

❑ configurable
--: not configurable

1) Configuration using the meta-knowledge integrated into STEP 7 (in Hardware Catalog under PROFIBUS DP > ET 200M > IM 153-1 / IM 153-2 or PROFINET IO > I/O > ET 200M > IM153-4 PN).

2) Configuration using GSD file
(after installation of the GSD file configurable from the Hardware Catalog under PROFIBUS DP > Additional field devices > I/O > ET200M).
During configuration on the CP 342-5 as DP master, S5 (IM 308C) as DP master or external masters, the GSD file must be configured.

3) Visible and configurable only with the corresponding configuration package in STEP 7.

Note:

Position measurement systems and pre-assembled connecting cables for counter and positioning function are offered under SIMODRIVE Sensor and Motion Connect 500.

http://www.siemens.com/simatic-technology

For further information, see SIMATIC S7-300, chapter 5.

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Overview Special modules



The special modules provide the user with functions for diagnostics and commissioning.

For further information, see SIMATIC S7-300, chapter 5.

Overview Communication



- Communication boards for data exchange using point-to-point coupling
- Communication board for the connection of identification systems

For further information, see SIMATIC S7-300, chapter 5.

Overview Power supplies



- Load current supplies for S7-300/ET 200M
- For converting the line voltage to the required operating voltage (24 V DC)
- Output current 2 A, 5 A or 10 A

For further information, see SIMATIC S7-300, chapter 5.

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Overview



The ET 200iSP is a modular, intrinsically-safe I/O system with IP30 degree of protection which can be operated in gas and dust atmospheres at ambient temperatures from -20 to +70 °C. It is optimized for use with SIMATIC PCS 7 and SIMATIC S7, but can also be integrated in other systems such as SIMATIC S5 per GSD file.

In accordance with ATEX directive 2014/34/EU, the ET 200iSP remote I/Os stations can be installed directly in the Ex zones 1, 2, 21 or 22 as well as in non-hazardous areas. The intrinsically-safe sensors, actuators and HART field devices can also be located in zone 0 or 20 if necessary.

The modular design of the ET 200iSP makes it possible to optimally adapt the remote I/O stations to the respective automation task through individual configuration and flexible expansion. To increase plant availability, the pressure-encapsulated power supply and the intrinsically-safe PROFIBUS DP connection (RS 485-iS) of the stations can also be of redundant design.

The modern architecture with hardwiring and automatic slot coding supports pre-wiring without the electronic modules, simple and reliable hot swapping of individual modules without a fire certificate as well as configuration in run (CiR).

In addition to analog and digital I/O modules for the automation of the technological functions of the process (Basic Process Control), the range of electronic modules also includes fail-safe F-I/O modules for implementing safety applications.
The various types of electronic module can be arranged mixed within a station. Comprehensive diagnostic options facilitate commissioning and troubleshooting.

Technical specifications

ET 200iSP – general		
Degree of protection	IP30	
Ambient temperature		
• Horizontal mounting position	-20 … +70 °C	
• Other mounting positions	-20 … +50 °C	
Loading of media	According to ISA-S71.04 severity level G1; G2; G3 (except for NH3, only level G2 in this case)	
EMC	Electromagnetic compatibility according to NE21	
Vibration resistance	0.5 g continuously, 1 g periodically	
Approvals, standards		
• ATEX	II 2 G (1) GD I M2	Ex de [ia/ib] IIC T4 Ex de [ia/ib] I
• IECEx	Zone 1	Ex de [ia/ib] IIC T4
• INMETRO	Zone 1	BR-Ex de [ia/ib] IIC T4
• cFMus	Class I, II, III	NI Division 2, Groups A, B, C, D, E, F, G T4 AIS Division 1, Groups A, B, C, D, E, F, G
	Class I	Zone 1, AEx de [ia/ib] IIC T4
• cULus	Class I, II, III	Division 2, Groups A, B, C, D, E, F, G T4 providing int. safe circuits for Division 1, Groups A, B, C, D, E, F, G
	Class I	Zone 1, AEx de [ia/ib] IIC T4
• NEPSI	Ex de ib[ia] IIC T4 Ex de [ia/ib] IIC T4	
• PROFIBUS	EN 50170, Volume 2	
• IEC	IEC 61131, Part 2	
• CE	In accordance with ATEX directive 2014/34/EU, EMC Directive 2014/30/EU and LVD-guideline 2014/35/EU	
• KCC	Korea Certification	
• Marine approval	Classification companies • ABS (American Bureau of Shipping) • BV (Bureau Veritas) • DNV (Det Norske Veritas) • GL (Germanischer Lloyd) • LRS (Lloyds Register of Shipping) • Class NK (Nippon Kaiji Kyokai)	

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Overview



An ET 200iSP power supply unit consists of a TM-PS terminal module (A or B) and a PS power supply module which is plugged onto this. Terminal modules and power supply modules can be ordered separately.

The power supply modules are suitable for both individual operation (standard) and redundant operation. Depending on the operating mode, they must be combined with the terminal modules as follows:

- Standard: 1 × PS on TM-PS-A UC
- Redundancy: 1 × PS on TM-PS-A UC (left) plus 1 × PS on TM-PS-B UC (right)

Power supply modules are available for supplies of 24 V DC and 120/230 V AC.

The operating state of the power supply modules is indicated by two LEDs on the IM 152 interface module (one for each module).

Technical specifications

Article number	**6ES7138-7EA01-0AA0**	**6ES7138-7EC00-0AA0**
	ET200ISP, POWER SUPPLY MODULE	ET200ISP, POWER SUPPLY MOD. AC120/230V
Supply voltage		
Rated value (DC)	24 V	
Rated value (AC)		230 V; 120/230 V AC
Reverse polarity protection	Yes	
Line frequency		
• permissible range, lower limit		47 Hz
• permissible range, upper limit		63 Hz
Input current		
from supply voltage L+, max.	4 A	
from supply voltage L1, max.		1.04 A; at rated voltage 230 VAC:0.45A at rated voltage 120 VAC:0.75A
Interrupts/diagnostics/ status information		
Status indicator	Yes	Yes
Alarms	No	No
Diagnostic messages		
• Diagnostic information readable	Yes; via IM 152	Yes; via IM 152
Diagnostics indication LED		
• Group error SF (red)	No	No
Ex(i) characteristics		
Maximum values of input circuits (per channel)		
• Um (fault voltage), max.	250 V; DC	264 V; AC/DC
Potential separation		
primary/secondary	Yes	Yes
between supply voltage and electronics	Yes	No
Standards, approvals, certificates		
CE mark	Yes	Yes
Use in hazardous areas		
• Type of protection acc. to EN 50020 (CENELEC)	Ex de [ib]IIC T4	Ex de [ib]IIC T4
• Type of protection acc. to KEMA	04 ATEX 2263	09 ATEX 0156
Dimensions		
Width	60 mm	60 mm
Height	190 mm	190 mm
Depth	136.5 mm	136.5 mm
Weights		
Weight, approx.	2 700 g	2 700 g

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Technical specifications (continued)

Article number	**6ES7193-7DA20-0AA0** ET200ISP, TERM. MOD. TM-PS-A UC	**6ES7193-7DB20-0AA0** ET200ISP, TERM. MOD. TM-PS-B UC
Standards, approvals, certificates		
CE mark	Yes	Yes
Use in hazardous areas		
• Type of protection acc. to EN 50020 (CENELEC)	see ET 200iSP system	see ET 200iSP system
• Test number KEMA	04 ATEX 2242	04 ATEX 2242
Dimensions		
Width	60 mm	60 mm
Height	190 mm	190 mm
Depth	52 mm	52 mm
Weights		
Weight, approx.	230 g	230 g

Ordering data

	Article No.		Article No.
PS 24 V DC power supply module for ET 200iSP	**6ES7138-7EA01-0AA0**	**TM-PS-A UC terminal module** For standard operation	**6ES7193-7DA20-0AA0**
PS 120/230 V AC power supply module for ET 200iSP	**6ES7138-7EC00-0AA0**	**TM-PS-B UC terminal module** Additional terminal module for redundant operation	**6ES7193-7DB20-0AA0**

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Overview



The IM 152 interface module connects the ET 200iSP to the PROFIBUS DP with intrinsically-safe RS 485-iS transmission technology with transmission rates of up to 1.5 Mbps.
A redundant connection is also possible. In this case the ET 200iSP is connected via two interface modules to two redundant PROFIBUS DP segments of a fault-tolerant automation system.

The IM 152 is plugged onto a special terminal module (to be ordered separately). The following terminal modules are available:

- TM-IM/IM terminal module for two interface modules (for redundant PROFIBUS DP connection)
- TM-IM/EM60 terminal module for one interface module and one watchdog, reserve or electronic module (except 2 DQ relay)
  - with blue screw-type or spring-loaded terminals for hazardous environments
  - with black screw-type terminals for non-hazardous environments

Tasks of the IM 152 interface module

- Connection of ET 200iSP to the intrinsically-safe PROFIBUS DP
- Autonomous communication with the host automation system
- Preparation of data for the fitted electronic modules
- Saving of parameters of the electronic modules
- Time stamping of digital process signals with an accuracy of 20 ms

The maximum address space of the interface module is 244 bytes for inputs, and 244 bytes for outputs.

Technical specifications

Article number	**6ES7152-1AA00-0AB0** ET200ISP, IM152-1 INTERFACE MODULE
Input current	
from supply voltage L+, max.	30 mA
Time stamping	
Description	for each digital input, digital input module, total ET 200iS
Accuracy	20 ms
Number of stampable digital inputs, max.	64; for accuracy class 20 ms
Time format	RFC 1119 Internet (ISP)
Time resolution	1 ms
Time interval for transmitting the message buffer if a message is present	1 000 ms
Time stamp on signal change	rising / falling edge as signal entering or exiting
Interfaces	
Interfaces/bus type	RS 485
Transmission rate, max.	1.5 Mbit/s; 9,6 / 19,2 / 45,45 / 93,75 / 187,5 / 500 kbit/s; 1,5 Mbit/s
Protocols	
PROFIBUS DP	Yes
PROFIBUS DP	
Services	
- SYNC capability	Yes
- FREEZE capability	Yes
- Direct data exchange (slave-to-slave communication)	Yes; Slave to slave as publisher
Isochronous mode	
Isochronous operation (application synchronized up to terminal)	No

Article number	**6ES7152-1AA00-0AB0** ET200ISP, IM152-1 INTERFACE MODULE
Interrupts/diagnostics/ status information	
Alarms	Yes
Diagnostics function	Yes
Alarms	
• acyclic function, interrupts	Yes
• acyclic function, parameters	Yes
Diagnostics indication LED	
• Bus fault BF (red)	Yes
• Group error SF (red)	Yes
• Monitoring 24 V voltage supply ON (green)	Yes
Potential separation	
between supply voltage and electronics	Yes
Standards, approvals, certificates	
CE mark	Yes
Use in hazardous areas	
• Type of protection acc. to EN 50020 (CENELEC)	II2 G Ex ib IIC T4 and I M2 Ex ib I
• Type of protection acc. to KEMA	04 ATEX 1243
Dimensions	
Width	30 mm
Height	129 mm
Depth	136.5 mm
Weights	
Weight, approx.	245 g

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Technical specifications (continued)

Article number	6ES7193-7AA00-0AA0 ET200ISP, TERM.-MOD. TM-IM/EM60S, SCREW	6ES7193-7AA10-0AA0 ET200ISP, TERM.-MOD. TM-IM/EM60C ,SPRING	6ES7193-7AA20-0AA0 ET200ISP, TERM.-MOD. TM-IM/EM60S	6ES7193-7AB00-0AA0 ET200ISP, TERM.-MOD. TM-IM/IM F. TWO IM
Standards, approvals, certificates				
CE mark	Yes	Yes	Yes	Yes
Use in hazardous areas				
• Type of protection acc. to EN 50020 (CENELEC)	see ET 200iSP system	see ET 200iSP system	No	see ET 200iSP system
• Test number KEMA	04 ATEX 2242	04 ATEX 2242		04 ATEX 2242
Dimensions				
Width	60 mm	60 mm	60 mm	60 mm
Height	190 mm	190 mm	190 mm	190 mm
Depth	52 mm	52 mm	52 mm	52 mm
Weights				
Weight, approx.	235 g	235 g	235 g	195 g

Ordering data

	Article No.
ET 200iSP interface module IM 152-1	**6ES7152-1AA00-0AB0**
ET 200iSP terminal module TM-IM/EM60 For an IM 152 and a watchdog, reserve or electronic module (except 2 DO relay), including terminating module	
• For hazardous environments	
- TM-IM/EM60S (blue screw-type terminals)	**6ES7193-7AA00-0AA0**
- TM-IM/EM60C (blue spring-loaded terminals)	**6ES7193-7AA10-0AA0**
• For non-hazardous environments	
- TM-IM/EM60S (black screw-type terminals)	**6ES7193-7AA20-0AA0**
ET 200iSP terminal module TM-IM/IM For two IM 152 modules (redundant operation), including terminating module	**6ES7193-7AB00-0AA0**

	Article No.
Accessories	
PROFIBUS connector with selectable terminating resistor For connection of IM 152 to PROFIBUS DP with RS 485-iS transmission technology	**6ES7972-0DA60-0XA0**
RS 485-iS coupler Isolating transformer for connection of PROFIBUS DP segments with RS 485 and RS 485-iS transmission technologies	**6ES7972-0AC80-0XA0**
Labeling sheet DIN A4, perforated, each consisting of 10 sheets of 30 strips each for electronic modules and 20 strips each for IM 152	
• petrol	**6ES7193-7BH00-0AA0**
• yellow	**6ES7193-7BB00-0AA0**
Labels, inscribed For slot numbering, label size H × W (in mm): 5 × 7	
• 204 labels, for slots 1 to 20	**8WA8361-0AB**
• 204 labels, for slots 1 to 40	**8WA8361-0AC**
• 136 labels, inscription in plain text	**8WA8348-0XA**
Labels, blank 136 labels for slot numbering, label size H × W (in mm): 5 × 7	**8WA8348-2AY**
S7-300 mounting rails	
• 585 mm long, suitable for assembly of ET 200iSP in a 650 mm wide wall box	**6ES7390-1AF85-0AA0**
• 885 mm long, suitable for assembly of ET 200iSP in a 950 mm wide wall box	**6ES7390-1AJ85-0AA0**

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Overview



Digital input modules

- 8-channel digital input module DI NAMUR EEx i, for evaluation of NAMUR sensors, connected and non-connected contacts, as well as for use as counter or frequency meter
  Parameterizable connections:
  - NAMUR sensor on/off
  - NAMUR changeover contact
  - Single contact connected (mechanical NO contact)
  - Changeover contact connected (mechanical changeover contact)
  - Single contact non-connected (mechanical NO contact with single contact)
  - Changeover contact non-connected (mechanical changeover contact)
  - Counting function: optional use of 2 channels for recording counter pulses or for frequency measurement
  - Short-circuit and wire break monitoring

Digital output modules

- 4-channel digital output modules DO EEx i, 23.1 V DC/20 mA, 17.4 V DC/27 mA , 17.4 V DC/40 mA or 25.5 V DC/22 mA, with external actuator switch-off via High or Low signal (H/L switch-off)
  - Load-free switching of outputs via external intrinsically-safe signal
  - Power boosting through parallel connection of two outputs for one actuator with 4 DO 17.4 V DC/27 mA or 4 DO 17.4 V DC/40 mA
  - Short-circuit and wire break monitoring
- 2-channel digital output module DO Relay EEx e, e.g. for switching solenoid valves, DC contactors or signaling lamps
  - Can be plugged onto TM-RM/RM terminal module
  - Output current up to 2 A with 60 V UC for each of the two relay outputs
  - Installation up to Ex zone 1
  - Intrinsically-safe and non-intrinsically-safe signals can be mixed in a station

Extra functions

Actuator shutdown function of the 4 DO EEx i modules

The 4 DO EEx i modules are equipped with a shutdown function. This permits implementation of an external switch-off independent of the automation system (controller).

As soon as the intrinsically-safe switch-off signal (High or Low) is present at the actuator switch-off input of the electronic module, its outputs are deactivated.

You can also combine several DO modules into a switch-off group. The intrinsically-safe power supply for the switch-off device is either via the watchdog module or a separate intrinsically-safe source.

9

Technical specifications

Article number	**6ES7131-7RF00-0AB0**
	ET200ISP, EL. MOD., 8DI, NAMUR
Input current	
Current consumption, typ.	80 mA
from supply voltage L+, max.	90 mA
Digital inputs	
Number of digital inputs	8
Number of NAMUR inputs	8
Encoder	
Number of connectable encoders, max.	8
Connectable encoders	
• NAMUR encoder	Yes
NAMUR encoder	
• Input current for signal "0", max.	1.2 mA
• Input current for signal "1", min.	2.1 mA
Interrupts/diagnostics/ status information	
Diagnostics function	Yes
Alarms	
• Diagnostic alarm	Yes; Parameterizable
• Hardware interrupt	No
Diagnostic messages	
• Diagnostic information readable	Yes
• Short-circuit	Yes; R load < 150 ohms with NAMUR sensor/sensor and NAMUR CO contact/sensor to DIN 19234
Diagnostics indication LED	
• Group error SF (red)	Yes

Article number	**6ES7131-7RF00-0AB0**
	ET200ISP, EL. MOD., 8DI, NAMUR
• Status indicator digital input (green)	Yes
Integrated Functions	
Frequency measurement	Yes; (Gate time) 50 ms; 200 ms; 1 s
Number of frequency meters	2
Counter	
Number of counter inputs	2; normal and periodic count function
Input frequency, max.	5 kHz; with a cable length of 20 m: 5 kHz; with a cable length of 100 m: 1 kHz; with a cable length of 200 m: 500 Hz
Potential separation	
Potential separation digital inputs	
• between the channels	No
• between the channels and backplane bus	Yes
Standards, approvals, certificates	
CE mark	Yes
Use in hazardous areas	
• Type of protection acc. to EN 50020 (CENELEC)	II2 G (1) GD Ex ib[ia] IIC T4 and I M2 Ex ib[ia] I
• Type of protection acc. to KEMA	04 ATEX 1248
Dimensions	
Width	30 mm
Height	129 mm
Depth	136.5 mm
Weights	
Weight, approx.	255 g

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Technical specifications (continued)

Article number	**6ES7132-7RD01-0AB0** ET200ISP, EL. MOD., 4DO, 23.1 V DC, 20MA	**6ES7132-7RD11-0AB0** ET200ISP, EL. MOD., 4DO, 17.4 V DC, 27MA	**6ES7132-7RD22-0AB0** ET200ISP, EL. MOD., 4DO, 17.4 V DC, 40MA
Input current			
Current consumption, typ.	290 mA	260 mA	380 mA
from load voltage L+ (without load), max.	340 mA; with actuator supply	300 mA	400 mA
from backplane bus 3.3 V DC, max.	10 mA	10 mA	
Digital outputs			
Number of digital outputs	4; additionally 1 intrinsically-safe input for H shutdown	4; additionally 1 intrinsically-safe input for H shutdown	4; additionally 1 intrinsically-safe input for H shutdown
Short-circuit protection	Yes	Yes	Yes
No-load voltage Uao (DC)	23.1 V	17.4 V	17.4 V
Internal resistor Ri	275 Ω	150 Ω	167 Ω
Trend key points E			
• Voltage Ue (DC)	17.6 V	13.3 V	10.7 V
• Current Ie	20 mA	27 mA	40 mA; 80 mA when outputs connected in parallel
Output current			
• for signal "1" rated value	0.02 A	0.027 A	0.04 A
Output delay with resistive load			
• "0" to "1", max.	2 ms	2 ms	2 ms
• "1" to "0", max.	1.5 ms	1.5 ms	1.5 ms
Parallel switching of two outputs			
• for uprating	No; for Ex reasons not possible; nor for predecessor	Yes	Yes
Switching frequency			
• with resistive load, max.	100 Hz	100 Hz	100 Hz
• with inductive load, max.	2 Hz	2 Hz	2 Hz
Cable length			
• shielded, max.	500 m	500 m	500 m
• unshielded, max.	500 m	500 m	500 m
Interrupts/diagnostics/ status information			
Status indicator	Yes	Yes	Yes
Alarms		No	
Diagnostics function	Yes	Yes	
Alarms			
• Diagnostic alarm	Yes; Parameterizable	Yes; Parameterizable	Yes; Parameterizable
Diagnostic messages			
• Diagnostic information readable	Yes	Yes	Yes
• Wire-break	Yes; R > 10 kohms, I < 100 µA	Yes	Yes; R > 10 kohms, I < 100 µA
• Short-circuit	Yes; R< 800 ohms (one output), R< 40 ohms (outputs connected in parallel)	Yes	Yes; R< 80 Ohm (one output), R< 40 Ohm (outputs connected in parallel)
Diagnostics indication LED			
• Group error SF (red)	Yes	Yes	Yes
• Status indicator digital output (green)	Yes	Yes	Yes; Per channel
Ex(i) characteristics			
Maximum values of output circuits (per channel)			
• Co (permissible external capacity), max.			241 nF; For IIC, 1507 nF for IIB
• Io (short-circuit current), max.			118 mA
• Lo (permissible external inductivity), max.			1.7 mH; For IIC, 10.4 mH for IIB
• Po (power of load), max.			572 mW
• Uo (output no-load voltage), max.			19.4 V
• Ta (permissible ambient temperature), max.	70 °C	70 °C	

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Technical specifications (continued)

Article number	**6ES7132-7RD01-0AB0** ET200ISP, EL. MOD., 4DO, 23.1 V DC, 20MA	**6ES7132-7RD11-0AB0** ET200ISP, EL. MOD., 4DO, 17.4 V DC, 27MA	**6ES7132-7RD22-0AB0** ET200ISP, EL. MOD., 4DO, 17.4 V DC, 40MA
Potential separation			
Potential separation digital outputs			
• between the channels	No	No	No
• between the channels and backplane bus	Yes	Yes	Yes
• Between the channels and load voltage L+	Yes	Yes	Yes
Standards, approvals, certificates			
CE mark			Yes
Highest safety class achievable in safety mode			
• SIL acc. to IEC 61508	No		No
Use in hazardous areas			
• Type of protection acc. to EN 50020 (CENELEC)	II2 G (1) GD Ex ib[ia] IIC T4 and I M2 Ex ib[ia] I	II2 G (1) GD Ex ib[ia] IIC T4 and I M2 Ex ib[ia] I	II2 G (1) GD Ex ib[ia] IIC T4 and I M2 Ex ib[ia] I
• Type of protection acc. to KEMA	04 ATEX 1249	04 ATEX 1249	04 ATEX 1249
Dimensions			
Width	30 mm	30 mm	30 mm
Height	129 mm	129 mm	129 mm
Depth	136.5 mm	136.5 mm	136.5 mm
Weights			
Weight, approx.	255 g	255 g	255 g

Article number	**6ES7132-7GD00-0AB0** ET200ISP, EL. MOD., 4DO, 23.1 V DC, 20MA	**6ES7132-7GD10-0AB0** ET200ISP, EL. MOD., 4DO, 17.4 V DC, 27MA	**6ES7132-7GD21-0AB0** ET200ISP, EL. MOD., 4DO, 17.4 V DC, 40MA	**6ES7132-7GD30-0AB0** ET200ISP, EL. MOD., 4DO, 25.5 V DC, 22MA
Input current				
Current consumption, typ.	290 mA	260 mA	380 mA	380 mA
from load voltage L+ (without load), max.	340 mA; with actuator supply	300 mA; with actuator supply	400 mA	400 mA
from backplane bus 3.3 V DC, max.	10 mA	10 mA		
Digital outputs				
Number of digital outputs	4; additionally 1 intrinsically-safe input for L shutdown	4; additionally 1 intrinsically-safe input for L shutdown	4; additionally 1 intrinsically-safe input for L shutdown	4; additionally 1 intrinsically-safe input for L shutdown
Short-circuit protection	Yes	Yes	Yes	Yes
No-load voltage Uao (DC)	23.1 V	17.4 V	17.4 V	25.5 V
Internal resistor Ri	275 Ω	150 Ω	167 Ω	260 Ω
Trend key points E				
• Voltage Ue (DC)	17.6 V	13.3 V	10.7 V	19.8 V
• Current Ie	20 mA	27 mA; 54 mA when outputs connected in parallel	40 mA	22 mA
Output current				
• for signal "1" rated value	0.02 A	0.027 A	0.04 A	0.022 A
Output delay with resistive load				
• "0" to "1", max.	2 ms	2 ms	2 ms	2 ms
• "1" to "0", max.	1.5 ms	1.5 ms	1.5 ms	1.5 ms
Parallel switching of two outputs				
• for uprating	No; for Ex reasons not possible; nor for predecessor	Yes	Yes	No
Switching frequency				
• with resistive load, max.	100 Hz	100 Hz	100 Hz	100 Hz
• with inductive load, max.	2 Hz	2 Hz	2 Hz	2 Hz
Cable length				
• shielded, max.	500 m	500 m	500 m	500 m
• unshielded, max.	500 m	500 m	500 m	500 m

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Technical specifications (continued)

Article number	6ES7132-7GD00-0AB0 ET200ISP, EL. MOD., 4DO, 23.1 V DC, 20MA	6ES7132-7GD10-0AB0 ET200ISP, EL. MOD., 4DO, 17.4 V DC, 27MA	6ES7132-7GD21-0AB0 ET200ISP, EL. MOD., 4DO, 17.4 V DC, 40MA	6ES7132-7GD30-0AB0 ET200ISP, EL. MOD., 4DO, 25.5 V DC, 22MA
Interrupts/diagnostics/ status information				
Status indicator	Yes	Yes	Yes	Yes
Diagnostics function	Yes	Yes	Yes	Yes
Alarms				
• Diagnostic alarm	Yes; Parameterizable	Yes; Parameterizable	Yes; Parameterizable	Yes; Parameterizable
Diagnostic messages				
• Diagnostic information readable	Yes	Yes	Yes	Yes
• Wire-break	Yes; R > 10 kohms, I < 100 µA	Yes; R > 10 kohms, I < 100 µA	Yes; R > 10 kohms, I < 100 µA	Yes; R > 10 kohms, I < 100 µA
• Short-circuit	Yes; R< 80 Ohm (one output), R< 40 Ohm (outputs connected in parallel)	Yes; R< 800 ohms (one output), R< 40 ohms (outputs connected in parallel)	Yes; R< 80 Ohm (one output), R< 40 Ohm (outputs connected in parallel)	Yes; R < 80 ohms
Diagnostics indication LED				
• Group error SF (red)	Yes	Yes	Yes	Yes
• Status indicator digital output (green)	Yes	Yes	Yes; Per channel	Yes; Per channel
Ex(i) characteristics				
Maximum values of output circuits (per channel)				
• Co (permissible external capacity), max.			241 nF; For IIC, 1507 nF for IIB	81 nF; For IIC, 651 nF for IIB
• Io (short-circuit current), max.			118 mA	110 mA
• Lo (permissible external inductivity), max.			1.7 mH; For IIC, 10.4 mH for IIB	1.7 mH; For IIC, 11.5 mH for IIB
• Po (power of load), max.			572 mW	764 mW
• Uo (output no-load voltage), max.			19.4 V	27.9 V
• Ta (permissible ambient temperature), max.	70 °C	70 °C		
Potential separation				
Potential separation digital outputs				
• between the channels	No	No	No	No
• between the channels and backplane bus	Yes	Yes	Yes	Yes
• Between the channels and load voltage L+	Yes	Yes	Yes	Yes
Standards, approvals, certificates				
CE mark	Yes	Yes	Yes	Yes
Highest safety class achievable in safety mode				
• SIL acc. to IEC 61508	No	No	No	No
Use in hazardous areas				
• Type of protection acc. to EN 50020 (CENELEC)	II2 G (1) GD Ex ib[ia] IIC T4 and I M2 Ex ib[ia] I	II2 G (1) GD Ex ib[ia] IIC T4 and I M2 Ex ib[ia] I	II 2 G (1) GD and I M2 Ex ib[ia][iaD] IIC T4; Ex ib [ia] I	II 2 G (1) GD and I M2 Ex ib[ia][iaD] IIC T4; Ex ib [ia] I
• Type of protection acc. to KEMA	04 ATEX 1249	04 ATEX 1249	04 ATEX 1249	04 ATEX 1249
Dimensions				
Width	30 mm	30 mm	30 mm	30 mm
Height	129 mm	129 mm	129 mm	129 mm
Depth	136.5 mm	136.5 mm	136.5 mm	136.5 mm
Weights				
Weight, approx.	255 g	255 g	255 g	255 g

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Technical specifications (continued)

Article number	**6ES7132-7HB00-0AB0** ET200ISP, RELAY MOD., 2DO, 60 V UC, 2A
Input current	
Current consumption, typ.	100 mA
from load voltage L+ (without load), max.	120 mA
Digital outputs	
Number of digital outputs	2
Short-circuit protection	No
Output current	
• for signal "1" rated value	2 A
Output delay with resistive load	
• "0" to "1", max.	8 ms
• "1" to "0", max.	3 ms
Parallel switching of two outputs	
• for uprating	No
• for redundant control of a load	No
Switching frequency	
• with resistive load, max.	0.5 Hz; See data in manual
• with inductive load, max.	0.2 Hz; See data in manual
Relay outputs	
Switching capacity of contacts	
- with resistive load, up to 60 °C, max.	2 A; See data in manual
- Thermal continuous current, max.	2 A; See data in manual
Cable length	
• shielded, max.	500 m
• unshielded, max.	500 m
Interrupts/diagnostics/ status information	
Status indicator	Yes
Alarms	No
Substitute values connectable	Yes
Alarms	
• Diagnostic alarm	Yes
• Hardware interrupt	No
Diagnostic messages	
• Diagnostic information readable	Yes
• Wire-break	No; Cannot be determined in contact power circuit
• Short-circuit	No; Cannot be determined in contact power circuit

Article number	**6ES7132-7HB00-0AB0** ET200ISP, RELAY MOD., 2DO, 60 V UC, 2A
Diagnostics indication LED	
• Group error SF (red)	Yes
• Status indicator digital output (green)	Yes; Per channel
Ex(i) characteristics	
Maximum values of output circuits (per channel)	
• Uo (output no-load voltage), max.	60 V
• Um (fault voltage), max.	250 V
• Ta (permissible ambient temperature), max.	70 °C
Potential separation	
Potential separation digital outputs	
• between the channels	Yes
• between the channels and backplane bus	Yes
• Between the channels and load voltage L+	Yes; Channels and power bus
Standards, approvals, certificates	
CE mark	Yes
Highest safety class achievable in safety mode	
• SIL acc. to IEC 61508	No
Use in hazardous areas	
• Type of protection acc. to EN 50020 (CENELEC)	II 2 G and I M2 Ex eibmb IIC T4; Ex eibmb I
• Type of protection acc. to KEMA	07 ATEX 0180
Dimensions	
Width	30 mm
Height	129 mm
Depth	136.5 mm
Weights	
Weight, approx.	255 g

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Technical specifications (continued)

Article number	6ES7193-7CA00-0AA0 ET200ISP, TERM. MOD. TM-EM/EM60S F. EM	6ES7193-7CA10-0AA0 ET200ISP, TERM. MOD. TM-EM/EM60C F. EM	6ES7193-7CA20-0AA0 ET200ISP, TERM. MOD. TM-EM/EM60S F. EM	6ES7193-7CB00-0AA0 ET200ISP, TERM. MOD. TM-RM/RM
Standards, approvals, certificates				
CE mark	Yes	Yes	Yes	Yes
Use in hazardous areas				
• Type of protection acc. to EN 50020 (CENELEC)	see ET 200iSP system	see ET 200iSP system	No	see ET 200iSP system
• Test number KEMA	04 ATEX 2242	04 ATEX 2242		07 ATEX 0205
Dimensions				
Width	60 mm	60 mm	60 mm	60 mm
Height	190 mm	190 mm	190 mm	190 mm
Depth	52 mm	52 mm	52 mm	52 mm
Weights				
Weight, approx.	275 g	275 g	235 g	340 g

Article number	6ES7138-7AA00-0AA0 ET200ISP, RESERVE MODULE
Digital inputs	
Number of digital inputs	0
Standards, approvals, certificates	
CE mark	Yes
Use in hazardous areas	
• Type of protection acc. to EN 50020 (CENELEC)	II2 G EEx ib IIC T4
• Test number KEMA	04 ATEX 1251

Article number	6ES7138-7AA00-0AA0 ET200ISP, RESERVE MODULE
Dimensions	
Width	30 mm
Height	129 mm
Depth	136.5 mm
Weights	
Weight, approx.	180 g

Ordering data

	Article No.
Digital input modules	
Digital input modules EEx i	
8 DI NAMUR For evaluation of NAMUR sensors, connected/non-connected contacts, as well as for recording counter pulses or measuring frequencies • 8 × NAMUR (NAMUR sensor on/off, NAMUR changeover contact) or connected/non-connected inputs (single/changeover contact) • 2 channels optionally usable as counters (max. 5 kHz) or frequency meters (1 Hz ... 5 kHz) • Time tagging 20 ms, rising or falling edge • Wire break monitoring • Short-circuit monitoring • Sensor power supply monitoring • Flutter monitoring	**6ES7131-7RF00-0AB0**
Digital output modules	
Digital output modules EEx i with H-switch-off (external actuator switch-off via H-signal); for switching of solenoid valves, DC relays, signal lamps, actuators	
4 DO DC 23.1 V/20 mA • 4 channels with 20 mA each • Short-circuit monitoring • Wire break monitoring • Configurable connection of substitute value in the event of CPU failure • Load-free switching of outputs via external intrinsically-safe signal	**6ES7132-7RD01-0AB0**
4 DO DC 17.4 V/27 mA • 4 channels with 27 mA each or • 2 outputs connected in parallel with 54 mA each • Short-circuit monitoring • Wire break monitoring • Configurable connection of substitute value in the event of CPU failure • Load-free switching of outputs via external intrinsically-safe signal	**6ES7132-7RD11-0AB0**
4 DO DC 17.4 V/40 mA • 4 channels with 40 mA each or • 2 outputs connected in parallel with 80 mA each • Short-circuit monitoring • Wire break monitoring • Configurable connection of substitute value in the event of CPU failure • Load-free switching of outputs via external intrinsically-safe signal	**6ES7132-7RD22-0AB0**
Digital output modules EEx i with L-switch-off (external actuator switch-off via L-signal); for switching of solenoid valves, DC relays, signal lamps, actuators	
4 DO DC 23.1 V/20 mA • 4 channels with 20 mA each • Short-circuit monitoring • Wire break monitoring • Configurable connection of substitute value in the event of CPU failure • Load-free switching of outputs via external intrinsically-safe signal	**6ES7132-7GD00-0AB0**

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Ordering data	Article No.
4 DO DC 17.4 V/27 mA • 4 channels with 27 mA each or • 2 outputs connected in parallel with 54 mA each • Short-circuit monitoring • Wire break monitoring • Configurable connection of substitute value in the event of CPU failure • Load-free switching of outputs via external intrinsically-safe signal	**6ES7132-7GD10-0AB0**
4 DO DC 17.4 V/40 mA • 4 channels with 40 mA each or • 2 outputs connected in parallel with 80 mA each • Short-circuit monitoring • Wire break monitoring • Configurable connection of substitute value in the event of CPU failure • Load-free switching of outputs via external intrinsically-safe signal	**6ES7132-7GD21-0AB0**
4 DO DC 25.5 V/22 mA[1] • 4 channels with 22 mA each • Short-circuit monitoring • Wire break monitoring • Configurable connection of substitute value in the event of CPU failure • Load-free switching of outputs via external intrinsically-safe signal	**6ES7132-7GD30-0AB0**
Digital output modules EEx e For switching of solenoid valves, DC contactors or indicator lights	
2 DO relays, 60 V UC, 2 A • Can be plugged onto TM-RM/RM terminal module • Output current up to 2 A with 60 V UC for each of the two relay outputs • Installation up to Ex zone 1 • Configurable connection of substitute value in the event of CPU failure	**6ES7132-7HB00-0AB0**

	Article No.
Terminal modules	
ET 200iSP terminal module TM-EM/EM60 For two modules (reserve module, watchdog module and all electronic modules except 2 DO relays can be plugged in)	
• For hazardous environments	
- TM-EM/EM60S (blue screw-type terminals)	**6ES7193-7CA00-0AA0**
- TM-EM/EM60C (blue spring-loaded terminals)	**6ES7193-7CA10-0AA0**
• For non-hazardous environments	
- TM-EM/EM60S (black screw-type terminals)	**6ES7193-7CA20-0AA0**
ET 200iSP terminal module TM-RM/RM 60 For two modules (electronic module 2 DO relays and reserve module can be plugged-in)	
• TM-RM/RM60S (screw-type terminals)	**6ES7193-7CB00-0AA0**
Accessories	
Reserve module For any electronic module	**6ES7138-7AA00-0AA0**
Labeling sheet DIN A4, perforated, each consisting of 10 sheets of 30 strips each for electronic modules and 20 strips each for IM 151	
• petrol	**6ES7193-7BH00-0AA0**
• yellow	**6ES7193-7BB00-0AA0**
Labels, inscribed For slot numbering, label size H × W (in mm): 5 × 7	
• 204 labels, for slots 1 to 20	**8WA8361-0AB**
• 204 labels, for slots 1 to 40	**8WA8361-0AC**
Labels, blank 136 labels for slot numbering, label size H × W (in mm): 5 × 7	**8WA8348-2AY**
S7-300 rails	
• 585 mm long, suitable for assembly of ET 200iSP in a 650 mm wide wall box	**6ES7390-1AF85-0AA0**
• 885 mm long, suitable for assembly of ET 200iSP in a 950 mm wide wall box	**6ES7390-1AJ85-0AA0**

[1] Can be used with SIMATIC PCS 7 V7.1+SP2 or higher

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Overview



Analog input modules

- 4-channel analog input module AI 2 WIRE HART EEx i for current measurement in the range 4 to 20 mA, suitable for connection of two-wire transmitters (with/without HART functionality)
  - Resolution 12 bit + sign
  - Max. load of transmitter 750 Ω
  - Short-circuit and wire break monitoring
- 4-channel analog input module AI 4 WIRE HART EEx i for current measurement in the range 0/4 to 20 mA, suitable for connection of 4-wire transmitters (with/without HART functionality)
  - Resolution 12 bit + sign
  - Max. load of transmitter 750 Ω
  - Wire break monitoring
- 4-channel analog input module AI RTD EEx i for resistance measurement and for temperature measurement per Pt100/Ni100 resistance thermometer
  - Resolution 15 bit + sign
  - 2, 3, or 4-wire connection possible
  - Resistance measurements 600 Ω absolute and 1 000 Ω absolute
  - Wire break monitoring
- 4-channel analog input module AI TC EEx i for thermoelectric EMF measurements and for temperature measurement per thermocouple, type B, E, N, J, K, L, S, R, T, U
  - Resolution 15 bit + sign
  - Internal temperature compensation possible using TC sensor module (included in scope of supply of module)
  - External temperature compensation by means of a temperature value acquired at an analog module of the same ET 200iSP station
  - Wire break monitoring

Analog output modules

- 4-channel analog output module AO I HART EEx i for output of current signals in the range 0/4 to 20 mA to field devices (with/without HART functionality)
  - Resolution 14 bit
  - Parameterizable substitute value in case of CPU failure
  - Short-circuit and wire break monitoring

Extra functions

Temperature compensation

A TC sensor module for internal temperature compensation is provided with the 4 AI TC module, and is fitted on the corresponding terminals of the associated terminal module.

External temperature compensation is possible via a Pt100 on a 4 AI RTD module.

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Technical specifications

Article number	**6ES7134-7SD00-0AB0** ET200ISP, EL-MOD., 4 AI TC	**6ES7134-7SD51-0AB0** ET200ISP, EL-MOD., 4 AI RTD, PT100/NI100	**6ES7134-7TD00-0AB0** ET200ISP, EL-MOD., 4 AI, HART, 2-WIRE	**6ES7134-7TD50-0AB0** ET200ISP, EL-MOD., 4 AI, HART, 4-WIRE
Input current				
Current consumption, typ.	17 mA	19 mA	280 mA	27 mA
from supply voltage L+, max.	30 mA	22 mA	320 mA	30 mA
Output voltage				
Power supply to the transmitters				
• short-circuit proof			Yes	
• Supply current, max.			23 mA; per channel	
Analog inputs				
Number of analog inputs	4	4	4	4
permissible input current for current input (destruction limit), max.			90 mA	50 mA
Cycle time (all channels) max.	320 ms; 66 ms basic conversion time x 4 channels with interference frequency suppression 60 Hz, 80 ms basic conversion time x 4 channels with interference frequency suppression 50 Hz	320 ms; 66 ms basic conversion time x 4 channels with interference frequency suppression 60 Hz, 80 ms basic conversion time x 4 channels with interference frequency suppression 50 Hz	120 ms; 30 ms basic conversion time x4 channels with 60 Hz, 50 Hz interference frequency suppression	120 ms; 30 ms basic conversion time x4 channels with 60 Hz, 50 Hz interference frequency suppression
Technical unit for temperature measurement adjustable	Yes	Yes	Yes	Yes
Input ranges (rated values), voltages				
• -80 mV to +80 mV	Yes			
Input ranges (rated values), currents				
• 4 mA to 20 mA			Yes	Yes
Input ranges (rated values), thermocouples				
• Type B	Yes			
• Type C	Yes			
• Type E	Yes			
• Type J	Yes			
• Type K	Yes			
• Type L	Yes			
• Type N	Yes			
• Type R	Yes			
• Type S	Yes			
• Type T	Yes			
• Type U	Yes			
Input ranges (rated values), resistance thermometer				
• Ni 100		Yes		
• Pt 100		Yes		
Input ranges (rated values), resistors				
• 0 to 600 ohms		Yes; Also 1 000 ohms		
Thermocouple (TC)				
Temperature compensation				
- internal temperature compensation	Yes; via supplied TC sensor module			
- external temperature compensation with compensations socket	Yes; via temperature value, acquired by an analog module of the same ET 200iSP station			
Characteristic linearization				
• parameterizable	Yes	Yes		
- for thermocouples	Yes			
- for resistance thermometer		Yes		
Cable length				
• shielded, max.	50 m	500 m	500 m	500 m

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Technical specifications (continued)

Article number	**6ES7134-7SD00-0AB0** ET200ISP, EL-MOD., 4 AI TC	**6ES7134-7SD51-0AB0** ET200ISP, EL-MOD., 4 AI RTD, PT100/NI100	**6ES7134-7TD00-0AB0** ET200ISP, EL-MOD., 4 AI, HART, 2-WIRE	**6ES7134-7TD50-0AB0** ET200ISP, EL-MOD., 4 AI, HART, 4-WIRE
Analog value generation for the inputs				
Measurement principle	integrating (Sigma-Delta)	integrating (Sigma-Delta)	integrating (Sigma-Delta)	integrating (Sigma-Delta)
Integration and conversion time/ resolution per channel				
• Resolution with overrange (bit including sign), max.	16 bit	16 bit	13 bit	12 bit; + sign
• Integration time, parameterizable	Yes	Yes	No	Yes
• Basic conversion time, including integration time (ms)	80 ms at 50 Hz; 66 ms at 60 Hz	80 ms at 50 Hz; 66 ms at 60 Hz		30 ms
- additional conversion time for wire-break monitoring	5 ms	5 ms		
• Interference voltage suppression for interference frequency f1 in Hz	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz
Smoothing of measured values				
• parameterizable	Yes; in 4 stages	Yes; in 4 stages	Yes; in 4 stages	Yes; in 4 stages
Encoder				
Connection of signal encoders				
• for current measurement as 2-wire transducer			Yes	
- Burden of 2-wire transmitter, max.			750 Ω	
• for current measurement as 4-wire transducer				Yes
• for resistance measurement with two-wire connection		Yes		
• for resistance measurement with three-wire connection		Yes		
• for resistance measurement with four-wire connection		Yes		
Errors/accuracies				
Linearity error (relative to input range), (+/-)	0.015 %	0.015 %	0.015 %	0.015 %
Temperature error (relative to input range), (+/-)	0.02 %/K	0.02 %/K	0.005 %/K	0.005 %/K
Crosstalk between the inputs, min.	-50 dB	-50 dB	-50 dB	-50 dB
Repeat accuracy in steady state at 25 °C (relative to input range), (+/-)	0.01 %	0.01 %	0.01 %	0.01 %
Operational error limit in overall temperature range				
• Voltage, relative to input range, (+/-)	0.15 %			
• Current, relative to input range, (+/-)			0.15 %	0.15 %
• Resistance thermometer, relative to input range, (+/-)		0.15 %; Applies to resistances standard ±0.8 K, climatic ±0.3 K		
Basic error limit (operational limit at 25 °C)				
• Voltage, relative to input range, (+/-)	0.1 %			
• Current, relative to input range, (+/-)			0.1 %	0.1 %
• Resistance thermometer, r elative to input range, (+/-)		0.1 %; Applies to resistances standard ±0.5 K, climatic ±0.2 K		
Interference voltage suppression for f = n x (f1 +/- 1 %), f1 = interference frequency				
• Series mode interference (peak value of interference < rated value of input range), min.	70 dB	70 dB	70 dB	70 dB
• Common mode interference, min.	90 dB	90 dB		

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Technical specifications (continued)

Article number	**6ES7134-7SD00-0AB0** ET200ISP, EL-MOD., 4 AI TC	**6ES7134-7SD51-0AB0** ET200ISP, EL-MOD., 4 AI RTD, PT100/NI100	**6ES7134-7TD00-0AB0** ET200ISP, EL-MOD., 4 AI, HART, 2-WIRE	**6ES7134-7TD50-0AB0** ET200ISP, EL-MOD., 4 AI, HART, 4-WIRE
Interrupts/diagnostics/ status information				
Alarms				
• Diagnostic alarm	Yes; Parameterizable	Yes	Yes; Parameterizable	Yes; Parameterizable
• Limit value alarm	Yes; Parameterizable	Yes	Yes; Parameterizable	Yes; Parameterizable
Diagnostic messages				
• Diagnostic information readable	Yes	Yes	Yes	Yes
• Wire-break		Yes	Yes	Yes
• Short-circuit		Yes	Yes	
• Group error		Yes		
Diagnostics indication LED				
• Group error SF (red)	Yes	Yes	Yes	Yes
Potential separation				
Potential separation analog inputs				
• between the channels	Yes; Functional	No	No	No
• between the channels and backplane bus	Yes	Yes	Yes	Yes
• Between the channels and load voltage L+		Yes; Channels and power bus		
Standards, approvals, certificates				
CE mark	Yes	Yes	Yes	Yes
Highest safety class achievable in safety mode				
• Performance level according to ISO 13849-1	none	none	none	none
• SIL acc. to IEC 61508	No	No	No	No
Use in hazardous areas				
• Type of protection acc. to EN 50020 (CENELEC)	II2 G (1) GD Ex ib[ia] IIC T4 and I M2 Ex ib[ia] I	II2 G (1) GD Ex ib[ia] IIC T4 and I M2 Ex ib[ia] I	II2 G (1) GD Ex ib[ia] IIC T4 and I M2 Ex ib[ia] I	II2 G (1) GD Ex ib[ia] IIC T4 and I M2 Ex ib[ia] I
• Type of protection acc. to KEMA	04 ATEX 1246	04 ATEX 1247	04 ATEX 1244	04 ATEX 1245
Dimensions				
Width	30 mm	30 mm	30 mm	30 mm
Height	129 mm	129 mm	129 mm	129 mm
Depth	136.5 mm	136.5 mm	136.5 mm	136.5 mm
Weights				
Weight, approx.	230 g	230 g	230 g	230 g

Article number	**6ES7135-7TD00-0AB0** ET200ISP, EL-MOD., 4 AO, 4-20MA, HART
Input current	
Current consumption, typ.	295 mA
from load voltage L+ (without load), max.	330 mA
Analog outputs	
Number of analog outputs	4
Cycle time (all channels) max.	3.6 ms
Output ranges, current	
• 0 to 20 mA	Yes
• 4 mA to 20 mA	Yes
Connection of actuators	
• for current output two-wire connection	Yes
Load impedance (in rated range of output)	
• with current outputs, max.	750 Ω
Cable length	
• shielded, max.	500 m

Article number	**6ES7135-7TD00-0AB0** ET200ISP, EL-MOD., 4 AO, 4-20MA, HART
Analog value generation for the outputs	
Integration and conversion time/ resolution per channel	
• Resolution with overrange (bit including sign), max.	14 bit
Settling time	
• for resistive load	4 ms
• for capacitive load	40 ms
• for inductive load	40 ms

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Technical specifications (continued)

Article number	**6ES7135-7TD00-0AB0** ET200ISP, EL-MOD., 4 AO, 4-20MA, HART
Errors/accuracies	
Linearity error (relative to output range), (+/-)	0.015 %
Temperature error (relative to output range), (+/-)	0.005 %/K
Crosstalk between the outputs, min.	-50 dB
Repeat accuracy in steady state at 25 °C (relative to output range), (+/-)	0.01 %
Operational error limit in overall temperature range	
• Current, relative to output range, (+/-)	0.15 %
Basic error limit (operational limit at 25 °C)	
• Current, relative to output range, (+/-)	0.1 %
Interrupts/diagnostics/ status information	
Substitute values connectable	Yes
Alarms	
• Diagnostic alarm	Yes
Diagnostic messages	
• Diagnostic information readable	Yes
• Wire-break	Yes
• Short-circuit	Yes
Diagnostics indication LED	
• Group error SF (red)	Yes

Article number	**6ES7135-7TD00-0AB0** ET200ISP, EL-MOD., 4 AO, 4-20MA, HART
Potential separation	
Potential separation analog outputs	
• between the channels	No
• between the channels and backplane bus	Yes
Standards, approvals, certificates	
CE mark	Yes
Use in hazardous areas	
• Type of protection acc. to EN 50020 (CENELEC)	II2 G (1) GD Ex ib[ia] IIC T4 and I M2 Ex ib[ia] I
• Type of protection acc. to KEMA	04 ATEX 1250
Dimensions	
Width	30 mm
Height	129 mm
Depth	136.5 mm
Weights	
Weight, approx.	265 g

Article number	**6ES7193-7CA00-0AA0** ET200ISP, TERM.-MOD. TM-EM/EM60S F. EM	**6ES7193-7CA10-0AA0** ET200ISP, TERM.-MOD. TM-EM/EM60C F. EM	**6ES7193-7CA20-0AA0** ET200ISP, TERM.-MOD. TM-EM/EM60S F. EM	**6ES7193-7CB00-0AA0** ET200ISP, TERM.-MOD. TM-RM/RM
Standards, approvals, certificates				
CE mark	Yes	Yes	Yes	Yes
Use in hazardous areas				
• Type of protection acc. to EN 50020 (CENELEC)	see ET 200iSP system	see ET 200iSP system	No	see ET 200iSP system
• Test number KEMA	04 ATEX 2242	04 ATEX 2242		07 ATEX 0205
Dimensions				
Width	60 mm	60 mm	60 mm	60 mm
Height	190 mm	190 mm	190 mm	190 mm
Depth	52 mm	52 mm	52 mm	52 mm
Weights				
Weight, approx.	275 g	275 g	235 g	340 g

Article number	**6ES7138-7AA00-0AA0** ET200ISP, RESERVE MODULE
Digital inputs	
Number of digital inputs	0
Standards, approvals, certificates	
CE mark	Yes
Use in hazardous areas	
• Type of protection acc. to EN 50020 (CENELEC)	II2 G EEx ib IIC T4
• Test number KEMA	04 ATEX 1251

Article number	**6ES7138-7AA00-0AA0** ET200ISP, RESERVE MODULE
Dimensions	
Width	30 mm
Height	129 mm
Depth	136.5 mm
Weights	
Weight, approx.	180 g

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Ordering data

	Article No.
Analog input modules	
Analog input modules EEx i	
4 AI I 2 WIRE HART For measuring currents with 2-wire transmitters with/without HART functionality • 4 × 4 ... 20 mA, HART, 2-wire transmitter • Transmitter load: max. 750 Ω • Resolution 12 bit + sign • Short-circuit monitoring • Wire break monitoring	**6ES7134-7TD00-0AB0**
4 AI I 4 WIRE HART For measuring currents with 4-wire transmitters with/without HART functionality • 4 × 0/4 ... 20 mA, HART, 4-wire transmitter • Transmitter load: max. 750 Ω • Resolution 12 bit + sign • Wire break monitoring	**6ES7134-7TD50-0AB0**
4 AI RTD For measuring resistances as well as for temperature measurements with resistance thermometers • 4 × RTD, resistance thermometer Pt100/Ni100 • 2, 3, 4-wire • Resolution 15 bit + sign • Short-circuit monitoring • Wire break monitoring	**6ES7134-7SD51-0AB0**
4 AI TC For thermoelectric EMF measurements as well as for temperature measurements with thermocouples • 4 × TC (thermocouples) • Type B [PtRh-PtRh] • Type N [NiCrSi-NiSi] • Type E [NiCr-CuNi] • Type R [PtRh-Pt] • Type S [PtPh-Pt] • Type J [Fe-CuNi] • Type L [Fe-CuNi] • Type T [Cu-CuNi] • Type K [NiCr-Ni] • Type U [Cu-CuNi] • Resolution 15 bit + sign • Internal compensation for the reference junction temperature possible using TC sensor module (included in scope of supply of module) • External temperature compensation via Pt100, connected to RTD module of same ET 200iSP station • Wire break monitoring	**6ES7134-7SD00-0AB0**

	Article No.
Analog output modules	
Analog output modules EEx i	
4 AO I HART For output of currents to field devices with/without HART functionality • 4 × 0/4 ... 20 mA, HART (max. load 750 Ω) • Resolution 14-bit • Short-circuit monitoring • Wire break monitoring • Parameterizable substitute value in case of CPU failure	**6ES7135-7TD00-0AB0**
Terminal modules	
ET 200iSP terminal module TM-EM/EM60 For two modules (reserve module, watchdog module and all electronic modules except 2 DQ relays can be plugged in) • For hazardous environments	
- TM-EM/EM60S (blue screw-type terminals)	**6ES7193-7CA00-0AA0**
- TM-EM/EM60C (blue spring-loaded terminals)	**6ES7193-7CA10-0AA0**
• For non-hazardous environments	
- TM-EM/EM60S (black screw-type terminals)	**6ES7193-7CA20-0AA0**
Accessories	
Reserve module For any electronic module	**6ES7138-7AA00-0AA0**
Labeling sheet DIN A4, perforated, each consisting of 10 sheets of 30 strips each for electronic modules and 20 strips each for IM 151	
• petrol	**6ES7193-7BH00-0AA0**
• yellow	**6ES7193-7BB00-0AA0**
Labels, inscribed For slot numbering, label size H × W (in mm): 5 × 7	
• 204 labels, for slots 1 to 20	**8WA8361-0AB**
• 204 labels, for slots 1 to 40	**8WA8361-0AC**
Labels, blank 136 labels for slot numbering, label size H × W (in mm): 5 × 7	**8WA8348-2AY**
S7-300 mounting rails	
• 585 mm long, suitable for assembly of ET 200iSP in a 650 mm wide wall box	**6ES7390-1AF85-0AA0**
• 885 mm long, suitable for assembly of ET 200iSP in a 950 mm wide wall box	**6ES7390-1AJ85-0AA0**

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Overview



The electronic modules of the SIMATIC ET 200iSP distributed I/O-system equipped with safety functions can be used together with the safety-related automation systems (controllers) for the implementation of safety applications. The input modules record the process signals, evaluate them, and prepare them for addional processing by the automation system. The output modules convert the safety-related signals output by the automation systems so that they are suitable for controlling the connected actuators.

F digital input modules

- 8 F-DI Ex NAMUR
  Safety-related digital input module for evaluating the signals from IEC 60947-5-6/NAMUR sensors and connected/ non-connected mechanical contacts in hazardous and non-hazardous areas
  - SIL3/Cat.3/PLe with 8 inputs (1-channel/1oo1 evaluation) or 4 inputs (2-channel/1oo2 evaluation)
  - 8 short-circuit-proof sensor supplies (8 V DC) for 1 channel each
  - Inputs and sensor supplies electrically isolated from power bus and backplane bus
  - Diagnostics evaluation (deactivated for non-connected mechanical contacts)
  - Internal diagnostics buffer
  - Programmable diagnostics interrupt
  - Supports time stamping
  - Channel-selective passivation
  - Firmware update using HW Config possible
  - Exclusively for safety mode
  - LED displays for safety mode, group errors and channel status/fault

F digital output modules

- 4 F-DO Ex 17.4 V DC/40 mA
  Safety-related digital output module for controlling actuators in hazardous and non-hazardous areas, e.g. solenoid valves, DC current relays or indicator lamps
  - SIL3/Cat.3/PLe with 4 outputs, P/P-switching
  - Galvanic isolation from power bus and backplane bus
  - Rated load voltage 17.4 V DC
  - Max. output current 40 mA
  - Performance enhancement through parallel connection of two digital outputs for one actuator
  - Short-circuit, overload and wire-break monitoring
  - Configurable diagnostics
  - Internal diagnostics buffer
  - Programmable diagnostics interrupt
  - Channel-selective passivation
  - Firmware update using HW Config possible
  - Exclusively for safety mode
  - LED displays for safety mode, group errors and channel status/fault

F analog input modules

- 4 F-AI Ex HART (0 ... 20 mA or 4 ... 20 mA)
  Safety-related digital input module for evaluating the signals from current sensors in hazardous and non-hazardous areas, e.g. 2-wire transmitters and HART field devices
  - SIL3/Cat.3/PLe with 4 inputs of one module (1-channel/1oo1 evaluation) or 4 inputs of two modules (2-channel/1oo2 evaluation)
  - Measuring ranges: 0 ... 20 mA or 4 ... 20 mA
  - Resolution 15 bit + sign
  - HART communication in measuring range 4 ... 20 mA
  - 4 short-circuit-proof sensor supplies (min. 12 V DC; max. 26 V DC) for 1 channel each
  - Inputs and sensor supplies electrically isolated from backplane bus
  - Configurable diagnostics
  - Configurable diagnostics interrupt
  - Internal diagnostics buffer
  - Firmware update using HW Config possible
  - Exclusively for safety mode
  - LED displays for safety mode, group errors, channel faults and HART status per channel

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Technical specifications

Article number	**6ES7138-7FN00-0AB0** ET200ISP, 8F-DI NAMUR EX, FAIL-SAFE
Input current	
Current consumption, typ.	145 mA
from supply voltage L+, max.	150 mA; int. Powerbus
Encoder supply	
Number of outputs	8
Type of output voltage	8 V DC
Digital inputs	
Number of digital inputs	8
Number of NAMUR inputs	8
Input current	
• for signal "1", typ.	9.5 mA
Encoder	
Number of connectable encoders, max.	8
Connectable encoders	
• NAMUR encoder	Yes
NAMUR encoder	
• Input current for signal "0", max.	1.2 mA
• Input current for signal "1", min.	2.1 mA
Interrupts/diagnostics/ status information	
Status indicator	Yes
Diagnostics function	Yes
Alarms	
• Diagnostic alarm	Yes; Parameterizable
• Hardware interrupt	No
Diagnostic messages	
• Diagnostic information readable	Yes
• Wire-break	Yes; NAMUR encoders or single contact with 10 kOhm parallel resistor
• Short-circuit	Yes; R load < 150 ohms with NAMUR sensor/sensor and NAMUR changeover contact/sensor to DIN 19234
Diagnostics indication LED	
• Group error SF (red)	Yes
Potential separation	
Potential separation digital inputs	
• between the channels	No
• between the channels and backplane bus	Yes
Standards, approvals, certificates	
CE mark	Yes
Highest safety class achievable in safety mode	
• Performance level according to ISO 13849-1	PLe
• SIL acc. to IEC 61508	SIL 3
Use in hazardous areas	
• Type of protection acc. to EN 50020 (CENELEC)	II 2 G (1) GD Ex ib[ia Ga][ia IIIC Da] IIC T4 GB and I M2 Ex ib[ia Ma] I Mb
• Type of protection acc. to KEMA	10 ATEX 0056
Dimensions	
Width	30 mm
Height	129 mm
Depth	136.5 mm
Weights	
Weight, approx.	288 g

Article number	**6ES7138-7FD00-0AB0** ET200ISP, 4F-DO 40MA EX, FAIL-SAFE
Input current	
Current consumption, typ.	340 mA
from load voltage L+ (without load), max.	510 mA; int. Powerbus
Digital outputs	
Number of digital outputs	4
Short-circuit protection	Yes
Controlling a digital input	No
No-load voltage Uao (DC)	17.4 V
Internal resistor Ri	167 Ω
Load resistance range	
• lower limit	270 Ω
• upper limit	18 kΩ
Trend key points E	
• Voltage Ue (DC)	10.7 V
• Current Ie	40 mA
Output voltage	
• for signal "1", min.	max. 17.4 V
Output current	
• for signal "0" residual current, max.	10 µA
Parallel switching of two outputs	
• for uprating	Yes
• for redundant control of a load	No
Switching frequency	
• with resistive load, max.	30 Hz
• with inductive load, max.	2 Hz
Cable length	
• shielded, max.	500 m
• unshielded, max.	500 m
Interrupts/diagnostics/ status information	
Status indicator	Yes
Substitute values connectable	Yes
Alarms	
• Diagnostic alarm	Yes; Parameterizable
Diagnostic messages	
• Diagnostic information readable	Yes
• Wire-break	Yes
• Short-circuit	Yes
Diagnostics indication LED	
• Group error SF (red)	Yes
• Status indicator digital output (green)	Yes
Potential separation	
Potential separation digital outputs	
• between the channels	No
• between the channels and backplane bus	Yes
• Between the channels and load voltage L+	Yes

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Technical specifications (continued)

Article number	6ES7138-7FD00-0AB0 ET200ISP, 4F-DO 40MA EX, FAIL-SAFE
Standards, approvals, certificates	
CE mark	Yes
Highest safety class achievable in safety mode	
• Performance level according to ISO 13849-1	PLe
• SIL acc. to IEC 61508	SIL 3
Use in hazardous areas	
• Type of protection acc. to EN 50020 (CENELEC)	II 2 G (1) GD Ex ib[ia Ga][ia IIIC Da] IIC T4 GB and I M2 Ex ib[ia Ma] I Mb
• Type of protection acc. to KEMA	10 ATEX 0057
Dimensions	
Width	30 mm
Height	129 mm
Depth	136.5 mm
Weights	
Weight, approx.	285 g

Article number	6ES7138-7FA00-0AB0 ET200ISP, 4F-AI HART EX, FAIL-SAFE
Input current	
Current consumption, typ.	315 mA
from supply voltage L+, max.	490 mA; int. Powerbus
Output voltage	
Power supply to the transmitters	
• short-circuit proof	Yes
• Supply current, max.	25 mA; Plus 4 mA per channel
Analog inputs	
Number of analog inputs	4
Cycle time (all channels) max.	See data in manual
Input ranges (rated values), currents	
• 0 to 20 mA	Yes
• 4 mA to 20 mA	Yes
Cable length	
• shielded, max.	500 m
Analog value generation for the inputs	
Measurement principle	integrating (Sigma-Delta)
Integration and conversion time/ resolution per channel	
• Resolution with overrange (bit including sign), max.	16 bit
• Integration time, parameterizable	Yes
• Interference voltage suppression for interference frequency f1 in Hz	50 / 60 Hz
Smoothing of measured values	
• parameterizable	Yes; in 4 stages
Encoder	
Connection of signal encoders	
• for current measurement as 2-wire transducer	Yes
- Burden of 2-wire transmitter, max.	750 Ω

Article number	6ES7138-7FA00-0AB0 ET200ISP, 4F-AI HART EX, FAIL-SAFE
Errors/accuracies	
Linearity error (relative to input range), (+/-)	0.015 %
Temperature error (relative to input range), (+/-)	0.005 %/K
Crosstalk between the inputs, min.	-50 dB
Repeat accuracy in steady state at 25 °C (relative to input range), (+/-)	0.015 %
Operational error limit in overall temperature range	
• Current, relative to input range, (+/-)	0.35 %
Basic error limit (operational limit at 25 °C)	
• Current, relative to input range, (+/-)	0.1 %
Interference voltage suppression for f = n x (f1 +/- 1 %), f1 = interference frequency	
• Series mode interference (peak value of interference < rated value of input range), min.	40 dB
• Common mode interference, min.	50 dB
Interrupts/diagnostics/ status information	
Alarms	
• Diagnostic alarm	Yes; Parameterizable
Diagnostic messages	
• Diagnostic information readable	Yes
• Wire-break	Yes
• Short-circuit	Yes
Diagnostics indication LED	
• Group error SF (red)	Yes
Potential separation	
Potential separation analog inputs	
• between the channels	No
• between the channels and backplane bus	Yes
• Between the channels and load voltage L+	Yes; Power bus
Standards, approvals, certificates	
CE mark	Yes
Highest safety class achievable in safety mode	
• Performance level according to ISO 13849-1	PLe
• SIL acc. to IEC 61508	SIL 3
Use in hazardous areas	
• Type of protection acc. to EN 50020 (CENELEC)	II 2 G (1) GD Ex ib[ia Ga][ia IIIC Da] IIC T4 GB and I M2 Ex ib[ia Ma] I Mb
• Type of protection acc. to KEMA	10 ATEX 0058
Dimensions	
Width	30 mm
Height	129 mm
Depth	136.5 mm
Weights	
Weight, approx.	299 g

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Technical specifications (continued)

Article number	**6ES7138-7AA00-0AA0**
	ET200ISP, RESERVE MODULE
Digital inputs	
Number of digital inputs	0
Standards, approvals, certificates	
CE mark	Yes
Use in hazardous areas	
• Type of protection acc. to EN 50020 (CENELEC)	II2 G EEx ib IIC T4
• Test number KEMA	04 ATEX 1251

Article number	**6ES7138-7AA00-0AA0**
	ET200ISP, RESERVE MODULE
Dimensions	
Width	30 mm
Height	129 mm
Depth	136.5 mm
Weights	
Weight, approx.	180 g

Ordering data

	Article No.
Safety-related electronic modules	
F digital input modules	
8 F-DI Ex NAMUR For evaluating the signals from IEC 60947-5-6/NAMUR sensors and connected/non-connected mechanical contacts in hazardous and non-hazardous areas • SIL3/Cat.3/PLe with 8 inputs (1-channel/1oo1 evaluation) or 4 inputs (2-channel/1oo2 evaluation)	**6ES7138-7FN00-0AB0**
F digital output modules	
4 F-DO Ex 17.4 V DC/40 mA For controlling actuators in hazardous and non-hazardous areas, e.g. solenoid valves, DC current relays or indicator lamps • SIL3/Cat.3/PLe with 4 outputs, P/P-switching	**6ES7138-7FD00-0AB0**
F analog input modules	
4 F-AI Ex HART (0 ... 20 mA or 4 ... 20 mA) For evaluating the signals from current sensors in hazardous and non-hazardous areas, e.g. 2-wire transmitters and HART field devices • SIL3/Cat.3/PLe with 4 inputs of one module (1-channel/1oo1 evaluation) or 4 inputs of two modules (2-channel/1oo2 evaluation) • Resolution 15 bit + sign • HART communication in measuring range 4 ... 20 mA	**6ES7138-7FA00-0AB0**
Terminal modules	
ET 200iSP terminal module TM-EM/EM60 For two modules (reserve module, watchdog module and all electronic modules except 2 DO relays can be plugged in) • For hazardous environments	
- TM-EM/EM60S (blue screw-type terminals)	**6ES7193-7CA00-0AA0**
- TM-EM/EM60C (blue spring-loaded terminals)	**6ES7193-7CA10-0AA0**
• For non-hazardous environments	
- TM-EM/EM60S (black screw-type terminals)	**6ES7193-7CA20-0AA0**

	Article No.
Accessories	
Reserve module For any electronic module	**6ES7138-7AA00-0AA0**
Labeling sheet DIN A4, perforated, each consisting of 10 sheets of 30 strips each for electronic modules and 20 strips each for IM 151	
• petrol	**6ES7193-7BH00-0AA0**
• yellow	**6ES7193-7BB00-0AA0**
Labels, inscribed For slot numbering, label size H × W (in mm): 5 × 7	
• 204 labels, for slots 1 to 20	**8WA8361-0AB**
• 204 labels, for slots 1 to 40	**8WA8361-0AC**
Labels, blank 136 labels for slot numbering, label size H × W (in mm): 5 × 7	**8WA8348-2AY**
S7-300 mounting rails	
• 585 mm long, suitable for assembly of ET 200iSP in a 650 mm wide wall box	**6ES7390-1AF85-0AA0**
• 885 mm long, suitable for assembly of ET 200iSP in a 950 mm wide wall box	**6ES7390-1AJ85-0AA0**

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Watchdog module

Overview



The watchdog module has two fundamental functions:

- Monitoring of the ET 200iSP remote I/O station for hardware failures (hardware lifebeat); external, applicative failure monitoring is also possible via an I/O address area of the module
- Intrinsically-safe power supply for external actuator switch-off

The watchdog module must be plugged onto a terminal module (order separately). The following terminal modules are suitable for this:

- TM-IM/EM60 terminal modules for one interface module and one watchdog, reserve or electronic module (for versions, see Interface module section)
- TM-EM/EM60 terminal modules with two slots for watchdog module, reserve module or electronic modules (except 2 DO relay):
  - with blue screw-type or spring-loaded terminals for hazardous environments
  - with black screw-type terminals for non-hazardous environments

The first slot directly next to the interface module is provided for the watchdog module.

Technical specifications

Article number	**6ES7138-7BB00-0AB0**
	ET 200ISP, WATCHDOG MOD.
Digital inputs	
Number of digital inputs	0
Dimensions	
Width	30 mm
Height	129 mm
Depth	136.5 mm

Ordering data

	Article No.
Watchdog module	
Watchdog module For failure monitoring and for the intrinsically-safe power supply of an external actuator switch-off	**6ES7138-7BB00-0AB0**
Terminal modules	
ET 200iSP terminal module TM-EM/EM60 For two modules (reserve module, watchdog module and all electronic modules except 2 DO relays can be plugged in)	
• For hazardous environments	
- TM-EM/EM60S (blue screw-type terminals)	**6ES7193-7CA00-0AA0**
- TM-EM/EM60C (blue spring-loaded terminals)	**6ES7193-7CA10-0AA0**
• For non-hazardous environments	
- TM-EM/EM60S (black screw-type terminals)	**6ES7193-7CA20-0AA0**
Accessories	
Labeling sheet DIN A4, perforated, each consisting of 10 sheets of 30 strips each for electronic modules and 20 strips each for IM 151	
• petrol	**6ES7193-7BH00-0AA0**
• yellow	**6ES7193-7BB00-0AA0**
Labels, inscribed for slot numbering, label size H × W (in mm): 5 × 7	
• 204 labels, for slots 1 to 20	**8WA8361-0AB**
• 204 labels, for slots 1 to 40	**8WA8361-0AC**
Labels, blank 136 labels for slot numbering, label size H × W (in mm): 5 × 7	**8WA8348-2AY**

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Overview



Tasks of the RS 485-iS coupler

- Conversion of the electrical PROFIBUS DP RS 485 transmission technology into the intrinsically-safe RS 485-iS transmission technology with a transmission rate of 1.5 Mbps
- Required to connect intrinsically-safe PROFIBUS DP stations, e.g. ET 200iSP or devices from other vendors with Ex i DP connection
- Acts as a safety barrier
- Additional use as a repeater in the hazardous area
- Passive bus station (no configuration necessary)
- Certified according to ATEX 100a

Technical specifications

Technical specifications - RS 485-iS coupler	
Dimensions and weight	
Dimensions W x H x D (mm)	80 × 125 × 130
Weight	Approx. 500 g
Technical data - General	
Degree of protection	IP20
Ambient temperature	- 20 …+ 60 °C
Standards and approvals	
• PROFIBUS	IEC 61784-1:2002 Ed1 CP 3/1
• EU directive	94/9/EG (ATEX 100a)
• CENELEC	II 3 (2) G EEx nA[ib] IIC T4
• UL and CSA	Class I, Division2, Group A, B, C, D T4 Class I Zone 2, Group IIC T4 AIS Class I, Divison 1, Group A, B, C, D [Aexib] IIC, Class I, Zone1, 2, Group IIC
• FM	Class I, Division2, Group A, B, C, D T4 Class I Zone 2, Group IIC T4 AIS Class I, Divison 1, Group A, B, C, D [Aexib] IIC, Class I, Zone1, 2, Group IIC
• IEC	IEC61131-2, Part 2
• CE	Conforming with 89/336/EWG Conforming with 73/23/EWG
• Ship-building certification	Classification companies • ABS (American Bureau of Shipping) • BV (Bureau Veritas) • DNV (Det Norske Veritas) • GL (Germanischer Lloyd) • LRD (Lloyds Register of Shipping) • Class NK (Nippon Kaiji Kyokai)
Module-specific specifications	
Transmission rate on PROFIBUS DP, PROFIBUS RS 485-iS	9.6; 19.2; 45.45; 93.75; 187.5; 500 kbps 1.5 Mbps
Bus-Protocol	PROFIBUS DP

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Technical specifications (continued)

Technical specifications - RS 485-iS coupler		
Voltages, Currents, Potentials		
Rated supply voltage of RS 485-iS coupler	24 V DC (20.4 ... 28.8 V)	
• Polarity reversal protection	Yes	
• Voltage drop bypass	Min. 5 ms	
Galvanic isolation of 24 V power supply		
• to PROFIBUS DP	Yes	
- tested with	500 V DC	
• to PROFIBUS RS 485-iS	Yes	
- tested with	AC 500 V	
Current consumption RS 485-iS coupler (24 V DC), max.	150 mA	
Power loss of the module, typically	3 Watts	
Status, alarms, diagnostics		
Status display	no	
Alarms	None	
Diagnostic functions	Yes	
• Bus monitoring PROFIBUS DP (primary)	Yellow LED "DP1"	
• Bus monitoring PROFIBUS RS 485-iS (secondary)	Yellow LED "DP2"	
• Monitoring 24 V power supply	Green LED "ON"	
Technical safety notice		
V_{DC}	±4.2 V	
I_{SC}	±93 mA	
P_0	0.1 Watts	
V_{max}	±4.2 V	
L_I	0	
C_i	0	
U_m	AC 250 V	
T_a	–25 ... +60 °C	
RS 485-IS segment		
permitted cable length on a single line	RS 485-iS	DP Ex i
• 9.6 to 187.5 Kbps	1 000 m	200 m
• 500 kbit/s	400 m	200 m
• 1.5 Mbps	200 m	200 m
Number of PROFIBUS DP nodes that can be connected, max.	31	16
PROFIBUS RS 485-iS bus terminator switch	integrated, can be added	

Ordering data

	Article No.
RS 485-iS coupler Isolating transformer for connection of PROFIBUS DP segments with RS 485 and RS 485-iS transmission systems	**6ES7972-0AC80-0XA0**
Accessories	
PROFIBUS connector with selectable terminating resistor For connection of IM 152 to PROFIBUS DP with RS 485-iS transmission technology	**6ES7972-0DA60-0XA0**
S7-300 rails	
Lengths:	
• 160 mm	**6ES7390-1AB60-0AA0**
• 482 mm	**6ES7390-1AE80-0AA0**
• 530 mm	**6ES7390-1AF30-0AA0**
• 830 mm	**6ES7390-1AJ30-0AA0**
• 2 000 mm	**6ES7390-1BC00-0AA0**

	Article No.
PROFIBUS FastConnect standard cable, violet Standard type with special design for fast mounting, 2-wire, shielded, cut-to-length	**6XV1830-0EH10**
Specify length in m Max. delivery unit 1 000 m, minimum order quantity 20 m	
Preferred lengths	
- 20 m	**6XV1830-0EN20**
- 50 m	**6XV1830-0EN50**
- 100 m	**6XV1830-0ET10**
- 200 m	**6XV1830-0ET20**
- 500 m	**6XV1830-0ET50**
- 1 000 m	**6XV1830-0EU10**
PROFIBUS FastConnect standard cable IS GP, blue Cable type for use in potentially explosive atmospheres, with special design for fast mounting, 2-wire, shielded, cut-to-length	**6XV1831-2A**
Specify length in m Max. delivery unit 1 000 m, minimum order quantity 20 m	

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Ordering data

	Article No.
Stainless steel enclosure IP65 for SIMATIC ET 200iSP	**6DL2804-** ■ ■ ■ ■ ■
I/O enclosure	
Surface casing in stainless steel, max. IP66, with mounting plate and equipotential bonding rail, empty enclosure for installation of ET 200iSP components[1]	**0**
I/O device consisting of surface casing with installed ET 200iSP components[2]	**1**
I/O device consisting of surface casing with installed ET 200iSP and pneumatic components[2]	**2**
I/O device consisting of surface casing with installed ET 200iSP and additional components for zone 2[3]	**3**
I/O device consisting of surface casing with installed ET 200iSP with pneumatic and additional components for zone 2[3]	**4**
Device group	
Device group II, up to zone 1 (including zone 2)	**A**
Device group II, up to zone 2 (not zone 1 and not zone 21)	**B**
Device group II, up to zone 21 (including zone 22)	**D**
Device group I M2 (max. degree of protection IP55), for use in mining	**M**
Enclosure dimensions W × H × D (in mm)	
650 × 450 × 230, for 15 ET 200iSP modules in non-redundant configuration	**D**
950 × 450 × 230, for 25 ET 200iSP modules in non-redundant configuration	**E**
800 × 800 × 300, for 2 rows with max. 30 ET 200iSP modules	**K**
800 × 1000 × 300, for 2 rows with max. 30 ET 200iSP modules	**M**
1000 × 1000 × 300, for 2 rows with max. 42 ET 200iSP modules	**U**
1000 × 1200 × 300, for 2 rows with max. 42 ET 200iSP modules	**V**
Cable entries/number	
6 × M25 for infeed, 6 or 9 × M32 (1 row) for signal lines[9]	**1**
6 × M25 for infeed, 12 or 18 × M32 (2 rows) for signal lines[9]	**2**
M16 cable entries for signals, 3 rows, 39 or 66 pcs.[4], 2 × M32 for power supply, 4 × M20 for bus cables[5]	**3**
M20 cable entries for signals, 3 rows, 36 or 57 pcs.[4], 2 × M32 for power supply, 4 × M20 for bus cables[5]	**4**
M16 cable entries for signals, 5 rows, 65 or 110 pcs.[4], 2 × M32 for power supply, 4 × M20 for bus cables[5]	**5**
M20 cable entries for signals, 3 rows, 60 or 95 pcs.[4], 2 × M32 for power supply, 4 × M20 for bus cables[5]	**6**
Icotek cable entry strip IP65, for up to 45 or 90 signals[4], 2 × M32 for power supply, 4 × M20 for bus cables[6]	**7**
Cable entries/material	
Cable entry in **plastic, black** Ambient operating temperatures: • Surface casing -20…+70 °C • I/O device -20 … +xx °C[5][7]	**0**
Cable entry in **metal (nickel-plated brass)** Ambient operating temperatures: • Surface casing -40…+70 °C • I/O device -30 … +xx °C[5][7][8]	**1**
Cable entry in **plastic, blue** Ambient operating temperatures: • Surface casing -20…+70 °C • I/O device -20 … +xx °C[5][7]	**2**
Icotek cable entry in plastic, gray HN-24 frame Ambient operating temperatures: • Surface casing -40…+70 °C • I/O device -40 … +xx °C[5][7][8]	**3**
Cable glands for use in mining	**6**

1) The supplied certificate is only valid for the empty enclosure.

2) The included certificate is valid for the supplied enclosure including the installed components.

3) The included manufacturer's declaration is valid for the supplied enclosure including the installed components.

4) Number of cable entries / signals depending on the enclosure dimensions

5) Not for device group I M2

6) Installing these components reduces the degree of protection for the enclosure to IP65

7) The maximum temperature depends on the installed components.

8) Only in conjunction with an installed heater. This takes up 2 slots for ET 200iSP modules. The heater (6DL9910-8AA) must be ordered separately.

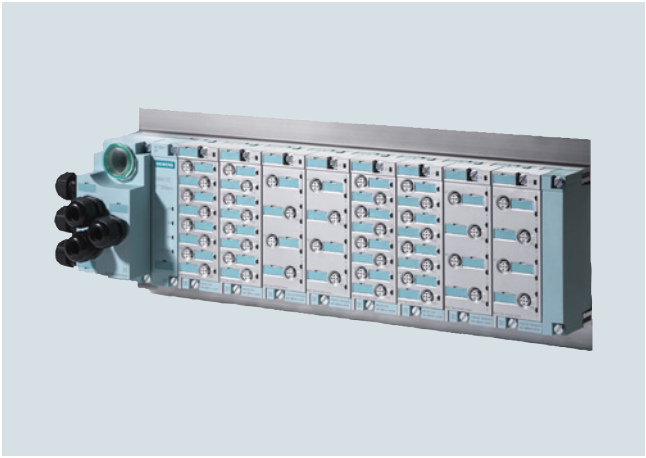
9) Only for device group I M2, number of signal lines depends on enclosure dimensions

Note:

Depending on the cables used, other types and sizes of cable entries can be fitted (on request).

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Overview



- SIMATIC ET 200pro distributed I/O system with IP65/67 degree of protection for cabinet-free use at the machine
- Small, multifunctional complete solution: Digital inputs/ outputs, fail-safe modules, motor starters up to 5.5 kW, etc.
- Communication over PROFIBUS or PROFINET
- Mixed arrangement of fail-safe and standard modules in the same station
- Freely selectable connection technique: direct, ECOFAST or M12 7/8"
- Power module for easy implementation of load groups
- Module replacement during operation (hot swapping)
- Easy installation as well as permanent wiring
- Transmission rate for PROFIBUS DP up to 12 Mbps
- Extensive diagnostics: module-specific or channel-specific
- Intelligent motor starters for starting and protection of motors and loads up to 5.5 kW
  - Versions: direct and reversing starters - Standard and High Feature
- Fail-safe motor starters
- Fail-safe modules with safety-related signal processing according to PROFIsafe
- Frequency converters
- RFID communication modules
- Pneumatic interface modules
- IO-Link master

Technical specifications

General technical specifications	
Electronic modules	• Digital inputs/outputs • Analog inputs • Analog outputs
Connections	M12 and M8 round connector with standard assignment for actuator/sensor
Transmission rate, max.	12 Mbps (PROFIBUS DP), 100 Mbps (PROFINET IO)
Supply voltage	24 V DC
Current consumption of one ET 200pro (internal and encoder supply, non-switched voltage), up to 55 °C, max.	≤ 5 A
Load current for ET 200pro per incoming supply (IM, PM, switched voltage), up to 55 °C, max.	10 A
For overall configuration with looping through (multiple ET 200pros), up to 55 °C, max.	16 A (with connecting module, directly)
Degree of protection	IP65/66/IP67 for interface, digital and analog modules
Material	Thermoplastic (reinforced with glass fiber)
Environmental conditions	
Temperature	From -25 °C/0 °C to +55 °C
Relative humidity	From 5 to 100%
Air pressure	From 795 to 1080 hPa
Mechanical stress	
• Vibration	Vibration test according to IEC 60068, Part 2-6 (sinusoidal) • Constant acceleration 5 g, occasionally 10 g for interface, digital and analog modules • 2 g motor starters
• Shock	• Shock test according to IEC 680068 Part 2-27, half-sine, 30 g, 18 ms duration for interface, • digital and analog modules • 15 g, 11 ms duration for motor starters
Approvals	UL, CSA or cULus

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Overview



Interface modules for handling communication between the ET 200pro and the higher-level master over PROFIBUS DP.

Technical specifications

Article number	**6ES7154-1AA01-0AB0** ET 200pro, IM 154-1 DP	**6ES7154-2AA01-0AB0** ET 200pro, IM154-2 DP HF
Supply voltage		
Rated value (DC)	24 V	24 V
Reverse polarity protection	Yes; against destruction	Yes; against destruction
Short-circuit protection	Yes; over exchangeable fuses	Yes; over exchangeable fuses
Load voltage 2L+		
• Rated value (DC)	24 V	24 V
• Reverse polarity protection	Yes; against destruction	Yes; against destruction
Input current		
from supply voltage 1L+, max.	200 mA	200 mA
Power loss		
Power loss, typ.	5 W	5 W
Address area		
Addressing volume		
• Inputs	244 byte	244 byte
• Outputs	244 byte	244 byte
Interfaces		
Interfaces/bus type	PROFIBUS DP	PROFIBUS DP
Interface types		
RS 485		
• Transmission rate, max.	12 Mbit/s	12 Mbit/s
• automatic detection of transmission rate	Yes	Yes
PROFIBUS DP		
Services		
- SYNC capability	Yes	Yes
- FREEZE capability	Yes	Yes
- Direct data exchange (slave-to-slave communication)	Yes	Yes
Interrupts/diagnostics/ status information		
Alarms		
• Diagnostic alarm	Yes; Parameterizable	Yes; Parameterizable
• Hardware interrupt	Yes; Parameterizable	Yes; Parameterizable
Diagnostics indication LED		
• Bus fault BF (red)	Yes	Yes
• Group error SF (red)	Yes	Yes
• Monitoring 24 V voltage supply ON (green)	Yes	Yes
• Load voltage monitoring 24 V DC (green)	Yes	Yes

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Technical specifications (continued)

Article number	**6ES7154-1AA01-0AB0** ET 200pro, IM 154-1 DP	**6ES7154-2AA01-0AB0** ET 200pro, IM154-2 DP HF
Parameter		
DPV1 operation	possible	possible
Swapping interrupt	Parameterizable	Parameterizable
Startup if setpoint not equal to actual configuration	Parameterizable	Parameterizable
Hot swapping of modules	possible	possible
Potential separation		
between supply voltage and electronics	Yes	Yes
Degree and class of protection		
IP degree of protection	IP65/67	IP65/67
Ambient conditions		
Ambient temperature during operation		
• min.	-25 °C	-25 °C
• max.	55 °C	55 °C
Ambient temperature during storage/transportation		
• min.	-40 °C	-40 °C
• max.	70 °C	70 °C
Dimensions		
Width	90 mm	90 mm
Height	130 mm	130 mm
Depth	60 mm	60 mm
Weights		
Weight, approx.	375 g	375 g

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Ordering data	Article No.
IM154-1 interface module For ET 200pro; for communication between ET 200pro and higher-level masters over PROFIBUS DP.	**6ES7154-1AA01-0AB0**
IM154-2 DP High Feature interface module For ET 200pro; for communication between ET 200pro and higher-level masters over PROFIBUS DP; supports PROFIsafe.	**6ES7154-2AA01-0AB0**
Accessories	
CM IM DP ECOFAST connection module For connecting PROFIBUS DP and the 24 V power supply to PROFIBUS interface modules, 2 ECOFAST Cu connections.	**6ES7194-4AA00-0AA0**
CM IM DP direct connection module For connecting PROFIBUS DP and the 24 V power supply directly to PROFIBUS interface modules, up to six M20 cable glands.	**6ES7194-4AC00-0AA0**
CM IM DP M12, 7/8" connection module For connecting PROFIBUS DP and the 24 V power supply to PROFIBUS interface modules, 2 x M12 and 2 x 7/8".	**6ES7194-4AD00-0AA0**
Accessories for CM IM DP ECOFAST	
PROFIBUS ECOFAST hybrid cable, pre-assembled With 2 ECOFAST connectors, trailing-type cable with 2 x Cu 0.64 mm^2 and 4 x Cu 1.5 mm^2, in various lengths:	
1.5 m	**6XV1830-7BH15**
3.0 m	**6XV1830-7BH30**
5.0 m	**6XV1830-7BH50**
10 m	**6XV1830-7BN10**
15 m	**6XV1830-7BN15**
20 m	**6XV1830-7BN20**
PROFIBUS ECOFAST hybrid cable GP, pre-assembled With 2 ECOFAST connectors, trailing-type cable with 2 x Cu 0.64 mm^2 and 4 x Cu 1.5 mm^2, in various lengths:	
1.5 m	**6XV1860-3PH15**
3.0 m	**6XV1860-3PH30**
5.0 m	**6XV1860-3PH50**
10 m	**6XV1860-3PN10**
15 m	**6XV1860-3PN15**
20 m	**6XV1860-3PN20**

	Article No.
PROFIBUS ECOFAST hybrid cable, non-assembled Trailing-type cable with 2 x Cu 0.64 mm^2 and 4 x Cu 1.5 mm^2, sold by the meter, minimum order quantity 20 m, maximum order quantity 1 000 m.	**6XV1830-7AH10**
PROFIBUS ECOFAST hybrid connector 180 ECOFAST Cu, 2 x Cu, 4 x 1.5 mm^2, HANBRID connector	
• With male insert, 5-pack	**6GK1905-0CA00**
• With female insert, 5-pack	**6GK1905-0CB00**
PROFIBUS ECOFAST hybrid connector angular ECOFAST Cu, 2 x Cu, 4 x 1.5 mm^2, HANBRID connector	
• With male insert, 5-pack	**6GK1905-0CC00**
• With female insert, 5-pack	**6GK1905-0CD00**
Accessories for CM IM DP direct	
PROFIBUS trailing cable Max. acceleration 4 m/s^2, at least 3 million bending cycles, bending radius at least 60 mm, 2-wire shielded, sold by the meter, minimum order quantity 20 m, maximum order quantity 1 000 m.	**6XV1830-3EH10**
PROFIBUS FC Food bus cable With PE sheath for use in the food and beverages industry, 2-wire, shielded, sold by the meter, minimum order quantity 20 m, maximum order quantity 1 000 m.	**6XV1830-0GH10**
PROFIBUS FC Robust bus cable With PUR sheath for use in environments subject to harsh chemicals and extreme mechanical stress, 2-wire, shielded, sold by the meter, minimum order quantity 20 m, maximum order quantity 1 000 m.	**6XV1830-0JH10**
Power line 5-wire, 5 x 1.5 mm^2, trailing type, sold by the meter, minimum order quantity 20 m, maximum order quantity 1 000 m.	**6XV1830-8AH10**

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Ordering data	Article No.
Accessories for CM IM DP M12, 7/8"	
PROFIBUS M12 connecting cable	
Pre-assembled with two M12 connectors, 5-pin, in various lengths:	
1.5 m	**6XV1830-3DH15**
2.0 m	**6XV1830-3DH20**
3.0 m	**6XV1830-3DH30**
5.0 m	**6XV1830-3DH50**
10 m	**6XV1830-3DN10**
15 m	**6XV1830-3DN15**
7/8" connecting cable to power supply	
5-wire, 5 x 1.5 mm^2, trailing type, pre-assembled with two 7/8" connectors, 5-pin, in various lengths:	
1.5 m	**6XV1822-5BH15**
2.0 m	**6XV1822-5BH20**
3.0 m	**6XV1822-5BH30**
5.0 m	**6XV1822-5BH50**
10 m	**6XV1822-5BN10**
15 m	**6XV1822-5BN15**
M12 cable connector	
For ET 200eco, with axial cable outlet.	
• With male insert, 5-pack	**6GK1905-0EA00**
• With female insert, 5-pack	**6GK1905-0EB00**
PROFIBUS M12 bus termination connector	**6GK1905-0EC00**
With male insert.	
7/8" cable connector	
For ET 200eco, with axial cable outlet.	
• With male insert, 5-pack	**6GK1905-0FA00**
• With female insert, 5-pack	**6GK1905-0FB00**
M12 sealing cap	**3RX9802-0AA00**
For protection of unused M12 connections with ET 200pro.	
Sealing cap 7/8"	**6ES7194-3JA00-0AA0**
For protection of unused 7/8" connections with ET 200pro; 10 units per pack.	

	Article No.
General accessories	
ET 200pro rack	
• Narrow, for interface, electronics and power modules	
- 500 mm	**6ES7194-4GA00-0AA0**
- 1 000 mm	**6ES7194-4GA60-0AA0**
- 2 000 mm, can be cut to length	**6ES7194-4GA20-0AA0**
• Compact, for interface, electronics and power modules	
- 500 mm	**6ES7194-4GC70-0AA0**
- 1 000 mm	**6ES7194-4GC60-0AA0**
- 2 000 mm, can be cut to length	**6ES7194-4GC20-0AA0**
• Wide, for interface, electronics, power modules and motor starters	
- 500 mm	**6ES7194-4GB00-0AA0**
- 1 000 mm	**6ES7194-4GB60-0AA0**
- 2 000 mm, can be cut to length	**6ES7194-4GB20-0AA0**
• Wide, for I/O modules and motor starters	
- 500 mm	**6ES7194-4GD00-0AA0**
- 1 000 mm	**6ES7194-4GD10-0AA0**
- 2 000 mm	**6ES7194-4GD20-0AA0**
Spare fuse	**6ES7194-4HB00-0AA0**
12.5 A fast-blow, for interface and power modules, 10 units per pack.	
PROFIBUS FastConnect bus cable	**6XV1830-0EH10**
Standard type with special design for quick mounting, 2-wire, shielded, sold by the meter, max. delivery unit 1 000 m, minimum order quantity 20 m.	
PROFIBUS hybrid standard cable GP	**6XV1860-2R**
Standard PROFIBUS hybrid cable with 2 energy cables (1.5 mm^2) for supplying data and energy for ET 200pro.	
SIMATIC Manual Collection	**6ES7998-8XC01-8YE0**
Electronic manuals on DVD, multi-language: S7-200, TD 200, S7-300, M7-300, C7, S7-400, M7-400, STEP 7, Engineering Tools, Runtime Software, SIMATIC DP (Distributed I/O), SIMATIC HMI (Human Machine Interface), SIMATIC NET (Industrial Communication).	
SIMATIC Manual Collection update service for 1 year	**6ES7998-8XC01-8YE2**
Scope of supply: Current DVD "S7 Manual Collection" and the three subsequent updates.	

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Overview



Interface module for processing the communication between ET 200pro and a higher-level controller over PROFINET IO.

Technical specifications

Article number	**6ES7154-3AB00-0AB0** ET 200pro, IM 154-3 PN HF	**6ES7154-4AB10-0AB0** ET 200pro, IM 154-4 PN HF
Supply voltage		
Rated value (DC)	24 V	24 V
Reverse polarity protection	Yes; against destruction	Yes; against destruction
Short-circuit protection	Yes; Fuse in lower part is exchangeable, the fuse on the IM-LP is not	Yes; Fuse in lower part is exchangeable, the fuse on the IM-LP is not
Load voltage 2L+		
• Rated value (DC)	24 V	24 V
• Reverse polarity protection	Yes; against destruction	Yes; against destruction
Input current		
from supply voltage 1L+, max.	300 mA	400 mA; Dependent on terminal module, typ. maximum value for FO connection method, full load on RWB and 20.4 V input voltage
Power loss		
Power loss, typ.	5 W	6 W; Dependent on terminal module, typ. maximum value for CU connection method, full load on RWB, for FO the value is approx. 0.7 W higher
Address area		
Addressing volume		
• Inputs	256 byte	256 byte
• Outputs	256 byte	256 byte
Interfaces		
Interfaces/bus type	PROFINET IO	PROFINET IO
M12 port		
• Autonegotiation	Yes	Yes
• Transmission rate, max.	100 Mbit/s	100 Mbit/s
Protocols		
Protocols (Ethernet)		
• SNMP	Yes	Yes
• LLDP	Yes	
• ping	Yes	Yes
• ARP	Yes	Yes

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Technical specifications (continued)

Article number	**6ES7154-3AB00-0AB0** ET 200pro, IM 154-3 PN HF	**6ES7154-4AB10-0AB0** ET 200pro, IM 154-4 PN HF
Interrupts/diagnostics/ status information		
Alarms		
• Diagnostic alarm	Yes; Parameterizable	Yes; Parameterizable
• Hardware interrupt	Yes; Parameterizable	Yes; Parameterizable
Diagnostics indication LED		
• MAINT LED	Yes	Yes
• LINK LED	Yes	Yes
• RX/TX LED	Yes	Yes
• Bus fault BF (red)	Yes	Yes
• Group error SF (red)	Yes	Yes
• Monitoring 24 V voltage supply ON (green)	Yes	Yes
• Load voltage monitoring 24 V DC (green)	Yes	Yes
Parameter		
Swapping interrupt	Parameterizable	Parameterizable
Startup if setpoint not equal to actual configuration	Parameterizable	Parameterizable
Hot swapping of modules	possible	possible
Potential separation		
between backplane bus and electronics	No	No
between supply voltage and electronics	Yes	Yes
Degree and class of protection		
IP degree of protection	IP65/67	IP65/67
Ambient conditions		
Ambient temperature during operation		
• min.	-25 °C	-25 °C
• max.	55 °C	55 °C
Ambient temperature during storage/transportation		
• min.	-40 °C	-40 °C
• max.	70 °C	70 °C
Dimensions		
Width	90 mm	135 mm
Height	130 mm	130 mm
Depth	60 mm	60 mm
Weights		
Weight, approx.	375 g	490 g

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Ordering data	Article No.
IM 154-3 PN High Feature interface module For communication between ET 200pro and higher-level controllers via PROFINET IO; supports PROFIsafe. Connection module 6ES7194-4AK00-0AA0 must be ordered separately.	**6ES7154-3AB00-0AB0**
IM 154-4 PN High Feature interface module For communication between ET 200pro and higher-level controllers via PROFINET IO; supports PROFIsafe. Order connection module 6ES7194-4A .00-0AA0 separately.	**6ES7154-4AB10-0AB0**
Accessories	
Connection modules for IM 154-3 PN High Feature	
• **Connection module CM IM PN M12, 7/8" S** for connecting PROFINET PN and 24 V power supply to PROFINET interface modules, 2 x M12 and 2 x 7/8"	**6ES7194-4AK00-0AA0**
Connection modules for IM 154-4 PN High Feature	
• **Connection module CM IM PN M12, 7/8"** for connecting PROFINET PN and 24 V power supply to PROFINET interface modules, 2 x M12 and 2 x 7/8"	**6ES7194-4AJ00-0AA0**
• **Connection module CM IM PN 2xRJ45** for connecting PROFINET PN and 24 V power supply to PROFINET interface modules, 2 x RJ45 and 2 x push-pull power connector	**6ES7194-4AF00-0AA0**
• **Connection module CM IM PN 2xSCRJ FO** for connecting PROFINET PN and 24 V power supply to PROFINET interface modules, 2 x SCRJ FO and 2 x push-pull power connector	**6ES7194-4AG00-0AA0**
M12 sealing cap For protection of unused M12 connections with ET 200pro.	**3RX9802-0AA00**
IE M12 connecting cables Pre-assembled with two M12 connectors, up to 85 m, in various lengths:	
0.3 m	**6XV1870-8AE30**
0.5 m	**6XV1870-8AE50**
1.0 m	**6XV1870-8AH10**
1.5 m	**6XV1870-8AH15**
2.0 m	**6XV1870-8AH20**
3.0 m	**6XV1870-8AH30**
5.0 m	**6XV1870-8AH50**
10 m	**6XV1870-8AN10**
15 m	**6XV1870-8AN15**
Other special lengths with 90° or 180° cable outlet.	See http://support.automation.siemens.com/WW/view/en/26999294

	Article No.
7/8" sealing caps 1 pack = 10 units	**6ES7194-3JA00-0AA0**
7/8" connecting cable to power supply 5-wire, 5 x 1.5 mm^2, trailing type, pre-assembled with two 7/8" connectors, 5-pin, up to 50 m, in various lengths:	
1.5 m	**6XV1822-5BH15**
2.0 m	**6XV1822-5BH20**
3.0 m	**6XV1822-5BH30**
5.0 m	**6XV1822-5BH50**
10 m	**6XV1822-5BN10**
15 m	**6XV1822-5BN15**
Other special lengths with 90° or 180° cable outlet.	See http://support.automation.siemens.com/WW/view/en/26999294
Power line 5-wire, 5 x 1.5 mm^2, trailing type, sold by the meter, minimum order quantity 20 m, maximum order quantity 1 000 m.	**6XV1830-8AH10**
7/8" cable connector For ET 200eco, with axial cable outlet.	
• With male insert, 5-pack	**6GK1905-0FA00**
• With female insert, 5-pack	**6GK1905-0FB00**
Industrial Ethernet FastConnect installation cables	
• **IE FC TP standard cable GP 2 x 2**; Sold by the meter, max. delivery unit 1 000 m; minimum order quantity 20 m.	**6XV1840-2AH10**
• **IE FC TP trailing cable 2 x 2**; Sold by the meter, max. order quantity 1 000 m; minimum order quantity 20 m.	**6XV1840-3AH10**
• **IE FC TP trailing cable GP 2 x 2**; sold by the meter, max. delivery unit 1 000 m; minimum order quantity 20 m.	**6XV1870-2D**
• **IE TP torsion Cable GP 2 x 2**; sold by the meter, max. delivery unit 1 000 m; minimum order quantity 20 m.	**6XV1870-2F**
• **IE FC TP marine cable 2 x 2**; Sold by the meter, max. order quantity 1 000 m; minimum order quantity 20 m.	**6XV1840-4AH10**

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Ordering data	Article No.
IE RJ45 plug PRO RJ45 plug connector in IP65/67-rated design for on-site assembly, plastic housing, insulation/displacement connection system, for SCALANCE X-200 IRT PRO and ET 200pro: 1 pack = 1 unit.	**6GK1901-1BB10-6AA0**
IE SC RJ POF plug PRO SC RJ plug for POF fibers in IP65/67-rated design for on-site assembly, plastic housing, for SCALANCE X-200 IRT PRO and ET 200pro 1 pack = 1 unit	**6GK1900-0MB00-6AA0**
IE SC RJ PCF plug PRO SC RJ plug for PCF fibers in IP65/67-rated design for on-site assembly, plastic housing, for SCALANCE X-200 IRT PRO 1 pack = 1 unit.	**6GK1900-0NB00-6AA0**
Power plug PRO 5-pole power plug for 2 x 24 V power supply in IP65/67-rated design, for on-site assembly, plastic housing, for SCALANCE X-200 IRT and ET 200 pro 1 pack = 1 unit.	**6GK1907-0AB11-6AA0**
IE panel feed-through Control cabinet feed-through for converting M12 D-coded connection system (IP65) to RJ45 connection system (IP20)	
• 1 pack = 5 units	**6GK1901-0DM20-2AA5**
Push-pull cable connector For 1L+/ 2L+, unassembled	**6GK1907-0AB11-6AA0**
Cover caps for push-pull RJ45 female connectors 5 items per pack	**6ES7194-4JD50-0AA0**
Cover caps for push-pull female connectors power (1L+, 2L+) 5 units	**6ES7194-4JA50-0AA0**

	Article No.
General accessories	
ET 200pro rack	
• Narrow, for interface, electronics and power modules	
- 500 mm	**6ES7194-4GA00-0AA0**
- 1 000 mm	**6ES7194-4GA60-0AA0**
- 2 000 mm, can be cut to length	**6ES7194-4GA20-0AA0**
• Compact, for interface, electronics and power modules	
- 500 mm	**6ES7194-4GC70-0AA0**
- 1 000 mm	**6ES7194-4GC60-0AA0**
- 2 000 mm, can be cut to length	**6ES7194-4GC20-0AA0**
• Wide, for interface, electronics, power modules and motor starters	
- 500 mm	**6ES7194-4GB00-0AA0**
- 1 000 mm	**6ES7194-4GB60-0AA0**
- 2 000 mm, can be cut to length	**6ES7194-4GB20-0AA0**
• Wide, for I/O modules and motor starters	
- 500 mm	**6ES7194-4GD00-0AA0**
- 1 000 mm	**6ES7194-4GD10-0AA0**
- 2 000 mm	**6ES7194-4GD20-0AA0**
Spare fuse 12.5 A fast-blow, for interface and power modules, 10 units per pack.	**6ES7194-4HB00-0AA0**
SIMATIC Manual Collection Electronic manuals on DVD, multi-language: LOGO!, SIMADYN, SIMATIC Bus Components, SIMATIC C7, SIMATIC Distributed I/O, SIMATIC HMI, SIMATIC sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	**6ES7998-8XC01-8YE0**
SIMATIC Manual Collection update service for 1 year Current "Manual Collection" DVD and the three subsequent updates	**6ES7998-8XC01-8YE2**

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Overview



- Expansion modules with digital inputs/outputs for connection of actuators/sensors
- With scalable diagnostics
  - Standard modules with module-specific diagnostics
  - High Feature module with channel-specific diagnostics and parameterizable input delay or hardware interrupts
- Double or single assignment can be implemented for each M12 in the case of the 8 DI and 8 DO module by selecting CM IO 4 x M12 or CM IO 8 x M12
- IO connection modules are available in metal and plastic versions

Technical specifications

Article number	**6ES7141-4BF00-0AA0**	**6ES7141-4BF00-0AB0**	**6ES7141-4BH00-0AA0**
	ET 200pro, EM 8DI 24V DC	ET 200pro, EM 8DI 24V DC HF	ET 200pro, EM 16DI 24V DC
Supply voltage			
Rated value (DC)	24 V	24 V	24 V
Reverse polarity protection	Yes; Against destruction; encoder power supply outputs applied with reversed polarity	Yes; against destruction; load increasing	Yes; Against destruction; encoder power supply outputs applied with reversed polarity
Input current			
from supply voltage 1L+, max.	20 mA	40 mA	30 mA
from backplane bus 3.3 V DC, max.	20 mA	20 mA	20 mA
Encoder supply			
Number of outputs	8	8	8
Short-circuit protection	Yes; per module, electronic	Yes; per channel, electronic	Yes; per module, electronic
Output current			
• up to 55 °C, max.	1 A	1 A	1 A
Digital inputs			
Number of digital inputs	8	8	16
Input characteristic curve in accordance with IEC 61131, type 1	Yes	No	Yes
Input characteristic curve in accordance with IEC 61131, type 2	No	Yes	
Number of simultaneously controllable inputs			
all mounting positions			
- up to 55 °C, max.	8	8	16
Input voltage			
• Rated value (DC)	24 V	24 V	24 V
• for signal "0"	-3 to +5V	-3 to +5V	-3 to +5V
• for signal "1"	13 to 30V	+11 to +30V	+11 to +30V
Input current			
• for signal "1", typ.	7 mA	7 mA	4 mA
Input delay (for rated value of input voltage)			
for standard inputs			
- parameterizable	No	Yes	No
Encoder			
Connectable encoders			
• 2-wire sensor	Yes	Yes	Yes
- permissible quiescent current (2-wire sensor), max.	1.5 mA	1.5 mA	1.5 mA
Isochronous mode			
Isochronous operation (application synchronized up to terminal)	No	No	No

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Technical specifications (continued)

Article number	**6ES7141-4BF00-0AA0**	**6ES7141-4BF00-0AB0**	**6ES7141-4BH00-0AA0**
	ET 200pro, EM 8DI 24V DC	ET 200pro, EM 8DI 24V DC HF	ET 200pro, EM 16DI 24V DC
Interrupts/diagnostics/ status information			
Diagnostics function	Yes	Yes; channel by channel, parameterizable	Yes
Alarms			
• Diagnostic alarm	Yes	Yes	Yes
Diagnostic messages			
• Diagnostic information readable	Yes	Yes	Yes
• Wire-break		Yes; Monitoring, I < 0.3 mA; per channel	
• Short-circuit	Yes; Sensor supply to M; module by module	Yes; channel by channel	Yes; Sensor supply to M; module by module
Diagnostics indication LED			
• Group error SF (red)	Yes	Yes	Yes
• Status indicator digital input (green)	Yes; Per channel	Yes; Per channel	Yes; Per channel
Potential separation			
between backplane bus and all other circuit components	Yes	Yes	Yes
Potential separation digital inputs			
• between the channels	No	No	No
• between the channels and backplane bus	Yes	Yes	Yes
Dimensions			
Width	45 mm	45 mm	45 mm
Height	130 mm	130 mm	130 mm
Depth	35 mm	35 mm; without terminal module	35 mm
Weights			
Weight, approx.	140 g	140 g	140 g

Article number	**6ES7142-4BD00-0AA0**	**6ES7142-4BD00-0AB0**	**6ES7142-4BF00-0AA0**
	ET 200pro, EM 4DO 24V DC/2.0A	ET 200pro, EM 4DO 24VDC/2.0A HF	ET 200pro, EM 8DO 24VDC/0.5A
Supply voltage			
Load voltage 2L+			
• Rated value (DC)	24 V	24 V	24 V
• Short-circuit protection	Yes; per channel, electronic	Yes; per channel, electronic	Yes; per channel, electronic
• Reverse polarity protection	Yes; against destruction; load increasing	Yes; against destruction; load increasing	Yes; against destruction; load increasing
Input current			
from load voltage 2L+ (without load), max.	20 mA	40 mA	30 mA
from backplane bus 3.3 V DC, max.	20 mA	30 mA	30 mA
Digital outputs			
Number of digital outputs	4	4	8
Short-circuit protection	Yes	Yes	Yes
Limitation of inductive shutdown voltage to	2L+ (-47 V)	2L+ (-47 V)	2L+ (-47 V)
Controlling a digital input	Yes	Yes	Yes; Isolation between 1L+ and 2L+ is no longer provided, as 1M and 2M are jumpered
Switching capacity of the outputs			
• on lamp load, max.	10 W	10 W	5 W
Load resistance range			
• lower limit	12 Ω	12 Ω	48 Ω
• upper limit	4 kΩ	4 kΩ	4 kΩ
Output voltage			
• for signal "1", min.	2L+ (-0,8 V)	2L+ (-0,8 V)	2L+ (-0,8 V)
Output current			
• for signal "1" rated value	2 A	2 A	0.5 A
• for signal "0" residual current, max.	0.5 mA	0.5 mA	0.5 mA
Parallel switching of two outputs			
• for uprating	No	No	No
• for redundant control of a load	Yes	Yes	Yes

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Technical specifications (continued)

Article number	**6ES7142-4BD00-0AA0**	**6ES7142-4BD00-0AB0**	**6ES7142-4BF00-0AA0**
	ET 200pro, EM 4DO 24V DC/2.0A	ET 200pro, EM 4DO 24VDC/2.0A HF	ET 200pro, EM 8DO 24VDC/0.5A
Switching frequency			
• with resistive load, max.	100 Hz	100 Hz	100 Hz
• with inductive load, max.	0.5 Hz	0.5 Hz	0.5 Hz
• on lamp load, max.	1 Hz	1 Hz	1 Hz
Total current of the outputs (per group)			
all mounting positions			
- up to 55 °C, max.	4 A	4 A	4 A
Cable length			
• shielded, max.	30 m	30 m	30 m
• unshielded, max.	30 m	30 m	30 m
Interrupts/diagnostics/ status information			
Diagnostics function	Yes	Yes	Yes
Substitute values connectable		Yes	
Alarms			
• Diagnostic alarm	Yes	Yes	Yes
Diagnostic messages			
• Diagnostic information readable	Yes	Yes	Yes
• Wire-break		Yes; channel by channel	
• Short-circuit	Yes; Short-circuit of outputs to ground; module by module	Yes; channel by channel	Yes; Short-circuit of outputs to ground; module by module
Diagnostics indication LED			
• Group error SF (red)	Yes	Yes	Yes
• Status indicator digital output (green)	Yes	Yes	Yes
• Channel fault indicator F (red)		Yes	
Potential separation			
between backplane bus and all other circuit components	Yes	Yes	Yes
Potential separation digital outputs			
• between the channels	No	No	No
• between the channels and backplane bus	Yes	Yes	Yes
Standards, approvals, certificates			
Suitable for safety-related tripping of standard modules	Yes	Yes	Yes
Highest safety class achievable for safety-related tripping of standard modules			
• Performance level according to ISO 13849-1	PL d	PL d	PL d
• Category according to ISO 13849-1	Cat. 3	Cat. 3	Cat. 3
• SILCL according to IEC 62061	SILCL 2	SILCL 2	SILCL 2
Dimensions			
Width	45 mm	45 mm	45 mm
Height	130 mm	130 mm	130 mm
Depth	35 mm	35 mm; without terminal module	35 mm
Weights			
Weight, approx.	140 g	140 g	140 g

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Technical specifications (continued)

Article number	**6ES7143-4BF50-0AA0** ET 200pro, EM 4DI / 4DO 24V DC, 0.5A	**6ES7143-4BF00-0AA0** ET 200pro, EM 4 DIO / 4 DO 24V DC, 0.5A
Supply voltage		
Rated value (DC)		24 V
Reverse polarity protection		Yes; Against destruction; encoder power supply outputs applied with reversed polarity
Load voltage 2L+		
• Rated value (DC)	24 V	24 V
• Short-circuit protection	Yes	Yes
• Reverse polarity protection	Yes	Yes; against destruction; load increasing
Input current		
from supply voltage 1L+, max.		20 mA
from load voltage 2L+ (without load), max.	20 mA	20 mA
from backplane bus 3.3 V DC, max.	20 mA	30 mA
Encoder supply		
Number of outputs	4	4
Short-circuit protection	Yes; per module, electronic	Yes; per module, electronic
Output current		
• up to 55 °C, max.	1 A	1 A
Digital inputs		
Number of digital inputs	4	4; 4 DIOs can be parameterized
Input characteristic curve in accordance with IEC 61131, type 3	Yes	Yes
Number of simultaneously controllable inputs		
all mounting positions		
- up to 55 °C, max.		4
Input voltage		
• Rated value (DC)	24 V	24 V
• for signal "0"	-3 to +5V	-3 to +5V
• for signal "1"	+11 to +30V	+11 to +30V
Input current		
• for signal "1", typ.	7 mA	7 mA
Digital outputs		
Number of digital outputs	4	8; 4 DO fixed, 4 DIO parameterizable
• in groups of		4; 2 load groups for 4 outputs each
Short-circuit protection	Yes; per channel, electronic	Yes; per channel, electronic
Limitation of inductive shutdown voltage to	Typ. (2L+) -47 V	Typ. (L1+, L2+) -47 V
Controlling a digital input	Yes	Yes
Switching capacity of the outputs		
• on lamp load, max.	5 W	5 W
Load resistance range		
• lower limit	48 Ω	48 Ω
• upper limit	4 kΩ	4 kΩ
Output voltage		
• for signal "1", min.		2L+ (-0,8 V)
Output current		
• for signal "1" rated value	0.5 A	0.5 A
• for signal "0" residual current, max.	0.5 mA	0.5 mA
Parallel switching of two outputs		
• for uprating	No	No
• for redundant control of a load	Yes	Yes
Switching frequency		
• with resistive load, max.	100 Hz	100 Hz
• with inductive load, max.	0.5 Hz	0.5 Hz
• on lamp load, max.	1 Hz	1 Hz

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Technical specifications (continued)

Article number	**6ES7143-4BF50-0AA0** ET 200pro, EM 4DI / 4DO 24V DC, 0.5A	**6ES7143-4BF00-0AA0** ET 200pro, EM 4 DIO / 4 DO 24V DC, 0.5A
Total current of the outputs (per group)		
all mounting positions		
- up to 55 °C, max.	2 A	2 A
Cable length		
• unshielded, max.	30 m	30 m
Encoder		
Connectable encoders		
• 2-wire sensor	Yes	Yes
- permissible quiescent current (2-wire sensor), max.	1.5 mA	1.5 mA
Interrupts/diagnostics/ status information		
Diagnostics function	Yes	Yes
Alarms		
• Diagnostic alarm	Yes	Yes
Diagnostic messages		
• Diagnostic information readable	Yes	Yes
• Short-circuit	Yes; Short-circuit of outputs to ground; module by module	Yes; Short-circuit of outputs to ground; module by module
Diagnostics indication LED		
• Group error SF (red)		Yes
• Status indicator digital input (green)	Yes	Yes
• Status indicator digital output (green)	Yes	Yes
Potential separation		
between backplane bus and all other circuit components	Yes	Yes
Potential separation digital inputs		
• between the channels	No	No
• between the channels and backplane bus	Yes	Yes
Potential separation digital outputs		
• between the channels	No	
• between the channels and backplane bus	Yes	Yes
Standards, approvals, certificates		
Suitable for safety-related tripping of standard modules		Yes
Highest safety class achievable for safety-related tripping of standard modules		
• Performance level according to ISO 13849-1		PL d
• Category according to ISO 13849-1		Cat. 3
• SILCL according to IEC 62061		SILCL 2
Dimensions		
Width	45 mm	45 mm
Height	130 mm	130 mm
Depth	35 mm	35 mm
Weights		
Weight, approx.	140 g	140 g

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Ordering data	Article No.
8 DI digital input module 24 V DC, with module-specific diagnostics, including bus module. Connection module must be ordered separately	**6ES7141-4BF00-0AA0**
8 DI High Feature digital input module 24 V DC, with channel-specific diagnostics, including bus module. Connection module must be ordered separately	**6ES7141-4BF00-0AB0**
16 DI digital input module 24 V DC, with module-specific diagnostics, including bus module. Connection module 6ES7194-4CB50-0AA0 must be ordered separately	**6ES7141-4BH00-0AA0**
4 DO digital output module 24 V DC, 2 A, with module-specific diagnostics, including bus module. Connection module must be ordered separately	**6ES7142-4BD00-0AA0**
4 DO High Feature digital output module 24 V DC, 2 A, with channel-specific diagnostics, including bus module. Connection module must be ordered separately	**6ES7142-4BD00-0AB0**
8 DO digital output module 24 V DC, 0.5 A, with module-specific diagnostics, including bus module. Connection module must be ordered separately	**6ES7142-4BF00-0AA0**
4 DI/4 DO digital input and output module 24 V DC, 0.5 A, with module-specific diagnostics, including bus module. Connection module must be ordered separately	**6ES7143-4BF50-0AA0**
Digital input and output module 4 DIO / 4 DO 24 V DC, 0.5 A, with module-specific diagnostics, including bus module. Connection module must be ordered separately	**6ES7143-4BF00-0AA0**

	Article No.
Accessories	
CM IO 4 x M12 connection module 4 M12 sockets for connecting digital or analog sensors or actuators to ET 200pro	**6ES7194-4CA00-0AA0**
CM IO 4 x M12 inverse connection module 4 M12 sockets for connection of digital actuators to ET 200pro (4 DO and 4 DO HF); 2 x M12 single assignment, 2 x M12 double assignment	**6ES7194-4CA50-0AA0**
CM IO 4 x M12 P connection module 4 M12 sockets for connecting digital sensors/actuators to ET 200pro; plastic version	**6ES7194-4CA10-0AA0**
CM IO 8 x M12 connection module 8 M12 sockets for connecting digital sensors or actuators to ET 200pro	**6ES7194-4CB00-0AA0**
CM IO 8 x M12 P connection module 8 M12 sockets for connecting digital sensors or actuators to ET 200pro; plastic version	**6ES7194-4CB10-0AA0**
CM IO 8 x M12D connection module 8 M12 sockets for connecting digital sensors or actuators to ET 200pro	**6ES7194-4CB50-0AA0**
CM IO 8 x M8 connection module 8 sockets M8 for connection of digital sensors or actuators to ET 200pro	**6ES7194-4EB00-0AA0**
CM IO 2 x M12 connection module 2 M12 8-pin sockets; for use with: EM 8 DI, 24 V DC and 8 DO, 24 V DC/0.5 A	**6ES7194-4FB00-0AA0**
CM IO 1 x M23 connection module 1 M23 socket; for use with: EM 8 DI, 24 V DC and 8 DO, 24 V DC/0.5 A	**6ES7194-4FA00-0AA0**
Module identification labels For color coding of the CM IOs in the colors of white, red, blue and green; pack with 100 units each	**6ES7194-4HA00-0AA0**
M12 sealing cap For protection of unused M12 connections with ET 200pro	**3RX9802-0AA00**
Labels 20 x 7, pale turquoise, 340 items per pack	**3RT1900-1SB20**
M12 Y circular connector For double connection of sensors via a single cable, 5-pole; cannot be used for F DI 4/8	**6ES7194-1KA01-0XA0**
M12 Y cable For double connection of I/O by means of a single-cable on ET 200, 5-pole	**6ES7194-6KA00-0XA0**
M8 sealing cap For IP67 modules	**3RK1901-1PN00**

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Overview



- Expansion modules with analog inputs and outputs for connecting sensors/actuators
- With diagnostics functionality, limit values and substitute values

Technical specifications

Article number	**6ES7144-4FF01-0AB0**	**6ES7144-4GF01-0AB0**	**6ES7144-4JF00-0AB0**	**6ES7144-4PF00-0AB0**
	ET 200pro, EM 4AI-U HF	ET 200pro, EM 4AI-I HF	ET 200pro, EM 4 AI-RTD HF	ET 200pro, EM 4 AI-TC HF
Supply voltage				
Rated value (DC)	24 V	24 V	24 V	24 V
Reverse polarity protection	Yes; against destruction	Yes; against destruction	Yes; against destruction	Yes; against destruction
Input current				
from supply voltage 1L+, max.	40 mA; Typical	40 mA; Typical	27 mA; Typical	34 mA; Typical
from backplane bus 3.3 V DC, max.	12 mA; Typical	12 mA; Typical	10 mA; Typical	20 mA; Typical
Encoder supply				
Number of outputs	4	4		
Short-circuit protection	Yes; per module, electronic to frame	Yes; per module, electronic to frame		
Output current				
• up to 55 °C, max.	1 A	1 A		
Analog inputs				
Number of analog inputs	4	4	4	4
permissible input voltage for voltage input (destruction limit), max.	35 V			20 V
permissible input current for current input (destruction limit), max.		40 mA		
Constant measurement current for resistance-type transmitter, typ.			1.25 mA; 1.25 / 0.5 mA depending on measuring range	
Cycle time (all channels) max.	5 ms	10 ms	83 ms; 83 ms at 50 Hz; 69 ms at 60 Hz	Number of active channels per module x basic conversion time
Technical unit for temperature measurement adjustable			Yes; Degrees Celsius/ degrees Fahrenheit	Yes; °C/°F/K
Input ranges (rated values), voltages				
• 0 to +10 V	Yes			
• 1 V to 5 V	Yes			
• -10 V to +10 V	Yes			
• -5 V to +5 V	Yes			
• -80 mV to +80 mV				Yes
Input ranges (rated values), currents				
• 0 to 20 mA		Yes		
• -20 mA to +20 mA		Yes		
• 4 mA to 20 mA		Yes		

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Technical specifications (continued)

Article number	**6ES7144-4FF01-0AB0**	**6ES7144-4GF01-0AB0**	**6ES7144-4JF00-0AB0**	**6ES7144-4PF00-0AB0**
	ET 200pro, EM 4AI-U HF	ET 200pro, EM 4AI-I HF	ET 200pro, EM 4 AI-RTD HF	ET 200pro, EM 4 AI-TC HF
Input ranges (rated values), thermocouples				
• Type B				Yes
• Type E				Yes
• Type J				Yes
• Type K				Yes
• Type L				Yes
• Type N				Yes
• Type R				Yes
• Type S				Yes
• Type T				Yes
Input ranges (rated values), resistance thermometer				
• Cu 10			No	
• Ni 100			Yes	
• Ni 1000			Yes	
• Ni 120			Yes	
• Ni 200			Yes	
• Ni 500			Yes	
• Pt 100			Yes	
• Pt 1000			Yes	
• Pt 200			Yes	
• Pt 500			Yes	
Input ranges (rated values), resistors				
• 0 to 150 ohms			Yes	
• 0 to 300 ohms			Yes	
• 0 to 600 ohms			Yes	
• 0 to 3000 ohms			Yes	
Thermocouple (TC)				
Temperature compensation				
- internal temperature compensation				Yes
- external temperature compensation with compensations socket				Yes
Characteristic linearization				
• parameterizable			Yes	
- for resistance thermometer			Ptxxx, Nixxx	
Cable length				
• shielded, max.	30 m	30 m	30 m	30 m
Analog value generation for the inputs				
Measurement principle	integrating	integrating	integrating	integrating
Integration and conversion time/ resolution per channel				
• Resolution with overrange (bit including sign), max.	15 bit; 15 bit + sign at ±10 V, at ±5 V; 15 bit at 0 V to 10 V, at 1 V to 5 V	15 bit; 15 bit + sign at ±10 V, at ±5 V; 15 bit at 0 V to 10 V, at 1 V to 5 V	15 bit; at 150, 300, 600 and 3000 ohms; otherwise 15 bits + sign	15 bit; + sign
• Integration time (ms)	0,3 / 16,7 / 20 / 60	0,3 / 16,7 / 20 / 60	20 / 16,667	2,5 / 16,67 / 20 / 100 ms
• Interference voltage suppression for interference frequency f1 in Hz	16,67 / 50 / 60 / 3 600	16,67 / 50 / 60 / 3 600	50 / 60 Hz	10 / 50 / 60 / 400 Hz
• Conversion time (per channel)	1.1 ms	1.1 ms	20.625 ms; 20.625 ms at 50 Hz; 17.25 ms at 60 Hz	4.7/19/22/102 ms
Smoothing of measured values				
• parameterizable	Yes	Yes	Yes	Yes

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Technical specifications (continued)

Article number	6ES7144-4FF01-0AB0 ET 200pro, EM 4AI-U HF	6ES7144-4GF01-0AB0 ET 200pro, EM 4AI-I HF	6ES7144-4JF00-0AB0 ET 200pro, EM 4 AI-RTD HF	6ES7144-4PF00-0AB0 ET 200pro, EM 4 AI-TC HF
Encoder				
Connection of signal encoders				
• for voltage measurement	Yes			Yes
• for current measurement as 2-wire transducer		Yes		
• for current measurement as 4-wire transducer		Yes		
• for resistance measurement with two-wire connection			Yes; Line resistances are also measured	
• for resistance measurement with three-wire connection			Yes	
• for resistance measurement with four-wire connection			Yes	
Errors/accuracies				
Linearity error (relative to input range), (+/-)	0.0075 %	0.0075 %	0.05 %	0.01 %
Temperature error (relative to input range), (+/-)	0.00075 %/K	0.00075 %/K	0.002 %/K	0.0004 %/K; Positive temperature
Crosstalk between the inputs, min.	-70 dB	-70 dB	-50 dB	-90 dB; max.
Repeat accuracy in steady state at 25 °C (relative to input range), (+/-)	0.004 %	0.004 %	0.015 %	0.01 %
Operational error limit in overall temperature range				
• Voltage, relative to input range, (+/-)	0.1 %			0.12 %; Positive temperature
• Current, relative to input range, (+/-)		0.1 %		
• Resistance thermometer, relative to input range, (+/-)			0.175 %	
Basic error limit (operational limit at 25 °C)				
• Voltage, relative to input range, (+/-)	0.075 %			0.1 %
• Current, relative to input range, (+/-)		0.075 %		
• Resistance thermometer, relative to input range, (+/-)			0.125 %	
Interference voltage suppression for f = n x (f1 +/- 1 %), f1 = interference frequency				
• Series mode interference (peak value of interference < rated value of input range), min.			50 dB	42 dB
• Common mode interference (USS < 2.5 V) , min.			70 dB; Interference voltage < 5 V	85 dB; Interference voltage < 10 V
Interference voltage suppression for f = n x (f1 +/- 0.5 %), f1 = interference frequency				
• Series mode interference (peak value of interference < rated value of input range), min.	60 dB	60 dB		
• Common mode interference (USS < 2.5 V) , min.	80 dB; Interference voltage < 10 V	80 dB; Interference voltage < 5 V		
Interrupts/diagnostics/ status information				
Diagnostics function	Yes	Yes	Yes	Yes
Alarms				
• Diagnostic alarm	Yes; Parameterizable	Yes; Parameterizable	Yes; Parameterizable	Yes; Parameterizable
• Hardware interrupt	Yes; (limit value alarm), can be parameterized for channel 0	Yes; (limit value alarm), can be parameterized for channel 0	No	No
Diagnostic messages				
• Diagnostic information readable	Yes	Yes	Yes	Yes
• Wire-break	Yes; at 1 to 5 V	Yes; at 4 to 20 mA	Yes	Yes
• Short-circuit	Yes; at 1 to 5 V	Yes; at 4 to 20 mA		
• Overflow/underflow			Yes	Yes
Diagnostics indication LED				
• Group error SF (red)	Yes	Yes	Yes	Yes

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Technical specifications (continued)

Article number	6ES7144-4FF01-0AB0 ET 200pro, EM 4AI-U HF	6ES7144-4GF01-0AB0 ET 200pro, EM 4AI-I HF	6ES7144-4JF00-0AB0 ET 200pro, EM 4 AI-RTD HF	6ES7144-4PF00-0AB0 ET 200pro, EM 4 AI-TC HF
Parameter				
Measurement type/range			R4L / R3L / R2L/ TR4L / TR3L / TR2L	Deactivated/ ±80 mV/ TC-EL Type T (Cu-CuNi)/ TC-EL Type K (NiCr-Ni)/ TC-EL Type B (PtRh-PtRh)/ TC-EL Type N (NiCrSi-NiSi)/ TC-EL Typ E (NiCr-CuNi)/ TC-EL Type R (PtRh-Pt)/ TC-EL Type S (PtRh-Pt)/ TC-EL Type J (Fe-Cu-Ni)/ TC-EL Type L (Fe-CuNi)
Comparison point				None/internal/RTD(0)/dyn. ref. temp./fix. ref. temp.
Potential separation				
Potential separation analog inputs				
• between the channels	No	No	No	No
• between the channels and backplane bus	Yes	Yes	Yes	Yes
Standards, approvals, certificates				
Suitable for applications according to AMS 2750				Yes; Declaration of Conformity, see online support entry 109757262
Suitable for applications according to CQI-9				Yes; Based on AMS 2750 E
Dimensions				
Width	45 mm	45 mm	45 mm	45 mm
Height	130 mm	130 mm	130 mm	130 mm
Depth	35 mm	35 mm	35 mm	35 mm
Weights				
Weight, approx.	150 g	150 g	150 g	150 g

Article number	6ES7145-4FF00-0AB0 ET 200pro, EM 4AO-U HF	6ES7145-4GF00-0AB0 ET 200pro, EM 4 AO-I HF
Supply voltage		
Rated value (DC)	24 V	24 V
Reverse polarity protection	Yes; against destruction	Yes; against destruction
Input current		
from supply voltage 1L+, max.	65 mA	110 mA
from backplane bus 3.3 V DC, max.	10 mA	10 mA
Actuator supply		
Number of outputs	4	4
Short-circuit protection	Yes; per module	Yes; per module
Output current		
• up to 55 °C, max.	1 A	1 A
Analog outputs		
Number of analog outputs	4	4
Voltage output, short-circuit protection	Yes; per channel, electronic to chassis	Yes; per module, electronic to frame
Voltage output, short-circuit current, max.	50 mA	
Current output, no-load voltage, max.		16 V
Cycle time (all channels) max.	3 ms	3 ms
Output ranges, voltage		
• 0 to 10 V	Yes	
• 1 V to 5 V	Yes	
• -10 V to +10 V	Yes	
Output ranges, current		
• 0 to 20 mA		Yes
• -20 mA to +20 mA		Yes
• 4 mA to 20 mA		Yes

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Technical specifications (continued)

Article number	**6ES7145-4FF00-0AB0** ET 200pro, EM 4AO-U HF	**6ES7145-4GF00-0AB0** ET 200pro, EM 4 AO-I HF
Connection of actuators		
• for voltage output two-wire connection	Yes	
• for voltage output four-wire connection	Yes	
• for current output two-wire connection		Yes
• for current output four-wire connection		Yes
Load impedance (in rated range of output)		
• with voltage outputs, min.	1 000 Ω	
• with voltage outputs, capacitive load, max.	1 µF	
• with current outputs, max.		600 Ω
• with current outputs, inductive load, max.		1 mH
Cable length		
• shielded, max.	30 m	30 m
Analog value generation for the outputs		
Integration and conversion time/ resolution per channel		
• Resolution with overrange (bit including sign), max.	15 bit; at -10 to +10 V; 14 bit at 1 to 5 V; 15 bit at 0 to 10 V	15 bit; at ±20 mA; 14 bit at 0 to 20 mA; 15 bit at 4 to 20 mA
• Conversion time (per channel)	0.7 ms	0.7 ms
Settling time		
• for resistive load	0.1 ms	0.1 ms
• for capacitive load	6 ms	
• for inductive load		1 ms
Errors/accuracies		
Output ripple (relative to output range, bandwidth 0 to 50 kHz), (+/-)	0.02 %	0.02 %
Linearity error (relative to output range), (+/-)	0.1 %	0.1 %
Temperature error (relative to output range), (+/-)	0.01 %/K	0.01 %/K
Repeat accuracy in steady state at 25 °C (relative to output range), (+/-)	0.05 %	0.05 %
Operational error limit in overall temperature range		
• Voltage, relative to output range, (+/-)	0.2 %	
• Current, relative to output range, (+/-)		0.2 %
Basic error limit (operational limit at 25 °C)		
• Voltage, relative to output range, (+/-)	0.15 %	
• Current, relative to output range, (+/-)		0.15 %
Interrupts/diagnostics/ status information		
Diagnostics function		Yes
Substitute values connectable	Yes	Yes
Alarms		
• Diagnostic alarm	Yes; Parameterizable	Yes; Parameterizable
• Hardware interrupt	No	No
Diagnostic messages		
• Diagnostic information readable	Yes	Yes
• Wire-break	No	Yes; per channel, not in zero range
• Short-circuit	Yes; per channel, not in zero range	No
Diagnostics indication LED		
• Group error SF (red)	Yes	Yes

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Technical specifications (continued)

Article number	**6ES7145-4FF00-0AB0** ET 200pro, EM 4AO-U HF	**6ES7145-4GF00-0AB0** ET 200pro, EM 4 AO-I HF
Potential separation		
Potential separation analog outputs		
• between the channels	No	No
• between the channels and backplane bus	Yes	Yes
Dimensions		
Width	45 mm	45 mm
Height	130 mm	130 mm
Depth	35 mm	35 mm
Weights		
Weight, approx.	150 g	150 g

Ordering data

	Article No.
4AI U analog input module High Feature, ±10 V; ±5 V; 0 to 10 V; 1 to 5 V, channel-specific diagnostics, including bus module. Connection module must be ordered separately	**6ES7144-4FF01-0AB0**
4AI I analog input module High Feature, ±20 mA; 0 to 20 mA; 4 to 20 mA, channel-specific diagnostics, including bus module. Connection module must be ordered separately	**6ES7144-4GF01-0AB0**
4AI RTD analog input module High Feature; resistances: 150, 300, 600 and 3000 Ohm; resistance thermometer: Pt100, 200, 500, 1000, Ni100, 120, 200, 500 and 1000; channel-specific diagnostics, incl. bus module. Connection module must be ordered separately	**6ES7144-4JF00-0AB0**
Analog input module 4AI TC High Feature; thermocouples: Type B, E, J, K, L, N, R, S, T; voltage measurement ±80 mV; channel-specific diagnostics, including bus module. Connection module must be ordered separately	**6ES7144-4PF00-0AB0**
4AO U analog output module High Feature, ±10 V; 0 to 10 V; 1 to 5 V, channel-specific diagnostics, including bus module. Connection module must be ordered separately	**6ES7145-4FF00-0AB0**
4AO I analog output module High Feature, ±20 mA; 0 to 20 mA; 4 to 20 mA, channel-specific diagnostics, including bus module. Connection module must be ordered separately	**6ES7145-4GF00-0AB0**

	Article No.
Accessories	
CM IO 4 x M12 connection module 4 M12 sockets for connecting digital or analog sensors or actuators to ET 200pro	**6ES7194-4CA00-0AA0**
M12 compensation connectors With integral Pt100 for reference point compensation when connecting thermocouples	**6ES7194-4AB00-0AA0**
Module identification labels For color coding of the CM IOs in the colors of white, red, blue and green; pack with 100 units each	**6ES7194-4HA00-0AA0**
M12 sealing cap For protection of unused M12 connections with ET 200pro	**3RX9802-0AA00**

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Overview

- 45 mm wide 4 IO-LINK HF electronic module
- 4 IO-Link ports according to IO-Link specification V1.1
- Port Class B
- The IO-Link parameters are configured using the Port Configuration Tool (S7-PCT), version V3.4 and higher

Technical specifications

Article number	**6ES7147-4JD00-0AB0**
	ET200pro, EM 4 IO-Link HF
Supply voltage	
Rated value (DC)	24 V
Reverse polarity protection	Yes
Load voltage 2L+	
• Rated value (DC)	24 V
• Short-circuit protection	Yes
• Reverse polarity protection	Yes; against destruction; load increasing
Input current	
from supply voltage 1L+, max.	40 mA
from load voltage 2L+ (without load), max.	20 mA
from backplane bus 3.3 V DC, max.	20 mA
Encoder supply	
Number of outputs	4
Short-circuit protection	Yes; per module, electronic
Output current	
• up to 55 °C, max.	2 A
Power loss	
Power loss, typ.	2.6 W
IO-Link	
Number of ports	4
• of which simultaneously controllable	4
IO-Link protocol 1.0	Yes
IO-Link protocol 1.1	Yes
Transmission rate	4.8 kBaud (COM1); 38.4 kBaud (COM2), 230.4 kBaud (COM3)
Size of process data, input per port	32 byte
Size of process data, input per module	32 byte
Size of process data, output per port	32 byte
Size of process data, output per module	32 byte
Memory size for device parameter	2 kbyte; for each port
Master backup	Possible with function block IO_LINK_MASTER
Configuration without S7-PCT	Possible; autostart/manual function
Cable length unshielded, max.	20 m
Operating modes	
• IO-Link	Yes
• DI	Yes
• DQ	Yes; max. 100 mA
Connection of IO-Link devices	
• Port type A	Yes; via 3-core cable
• Port type B	Yes; Additional device supply: for X1 and X2 max. 2 A in total, for X3 and X4 max. 2 A in total

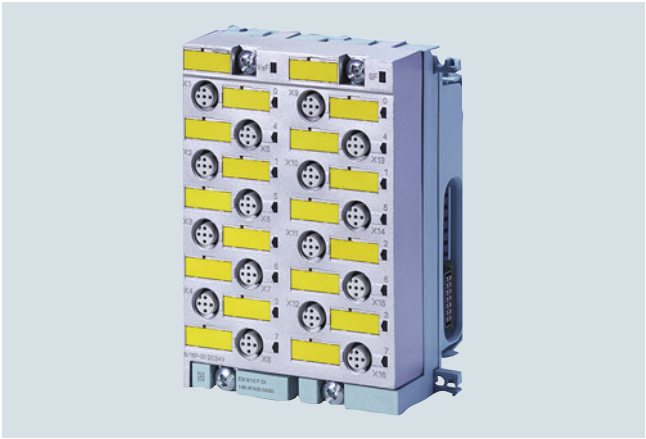
Article number	**6ES7147-4JD00-0AB0**
	ET200pro, EM 4 IO-Link HF
Interrupts/diagnostics/ status information	
Diagnostics function	Yes
Alarms	
• Diagnostic alarm	Yes
Diagnostic messages	
• Diagnostic information readable	Yes
• Wire-break	Yes; channel by channel
• Short-circuit	Yes; channel by channel
Diagnostics indication LED	
• Channel status display	Yes; One green LED for channel status Qn (SIO mode) and port status IO-Ln (IO-Link mode)
• Group error SF (red)	Yes
• Channel fault indicator F (red)	Yes; combined with the IO-Link port status
Potential separation	
between the load voltages	Yes
between backplane bus and all other circuit components	Yes
Potential separation channels	
• between the channels	No
Degree and class of protection	
IP degree of protection	IP65/67
Standards, approvals, certificates	
Suitable for safety-related tripping of standard modules	No
Dimensions	
Width	45 mm
Height	130 mm
Depth	35 mm
Weights	
Weight, approx.	150 g

Ordering data

	Article No.
4 IO-LINK HF electronic module 4 IO-Link ports according to IO-Link specification V1.1, port Class B; High Feature, channel diagnostics, including bus module. Connection module must be ordered separately	**6ES7147-4JD00-0AB0**
Accessories	
CM IO-Link 4 x M12 P connection module 4 M12 sockets for connecting IO-Link devices to ET 200pro electronic module 4 IO-LINK HF	**6ES7194-4CA20-0AA0**
Module identification labels For color coding of the CM IOs in the colors of white, red, blue and green; pack with 100 units each	**6ES7194-4HA00-0AA0**
M12 sealing cap For protection of unused M12 connections with ET 200pro	**3RX9802-0AA00**

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Overview



Fail-safe digital inputs/outputs with IP65/66/67 degree of protection for application on the machine level without control cabinet.

Fail-safe digital inputs

- For fail-safe reading of sensor information (1 or 2 channels)
- Provide integral discrepancy evaluation for 2-out-of-2 signals
- Internal sensor supplies (incl. test function) available

Fail-safe digital outputs

- Fail-safe 2-channel activation (sink/source output) by actuators
- Actuators can be driven by up to 2 A

All modules are certified up to SIL 3 (IEC 61508) and feature detailed diagnostics.

The modules support PROFIsafe, both in PROFIBUS, and in PROFINET configurations. They can be used with IM151-7 F-CPU, CPU31xF-2 DP, CPU31xF-2 PN/DP and CPU416F-2.

Technical specifications

Article number	**6ES7148-4FA00-0AB0** ET200PRO, Elec. module, 8/16 F-DI 24V DC
Supply voltage	
Rated value (DC)	24 V
Reverse polarity protection	Yes
Digital inputs	
Number of digital inputs	16
Input current	
• for signal "1", typ.	3.7 mA
Standards, approvals, certificates	
Highest safety class achievable in safety mode	
• Performance level according to ISO 13849-1	e
• SIL acc. to IEC 61508	3
Dimensions	
Width	90 mm
Height	130 mm
Depth	65 mm

Article number	**6ES7148-4FC00-0AB0** ET200PRO, Elec. module, 4/8 F-DI/4 F-DO 24VDC/2A	**6ES7148-4FS00-0AB0** ET200PRO, Elec. module, F-Switch PROFIsafe
Supply voltage		
Rated value (DC)	24 V	24 V
Digital inputs		
Number of digital inputs	8	2
Input current		
• for signal "1", typ.	3.7 mA	3.5 mA
Digital outputs		
Number of digital outputs	4	3
Short-circuit protection	Yes	Yes
Output current		
• for signal "1" rated value	2 A	
Dimensions		
Width	90 mm	45 mm
Height	130 mm	130 mm
Depth	65 mm	65 mm

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Ordering data

	Article No.
Fail-safe digital input module 8/16 F-DI PROFIsafe 24 V DC, including bus module. Connection module must be ordered separately	**6ES7148-4FA00-0AB0**
Fail-safe digital input/output module 4/8 F-DI, 4 F-DO 2 A 24 V DC, including bus module. Connection module must be ordered separately	**6ES7148-4FC00-0AB0**
Fail-safe electronic module F-Switch PROFIsafe Three fail-safe PP-switching outputs for safe switching of the rear panel busbar (2L+, F0, F1); two fail-safe digital inputs, 45 mm; usable up to SIL3 (IEC 61508)	**6ES7148-4FS00-0AB0**

	Article No.
Accessories	
Connection module For the fail-safe electronic module F-Switch PROFIsafe	**6ES7194-4DA00-0AA0**
Connection module For the fail-safe electronic module 4/8 F-DI/4 F-DO, 24 V DC/2 A	**6ES7194-4DC00-0AA0**
Connection module For the fail-safe electronic module 8/16 F-DI, 24 V DC	**6ES7194-4DD00-0AA0**
PROFIBUS DP interface module IM154-2 Including termination module	**6ES7154-2AA01-0AB0**
PROFINET interface module IM154-4 PN Including termination module	**6ES7154-4AB10-0AB0**
M12 sealing cap For protection of unused M12 connections with ET 200pro	**3RX9802-0AA00**

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Overview



PM-E 24 V DC power module

Technical specifications

Article number	**6ES7148-4CA00-0AA0**
	ET 200pro, PM-E 24V DC
Supply voltage	
Load voltage 2L+	
• Rated value (DC)	24 V
• Short-circuit protection	Yes; via an exchangeable fuse in the power module
• Reverse polarity protection	Yes; against destruction
Input current	
from load voltage 2L+, max.	3 mA
Current carrying capacity	
max.	10 A; up to 55 °C (on the internal busbars of the ET 200pro)
Power loss	
Power loss, typ.	0.1 W
Interrupts/diagnostics/ status information	
Diagnostics function	Yes
Diagnostic messages	
• Diagnostic information readable	Yes
• missing load voltage	Yes
Diagnostics indication LED	
• Group error SF (red)	Yes
• Load voltage monitoring 24 V DC (green)	Yes

Article number	**6ES7148-4CA00-0AA0**
	ET 200pro, PM-E 24V DC
Parameter	
missing load voltage	Potential group of the power module
Potential separation	
between load voltage and backplane bus	Yes
Degree and class of protection	
IP degree of protection	IP65/67
Dimensions	
Width	45 mm
Height	130 mm
Depth	35 mm
Weights	
Weight, approx.	140 g

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Ordering data	Article No.
PM-E 24 V DC power module For backfeed and group formation of the 24 V DC load voltage for electronic modules within an ET 200pro station.	**6ES7148-4CA00-0AA0**
Accessories	
CM PM-E ECOFAST connecting module For backfeed of 24 V load voltage, 1 ECOFAST Cu connection	**6ES7194-4BA00-0AA0**
CM PM-E direct connecting module For backfeed of 24 V load voltage, up to 2 M20 screwed cable glands	**6ES7194-4BC00-0AA0**
CM PM-E 7/8" connecting module For backfeed of 24 V load voltage, 1 x 7/8"	**6ES7194-4BD00-0AA0**
CM PM-E PP connection module For supplying 24 V load voltage, 2 x push-pull, with spare fuse	**6ES7194-4BE00-0AA0**
Spare fuse 12.5 A quick-response, for interface and power modules, 10 items per package unit	**6ES7194-4HB00-0AA0**
PROFIBUS ECOFAST hybrid cable, copper Trailing-type cable (PUR sheath), with two shielded Cu wires for PROFIBUS DP plus four Cu wires of 1.5 mm^2, sold by the meter, minimum order quantity 20 m, maximum order quantity 1 000 m	**6XV1830-7AH10**
Preassembled with ECOFAST male and female connector, fixed length	
• 1.5 m	**6XV1830-7BH15**
• 3 m	**6XV1830-7BH30**
• 5 m	**6XV1830-7BH50**
• 10 m	**6XV1830-7BN10**
• 15 m	**6XV1830-7BN15**
• 20 m	**6XV1830-7BN20**
PROFIBUS ECOFAST hybrid cable, GP Trailing-type cable with 4 x copper cores and 2 x copper cores, shielded, with UL approval	
Preassembled with ECOFAST male and female connector	
• 1.5 m	**6XV1860-3PH15**
• 3 m	**6XV1860-3PH30**
• 5 m	**6XV1860-3PH50**
• 10 m	**6XV1860-3PN10**
• 15 m	**6XV1860-3PN15**
• 20 m	**6XV1860-3PN20**

	Article No.
ECOFAST cable connector, for user assembly Female connector; ordering unit 5 items	**6GK1905-0CB00**
PROFIBUS ECOFAST hybrid plug, angled With 2 x shielded copper cores and 4 x 1.5 mm^2 copper cores; 5 items; with assembly instructions; female insert	**6GK1905-0CD00**
Push-pull cable connector For 1L+/ 2L+, unassembled	**6GK1907-0AB11-6AA0**
Cover caps for push-pull female connectors 5 units	**6ES7194-4JA50-0AA0**
Accessories for CM PM-E direct	
Power line 5-wire, 5 x 1.5 mm^2, trailing type, sold by the meter, minimum order quantity 20 m, maximum order quantity 1 000 m	**6XV1830-8AH10**
Accessories for CM PM-E 7/8"	
7/8" connecting cable to power supply 5-wire, 5 x 1.5 mm^2, trailing type, preassembled with two 7/8" connectors, 5-pin	
• 1.5 m long	**6XV1822-5BH15**
• 2.0 m long	**6XV1822-5BH20**
• 3.0 m long	**6XV1822-5BH30**
• 5.0 m long	**6XV1822-5BH50**
• 10 m long	**6XV1822-5BN10**
• 15 m long	**6XV1822-5BN15**
7/8" cable connector With axial cable outlet	
• with female insert, 5 per pack	**6GK1905-0FB00**

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Overview



PM-O 2 x 24 V DC power module with CM PM-O PP

PM-O 2x 24 V DC power module

Technical specifications

Article number	**6ES7148-4CA60-0AA0**
	ET200PRO, PM-O 2x24V DC
Supply voltage	
Load voltage 2L+	
• Rated value (DC)	24 V
• Short-circuit protection	Yes
• Reverse polarity protection	Yes; against destruction
Input current	
from load voltage 2L+, max.	3 mA
Current carrying capacity	
max.	10 A; up to 55 °C (on the internal busbars of the ET 200pro)
Power loss	
Power loss, typ.	1.1 W
Interrupts/diagnostics/ status information	
Diagnostics function	Yes
Diagnostic messages	
• Diagnostic information readable	Yes
• missing load voltage	No
Diagnostics indication LED	
• Group error SF (red)	Yes
• Load voltage monitoring 24 V DC (green)	No; Signalled in IM or in PM

Article number	**6ES7148-4CA60-0AA0**
	ET200PRO, PM-O 2x24V DC
Parameter	
Diagnostics short-circuit	Diagnosis short circuit implemented after M for 1L+
Potential separation	
between load voltage and backplane bus	Yes
Degree and class of protection	
IP degree of protection	IP65/67
Dimensions	
Width	45 mm
Height	130 mm
Depth	35 mm
Weights	
Weight, approx.	150 g

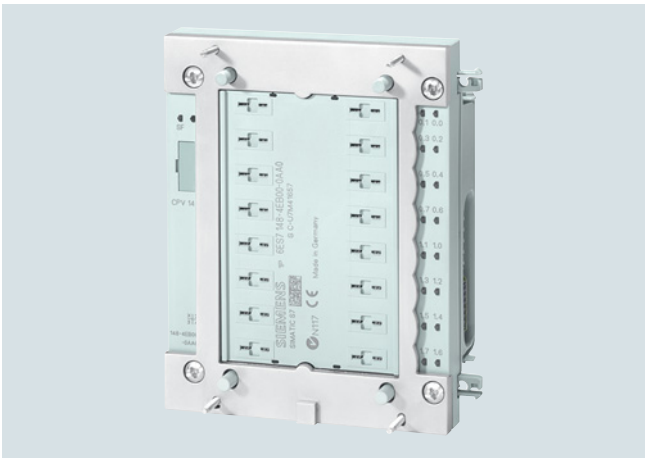
Ordering data

	Article No.
PM-O 2 x 24 V DC power module For drawing the 24 V load voltage 2L+ and electronic/encoder supply voltage 1L+ within an ET 200pro station.	**6ES7148-4CA60-0AA0**

	Article No.
Accessories	
CM PM-O PP connection module For drawing the 24 V load voltage and electronic/encoder supply voltage, 2 x push-pull connector	**6ES7194-4BH00-0AA0**
Push-pull cable connector For 1L+/ 2L+, unassembled	**6GK1907-0AB11-6AA0**
Cover caps for push-pull female connectors 5 units	**6ES7194-4JA50-0AA0**

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Overview



- Interface for holding an original FESTO CPV 10 or CPV 14 compact performance valve terminal
- For using the ET 200pro in applications with flexible pneumatics
- Highly flexible pneumatics due to a variety of valve functions and choice of flow rates

Technical specifications

Article number	**6ES7148-4EA00-0AA0** ET200PRO, 16DO, Pneumatic Interface CPV10	**6ES7148-4EB00-0AA0** ET200PRO, 16DO, Pneumatic Interface CPV14
Supply voltage		
Load voltage 2L+		
• Rated value (DC)	24 V	24 V
• Short-circuit protection	Yes	Yes
• Reverse polarity protection	Yes	Yes
Input current		
from load voltage 2L+, max.	300 mA; Including valves	370 mA; Including valves
from backplane bus 3.3 V DC, max.	25 mA	25 mA
Power loss		
Power loss, typ.	2.6 W	3.7 W
Address area		
Address space per module		
• Address space per module, max.	2 byte	2 byte
Digital outputs		
Number of digital outputs	16	16
Load resistance range		
• lower limit	500 Ω	500 Ω
• upper limit	2 500 Ω	2 500 Ω
Output current		
• for signal "1" rated value	12 mA	16 mA
Switching frequency		
• with inductive load, max.	25 Hz	20 Hz
Total current of the outputs (per group)		
all mounting positions		
- up to 55 °C, max.	250 mA; only up to 50 °C, limited by valves	330 mA; only up to 50 °C, limited by valves
Interrupts/diagnostics/ status information		
Diagnostics function	Yes	Yes
Alarms		
• Diagnostic alarm	Yes	Yes
Diagnostic messages		
• Diagnostic information readable	Yes	Yes
Diagnostics indication LED		
• Group error SF (red)	Yes	Yes
• Status indicator digital output (green)	Yes	Yes

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Technical specifications (continued)

Article number	**6ES7148-4EA00-0AA0** ET200PRO, 16DO, Pneumatic Interface CPV10	**6ES7148-4EB00-0AA0** ET200PRO, 16DO, Pneumatic Interface CPV14
Pneumatics		
Number of connectable valves, max.	16	16
permissible working pressure, min.	3 bar	3 bar
permissible working pressure, max.	8 bar	8 bar
Rated flow rate	400 l/min	800 l/min
Parameter		
Remark	Diagnosis load voltage 2L+	Diagnosis load voltage 2L+
Response to CPU/master STOP	No	
Potential separation		
between backplane bus and all other circuit components	Yes	Yes
Potential separation digital outputs		
• between the channels and backplane bus	Yes	Yes
Standards, approvals, certificates		
Suitable for safety-related tripping of standard modules	Yes	Yes
Highest safety class achievable for safety-related tripping of standard modules		
• Performance level according to ISO 13849-1	PL d	PL d
• Category according to ISO 13849-1	Cat. 3	Cat. 3
• SILCL according to IEC 62061	SILCL 2	SILCL 2
Dimensions		
Width	90 mm	120 mm
Height	130 mm	152 mm
Depth	47 mm	47 mm

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Ordering data

	Article No.
EM 148-P pneumatic interface	
DO 16 x P/CPV 10 for direct accommodation of FESTO valve terminal CPV 10 16 DO x P	**6ES7148-4EA00-0AA0**
DO 16 x P/CPV 14 for direct accommodation of FESTO valve terminal CPV 14 16 DO x P	**6ES7148-4EB00-0AA0**

	Article No.
FESTO CPV 10 valve terminal	available from FESTO
FESTO CPV 14 valve terminal	available from FESTO
	FESTO AG & Co Ruiterstr. 82 D-73732 Esslingen
	More addresses on the Internet at: http://www.festo.de

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Overview



The SIMATIC RF170C is a communication module for connecting the SIMATIC identification systems to the ET 200pro distributed I/O system. The readers (SLGs) of all RFID systems as well as the MV400 optical reader devices and MV300 optical handheld readers can be operated on the RF170C. In addition, the RF170C provides a universal RS 232/ RS 422 interface for connecting devices using the Freeport protocol.

Thanks to the high degree of protection and ruggedness, ET 200pro is particularly suitable for machine-level use. The modular structure with PROFIBUS and PROFINET connection systems allows it to be used in all applications. The uniform plug-in connection system ensures rapid commissioning.

Technical specifications

Article number	**6GT2002-0HD01**
Product type designation	RF170C communication module
Suitability for operation	ET200pro distributed I/O together with RF200/300/600, MV300/400, MOBY D/E/I/U and RS232 devices
Transmission rate	
Transfer rate at the point-to-point connection serial maximum	115.2 kbit/s
Interfaces	
Design of the interface for point-to-point connection	RS422/RS232 via connection block
Number of readers connectable	2
Type of electrical connection	
• of the backplane bus	ET 200pro backplane bus
• of the PROFIBUS interface	(according to the head module)
• of Industrial Ethernet interface	(according to the head module)
• for supply voltage	ET 200pro backplane bus
Design of the interface to the reader for communication	Internal plug to the connection block
Mechanical data	
Material	Thermoplastic (Valox 467, fiberglass reinforced)
Color	IP Basic 714
Tightening torque of the screw for securing the equipment maximum	1.5 N·m
Supply voltage, current consumption, power loss	
Supply voltage	
• at DC Rated value	24 V
• at DC	20 ... 30 V
Consumed current at DC at 24 V	
• without connected devices typical	0.13 A
• with connected devices maximum	1 A

Article number	**6GT2002-0HD01**
Product type designation	RF170C communication module
Permitted ambient conditions	
Ambient temperature	
• during operation	-25 ... +55 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
Protection class IP	IP67
Shock resistance	According to IEC 61131-2
Shock acceleration	300 m/s²
Vibrational acceleration	100 m/s²
Design, dimensions and weight	
Width	90 mm
Height	130 mm
Depth	35 mm
Net weight	0.27 kg
Mounting type	ET 200pro rack
Wire length for RS 422 interface maximum	1 000 m
Product properties, functions, components general	
Display version	(see connection block)
Product function transponder file handler can be addressed	No
Protocol is supported	
• S7 communication	Yes
Type of parameterization	HSP
Type of programming	FB 45, FB 55, ID profile, library with functions, (FC 45/55 with restricted functionality)
Type of computer-mediated communication	acyclic communication
Standards, specifications, approvals	
Certificate of suitability	CE, FCC, cULus
MTBF	77 y
Accessories	
accessories	Connection block for RF170C

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Ordering data

	Article No.
SIMATIC RF170C communication module For connecting to the ET 200pro distributed I/O system	**6GT2002-0HD01**
Accessories	
Connection block for SIMATIC RF170C For connecting 2 readers or other RS 422/RS 232 devices via an M12 connector	**6GT2002-1HD01**
Reader cable for SIMATIC RF200 / RF300 / RF600 / MV440 Or MOBY D extension cable and SIMATIC RF200 / RF300 / RF600 / MV400, PUR material, suitable for cable carriers	
2 m, straight connector	**6GT2891-4FH20**
5 m, straight connector	**6GT2891-4FH50**
10 m, straight connector	**6GT2891-4FN10**
20 m, straight connector	**6GT2891-4FN20**
50 m, straight connector	**6GT2891-4FN50**
2 m, connector angled at reader	**6GT2891-4JH20**
5 m, connector angled at reader	**6GT2891-4JH50**
10 m, connector angled at reader	**6GT2891-4JN10**

	Article No.
MOBY D reader cable PUR material, suitable for cable carriers, 2 m.	**6GT2691-4FH20**
Reader cable for MV300 handheld readers	
Coiled cable with usable length of 1.6 m to 4 m for MV320, PUR material	**6GT2191-0BH50**
Coiled cable with usable length of 1.6 m to 4 m for MV340, PUR material	**6GT2191-0AH50**
Connector for connection of other RS 422/RS 232 devices 8-pin M12 connector, male, screw contacts for wires up to 0.5 mm^2. Order quantity 1 pack with 5 units	**6GT2090-0BE00**
M12 sealing caps for unused reader connections Minimum order quantity 10 units, price per 100 units	**3RX9802-0AA00**
DVD "RFID Systems Software & Documentation"	**6GT2080-2AA20**

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Overview



Power supply for ET200pro:

- 3-phase, 24 V DC/8 A

The SIMATIC ET200pro PS power supply unit with degree of protection IP67 is used as the electronics/encoder supply and load voltage supply of the new SIMATIC ET 200pro distributed I/O system for use close to the machine without a cabinet. With a signaling contact for "24 V OK" and "Overtemperature", as well as a second plug-in connector for input voltage loop-through.

Technical specifications

Article number	**6ES7148-4PC00-0HA0**
Product	SIMATIC ET200pro PS
Power supply, type	24 V/8 A
Input	
Input	3-phase AC
Rated voltage value $V_{in\ rated}$	400 ... 480 V
Voltage range AC	340 ... 550 V
• Note	320 ... 340 V for max. 1 min
Wide-range input	Yes
Overvoltage resistance	Implemented internally with varistors
Mains buffering at $I_{out\ rated}$, min.	15 ms; at V_{in} = 400 V
Rated line frequency 1	50 Hz
Rated line frequency 2	60 Hz
Rated line range	45 ... 66 Hz
Input current	
• at rated input voltage 400 V	0.5 A
Switch-on current limiting (+25 °C), max.	40 A
I^2t, max.	3.5 $A^2 \cdot s$
Built-in incoming fuse	T 4 A
Protection in the mains power input (IEC 898)	Required: Circuit breaker 3RV2011-1DA10 or 3RV2711-1DD10 (UL 489)
Output	
Output	Controlled, isolated DC voltage
Rated voltage V_{out} DC	24 V
Total tolerance, static ±	3 %
Static mains compensation, approx.	0.5 %
Static load balancing, approx.	0.5 %
Residual ripple peak-peak, max.	200 mV
Spikes peak-peak, max. (bandwidth: 20 MHz)	250 mV
Product function Output voltage adjustable	No
Output voltage setting	-
Status display	Green LED for 24 V OK
Signaling	max. 30 V, 10 mA; Power-Good (High-Pegel 1L+ for Vout in range 21.3 ... 29 V); Overtemperature warning at least 30 s before switch-off (high level 1L+ when the max. internal temperature is exceeded)

Article number	**6ES7148-4PC00-0HA0**
Product	SIMATIC ET200pro PS
Power supply, type	24 V/8 A
On/off behavior	Overshoot of V_{out} < 2 %
Startup delay, max.	1.5 s
Voltage rise, typ.	40 ms
Rated current value Iout rated	8 A
Current range	0 ... 8 A
Supplied active power typical	192 W
Short-term overload current	
• on short-circuiting during the start-up typical	50 A
• at short-circuit during operation typical	50 A
Duration of overloading capability for excess current	
• on short-circuiting during the start-up	100 ms
• at short-circuit during operation	100 ms
Parallel switching for enhanced performance	No
Efficiency	
Efficiency at $V_{out\ rated}$, $I_{out\ rated}$, approx.	88 %
Power loss at $V_{out\ rated}$, $I_{out\ rated}$, approx.	25 W
Closed-loop control	
Dynamic mains compensation ($V_{in\ rated}$ ±15 %), max.	0.5 %
Dynamic load smoothing (I_{out}: 50/100/50 %), U_{out} ± typ.	1 %
Setting time maximum	2 ms
Protection and monitoring	
Output overvoltage protection	< 33 V
Current limitation, typ.	9.4 A
Property of the output Short-circuit proof	Yes
Short-circuit protection	Electronic shutdown, automatic restart
Enduring short circuit current RMS value	
• maximum	10 A
Overload/short-circuit indicator	-

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Technical specifications (continued)

Article number	6ES7148-4PC00-0HA0
Product	SIMATIC ET200pro PS
Power supply, type	24 V/8 A
Safety	
Primary/secondary isolation	Yes
(galvanic isolation)	Protective extra low output voltage Vout according to EN 60950-1 and EN 50178
Protection class	Class I
Leakage current	
• maximum	3.5 mA
• typical	0.4 mA
CE mark	Yes
UL/cUL (CSA) approval	UL-Listed (UL 508) according to NFPA compatibility (National Fire Protection Association), see operating instructions
Explosion protection	-
FM approval	-
CB approval	Yes
Marine approval	-
Degree of protection (EN 60529)	IP67, enclosure type 5 indoor
EMC	
Emitted interference	EN 55022 Class A
Supply harmonics limitation	-
Noise immunity	EN 61000-6-2
Operating data	
Ambient temperature	
• during operation	-25 ... +55 °C
- Note	with natural convection
• during transport	-40 ... +70 °C
• during storage	-40 ... +70 °C
Humidity class according to EN 60721	Climate class 3K3, no condensation

Article number	6ES7148-4PC00-0HA0
Product	SIMATIC ET200pro PS
Power supply, type	24 V/8 A
Mechanics	
Connection technology	screw-type terminals
Connections	
• Supply input	L1, L2, L3, PE: Plug connector HAN Q4/2 (counterpart see "Electrical accessories")
• Output	L+, M: 2 x 1.5 mm² each (4-pole cable for +/- with open, labeled ends, 4 x 1.5 mm²)
• Auxiliary	Alarm signals: M12 plug-in connector 5-pin
Width of the enclosure	310 mm
Height of the enclosure	135 mm
Depth of the enclosure	90 mm
Weight, approx.	2.8 kg
Product feature of the enclosure housing for side-by-side mounting	No
Installation	Can be mounted onto ET200pro mounting rail
Electrical accessories	Power connector (Input: 3RK1911-2BE30 (6 mm²)) (Output: 3RK1911-2BF10 (4 mm²))
MTBF at 40 °C	196 354 h
Other information	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)

Ordering data

	Article No.
SIMATIC ET 200pro PS Stabilized power supply in distributed I/O system design, permitting the loop-through of energy to further modules; with degree of protection IP67; Input: 400-480 V 3 AC Output: 24 V DC/8 A	**6ES7148-4PC00-0HA0**
Accessories	
Power connector For connecting to the distributed I/O system	
• For X1 (6 mm²)	**3RK1911-2BE30**
• For X2 (4 mm²)	**3RK1911-2BF10**

	Article No.
National Fire Protection Association compatible These devices are only approved for installation in industrial machinery according to the NFPA79 Electrical Standard for Industrial Machinery.	
• for X1 SIMATIC ET200pro PS 61 88 201 1003.xx (AWG10)*	* http://www.harting.com/startseite
• for X1 SITOP PSU300P 61 88 201 1000.xx / 61 88 201 1002.xx (AWG14)*	
• for X2 SIMATIC ET200pro PS 61 88 202 1010.xx (AWG10)*	
supplied blanking cap for X2	**3RK1902-0CK00**
• for X3 Phoenix-Contact SAC-5P-M12-M12FS	
supplied blanking cap for X3	
Sealing cap	
For 9-pole power sockets	
• X2 (1 unit)	**3RK1902-0CK00**
• X2 (10 units)	**3RK1902-0CJ00**

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Overview

ET 200pro motor starters in I/O system ET 200pro

SIMATIC ET 200pro is the modular I/O system with high degree of protection IP65/66/67 for local, cabinet-free use. The ET 200pro motor starters with the high degree of protection IP65 are an integral part of ET 200pro.



ET 200pro motor starter: Isolator module, Standard starter and High Feature starter mounted on a wide module rack

ET 200pro motor starters (see pages 9/312 and 9/313)

- Only two variants up to 5.5 kW
- All settings can be parameterized by bus
- Comprehensive diagnostic signals
- Support for PROFIenergy
- Overload can be acknowledged by remote reset
- Current unbalance monitoring
- Stall protection
- EMERGENCY START function on overload
- Current value transmission by bus
- Current limit monitoring
- Full support of acyclic services
- Direct-on-line or reversing starters
- Power bus connection can be plugged in using Han Q4/2 plug-in connectors
- Motor feeder with Han Q8/0 connector
- Conductor cross-section up to 6 x 4 mm^2
- 25 A per segment (power looped through using jumper plug)
- In the Standard and High Feature versions (with 4 DI on-board)
- Electromechanical switching and electronic switching
- Electronic starter for direct activation or with integrated soft starter function
- Supplied with 400 V AC brake contact as an option
- Temperature sensor can be connected (Thermoclick or PTC type A)
- Provision of the motor current in PROFIenergy format to higher-level systems, motor current shutdown in dead times using PROFIenergy

More information

Homepage, see www.siemens.com/ET200pro

Industry Mall, see www.siemens.com/product?3RK1304

Further components in the ET 200pro distributed I/O system see Industry Mall, www.siemens.com/product?ET200pro

ET 200pro isolator modules (see page 9/314)

The isolator module with switch disconnector function is used for safe disconnection of the 400 V operational voltage during repair work in the plant and provides an integrated group fusing function (i.e. additional group short-circuit protection for all subsequently supplied motor starters).

Depending on the power distribution concept, all stations can be equipped with an isolator module as an option.

Safety applications

Safety Solution local (see page 9/317)

With the Safety local modules
- Safety local isolator module and
- 400 V disconnecting module

with an appropriate connection, safety level PL e (according to ISO 13849-1) can be reached.

Safety Solution PROFIsafe (see page 9/318)

With the Safety PROFIsafe modules
- F-Switch and
- 400 V disconnecting module

with an appropriate connection, safety levels SIL 3 (according to IEC 62061) and PL e (according to ISO 13849-1) can also be reached.

Functionality

With the ET 200pro motor starters, any three-phase loads can be protected and switched.

The ET 200pro motor starters are available with mechanical and also electronic contacts.

The ET 200pro electromechanical starters are offered as direct-on-line starters (DSe) and reversing starters (RSe) as **Standard** and **High Feature** versions. There are device versions with or without control for externally fed brakes with 400 V AC.

Compared with the Standard motor starters, the **High Feature, mechanical** motor starter also has:
- Four digital inputs
- Advanced parameterization options

The ET 200pro electronic starters are offered as direct-on-line starters (sDSSte/sDSte) and reversing starters (sRSSte/sRSte) in the High Feature version.

Compared with the High Feature mechanical motor starters, the **High Feature, electronic** motor starter also has:
- Soft starting and smooth ramp-down function
- Deactivated soft start function as an electronic starter for applications with a high switching frequency
- Advanced parameterization options

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As a result of the protection concept with solid-state overload evaluation and the use of SIRIUS switching devices, size S00, additional advantages are realized on the Standard and High Feature motor starters – advantages that soon make themselves positively felt particularly in manufacturing processes with high plant stoppage costs:

- Configuration is made easier by the fine modular structure with ET 200pro. When using ET 200pro motor starters, the parts list per load feeder is reduced to two main items: the bus module and the motor starter. This makes the ET 200pro ideal for modular machine concepts or solutions for conveying systems and in machine-tool building.
- Expansions are easily possible through the subsequent adding of modules. The innovative plug-in technology also does away with the wiring needed up to now. Through the hot swapping function (disconnection and connection during operation) a motor starter can be replaced within seconds if necessary, without having to shut down the ET 200pro station and with it the process in the plant. The motor starters are therefore recommendable in particular for applications with special demands on availability. Storage costs are also optimized by the low level of variance (two units up to 5.5 kW).
- With four locally acting inputs available on the High Feature motor starter it is possible to realize autonomous special functions that work independently of the bus and the higher level control system, e.g. as a quick stop on gate valve controls or limit position disconnectors. In parallel with this, the states of these inputs are signaled to the control system.

Article No. scheme

Product versions		Article number										
Motor starters		**3RK1304**	**–**	**5**	**□**	**S**	**□**	**0**	**–**	**□**	**A**	**A**	**□**	
Setting range	0.15 ... 2.0 A				**K**									
	1.5 ... 12 A				**L**									
Product function	Direct-on-line starters DSe						**4**			**4**				Standard
	Reversing starters RSe						**4**			**5**				Standard
	Direct-on-line starters DSe						**4**			**2**				High Feature
	Reversing starters RSe						**4**			**3**				High Feature
	Direct-on-line starters sDSSte/sDSte						**7**			**2**				High Feature
	Reversing starters sDSSte/sDSte						**7**			**3**				High Feature
Inputs/outputs	Without brake output												**0**	
	With brake output												**3**	400 V AC, with High Feature + 4 inputs
Example		**3RK1304**	**–**	**5**	**K**	**S**	**4**	**0**	**–**	**4**	**A**	**A**	**0**	

Product versions		Article number										
Modules		**3RK1304**	**–**	**0**	**H**	**S**	**0**	**0**	**–**	**□**	**A**	**A**	**0**	
Product function	Isolator modules									**6**				
	Isolator modules									**7**				Safety modules local
	400 V disconnecting module									**8**				Safety modules local/PROFIsafe
Example		**3RK1304**	**–**	**0**	**H**	**S**	**0**	**0**	**–**	**6**	**A**	**A**	**0**	

Note:

The article number schemes show an overview of product versions for better understanding of the logic behind the article numbers.

For your orders, please use the article numbers quoted in the selection and ordering data.

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Type		Standard motor starters	High Feature motor starters	
Technology designation[1]		DSe, RSe	DSe, RSe	sDSSte, sDSte, sRSSte, sRSte
Device functions (firmware features)				
Parameterizable rated operational current		✓		
Integrated short-circuit protection		✓		
Parameterizable current limit values		--	✓ 2 limit values	
Parameterizable response in case of current limit violation		--	✓	
Zero current monitoring		✓		
Parameterizable response in case of zero current violation		✓		
Parameterizable current unbalance limit	%	-- Fixed limit value (30 x I_e)	✓ 30 ... 60 x I_e	
Parameterizable response in case of unbalance limit violation		✓		
Motor blocking monitoring		--	✓	
Parameterizable blocking current limit	%	--	✓ 150 ... 1 000 x I_e	
Parameterizable blocking time limit	s	--	✓ 1 ... 5	
Current value transmission		✓		
Group warning diagnostics		--	✓ Parameterizable	
Group diagnostics		✓ Parameterizable		
EMERGENCY START		✓		
Digital inputs		--	✓ 4 inputs	
• Parameterizable input signal		--	✓ Latching/non-latching	
• Parameterizable input level		--	✓ NC/NO contacts	
• Parameterizable input signal delay	ms	--	✓ 10 ... 80	
• Parameterizable input signal extension	ms	--	✓ 0 ... 200	
• Parameterizable input control actions		--	✓ 12 different actions	
Brake output (400 V AC)		✓ Order option		
Parameterizable brake enabling delay	s	✓ -2.5 ... +2.5		
Parameterizable holding time of the brake during stopping	s	✓ 0 ... 25		
Parameterizable start up type		--		✓
Parameterizable ramp-down time		--		✓
Parameterizable starting voltage		--		✓
Parameterizable stopping voltage		--		✓
Local device interface		✓		
Firmware update		✓ By specialists		
Thermal motor model		✓		
Parameterizable trip class		-- CLASS 10 fixed	✓ CLASS 5, 10, 15, 20	
Parameterizable response in case of overload of thermal motor model		--	✓ 3 possible states	
Advance warning limit for motor heating	%	--	✓ Parameterizable 0 ... 95	
Advance warning limit time-related trip reserve	s	--	✓ Parameterizable 0 ... 500	
Parameterizable recovery time	min	--	✓ 1 ... 30	
Parameterizable protection against voltage failure		-- Permanently integrated	✓	
Reversing start function		✓ Order option		
Parameterizable interlock time for reversing starters		-- 150 ms fixed	✓ 0 ... 60 s	
Integrated logbook functions		✓ 3 device logbooks		
Integrated statistics data memory		✓		
Parameterizable response in case of CPU/master stop		✓		
PROFIenergy profile support				
• Disconnection of the motor current during idle times		✓		
• Measured motor current values		✓		
Device indications				
• Group fault		SF LED (red)		
• Switching state		STATE LED (red, yellow, green)		
• Device status		DEVICE LED (red, yellow, green)		
• Digital inputs		--	IN 1 ... IN 4, LED	

✓ Function available

-- Function not available

1) DS .... Direct-on-line starters
RS .... Reversing starters
DSS .. Direct-on-line soft starters
RSS .. Reversing soft starters
e ..... Electronic motor protection
te ..... Full motor protection (thermal + electronic)
s ..... Electronic switching with semiconductor.

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Benefits

ET 200pro motor starters provide the following advantages:

- High flexibility thanks to a modular and compact design
- Little variance among all motor starter versions (two units up to 5.5 kW)
- Extensive parameterization using STEP 7 HW Config
- Increase of plant availability through fast replacement of units (easy mounting and plug-in technology)
- Extensive diagnostics and information for preventive maintenance
- Parameterizable inputs for on-site control functions (High Feature)
- Cabinet-free design thanks to high degree of protection IP65

Application

The SIMATIC ET 200pro motor starters are ideal for the use of several spatially concentrated distributed drive solutions in which several motors, or digital or analog sensors and actuators are addressed from a distributed station. They are perfectly suited for protecting and switching any AC loads.

Application areas

The SIMATIC ET 200pro motor starters are suitable for numerous sectors of industry, e.g. machinery and plant engineering or conveying applications.

Use of ET 200pro motor starters in conjunction with IE3/IE4 motors

Note:

For the use of ET 200pro motor starters in conjunction with highly energy-efficient IE3/IE4 motors, please observe the information on dimensioning and configuring, see Application Manual.

For more information, see www.siemens.com/IE3ready.

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Technical specifications

More information	
Manual, see https://support.industry.siemens.com/cs/ww/en/view/22332388	Notes on security: System networking requires suitable protective measures (including network segmentation for IT security) in order to ensure safe plant operation. For more information on the subject of Industrial Security, see www.siemens.com/industrialsecurity.

Type		Standard motor starters	High Feature motor starters	
		Mechanically switching without inputs	Mechanically switching with inputs	Mechanically switching with inputs and soft starter function
Technology designation[1]		**DSe, RSe**	**DSe, RSe**	**sDSSte, sDSte, sRSSte, sRSte**
Mechanics and environment				
Motor starters or modules that can be connected to ET 200pro With width of 110 mm		max. 8		
Mounting dimensions (W x H x D) • Direct-on-line starters and reversing starters	mm	110 x 230 x 150		110 x 230 x 160
Permissible ambient temperature • During operation • During storage	 °C °C	 -25 ... +55, from +40 with derating -40 ... +70		
Permissible mounting position		Vertical, horizontal		
Vibration resistance acc. to IEC 60068, Part 2-6	*g*	2		
Shock resistance acc. to IEC 60068, Part 2-27	*g*/ms	Half-sine 15/11		
Degree of protection		IP65		
Pollution degree		3, IEC 60664 (IEC 61131)		
Electrical specifications				
Power consumption at 24 V DC • From auxiliary circuit L+/M (U1) • From auxiliary circuit A1/A2 (U2)	 mA mA	 Approx. 40 Approx. 200		
Rated operational current I_e for power bus	A	25		
Rated operational voltage U_e • Approval according to EN 60947-1, Appendix N • Approval according to CSA and UL	V AC V AC V AC	400 (50/60 Hz) Up to 400 (50/60 Hz) Up to 600 (50/60 Hz)	 	 Up to 400 (50/60 Hz) Up to 480 (50/60 Hz)
Approval • DIN VDE 0106, Part 101 • CSA and UL approval	 V V	 Up to 400 Up to 600	 	 Up to 480 Up to 480
Conductor cross-sections • Incoming power supply	 mm^2	 Max. 6 x 4	 	
Touch protection		Finger-safe		
Rated impulse withstand voltage U_{imp}	kV	6		
Rated insulation voltage U_i	V	400		
Rated operational current I_e for starters • AC-1 / 2 / 3 at 40 °C - At 400 V - At 500 V • AC-4 at 40 °C - At 400 V	 A A A	 0.15 ... 2.0/1.5 ... 12.0 0.15 ... 2.0/1.5 ... 9.0 0.15 ... 2.0/1.5 ... 4.0	 	 0.15 ... 2.0/1.5 ... 12.0[2]
Rated short-circuit breaking capacity	kA	100 at 400 V		
Type of coordination acc. to IEC 60947-4-1		1		
Power of three-phase motors at 400 V	kW	Max. 5.5		Max. 5.5/4[3]
Utilization categories		AC-1, AC-2, AC-3, AC-4		AC-53a[4] (max. 9 A with deactivated soft start function up to CLASS 10)
Protective separation between main and auxiliary circuits	V	400, acc. to EN 60947-1, Appendix N		
Endurance of contactor • Mechanical • Electrical	 Operating cycles Operating cycles	 30 million Up to 10 million; depending on the current loading (see manual)	 	 -- --
Permissible switching frequency		Depending on the current loading, motor starting time, and relative ON period (see manual)		
Operating times at 0.85 ... 1.1 x U_e • Closing delay • Opening delay	 ms ms	 11 ... 50 5 ... 45	 	 -- --

[1] DS .... Direct-on-line starters
RS .... Reversing starters
DSS .. Direct-on-line soft starters
RSS .. Reversing soft starters
e ..... Electronic motor protection
te ..... Full motor protection (thermal + electronic)
s ..... Electronic switching with semiconductor.

[2] If the soft starter control function is deactivated, the permissible rated operational current is reduced to 9 A up to CLASS 10.

[3] With parameterization as electronic starter max. 4 kW.

[4] 8-hour operation.

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Overview

The functionality, device functions, and technical specifications of the Standard motor starter are described in "ET 200pro motor starters, General data" (see page 9/307 onwards).

Selection and ordering data

Version	Article No.
Standard motor starters, mechanical **Motor protection: thermal model**	
 DSe Standard	
DSe direct-on-line starters[1]	
• Without brake output	**3RK1304-5□S40-4AA0**
• With brake output 400 V AC	**3RK1304-5□S40-4AA3**
RSe reversing starters[1]	
• Without brake output	**3RK1304-5□S40-5AA0**
• With brake output 400 V AC	**3RK1304-5□S40-5AA3**
Setting range Rated operational current	
• 0.15 ... 2.0 A	**K**
• 1.5 ... 12.0 A	**L**

[1] Only functions when used together with the backplane bus module and the wide module rack. The backplane bus module and the wide module rack must be ordered separately (see "Accessories for ET 200pro motor starters", page 9/323).

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Overview

The functionality, device functions, and technical specifications of the High Feature motor starter are described in "ET 200pro motor starters, General data" (see page 9/307 onwards).

The High Feature motor starter differs from the Standard motor starter in having more parameters and four integrated, freely-parameterizable digital inputs.

Selection and ordering data

Version	Article No.
High Feature motor starters, mechanical **Motor protection: thermal model**	
 RSe High Feature	
DSe direct-on-line starters[1]	
• Without brake output and with 4 inputs	**3RK1304-5□S40-2AA0**
• With brake output 400 V AC and 4 inputs	**3RK1304-5□S40-2AA3**
RSe reversing starters[1]	
• Without brake output and with 4 inputs	**3RK1304-5□S40-3AA0**
• With brake output 400 V AC and 4 inputs	**3RK1304-5□S40-3AA3**
Setting range Rated operational current	
• 0.15 ... 2.0 A	**K**
• 1.5 ... 12.0 A	**L**
High Feature motor starters[2], **electronic** **Full motor protection, comprising thermal motor protection and thermistor motor protection**	
 sRSSte High Feature	
Direct-on-line starters sDSSte/sDSte[1][2]	
• Without brake output and with 4 inputs	**3RK1304-5□S70-2AA0**
• With brake output 400 V AC and 4 inputs	**3RK1304-5□S70-2AA3**
Reversing starters sRSSte/sRSte[1][2]	
• Without brake output and with 4 inputs	**3RK1304-5□S70-3AA0**
• With brake output 400 V AC and 4 inputs	**3RK1304-5□S70-3AA3**
Setting range Rated operational current	
• 0.15 ... 2.0 A	**K**
• 1.5 ... 12.0 A	**L**

1) Only functions when used together with the backplane bus module and the wide module rack. The backplane bus module and the wide module rack must be ordered separately (see "Accessories for ET 200pro motor starters", page 9/323).

2) The solid-state motor starters can be used not only as solid-state motors starters with a high level of switching frequency but also as fully fledged soft starters for soft starting and stopping. The changeover from motor starter to soft starter takes place through reparameterization in HW Config. Depending on the setting, this results in the following current ranges:
- Parameterization as solid-state motor starter: 0.15 to 2 A and 1.5 to 9 A (4 kW)
- Parameterization as soft starter: 0.15 to 2 A and 1.5 to 12 A (5.5 kW).

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Overview

The isolator module with integrated group fusing function (i.e. additional group short-circuit protection for all subsequently supplied motor starters) and switch disconnector function is used to safely disconnect the 400 V operating voltage during repair work in the plant.

Depending on the power distribution concept, all stations can be equipped with an isolator module as an option.

The following properties apply to the isolator module:

- Increase of plant availability through fast replacement of units (easy mounting and plug-in technology)
- Cabinet-free design thanks to high degree of protection IP65

The isolator module is available in addition in a safety version (see "Safety local isolator module" on page 9/315).

Technical specifications

Type		Isolator modules
General data		
Mounting dimensions (W x H x D)		
• Direct-on-line starters and reversing starters	mm	110 x 230 x 170
Permissible ambient temperature		
• During operation	°C	-25 ... +55
• During storage	°C	-40 ... +70
Permissible mounting position		Any
Vibration resistance acc. to IEC 60068 Part 2-6	*g*	2
Shock resistance acc. to IEC 60068 Part 2-27	*g*/ms	Half-sine 15/11
Power consumption		
• From auxiliary circuit L+/M (U1)	mA	Approx. 20
• From auxiliary circuit A1/A2 (U2)		--
Rated operational current I_e for power bus	A	25
Rated operational voltage U_e	V	400
Approvals according to		
• DIN VDE 0106, Part 101	V	Up to 500
• CSA and UL	V	Up to 600
Conductor cross-sections		
• Incoming power supply	mm^2	Max. 6 x 4

Type		Isolator modules
Degree of protection		IP65
Touch protection		Finger-safe
Pollution degree		3, IEC 60664 (IEC 61131)
Rated impulse withstand voltage U_{imp}	kV	6
Rated insulation voltage U_i	V	400
Rated operational current I_e for starters		
• AC-1 / 2 / 3 at 40 °C		
- At 400 V	A	25
- At 500 V	A	25
Rated short-circuit breaking capacity	kA	50 at 400 V
Type of coordination acc. to IEC 60947-4-1		2
Protective separation between main and auxiliary circuits	V	400, according to DIN VDE 0106, Part 101
Device functions		
• Group diagnostics		Yes, parameterizable
Device indications		
• Group fault		SF LED (red)

Selection and ordering data

	Version	Article No.
ET 200pro isolator modules, mechanical		
 3RK1304-0HS00-6AA0	**Isolator modules**[1] Rated operational current 25 A	**3RK1304-0HS00-6AA0**

[1] Only functions when used together with the related 110 mm backplane bus module and the wide module rack. The backplane bus module and the wide module rack must be ordered separately (see page 9/323).

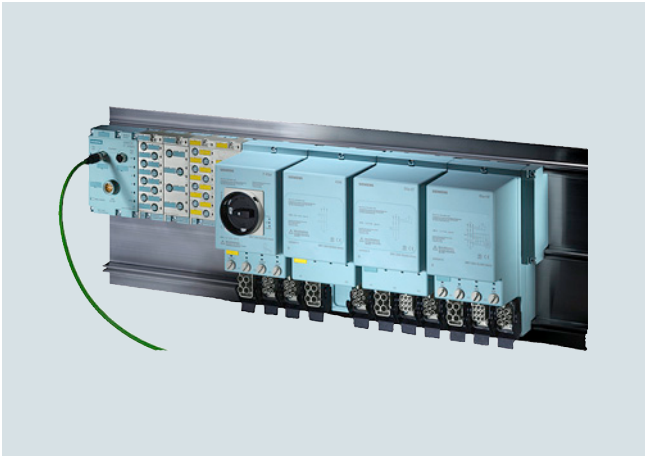
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Overview

Safety Solution local

With the Safety local modules
- Safety local isolator module and
- 400 V disconnecting module

with an appropriate connection, safety level PL e (according to ISO 13849-1) can be reached.



ET 200pro motor starter (Safety Solution local): Safety local isolator module, disconnecting module, Standard starter and High Feature starter mounted on a wide module rack

Safety local isolator module

The Safety local isolator module is a repair switch with integrated safety evaluation functions that can be parameterized using DIP switches.

It is used for
- Connection of a 1- or 2-channel EMERGENCY STOP circuit up to PL e (protective door or EMERGENCY STOP pushbuttons) and parameterizable start behavior
- For controlling the 400 V disconnecting module by means of a safety rail signal

400 V disconnecting module

The 400 V disconnecting module enables the safe disconnection of an operational voltage of 400 V up to PL e. For operation in a Safety Solution local application, it functions only in combination with the Safety local isolator module.

For operation in a Safety PROFIsafe application it functions only in combination with the F-Switch.

Functionality

Safety local isolator module

The Safety local isolator module features the same functions as a standard isolator module with an additional local safety function.

The Safety local isolator module contains a 3TK2841 module and is equipped with M12 terminals for the connection of external safety components.

Terminals 1 and 2 can be used to connect either 1-channel or 2-channel EMERGENCY STOP circuits or protective door circuits (IN 1, IN 2).

For monitored starts, an external START switch can be connected to terminal 3.

The required safety functions can be set using two slide switches located under the left M12 opening.

In the event of an EMERGENCY STOP, the Safety local isolator module trips the downstream 400 V disconnecting module. This safely separates the 400 V circuit up to PL e.

In combination with the 400 V disconnecting module, the Safety local isolator module can be used for safety applications up to PL e.

400 V disconnecting module

The 400 V disconnecting module can be used together with the Safety local isolator module for local safety applications and together with the F-Switch for PROFIsafe safety applications.

It contains two contactors connected in series for safety-related disconnection of the main circuit.

The auxiliary circuit supply of the device is over a safety power rail in the backplane bus module.

The 400 V disconnecting module can be used in conjunction with the Safety local isolator module or with the F-Switch for safety applications up to PL e.

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Technical specifications

Type		Safety local isolator module	400 V disconnecting module
General data			
Mounting dimensions (W x H x D)			
• Direct-on-line starters and reversing starters	mm	110 x 230 x 170	110 x 230 x 150
Permissible ambient temperature			
• During operation	°C	-25 ... +55	
• During storage	°C	-40 ... +70	
Permissible mounting position		Any	
Vibration resistance acc. to IEC 60068, Part 2-6		2 *g*	
Shock resistance acc. to IEC 60068, Part 2-27		Half-sine 15 *g*/11 ms	
Power consumption			
• From auxiliary circuit L+/M (U1)	mA	Approx. 20	
• From auxiliary circuit A1/A2 (U2)		--	
Rated operational current I_e for power bus	A	25	
Rated operational voltage U_e	V	400 (50/60 Hz)	
Approval DIN VDE 0106, Part 101	V	Up to 500	
CSA and UL approval	V	Up to 600	
Conductor cross-sections			
Incoming power supply	mm^2	Max. 6 x 4	
Degree of protection		IP65	
Touch protection		Finger-safe	
Pollution degree		3, IEC 60664 (IEC 61131)	
Rated impulse withstand voltage U_{imp}	kV	6	
Rated insulation voltage U_i	V	400	
Rated operational current I_e for starters			
• AC-1 / 2 / 3 at 40 °C			
- At 400 V	A	16	25
- At 500 V	A	16	25
Rated short-circuit breaking capacity	kA	50 at 400 V	
Type of coordination acc. to IEC 60947-4-1		2	
Protective separation between main and auxiliary circuits	V	400, according to DIN VDE 0106, Part 101	
Operating times at 0.85 ... 1.1 x U_s			
• Closing delay	ms	--	25 ... 100
• Opening delay	ms	--	7 ... 10
Device functions			
• Group diagnostics		Yes, parameterizable	
Device indications			
• Group fault		SF LED (red)	

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Selection and ordering data

	Version	Article No.
Safety modules local		
 3RK1304-0HS00-7AA0	**Safety local isolator module**[1)2)] Rated operational current 16 A	**3RK1304-0HS00-7AA0**
 3RK1304-0HS00-8AA0	**400 V disconnecting module**[3)4)] Rated operational current 25 A	**3RK1304-0HS00-8AA0**

1) The Safety local isolator module only functions when used together with the 400 V disconnecting module.
2) Only in combination with the special backplane bus module for the Safety Local isolator module (see "Accessories for ET 200pro motor starters", page 9/323).
3) The 400 V disconnecting module functions only when used together with the Safety local isolator module or with the F-Switch.
4) The 400 V disconnecting module functions only when used together with the backplane bus module and the wide module rack. The backplane bus module and the wide module rack must be ordered separately (see "Accessories for ET 200pro motor starters", page 9/323).

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Overview

Safety Solution PROFIsafe

With the Safety PROFIsafe modules
- F-Switch and
- 400 V disconnecting module

With an appropriate connection, safety levels SIL 3 (according to IEC 62061) and PL e (according to ISO 13849-1) can be reached.

F-Switch PROFIsafe

Fail-safe digital inputs/outputs in degrees of protection IP65 to IP67 for near-machine, cabinet-free use.

Fail-safe digital inputs

- For the fail-safe reading in of sensor information (1-/2-channel)
- Including integrated discrepancy evaluation for 2v2 signals
- Internal sensor supplies (incl. testing) available

Fail-safe digital outputs

- Three fail-safe PP-switching outputs for safe switching of the backplane busbars

The F-Switch is certified up to SIL 3/PL e and has detailed diagnostics.

It supports PROFIsafe in PROFIBUS configurations as well as in PROFINET configurations.

Note:

Safety characteristics, see https://support.industry.siemens.com/cs/ww/en/view/109739348

Functionality

The PROFIsafe F-Switch is a fail-safe solid-state module for PROFIsafe safety applications. It has two fail-safe inputs and outputs for safe switching of the 24 V supply over backplane busbars. In combination with the 400 V disconnecting module, fail-safe disconnection of ET 200pro motor starters is possible in PROFIsafe applications up to SIL 3/PL e.

400 V disconnecting module

See "Safety modules local", Overview, page 9/315 and Technical specifications, page 9/316.

Selection and ordering data

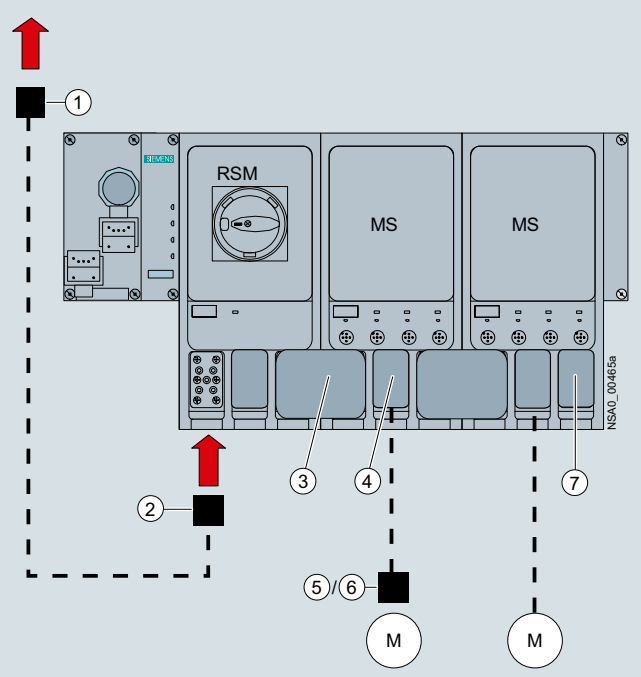
	Version	Article No.
Safety modules PROFIsafe		
 3RK1304-0HS00-8AA0	**400 V disconnecting modules**[1)2)] Rated operational current 25 A	**3RK1304-0HS00-8AA0**
 6ES7148-1FS00-0AB0	**F-Switch PROFIsafe** 24 V DC, including bus module Note: Connection module must be ordered separately	**6ES7148-4FS00-0AB0**
	Connection modules for F-Switch 24 V DC	**6ES7194-4DA00-0AA0**

1) The 400 V disconnecting module functions only when used together with the Safety local isolator module or with the F-Switch.

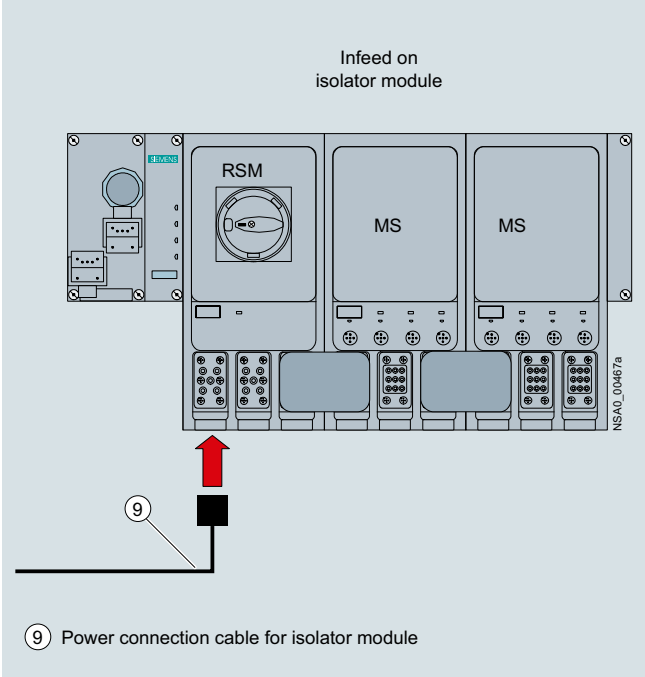
2) The 400 V disconnecting module functions only when used together with the backplane bus module and the wide module rack. The backplane bus module and the wide module rack must be ordered separately (see "Accessories for ET 200pro motor starters", page 9/323).

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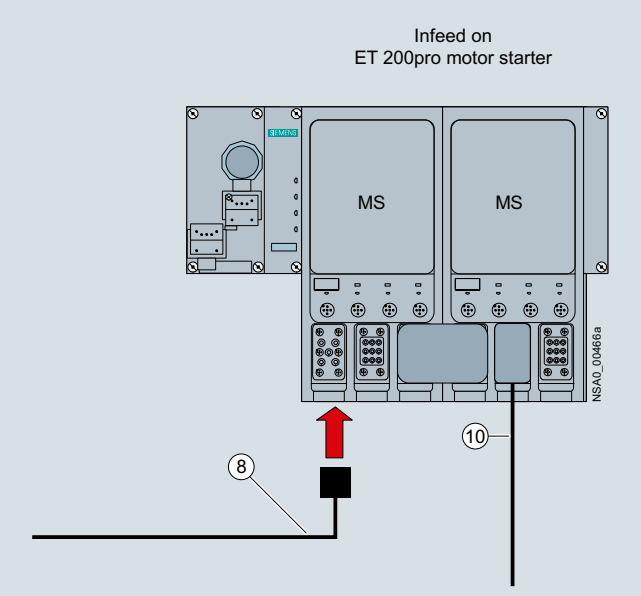
Overview



Basic design of an ET 200pro version with (from the left) connection module for IM, interface module for communication (IM), RSM isolator module, two ET 200pro motor starters (MS), and connections for energy



Infeed on the RSM isolator module



Infeed on the ET 200pro motor starter

Legend:

① Power feeder plug (see page 9/321)
② Power connection plug (see page 9/321)
③ Power jumper plug (see page 9/321)
④ Motor connection plug (see page 9/321)
⑤ Motor plug (see page 9/321)
⑥ Motor plug with EMC suppressor circuit (see page 9/321)
⑦ Power loop-through plug (see page 9/321)
⑧ Power connection cable (see page 9/321)
⑨ Power connection cable for isolator module (see page 9/321)
⑩ Motor cable (see page 9/322)

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Power bus

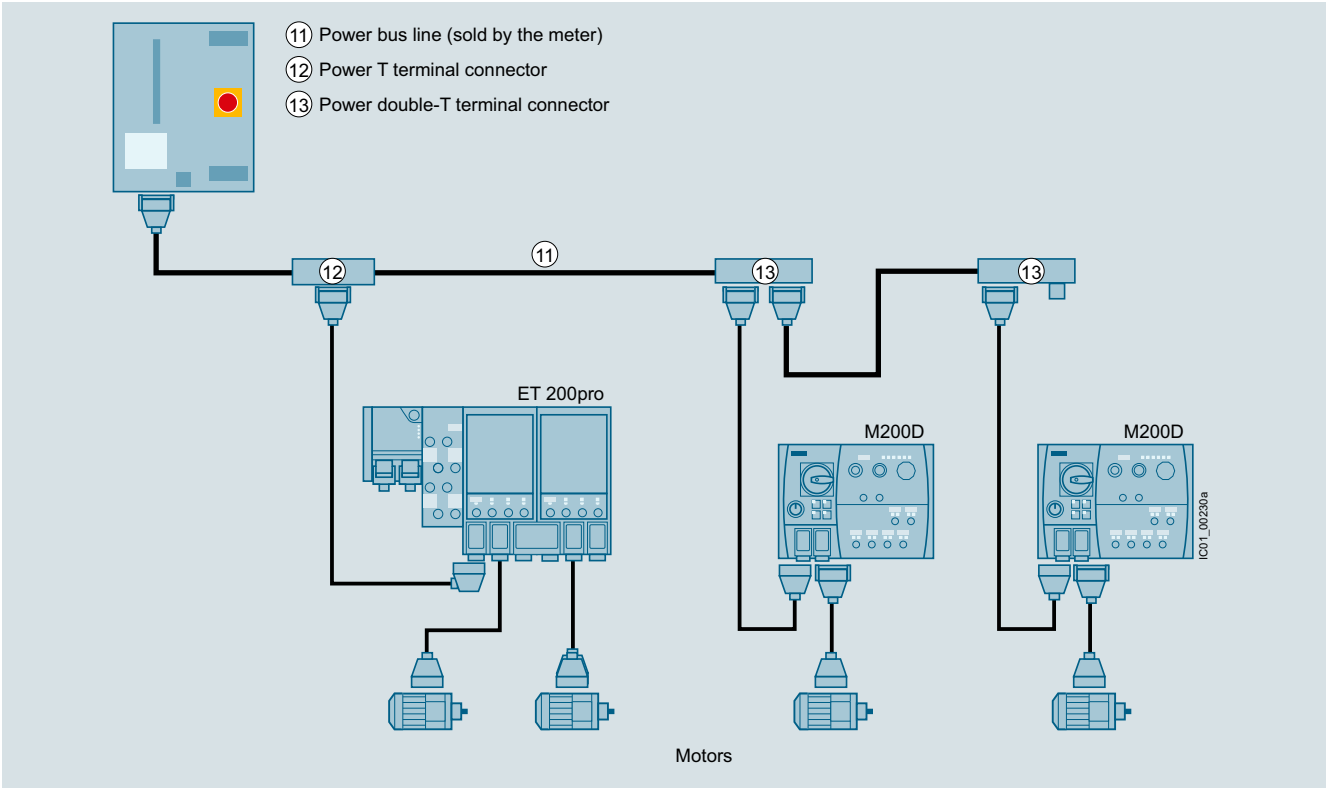
The power supply to the field devices (ET 200pro motor starters, M200D motor starters) is provided via the power bus, in which the power T terminal connectors or power double-T terminal connectors are connected by power bus cables.

Feeders

From the terminal connectors, spur lines with Han Q4/2 plugs lead to the field devices, from which the motors are supplied with power via motor connection cables.

Interruption-free thanks to power terminal connectors

In finger-safe connection technology the power T terminal connectors and power double-T terminal connectors connect the components of a feeder to the power bus. They ensure interruption-free operation, i.e. the power bus is not interrupted when the components are plugged in.



Power supply to the motors via the power bus with power T and double-T terminal connectors linked by power bus cables, spur lines to the field devices (motor starters), and power loop-through connections to the motors via motor connection cables

Motor control via PROFIBUS

The interface modules (IM) for PROFIBUS can be combined with three different connection modules for connecting PROFIBUS DP and the power supply:

- Direct connection with cable bushings
- ECOFAST connection with hybrid fieldbus cables (with two copper cores for data transmission with PROFIBUS DP, and four copper cores for the power supply), and ECOFAST connectors (HanBrid)[1)]
- M12, 7/8" connection
  - with M12 connecting cable and M12 plugs for data transmission with PROFIBUS DP
  - with 7/8" connecting cable and 7/8" plugs for the power supply[2)]

For the connection modules with the associated accessories, see "Accessories ET 200pro interface modules", page 9/277).

Motor control via PROFINET

For the connection modules with the associated accessories, see "Accessories for ET 200pro interface modules", page 9/281 onwards.

[1)] Hybrid fieldbus connections with HanBrid sockets designed as cabinet bushings transmit data and energy from the control cabinet (IP20) to the field (IP65). They are the interface for jointly routing PROFIBUS DP and the auxiliary voltages into the hybrid fieldbus cable (see https://mall.industry.siemens.com/mall/en/WW/Catalog/Products/10314206?tree=CatalogTree).

[2)] On the control cabinet bushings with two M12 sockets for the PROFIBUS M12 connecting cables (see https://mall.industry.siemens.com/mall/en/WW/Catalog/Products/10314206?tree=CatalogTree), the 24 V supply of the motor starters is implemented via separate 7/8" connecting cables.

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Selection and ordering data

Version	Article No.
Incoming power supply	
① **Power feeder plugs** Connector set for incoming power supply, e.g. for connecting to T terminal connectors, comprising a coupling enclosure, straight outgoing feeder (with bracket), pin insert for HAN Q4/2, incl. bushing	
• 5 male contacts, 2.5 mm^2	**3RK1911-2BS60**
• 5 male contacts, 4 mm^2	**3RK1911-2BS20**
• 5 male contacts, 6 mm^2	**3RK1911-2BS40**
② **Power connection plugs** Connector set for incoming power supply for connection to ET 200pro motor starters/ET 200pro isolator modules, comprising a cable-end connector hood, angular outgoing feeder, female insert for HAN Q4/2, including bushing	
• 5 female contacts, 2.5 mm^2	**3RK1911-2BE50**
• 5 female contacts, 4 mm^2	**3RK1911-2BE10**
• 5 female contacts, 6 mm^2	**3RK1911-2BE30**
⑧ **Power connection cables, assembled at one end** Power connection cable for ET 200pro motor starters, open at one end, for HAN Q4/2, angular, 4 x 4 mm^2	
• Length 1.5 m	**3RK1911-0DB13**
• Length 5.0 m	**3RK1911-0DB33**
⑨ **Power connection cables for isolator module, assembled at one end** Power connection cable for ET 200pro isolator modules, open at one end, for HAN Q4/2, angular, insert turned at isolator module end, 4 x 4 mm^2	
• Length 1.5 m	**3RK1911-0DF13**
• Length 5.0 m	**3RK1911-0DF33**
Power loop-through on the field device	
③ **Power jumper plugs**	**3RK1922-2BQ00**
⑦ **Power loop-through plugs** Connector set for power loop-through for connection to ET 200pro motor starters/ET 200pro isolator modules, comprising a cable-end connector hood, angular outgoing feeder, pin insert for HAN Q4/2, including bushing	
• 4 male contacts, 2.5 mm^2	**3RK1911-2BF50**
• 4 male contacts, 4 mm^2	**3RK1911-2BF10**
Motor cables	
④ **Motor connection plugs** Connector set for motor cable for connection to ET 200pro motor starters, comprising a cable-end connector hood, angular outgoing feeder, pin insert for HAN Q8/0, incl. bushing	
• 8 male contacts, 1.5 mm^2	**3RK1902-0CE00**
• 6 male contacts, 2.5 mm^2	**3RK1902-0CC00**
⑤ **Motor plugs** Connector set for motor cable for connection to motors, comprising a cable-end connector hood, straight outgoing feeder, female insert for HAN 10e, incl. star jumper, including bushing	
• 7 female contacts, 1.5 mm^2	**3RK1911-2BM21**
• 7 female contacts, 2.5 mm^2	**3RK1911-2BM22**
⑥ **Motor plugs with EMC suppressor circuit** Connector set for motor cable for connection to motors, comprising a cable-end connector hood, straight outgoing feeder, female insert for HAN 10e with EMC suppressor circuit, including star jumper, including bushing	
• 7 female contacts, 1.5 mm^2	**3RK1911-2BL21**
• 7 female contacts, 2.5 mm^2	**3RK1911-2BL22**

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	Version	Article No.
Motor cables (continued)		
	⑩ **Motor cables, assembled at one end** Open at one end, HAN Q8, angular, length 5 m	
	• For motor without brake, for ET 200pro, 4 x 1.5 mm^2	**3RK1911-0EB31**
	• For motor with brake for ET 200pro, 6 x 1.5 mm^2	**3RK1911-0ED31**
	• For motor without brake, with thermistor, for ET 200pro, 6 x 1.5 mm^2	**3RK1911-0EF31**
	• For motor with brake and thermistor for ET 200pro, 8 x 1.5 mm^2	**3RK1911-0EG31**
Power bus		
	⑫ **Power T terminal connectors** For 400 V AC, for connection of feeders (e.g. motor starters) by means of standard round cable at any point of the power bus, by insulation displacement connection, used with preassembled bus segments	
	• 2.5 mm^2 / 4 mm^2	**3RK1911-2BF01**
	• 4 mm^2 / 6 mm^2	**3RK1911-2BF02**
	⑬ **Power double-T terminal connectors** For 400 V AC, for connection of feeders (e.g. motor starters) by means of standard round cable at any point of the power bus, by insulation displacement connection, used with preassembled bus segments, connection of two motor starters possible	
	• 4 mm^2/ 6 mm^2	**3RK1911-2BG02**
	Sealing set (comprising 2 seals) For power T/power double-T terminal connectors	
	• For power cables with Ø 10 ... 13 mm	**3RK1911-5BA00**
	• For power cables with Ø 13 ... 16 mm	**3RK1911-5BA10**
	• For power cables with Ø 16 ... 19 mm	**3RK1911-5BA20**
	• For power cables with Ø 19 ... 22 mm	**3RK1911-5BA30**
	• Blanking plugs	**3RK1911-5BA50**
Further accessories for power connections		
 3RK1902-0CW00	**Crimping tool** for pins/sockets, 4 mm^2 and 6 mm^2	**3RK1902-0CW00**
	Dismantling tools	
	• For male and female contacts for 9-pole HAN Q4/2 inserts	**3RK1902-0AB00**
	• For male and female contacts for 9-pole HAN Q8 inserts	**3RK1902-0AJ00**
 3RK1902-0CK00	**Sealing caps** For 9-pole power socket connectors	
	• 1 unit per pack	**3RK1902-0CK00**
	• 10 units per pack	**3RK1902-0CJ00**

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	Version	Article No.
Further accessories		
	Module racks, wide[1] • Length 500 mm • Length 1 000 mm • Length 2 000 mm	 **6ES7194-4GB00-0AA0** **6ES7194-4GB60-0AA0** **6ES7194-4GB20-0AA0**
	Module racks, wide, compact[1] • Length 500 mm • Length 1 000 mm • Length 2 000 mm	 **6ES7194-4GD00-0AA0** **6ES7194-4GD10-0AA0** **6ES7194-4GD20-0AA0**
	Backplane bus modules 110 mm[2]	**3RK1922-2BA00**
	Backplane bus module For Safety local isolator modules	**3RK1922-2BA01**
 3RK1922-3BA00	**Handheld devices** For ET 200pro motor starters (or for ET 200S High Feature and M200D motor starters) for local operation Notes: • The motor-starter-specific serial interface cables must be ordered separately. • The RS 232 interface cable 3RK1922-2BP00 is used for the MS ET 200pro.	**3RK1922-3BA00**
	RS 232 interface cable Serial data connection between ET 200pro (or M200D) motor starters and the RS 232 interface of a PC/PG/ laptop (with the Motor Starter ES software) or the handheld device 3RK1922-3BA00	**3RK1922-2BP00**
	USB interface cable, 2.5 m Serial data connection between ET 200pro (or M200D) motor starters and the USB interface of a PC/PG/laptop (with the Motor Starter ES software)	**6SL3555-0PA00-2AA0**
 3RK1901-1KA00	**M12 sealing caps** For sealing unused M12 input or output sockets (one set contains ten sealing caps)	**3RK1901-1KA00**
 3RK1911-6EA00	**Motor suppression module** *NEW* RC element for installation in motor terminal box • Type of construction square	 **3RK1911-6EA00**
 3RK1911-6EB00	• Type of construction round	**3RK1911-6EB00**

[1] The wide module rack can accommodate all ET 200pro motor starters and any optional modules (isolator module, Safety local isolator module and 400 V disconnecting module).

[2] The backplane bus module is a prerequisite for operation of the ET 200pro motor starter and the optional module.

Notes:

- For motor control with PROFIBUS, see page 9/277
- For motor control with PROFINET, see page 9/281
- For Manual "SIMATIC ET 200pro Motor Starters", see https://support.industry.siemens.com/cs/ww/en/view/22332388

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SIMATIC ET 200pro FC-2 frequency converter

Overview



SIMATIC ET 200pro FC-2 frequency converter

The SIMATIC ET 200pro FC-2 frequency converter has the design of a SIMATIC ET 200pro module. It supplements the SIMATIC ET 200pro system range with distributed, speed-controlled drives. It is suitable for the open-loop and closed-loop control of asynchronous (induction) motors in a wide range of industrial applications. It is predestined for conveyor technology applications using drives networked via PROFIBUS and PROFINET, in particular in distributed designs without control cabinet with high degree of protection (IP65), when combining several drives. The modular, service-friendly concept is ideally suited to manufacturing processes with high plant standstill costs.

Reasons for using distributed drive systems:

- Modular drive solutions – therefore standardized mechatronic elements that can be individually tested
- A control cabinet is not required, resulting in a smaller space requirement and lower cooling requirements
- Long motor cables between converter and motor are not required
  - Less power losses
  - Reduced noise radiation
  - Reduced costs for shielded cables
  - No additional filters
- Distributed configurations offer considerable benefits for conveyor systems with their extensive coverage (e.g. in the automotive and logistics industries)

Siemens family of distributed drives

Siemens offers an innovative portfolio of frequency converters to optimally implement distributed drive solutions. The strengths of the individual members of the drive family permit simple adaptation to the widest range of application demands:

- Identical connection systems
- Standard commissioning and engineering tools for the family of distributed drives:
  - SINAMICS G110M frequency converters
  - SINAMICS G110D frequency converters
  - SINAMICS G120D frequency converters
  - SIMATIC ET 200pro FC-2 frequency converters
  - SIRIUS M200D motor starters

Safety Integrated

The distributed SIMATIC ET 200pro FC-2 frequency converters are already equipped with the integrated STO (Safe Torque Off) safety function, certified in accordance with IEC 61508 SIL 2 as well as EN ISO 13849-1 PL d and Category 3. It can be activated locally via the F-RSM or by means of PROFIsafe.

STARTER commissioning tool

The STARTER commissioning tool (V4.4 and higher) plus the corresponding SINAMICS Support Package (SSP) supports the commissioning and maintenance of SIMATIC ET 200pro FC-2 frequency converters.

The operator guidance combined with comprehensive, user-friendly functions for the relevant drive solution allow you to commission the device quickly and easily.

Engineering Framework STEP 7 classic (V5.5 and higher)

Hardware Support Packages (HSP) are available to integrate SIMATIC ET 200pro FC-2 in STEP7 classic.

Engineering Framework TIA Portal (as from V13 SP1)

TIA Portal is a powerful engineering framework providing full access to the whole digitized automation.

Hardware Support Packages (HSP) are available to integrate SIMATIC ET 200pro FC-2 in TIA Portal.

Technical specifications

Distributed frequency converter	SIMATIC ET 200pro FC-2
Selection features	
Integrated safety functions acc. to IEC 61508 SIL 2 and EN ISO 13849-1 PL d and Category 3	• Safe Torque Off (STO) • Control of the integrated safety function via the Safety Local isolator module F-RSM or via F-Switch PROFIsafe
Electrical data	
Line voltage	380 ... 480 V 3 AC ±10 %
Power	
• With an ambient temperature of 0 ... 55 °C	1.1 kW
• With an ambient temperature of 0 ... 45 °C	1.5 kW
Rated input current/output current	
• With an ambient temperature of 0 ... 55 °C	2 A/3.5 A
• With an ambient temperature of 0 ... 45 °C	2.5 A/3.9 A
Line frequency	47 ... 63 Hz

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Technical specifications (continued)

Distributed frequency converter	SIMATIC ET 200pro FC-2
Overload capability	• Overload current 1.5 x rated output current (i.e. 150 % overload) for 60 s, cycle time 300 s • Overload current 2 x rated output current (i.e. 200 % overload) for 3 s, cycle time 300 s
Output frequency	0 ... 550 Hz
Pulse frequency	4 kHz (standard), 4 ... 16 kHz (in 2-kHz increments)
Standard SCCR (Short Circuit Current Rating)	10 kA
Skipped frequency range	1, programmable
Converter efficiency	95 ... 97 %
Interfaces	• Connection to PROFIBUS and PROFINET over the SIMATIC ET 200pro backplane bus • Mini USB interface for commissioning via PC (as from STARTER V4.4 plus SSP) • Optical interface for commissioning via the IOP-2 Handheld • Slot for an optional memory card (SD) for uploading or downloading parameter settings. Facilitates easy device replacement. • PTC, bimetal, KTY84, Pt1000 interface for motor temperature monitoring
Functions	
Open-loop/closed-loop control techniques	• V/f control – linear ($M \sim n$) with/without flux current control (FCC), quadratic ($M \sim n^2$) or parameterizable • Vector control – sensorless • Closed-loop torque control
Operating functions	• Jogging • BICO technology • Automatic restart following interruptions in operation due to a power failure • Smooth connection of converter to rotating motor
Braking functions	• Integrated regenerative feedback functionality • Control of an electromagnetic holding brake Integrated brake control supplies DC power supply to the brake

Line voltage	380 V AC	400 V AC	440 V AC	480 V AC
Rectified brake voltage	171 V DC	180 V DC	198 V DC	216 V DC
Recommended brake coil voltage for Siemens motors	170 ... 200 V DC	170 ... 200 V DC 184 ... 218 V DC	184 ... 218 V DC	184 ... 218 V DC

	Disconnection on the DC side permits "fast" braking.
Protective functions	• Undervoltage • Overvoltage • Ground fault • Short-circuit • Stall protection • Thermal motor protection (I^2t or sensor) • Converter overtemperature • Motor blocking protection • Phase failure detection
Connectable motors	• Low-voltage asynchronous (induction) motors • Motor cable lengths: max. 15 m (49 ft) (shielded)
Mechanical data	
Degree of protection	IP65
Operating temperature	0 ... 55 °C (32 ... 131 °F)
Mounting position	Vertical wall mounting (vertical alignment of the cooling fins)
Dimensions (W × H × D)	155 mm × 246 mm × 248 mm (6.10 in × 9.69 in × 9.76 in)
Weight, approx.	4 kg (8.8 lb)
Standards	
Certificates of suitability	UL508C, cUL, CE, Low Voltage Directive 2014/35/EU, EMC Directive 2014/30/EU

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SIMATIC ET 200pro FC-2 frequency converter

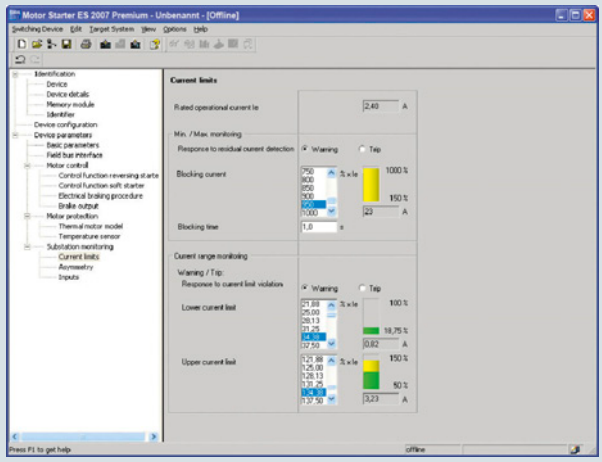
Ordering data	Article No.
SIMATIC ET 200pro FC-2 frequency converter with integrated safety function STO (Safe Torque Off)	**6SL3514-1KE13-5AE0**
Backplane bus module for mounting the frequency converter (absolutely essential for operation of the converter)	**6SL3260-2TA00-0AA0**
Accessories	
IOP-2 Handheld For use with SINAMICS G120 SINAMICS G120C SINAMICS G120P SINAMICS G110D SINAMICS G120D SINAMICS G110M SIMATIC ET 200pro FC-2 Included in the scope of supply: • IOP-2 • Handheld housing • Rechargeable batteries (4 × AA) • Charging unit (international) • RS 232 connecting cable 3 m long, for use with SINAMICS G120 SINAMICS G120C SINAMICS G120P • USB cable, length 1 m	**6SL3255-0AA00-4HA1**
RS 232 interface cable Length 2.5 m, With optical interface to connect SINAMICS G110D SINAMICS G120D SINAMICS G110M SIMATIC ET 200pro FC-2 to the IOP-2 Handheld	**3RK1922-2BP00**
Memory cards	
SINAMICS SD card 512 MB	**6SL3054-4AG00-2AA0**
Optional Firmware memory cards	
SINAMICS SD card 512 MB + Firmware V4.7 SP10 (Multicard V4.7 SP10)	**6SL3054-7TF00-2BA0**

	Article No.
STARTER commissioning tool [1] on DVD-ROM	**6SL3072-0AA00-0AG0**
PC inverter connection kit 2 Mini USB interface cable for communication with a PC, 3 m long	**6SL3255-0AA00-2CA0**
Connecting cable pre-assembled at one end Power supply cable, open at one end, for HAN Q4/2, angled, 4 × 4 mm^2	
• Length 1.5 m	**3RK1911-0DB13**
• Length 5 m	**3RK1911-0DB33**
Connector set for the power supply HAN Q4/2	
• 2.5 mm^2	**3RK1911-2BE50**
• 4 mm^2	**3RK1911-2BE10**
• 6 mm^2	**3RK1911-2BE30**
Motor cables pre-assembled at one end	(HTG: supplied by Harting) (ZKT: supplied by KnorrTec)
Cross-section	**4 × 1.5 mm^2** **2 × (2 × 0.75 mm^2)**
• Length 1,5 m	**HTG: 61 88 201 0288** **ZKT: 70020501000150**
• Length 3 m	**HTG: 61 88 201 0289** **ZKT: 70020501000300**
• Length 5 m	**HTG: 61 88 201 0290** **ZKT: 70020501000500**
• Length 10 m	**HTG: 61 88 201 0299** **ZKT: 70020501001000**
Connector set for motor cable HAN Q8, shielded	**HTG: 61 83 401 0131** **ZKT: 10032001**
Power jumper connector	**3RK1922-2BQ00**

[1] The STARTER commissioning tool is also available on the Internet at http://www.siemens.com/starter

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Overview



Motor Starter ES for parameterization, monitoring, diagnostics and testing of motor starters

More information

Homepage see www.siemens.com/sirius-engineering

Industry Mall see www.siemens.com/product?3ZS1

Technical specifications and system requirements, see https://support.industry.siemens.com/cs/ww/en/ps/16713/td

Motor Starter ES is used for the startup, parameterization, diagnostics, documentation and preventive maintenance of SIMATIC ET 200S, ET 200pro, ECOFAST and M200D motor starters.

Interfacing is performed

- Via the local interface on the device
- With PROFIBUS DP-V1-capable motor starters from any point in PROFIBUS (applies to ET 200S DP V1/ET 200pro/ ECOFAST/M200D)
- With PROFINET-capable motor starters from any point in PROFINET (applies to ET 200S DP V1/ET 200pro/M200D).

Using Motor Starter ES, the communication-capable motor starters are easily parameterized during startup, monitored during normal operation and successfully diagnosed for service purposes. Preventative maintenance is supported by a function for reading out diverse statistical data (e.g. operating hours, operating cycles, cut-off currents, etc.). The user is supported during these procedures with comprehensive Help functions and plain text displays.

Motor Starter ES can either be used as a stand-alone program or it can be integrated into STEP 7 via an Object Manager.

Efficient engineering with three program versions

The Motor Starter ES software program is available in three versions which differ in their user-friendliness, scope of functions and price.

Motor Starter ES	Basic	Standard	Premium
ET 200S High Feature PROFIBUS IM	✓	✓	✓
ET 200S High Feature PROFINET IM	✓	✓	✓
ECOFAST AS-Interface High Feature	✓	✓	--
ECOFAST PROFIBUS	✓	✓	✓
ET 200pro PROFIBUS IM	✓	✓	✓
ET 200pro PROFINET IM	✓	✓	✓
M200D AS-Interface Standard	✓	✓	(✓)
M200D PROFIBUS	✓	✓	✓
M200D PROFINET	✓	✓	✓

✓ Function available, (✓) Available with restricted functionality

-- Function not available

Motor Starter ES	Basic	Standard	Premium
Access via the local interface on the device	✓	✓	✓
Parameter assignment	✓	✓	✓
Operating	✓	✓	✓
Diagnostics	--	✓	✓
Creation of typicals	--	✓	✓
Comparison functions	--	✓	✓
Standard-compliant printout according to EN ISO 7200	--	✓	✓
Service data (slave pointer, statistics data)	--	✓	✓
Access via PROFIBUS	--	--	✓
Access via PROFINET	--	--	✓
S7 routing	--	--	✓
Teleservice via MPI	--	--	✓
STEP 7 object manager[1)]	--	--	✓
Trace function	--	✓	✓

✓ Function available

-- Function not available

1) Only for STEP 7 V5.x

Additional functions

Standard-compliant printouts

The software tool greatly simplifies machine documentation. It enables parameterization printouts according to EN ISO 7200. The elements to be printed are easy to select and group as required.

Easy creation of typicals

Typicals can be created for devices and applications with only minimum differences in their parameters. These typicals contain all the parameters which are needed for the parameterization. In addition it is possible to specify which of these parameters are fixed and which can be adapted, e.g. by the startup engineer.

Teleservice via MPI

The Motor Starter ES Premium version supports the use of MPI Teleservice (comprising the Teleservice software and various Teleservice adapters) for remote diagnostics of the devices. This facilitates diagnostics and maintenance, and it shortens response times for service purposes.

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Benefits

- Fast, error-free configuration and startup of motor starters even without extensive previous knowledge
- Transparent setting of the device functions and their parameters – online and offline
- Effective diagnostics functions on the soft starter and display of the most important measured values
- Trace function (oscilloscope function) for recording measured values and events (included in the Motor Starter ES Standard and Premium software version for M200D PROFIBUS and PROFINET).

Selection and ordering data

Parameterization, startup and diagnostics software
Motor Starter ES 2007

For ECOFAST Motor Starter, SIMATIC ET 200S High-Feature Starter, SIMATIC ET 200pro Starter and M200D (AS-I Standard, PROFIBUS, PROFINET)

- Delivered without PC cable

Version	Article No.
Motor Starter ES 2007 Basic	
 3ZS1310-4CC10-0YA5 **Floating license for one user** Engineering software in limited-function version for diagnostics purposes, software and documentation on CD, 3 languages (German/English/French), communication via system interface	
• License key on USB flash drive, Class A, including CD	**3ZS1310-4CC10-0YA5**
• License key download, Class A, without CD	**3ZS1310-4CE10-0YB5**
Motor Starter ES 2007 Standard	
 3ZS1310-5CC10-0YA5 **Floating license for one user** Engineering software, software and documentation on CD, 3 languages (German/English/French), communication via system interface	
• License key on USB flash drive, Class A, including CD	**3ZS1310-5CC10-0YA5**
• License key download, Class A, without CD	**3ZS1310-5CE10-0YB5**
Motor Starter ES 2007 Premium	
 3ZS1310-6CC10-0YA5 **Floating license for one user** Engineering software, software and documentation on CD, 3 languages (German/English/French), communication via system interface or PROFIBUS/PROFINET, STEP 7 Object Manager	
• License key on USB flash drive, Class A, including CD	**3ZS1310-6CC10-0YA5**
• License key download, Class A, without CD	**3ZS1310-6CE10-0YB5**

Notes:

Please order PC cable separately, see Accessories.

For a description of the software versions, see page 9/327.

Accessories

Version	Article No.
Optional accessories	
RS 232 interface cable Serial data connection between ET 200pro MS/FC, M200D and laptop/PC/PG or MS	**3RK1922-2BP00**
USB interface cable Serial data connection between ET 200pro MS/FC, M200D and laptop/PC/PG or MS	**6SL3555-0PA00-2AA0**
USB/serial adapters For connecting an RS 232 PC cable to the USB interface of a PC, recommended for use in conjunction with ET 200S/ECOFAST/ET 200pro motor starters	**3UF7946-0AA00-0**

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Overview

An interface module (EtherNet/IP adapter) is provided for operating the ET 200pro on EtherNet/IP. It can be used together with system and IO components of the ET 200pro distributed I/O system.

Technical specifications

Article number	**ZNX:EIP200PRO** Ethernet/IP Head Assembly for ET 200PRO
Supply voltage	
Rated value (DC)	24 V
Input current	
from supply voltage 1L+, max.	400 mA
Power loss	
Power loss, typ.	6 W
Address area	
Addressing volume	
• Inputs	255 byte
• Outputs	255 byte
M12 port	
• Autonegotiation	Yes
• Transmission rate, max.	100 Mbit/s
Diagnostics indication LED	
• Bus fault BF (red)	Yes
• Group error SF (red)	Yes
• Monitoring 24 V voltage supply ON (green)	Yes
• Load voltage monitoring 24 V DC (green)	Yes
Potential separation	
between backplane bus and electronics	Yes
between supply voltage and electronics	Yes
Degree and class of protection	
IP degree of protection	IP65/67
Ambient conditions	
Ambient temperature during operation	
• min.	-25 °C
• max.	55 °C
Ambient temperature during storage/transportation	
• min.	-40 °C
• max.	70 °C
Dimensions	
Width	135 mm
Height	130 mm
Depth	59.3 mm
Weights	
Weight, approx.	490 g

Article number	**ZNX:EIP200PROCM1** ET 200pro, CM IM DP M12 / 7/8"
Input current	
from supply voltage 1L+, max.	No current input, only infeed current, max. 8 A
from load voltage 2L+ (without load), max.	No current input, only infeed current, max. 8 A
Dimensions	
Width	90 mm
Height	130 mm
Depth	51 mm
Weights	
Weight, approx.	540 g

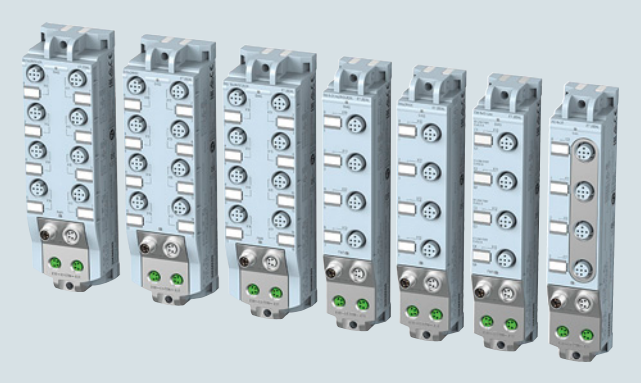
Ordering data

	Article No.
SIMATIC ET 200pro interface module for EtherNet/IP Including: • Bus terminating module for ET 200pro • Companion disk with the manuals and the Configuration Tool	**ZNX:EIP200PRO**

	Article No.
Connecting module for EtherNet/IP for connecting the interface module to EtherNet/IP	**ZNX:EIP200PROCM1**

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Overview



- Modular, distributed I/O system with compact I/O modules in IP65/67.
- Especially easy and flexible installation, even in extremely confined spaces.
- Easy wiring
- Easy commissioning
- SIMATIC ET 200AL consists of the following components:
  - Interface module for communication with IO Controllers on PROFINET.
  - Interface module for communication with all masters on the PROFIBUS.
  - Bus adapters for connection to the ET 200SP I/O system.
  - Various I/O modules, 30 mm and 45 mm wide.
- Maximum configuration of an ET 200AL station:
  - Up to 32 I/O modules with PROFINET or PROFIBUS in any combination
  - Up to 16 I/O modules at the ET 200SP in any combination
- Connection of the modules via an internal backplane bus established using bus cables (ET connection).

Highlights

- Compact dimensions
- Low weight
- Safety-oriented collective shutdown of the outputs (available soon)
- High degree of user-friendliness due to the following design features:
  - Flexible mounting in all positions possible due to screw fastening through the front or side
  - Direct installation on even surfaces or aluminum mounting rails
  - Labels for the identification of channels, modules and slots
  - Integrated cable tie opening
  - Clear and CAx-compliant interface designations
  - Uniform coloring of the system interfaces and system cables
  - 1:1 assignment of channel status LED, I/O socket and label
  - Pin assignment on the side
- I/O module portfolio comprising digital and analog modules as well as IO-Link communication module
- Ambient temperature range from -25 °C to +55 °C
- Extensive system functions
  - All interface and I/O modules support firmware update
  - Configuration control (option handling) via user software
  - System support of PROFIenergy for power saving purposes
  - Consistent use of identification and maintenance data IM0 to IM3/4 (electronic rating plate) for fast electronic and unambiguous identification of individual modules (Article No., serial number, etc.).

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Overview



- Interface module for linking the ET 200AL to PROFIBUS
- As DPV1 slave it handles the data exchange with the PROFIBUS master in the PLC
- Max. 32 I/O modules can be connected
- Max. data volume of 244 bytes, for input and output data respectively
- Automatic detection of baud rate 9.6 kBd ... 12 MBd
- PROFIBUS addresses 1 ... 99; can be set by means of rotary switch
- Identification and maintenance data IM0 ... IM3
- Firmware update
- Configuration management (option handling)

Technical specifications

Article number	**6ES7157-1AA00-0AB0** ET 200AL, IM 157-1 DP
General information	
Product type designation	IM 157-1 DP
Product function	
• I&M data	Yes; I&M0 to I&M3
Engineering with	
• STEP 7 TIA Portal configurable/ integrated as of version	STEP 7 V13 SP1 or higher
• STEP 7 configurable/integrated as of version	From V5.5 SP4 Hotfix 3
• PROFIBUS as of GSD version/ GSD revision	GSD as of Revision 5
Supply voltage	
Load voltage 1L+	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes; against destruction
Input current	
Current consumption (rated value)	50 mA
from load voltage 1L+ (unswitched voltage)	4 A; Maximum value
from load voltage 2L+, max.	4 A; Maximum value
Address area	
Address space per station	
• Address space per station, max.	244 byte
Interfaces	
Number of PROFIBUS interfaces	1
1. Interface	
Interface type	PROFIBUS DP
Interface types	
• RS 485	Yes
• M12 port	Yes; 2x M12 B-coded
Protocols	
• PROFIBUS DP slave	Yes
Interface types	
RS 485	
• Transmission rate, max.	12 Mbit/s

Article number	**6ES7157-1AA00-0AB0** ET 200AL, IM 157-1 DP
PROFIBUS DP	
Services	
- SYNC capability	Yes
- FREEZE capability	Yes
- Direct data exchange (slave-to-slave communication)	Yes
- DPV0	Yes
- DPV1	Yes
Interrupts/diagnostics/ status information	
Alarms	Yes
Diagnostics function	Yes
Diagnostics indication LED	
• RUN LED	Yes; Green LED
• ERROR LED	Yes; Red LED
• MAINT LED	Yes; yellow LED
• Connection display DP	Yes; Green LED
Potential separation	
between the load voltages	Yes
between PROFIBUS DP and all other circuit components	Yes
Degree and class of protection	
IP degree of protection	IP65/67
Standards, approvals, certificates	
Suitable for safety-related tripping of standard modules	Yes; From FS01
Highest safety class achievable for safety-related tripping of standard modules	
• Performance level according to ISO 13849-1	PL d
• Category according to ISO 13849-1	Cat. 3
• SILCL according to IEC 62061	SILCL 2

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Technical specifications (continued)

Article number	**6ES7157-1AA00-0AB0**
	ET 200AL, IM 157-1 DP
Ambient conditions	
Ambient temperature during operation	
• min.	-25 °C
• max.	55 °C
Connection method	
Design of electrical connection for supply voltage	M8, 4-pole
ET-Connection	
• ET-Connection	M8, 4-pin, shielded

Article number	**6ES7157-1AA00-0AB0**
	ET 200AL, IM 157-1 DP
Dimensions	
Width	45 mm
Height	159 mm
Depth	46 mm
Weights	
Weight, approx.	211 g

Ordering data

	Article No.
IM 157-1 DP interface module	**6ES7157-1AA00-0AB0**
For connecting ET 200AL to PROFIBUS	
Accessories	
Bus cable for backplane bus (ET connection)	
4-pin, shielded	
Pre-assembled at both ends, 2 M8 connectors	
0.19 m	**6ES7194-2LH02-0AA0**
0.3 m	**6ES7194-2LH03-0AA0**
1 m	**6ES7194-2LH10-0AA0**
2 m	**6ES7194-2LH20-0AA0**
5 m	**6ES7194-2LH50-0AA0**
10 m	**6ES7194-2LN10-0AA0**
15 m	**6ES7194-2LN15-0AA0**
Pre-assembled at both ends, 2 M8 connectors, angled	
0.3 m	**6ES7194-2LH03-0AB0**
1 m	**6ES7194-2LH10-0AB0**
2 m	**6ES7194-2LH20-0AB0**
5 m	**6ES7194-2LH50-0AB0**
10 m	**6ES7194-2LN10-0AB0**
15 m	**6ES7194-2LN15-0AB0**
Pre-assembled at one end, 1 M8 connector	
2 m	**6ES7194-2LH20-0AC0**
5 m	**6ES7194-2LH50-0AC0**
10 m	**6ES7194-2LN10-0AC0**
15 m	**6ES7194-2LN15-0AC0**

	Article No.
M8 power cable	
4-pin	
Pre-assembled at both ends, M8 connector and M8 socket	
0.19 m	**6ES7194-2LH02-1AA0**
0.3 m	**6ES7194-2LH03-1AA0**
1 m	**6ES7194-2LH10-1AA0**
2 m	**6ES7194-2LH20-1AA0**
5 m	**6ES7194-2LH50-1AA0**
10 m	**6ES7194-2LN10-1AA0**
15 m	**6ES7194-2LN15-1AA0**
Pre-assembled at both ends, angled M8 connector and angled M8 socket	
0.3 m	**6ES7194-2LH03-1AB0**
1 m	**6ES7194-2LH10-1AB0**
2 m	**6ES7194-2LH20-1AB0**
5 m	**6ES7194-2LH50-1AB0**
10 m	**6ES7194-2LN10-1AB0**
15 m	**6ES7194-2LN15-1AB0**
Pre-assembled at one end, M8 socket	
2 m	**6ES7194-2LH20-1AC0**
5 m	**6ES7194-2LH50-1AC0**
10 m	**6ES7194-2LN10-1AC0**
15 m	**6ES7194-2LN15-1AC0**
M8 connector for ET connection	**6ES7194-2AB00-0AA0**
4-pin, shielded	
M8 power connector	
Male contact insert, 4-pin	**6ES7194-2AA00-0AA0**
Female contact insert, 4-pin	**6ES7194-2AC00-0AA0**
ET connection FastConnect stripping tool	**6ES7194-2KA00-0AA0**
Stripping tool for stripping the ET connection bus cable	
Labels	**6ES7194-2BA00-0AA0**
10 x 5 mm, RAL 9016; 5 frames with 40 labels each	

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Overview



- Interface module for linking the ET 200AL to PROFINET
- Handles data exchange with the PROFINET I/O controller in the PLC
- Max. 32 I/O modules can be connected
- Max. data volume of 1430 bytes, for input and output data respectively
- Shortest bus cycle 250 µs
- Automatic power-up by means of topology recognition
- Autocrossover
- Shared device on up to 4 IO controllers
- Support for the MRP (media redundancy protocol) and MRPD (media redundancy with planned duplication) functions
- Identification and maintenance data IM0 ... IM4
- Firmware update
- Configuration management (option handling)
- PROFIenergy

Technical specifications

Article number	**6ES7157-1AB00-0AB0**
	ET 200AL, IM 157-1 PN
General information	
Product type designation	IM 157-1 PN
Product function	
• I&M data	Yes; I&M0 to I&M4
Engineering with	
• STEP 7 TIA Portal configurable/ integrated as of version	STEP 7 V13 SP1 or higher
• STEP 7 configurable/integrated as of version	From V5.5 SP4 Hotfix 3
• PROFINET as of GSD version/ GSD revision	GSDML V2.3.1
Supply voltage	
Load voltage 1L+	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes; against destruction
Input current	
Current consumption (rated value)	100 mA
from load voltage 1L+ (unswitched voltage)	4 A; Maximum value
from load voltage 2L+, max.	4 A; Maximum value
Address area	
Address space per station	
• Address space per station, max.	1 430 byte
Interfaces	
Number of PROFINET interfaces	1
1. Interface	
Interface type	PROFINET
Interface types	
• integrated switch	Yes
• M12 port	Yes; 2x M12 d-coded
Protocols	
• PROFINET IO Device	Yes
M12 port	
• Transmission procedure	PROFINET with 100 Mbit/s full duplex (100BASE-TX)
• 10 Mbps	Yes; for Ethernet services
• 100 Mbps	Yes; PROFINET with 100 Mbit/s full duplex (100BASE-TX)
• Autonegotiation	Yes
• Autocrossing	Yes

Article number	**6ES7157-1AB00-0AB0**
	ET 200AL, IM 157-1 PN
Protocols	
PROFINET IO Device	
Services	
- Open IE communication	Yes
- IRT	Yes; 250 µs, 500 µs, 1 ms, 2 ms, 4 ms, 8 ms, 16 ms, 32 ms, 64 ms, 128 ms
- PROFIenergy	Yes
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4
Redundancy mode	
• MRP	Yes
• MRPD	Yes
Open IE communication	
• TCP/IP	Yes
• SNMP	Yes
• LLDP	Yes
Interrupts/diagnostics/ status information	
Alarms	Yes
Diagnostics function	Yes
Diagnostics indication LED	
• RUN LED	Yes; Green LED
• ERROR LED	Yes; Red LED
• MAINT LED	Yes; yellow LED
• Connection display LINK TX/RX	Yes; 2x green LED
Potential separation	
between the load voltages	Yes
between PROFINET and all other circuits	Yes
Degree and class of protection	
IP degree of protection	IP65/67

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Technical specifications (continued)

Article number	6ES7157-1AB00-0AB0 ET 200AL, IM 157-1 PN
Standards, approvals, certificates	
Suitable for safety-related tripping of standard modules	Yes; From FS01
Highest safety class achievable for safety-related tripping of standard modules	
• Performance level according to ISO 13849-1	PL d
• Category according to ISO 13849-1	Cat. 3
• SILCL according to IEC 62061	SILCL 2
Ambient conditions	
Ambient temperature during operation	
• min.	-25 °C
• max.	55 °C

Article number	6ES7157-1AB00-0AB0 ET 200AL, IM 157-1 PN
Connection method	
Design of electrical connection for supply voltage	M8, 4-pole
ET-Connection	
• ET-Connection	M8, 4-pin, shielded
Dimensions	
Width	45 mm
Height	159 mm
Depth	40 mm
Weights	
Weight, approx.	263 g

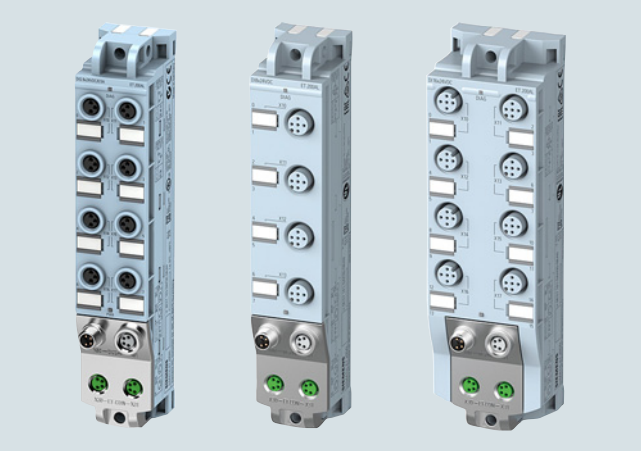
Ordering data

	Article No.
IM 157-1 PN interface module For connecting ET 200AL to PROFINET	**6ES7157-1AB00-0AB0**
Accessories	
Bus cable for backplane bus (ET connection) 4-pin, shielded Pre-assembled at both ends, 2 M8 connectors	
0.19 m	**6ES7194-2LH02-0AA0**
0.3 m	**6ES7194-2LH03-0AA0**
1 m	**6ES7194-2LH10-0AA0**
2 m	**6ES7194-2LH20-0AA0**
5 m	**6ES7194-2LH50-0AA0**
10 m	**6ES7194-2LN10-0AA0**
15 m	**6ES7194-2LN15-0AA0**
Pre-assembled at both ends, 2 M8 connectors, angled	
0.3 m	**6ES7194-2LH03-0AB0**
1 m	**6ES7194-2LH10-0AB0**
2 m	**6ES7194-2LH20-0AB0**
5 m	**6ES7194-2LH50-0AB0**
10 m	**6ES7194-2LN10-0AB0**
15 m	**6ES7194-2LN15-0AB0**
Pre-assembled at one end, 1 M8 connector	
2 m	**6ES7194-2LH20-0AC0**
5 m	**6ES7194-2LH50-0AC0**
10 m	**6ES7194-2LN10-0AC0**
15 m	**6ES7194-2LN15-0AC0**

	Article No.
Power cable M8 4-pin Pre-assembled at both ends, M8 connector and M8 socket	
0.19 m	**6ES7194-2LH02-1AA0**
0.3 m	**6ES7194-2LH03-1AA0**
1 m	**6ES7194-2LH10-1AA0**
2 m	**6ES7194-2LH20-1AA0**
5 m	**6ES7194-2LH50-1AA0**
10 m	**6ES7194-2LN10-1AA0**
15 m	**6ES7194-2LN15-1AA0**
Pre-assembled at both ends, angled M8 connector and angled M8 socket	
0.3 m	**6ES7194-2LH03-1AB0**
1 m	**6ES7194-2LH10-1AB0**
2 m	**6ES7194-2LH20-1AB0**
5 m	**6ES7194-2LH50-1AB0**
10 m	**6ES7194-2LN10-1AB0**
15 m	**6ES7194-2LN15-1AB0**
Pre-assembled at one end, M8 socket	
2 m	**6ES7194-2LH20-1AC0**
5 m	**6ES7194-2LH50-1AC0**
10 m	**6ES7194-2LN10-1AC0**
15 m	**6ES7194-2LN15-1AC0**
M8 connector for ET connection 4-pin, shielded	**6ES7194-2AB00-0AA0**
M8 power connector	
Male contact insert, 4-pin	**6ES7194-2AA00-0AA0**
Female contact insert, 4-pin	**6ES7194-2AC00-0AA0**
ET connection FastConnect stripping tool Stripping tool for stripping the ET connection bus cable	**6ES7194-2KA00-0AA0**
Labels 10 x 5 mm, RAL 9016; 5 frames with 40 labels each	**6ES7194-2BA00-0AA0**

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Overview



- 30 and 45 mm wide modules with parameters and diagnostic functions
- 8-channel digital input module with M8 or M12 connection
- 16-channel digital input module with M12 connection
- 8-channel digital input/output module with M8 or M12 connection
- 16-channel digital input / output module with M12 connection
- 8-channel digital output module 2A with M12 connection

Technical specifications

Article number	**6ES7141-5BF00-0BA0** ET 200AL, DI 8x24VDC, 8xM8	**6ES7141-5AF00-0BA0** ET 200AL, DI 8x24VDC, 4xM12	**6ES7141-5AH00-0BA0** ET 200AL, DI 16x24VDC, 8xM12
General information			
Product type designation	DI 8x24VDC	DI 8x24VDC	DI 16x24VDC
Engineering with			
• STEP 7 TIA Portal configurable/ integrated as of version	STEP 7 V13 SP1 or higher	STEP 7 V13 SP1 or higher	STEP 7 V13 SP1 or higher
• STEP 7 configurable/integrated as of version	From V5.5 SP4 Hotfix 3	V5.5 SP4 Hotfix 7 or higher	V5.5 SP4 Hotfix 7 or higher
• PROFIBUS as of GSD version/ GSD revision	GSD as of Revision 5	GSD as of Revision 5	GSD as of Revision 5
• PROFINET as of GSD version/ GSD revision	GSDML V2.3.1	GSDML V2.3.1	GSDML V2.3.1
Supply voltage			
Load voltage 1L+			
• Rated value (DC)	24 V	24 V	24 V
• Reverse polarity protection	Yes; Against destruction; encoder power supply outputs applied with reversed polarity	Yes; Against destruction; encoder power supply outputs applied with reversed polarity	Yes; Against destruction; encoder power supply outputs applied with reversed polarity
Input current			
Current consumption (rated value)	25 mA; without load	25 mA; without load	30 mA; without load
from load voltage 1L+ (unswitched voltage)	4 A; Maximum value	4 A; Maximum value	4 A; Maximum value
from load voltage 2L+, max.	4 A; Maximum value	4 A; Maximum value	4 A; Maximum value
Encoder supply			
Number of outputs	8	4	8
24 V encoder supply			
• Short-circuit protection	Yes; per module, electronic	Yes; per module, electronic	Yes; per module, electronic
• Output current, max.	0.7 A; Total current of all encoders	0.7 A; Total current of all encoders	1.4 A; Total current of all encoders
Digital inputs			
Number of digital inputs	8	8	16
Input characteristic curve in accordance with IEC 61131, type 3	Yes	Yes	Yes
Number of simultaneously controllable inputs			
all mounting positions			
- up to 55 °C, max.	8	8	16
Input voltage			
• Rated value (DC)	24 V	24 V	24 V
• for signal "0"	-30 to +5V	-30 to +5V	-30 to +5V
• for signal "1"	+11 to +30V	+11 to +30V	+11 to +30V
Input current			
• for signal "1", typ.	3.2 mA	3.2 mA	3.2 mA

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Technical specifications (continued)

Article number	**6ES7141-5BF00-0BA0** ET 200AL, DI 8x24VDC, 8xM8	**6ES7141-5AF00-0BA0** ET 200AL, DI 8x24VDC, 4xM12	**6ES7141-5AH00-0BA0** ET 200AL, DI 16x24VDC, 8xM12
Encoder			
Connectable encoders			
• 2-wire sensor	Yes	Yes	Yes
- permissible quiescent current (2-wire sensor), max.	1.5 mA	1.5 mA	1.5 mA
Interrupts/diagnostics/ status information			
Alarms			
• Diagnostic alarm	Yes; Parameterizable	Yes; Parameterizable	Yes; Parameterizable
Diagnostic messages			
• Short-circuit	Yes; Sensor supply to M; module by module	Yes; Sensor supply to M; module by module	Yes; Sensor supply to M; module by module
Diagnostics indication LED			
• Channel status display	Yes; Green LED	Yes; Green LED	Yes; Green LED
• for module diagnostics	Yes; Green/red LED	Yes; Green/red LED	Yes; Green/red LED
Potential separation			
between the load voltages	Yes	Yes	Yes
Potential separation channels			
• between the channels	No	No	No
• between the channels and backplane bus	Yes	Yes	Yes
• between the channels and the power supply of the electronics	No	No	No
Degree and class of protection			
IP degree of protection	IP65/67	IP65/67	IP65/67
Standards, approvals, certificates			
Suitable for safety-related tripping of standard modules	Yes; From FS01	Yes; From FS01	Yes; From FS01
Highest safety class achievable for safety-related tripping of standard modules			
• Performance level according to ISO 13849-1	PL d	PL d	PL d
• Category according to ISO 13849-1	Cat. 3	Cat. 3	Cat. 3
• SILCL according to IEC 62061	SILCL 2	SILCL 2	SILCL 2
Ambient conditions			
Ambient temperature during operation			
• min.	-25 °C	-25 °C	-25 °C
• max.	55 °C	55 °C	55 °C
Connection method			
Design of electrical connection for the inputs and outputs	M8, 3-pole	M12, 5-pole	M12, 5-pole
Design of electrical connection for supply voltage	M8, 4-pole	M8, 4-pole	M8, 4-pole
ET-Connection			
• ET-Connection	M8, 4-pin, shielded	M8, 4-pin, shielded	M8, 4-pin, shielded
Dimensions			
Width	30 mm	30 mm	45 mm
Height	159 mm	159 mm	159 mm
Depth	40 mm	40 mm	40 mm
Weights			
Weight, approx.	145 g	145 g	184 g

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Technical specifications (continued)

Article number	**6ES7142-5AF00-0BA0**
	ET 200AL, DQ 8x24VDC/2A, 8xM12
General information	
Product type designation	DQ 8x24VDC/2A
Engineering with	
• STEP 7 TIA Portal configurable/ integrated as of version	STEP 7 V13 SP1 or higher
• STEP 7 configurable/integrated as of version	V5.5 SP4 Hotfix 7 or higher
• PROFIBUS as of GSD version/ GSD revision	GSD as of Revision 5
• PROFINET as of GSD version/ GSD revision	GSDML V2.3.1
Supply voltage	
Load voltage 1L+	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes; against destruction; load increasing
Load voltage 2L+	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes; against destruction; load increasing
Input current	
Current consumption (rated value)	40 mA; without load
from load voltage 1L+ (unswitched voltage)	4 A; Maximum value
from load voltage 2L+, max.	4 A; Maximum value
Digital outputs	
Number of digital outputs	8
• in groups of	4; 2 load groups for 4 outputs each
Short-circuit protection	Yes; per channel, electronic
Limitation of inductive shutdown voltage to	2L+ (-47 V)
Switching capacity of the outputs	
• on lamp load, max.	10 W
Load resistance range	
• lower limit	12 Ω
• upper limit	4 kΩ
Output voltage	
• for signal "1", min.	L+ (-0.8 V)
Output current	
• for signal "1" rated value	2 A
• for signal "0" residual current, max.	0.5 mA
Switching frequency	
• with resistive load, max.	100 Hz
• with inductive load, max.	0.1 Hz; 0.25 Hz at 25 °C
• on lamp load, max.	1 Hz
Total current of the outputs	
• Current per group, max.	4 A; For inductive load max. 2 channels per group
Cable length	
• unshielded, max.	30 m

Article number	**6ES7142-5AF00-0BA0**
	ET 200AL, DQ 8x24VDC/2A, 8xM12
Interrupts/diagnostics/ status information	
Substitute values connectable	Yes; channel by channel, parameterizable
Alarms	
• Diagnostic alarm	Yes; Parameterizable
Diagnostic messages	
• Short-circuit	Yes; Outputs to ground; module by module
Diagnostics indication LED	
• Channel status display	Yes; Green LED
• for module diagnostics	Yes; Green/red LED
• For load voltage monitoring	Yes; Green LED
Potential separation	
between the load voltages	Yes
Potential separation channels	
• between the channels, in groups of	4
• between the channels and backplane bus	Yes
• between the channels and the power supply of the electronics	No; 4 channels are non-isolated and 4 channels are isolated from supply voltage 1L+
Degree and class of protection	
IP degree of protection	IP65/67
Standards, approvals, certificates	
Suitable for safety-related tripping of standard modules	Yes; From FS01
Highest safety class achievable for safety-related tripping of standard modules	
• Performance level according to ISO 13849-1	PL d
• Category according to ISO 13849-1	Cat. 3
• SILCL according to IEC 62061	SILCL 2
Ambient conditions	
Ambient temperature during operation	
• min.	-25 °C
• max.	55 °C
Connection method	
Design of electrical connection for the inputs and outputs	M12, 5-pole
Design of electrical connection for supply voltage	M8, 4-pole
ET-Connection	
• ET-Connection	M8, 4-pin, shielded
Dimensions	
Width	45 mm
Height	159 mm
Depth	40 mm
Weights	
Weight, approx.	192 g

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Technical specifications (continued)

Article number	**6ES7143-5BF00-0BA0** ET 200AL, DIQ 4+DQ 4x24VDC/0.5A, 8xM8	**6ES7143-5AF00-0BA0** ET 200AL, DIQ 4+DQ 4x24VDC/0.5A, 4xM12	**6ES7143-5AH00-0BA0** ET 200AL, DIQ 16x24VDC/0.5A, 8xM12
General information			
Product type designation	DIQ 4+DQ 4x24VDC/0.5A	DIQ 4+DQ 4x24VDC/0.5A	DIQ 16x24VDC/0.5A
Engineering with			
• STEP 7 TIA Portal configurable/ integrated as of version	STEP 7 V13 SP1 or higher	STEP 7 V13 SP1 or higher	STEP 7 V14 or higher
• STEP 7 configurable/integrated as of version	From V5.5 SP4 Hotfix 3	V5.5 SP4 Hotfix 7 or higher	V5.5 SP4 Hotfix 7 or higher
• PROFIBUS as of GSD version/ GSD revision	GSD as of Revision 5	GSD as of Revision 5	GSD as of Revision 5
• PROFINET as of GSD version/ GSD revision	GSDML V2.3.1	GSDML V2.3.1	GSDML V2.3.1
Operating mode			
• DI			Yes
• Counter			Yes
• DQ			Yes
Supply voltage			
Load voltage 1L+			
• Rated value (DC)	24 V	24 V	24 V
• Reverse polarity protection	Yes; Against destruction; encoder power supply outputs applied with reversed polarity, loads pick up	Yes; Against destruction; encoder power supply outputs applied with reversed polarity, loads pick up	Yes; Against destruction; encoder power supply outputs applied with reversed polarity, loads pick up
Load voltage 2L+			
• Rated value (DC)	24 V	24 V	24 V
• Reverse polarity protection	Yes; against destruction; load increasing	Yes; against destruction; load increasing	Yes; Against destruction; encoder power supply outputs applied with reversed polarity, loads pick up
Input current			
Current consumption (rated value)	40 mA; without load	40 mA; without load	75 mA; without load
from load voltage 1L+ (unswitched voltage)	4 A; Maximum value	4 A; Maximum value	4 A; Maximum value
from load voltage 2L+, max.	4 A; Maximum value	4 A; Maximum value	4 A; Maximum value
Encoder supply			
Number of outputs	4	4	8
24 V encoder supply			
• Short-circuit protection	Yes; per module, electronic	Yes; per module, electronic	Yes; Per load voltage, electronic
• Output current, max.	0.7 A; Total current of all encoders	0.7 A; Total current of all encoders	1.4 A; Total current of all encoders, max. 0.7 A per load voltage
Digital inputs			
Number of digital inputs	4; Parameterizable as DIQ	4; Parameterizable as DIQ	16; Parameterizable as DIQ
Input characteristic curve in accordance with IEC 61131, type 3	Yes	Yes	Yes
Number of simultaneously controllable inputs			
all mounting positions			
- up to 55 °C, max.	4	4	16
Digital input functions, parameterizable			
• Freely usable digital input			Yes
• Counter			Yes
Input voltage			
• Rated value (DC)	24 V	24 V	24 V
• for signal "0"	-3 to +5V	-3 to +5V	-3 to +5V
• for signal "1"	+11 to +30V	+11 to +30V	+11 to +30V
Input current			
• for signal "1", typ.	3.2 mA	3.2 mA	3 mA
Input delay (for rated value of input voltage)			
for standard inputs			
- parameterizable			Yes
for technological functions			
- parameterizable			Yes

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Technical specifications (continued)

Article number	**6ES7143-5BF00-0BA0** ET 200AL, DIQ 4+DQ 4x24VDC/0.5A, 8xM8	**6ES7143-5AF00-0BA0** ET 200AL, DIQ 4+DQ 4x24VDC/0.5A, 4xM12	**6ES7143-5AH00-0BA0** ET 200AL, DIQ 16x24VDC/0.5A, 8xM12
Digital outputs			
Number of digital outputs	8; 4 DQ fixed, 4 DIQ parameterizable	8; 4 DQ fixed, 4 DIQ parameterizable	16; Parameterizable as DIQ
• in groups of	4; 2 load groups for 4 outputs each	4; 2 load groups for 4 outputs each	8; 2 load groups for 8 outputs each
Short-circuit protection	Yes; per channel, electronic	Yes; per channel, electronic	Yes; per channel, electronic
Limitation of inductive shutdown voltage to	2L+ (-47 V)	2L+ (-47 V)	L+ (-53 V)
Digital output functions, parameterizable			
• Switching tripped by comparison values			Yes
• Freely usable digital output			Yes
Switching capacity of the outputs			
• on lamp load, max.	5 W	5 W	5 W
Load resistance range			
• lower limit	48 Ω	48 Ω	48 Ω
• upper limit	4 kΩ	4 kΩ	4 kΩ
Output voltage			
• for signal "1", min.	L+ (-0.8 V)	L+ (-0.8 V)	L+ (-0.8 V)
Output current			
• for signal "1" rated value	0.5 A	0.5 A	0.5 A
• for signal "0" residual current, max.	0.5 mA	0.5 mA	0.5 mA
Switching frequency			
• with resistive load, max.	100 Hz	100 Hz	100 Hz
• with inductive load, max.	0.5 Hz	0.5 Hz	0.5 Hz
• on lamp load, max.	1 Hz	1 Hz	1 Hz
Total current of the outputs			
• Current per group, max.	2 A	2 A	4 A
Cable length			
• unshielded, max.	30 m	30 m	30 m
Encoder			
Connectable encoders			
• 2-wire sensor	Yes	Yes	Yes
- permissible quiescent current (2-wire sensor), max.	1.5 mA	1.5 mA	1.5 mA
Interrupts/diagnostics/ status information			
Substitute values connectable	Yes; channel by channel, parameterizable	Yes; channel by channel, parameterizable	Yes; channel by channel, parameterizable
Alarms			
• Diagnostic alarm	Yes; Parameterizable	Yes; Parameterizable	Yes; Parameterizable
Diagnostic messages			
• Short-circuit	Yes; Outputs to M; encoder supply to M; module by module	Yes; Outputs to M; encoder supply to M; module by module	Yes; Outputs to M; encoder supply to M; module by module
Diagnostics indication LED			
• Channel status display	Yes; Green LED	Yes; Green LED	Yes; Green LED
• for module diagnostics	Yes; Green/red LED	Yes; Green/red LED	Yes; Green/red LED
• For load voltage monitoring	Yes; Green LED	Yes; Green LED	Yes; Green LED
Potential separation			
between the load voltages	Yes	Yes	Yes
Potential separation channels			
• between the channels, in groups of	4; DIQ channels are isolated from DQ channels	4; DIQ channels are isolated from DQ channels	8
• between the channels and backplane bus	Yes	Yes	Yes
• between the channels and the power supply of the electronics	No; DIQ channels are non-isolated and DQ channels are isolated from supply voltage 1L+	No; DIQ channels are non-isolated and DQ channels are isolated from supply voltage 1L+	No; 8 channels are non-isolated and 8 channels are isolated from supply voltage 1L+
Degree and class of protection			
IP degree of protection	IP65/67	IP65/67	IP65/67

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Technical specifications (continued)

Article number	**6ES7143-5BF00-0BA0**	**6ES7143-5AF00-0BA0**	**6ES7143-5AH00-0BA0**
	ET 200AL, DIQ 4+DQ 4x24VDC/0.5A, 8xM8	ET 200AL, DIQ 4+DQ 4x24VDC/0.5A, 4xM12	ET 200AL, DIQ 16x24VDC/0.5A, 8xM12
Standards, approvals, certificates			
Suitable for safety-related tripping of standard modules	Yes; From FS01	Yes; From FS01	
Highest safety class achievable for safety-related tripping of standard modules			
• Performance level according to ISO 13849-1	PL d	PL d	
• Category according to ISO 13849-1	Cat. 3	Cat. 3	
• SILCL according to IEC 62061	SILCL 2	SILCL 2	
Ambient conditions			
Ambient temperature during operation			
• min.	-25 °C	-25 °C	-25 °C
• max.	55 °C	55 °C	55 °C
Connection method			
Design of electrical connection for the inputs and outputs	M8, 3-pole	M12, 5-pole	M12, 5-pole
Design of electrical connection for supply voltage	M8, 4-pole	M8, 4-pole	M8, 4-pole
ET-Connection			
• ET-Connection	M8, 4-pin, shielded	M8, 4-pin, shielded	M8, 4-pin, shielded
Dimensions			
Width	30 mm	30 mm	45 mm
Height	159 mm	159 mm	159 mm
Depth	40 mm	40 mm	40 mm
Weights			
Weight, approx.	145 g	145 g	195 g

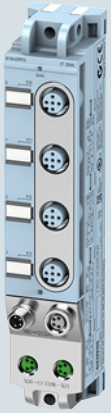
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Ordering data	Article No.
Digital input modules	
DI 8X24VDC, 8XM8	**6ES7141-5BF00-0BA0**
DI 8X24VDC, 4XM12	**6ES7141-5AF00-0BA0**
DI 16X24VDC, 8XM12	**6ES7141-5AH00-0BA0**
Digital output modules	
DQ 8X24VDC/2A, 8XM12	**6ES7142-5AF00-0BA0**
Digital input/output modules	
4 DIQ / 4 DQ, 24 V DC, 0.5 A	**6ES7143-5BF00-0BA0**
DIQ 4+DQ 4X24VDC/0.5A, 4XM12	**6ES7143-5AF00-0BA0**
DIQ 16X24VDC/0.5A, 8XM12	**6ES7143-5AH00-0BA0**
Accessories	
Bus cable for backplane bus (ET connection)	
4-pin, shielded	
Pre-assembled at both ends, 2 M8 connectors	
0.19 m	**6ES7194-2LH02-0AA0**
0.3 m	**6ES7194-2LH03-0AA0**
1 m	**6ES7194-2LH10-0AA0**
2 m	**6ES7194-2LH20-0AA0**
5 m	**6ES7194-2LH50-0AA0**
10 m	**6ES7194-2LN10-0AA0**
15 m	**6ES7194-2LN15-0AA0**
Pre-assembled at both ends, two M8 connectors, angled	
0.3 m	**6ES7194-2LH03-0AB0**
1 m	**6ES7194-2LH10-0AB0**
2 m	**6ES7194-2LH20-0AB0**
5 m	**6ES7194-2LH50-0AB0**
10 m	**6ES7194-2LN10-0AB0**
15 m	**6ES7194-2LN15-0AB0**
Pre-assembled at one end, one M8 connector	
2 m	**6ES7194-2LH20-0AC0**
5 m	**6ES7194-2LH50-0AC0**
10 m	**6ES7194-2LN10-0AC0**
15 m	**6ES7194-2LN15-0AC0**

	Article No.
Power cable M8	
4-pin	
Pre-assembled at both ends, M8 connector and M8 socket	
0.19 m	**6ES7194-2LH02-1AA0**
0.3 m	**6ES7194-2LH03-1AA0**
1 m	**6ES7194-2LH10-1AA0**
2 m	**6ES7194-2LH20-1AA0**
5 m	**6ES7194-2LH50-1AA0**
10 m	**6ES7194-2LN10-1AA0**
15 m	**6ES7194-2LN15-1AA0**
Pre-assembled at both ends, angled M8 connector and angled M8 socket	
0.3 m	**6ES7194-2LH03-1AB0**
1 m	**6ES7194-2LH10-1AB0**
2 m	**6ES7194-2LH20-1AB0**
5 m	**6ES7194-2LH50-1AB0**
10 m	**6ES7194-2LN10-1AB0**
15 m	**6ES7194-2LN15-1AB0**
Pre-assembled at one end, M8 socket	
2 m	**6ES7194-2LH20-1AC0**
5 m	**6ES7194-2LH50-1AC0**
10 m	**6ES7194-2LN10-1AC0**
15 m	**6ES7194-2LN15-1AC0**
M8 connector for ET connection	**6ES7194-2AB00-0AA0**
4-pin, shielded	
M8 power connector	
Male contact insert, 4-pin	**6ES7194-2AA00-0AA0**
Female contact insert, 4-pin	**6ES7194-2AC00-0AA0**
ET connection FastConnect stripping tool	**6ES7194-2KA00-0AA0**
Stripping tool for stripping the ET connection bus cable	
Labels	**6ES7194-2BA00-0AA0**
10 x 5 mm, RAL 9016; 5 frames with 40 labels each	

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Overview



- 30-mm wide module with parameters and diagnostic functions
- For connecting analog actuators and sensors without additional amplifiers
- 4-channel analog input module with M12 connection
- 4-channel analog output module with M12 connection

Technical specifications

Article number	**6ES7144-5KD00-0BA0**
	ET 200AL, AI 4xU/I/RTD, 4xM12
General information	
Product type designation	AI 4xU/I/RTD
Engineering with	
• STEP 7 TIA Portal configurable/ integrated as of version	STEP 7 V13 SP1 or higher
• STEP 7 configurable/integrated as of version	From V5.5 SP4 Hotfix 3
• PROFIBUS as of GSD version/ GSD revision	GSD as of Revision 5
• PROFINET as of GSD version/ GSD revision	GSDML V2.3.1
Supply voltage	
Load voltage 1L+	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes; against destruction
Input current	
Current consumption (rated value)	35 mA; without load
from load voltage 1L+ (unswitched voltage)	4 A; Maximum value
from load voltage 2L+, max.	4 A; Maximum value
Encoder supply	
Number of outputs	4
24 V encoder supply	
• Short-circuit protection	Yes; per channel, electronic
• Output current, max.	0.5 A; Per channel, total current of all channels max. 1 A

Article number	**6ES7144-5KD00-0BA0**
	ET 200AL, AI 4xU/I/RTD, 4xM12
Analog inputs	
Number of analog inputs	4
• For current measurement	4
• For voltage measurement	4
• For resistance/resistance thermometer measurement	4
permissible input voltage for voltage input (destruction limit), max.	30 V
permissible input current for current input (destruction limit), max.	50 mA
Cycle time (all channels), min.	8 ms
Technical unit for temperature measurement adjustable	Yes; Degrees Celsius / degrees Fahrenheit / Kelvin
Input ranges (rated values), voltages	
• 0 to +10 V	Yes
• 1 V to 5 V	Yes
Input ranges (rated values), currents	
• 0 to 20 mA	Yes
• 4 mA to 20 mA	Yes
Input ranges (rated values), resistance thermometer	
• Ni 100	Yes; Standard/climate
• Pt 100	Yes; Standard/climate
Input ranges (rated values), resistors	
• 0 to 150 ohms	Yes
• 0 to 300 ohms	Yes
Cable length	
• shielded, max.	30 m

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Technical specifications (continued)

Article number	**6ES7144-5KD00-0BA0**
	ET 200AL, AI 4xU/I/RTD, 4xM12
Analog value generation for the inputs	
Measurement principle	integrating
Integration and conversion time/ resolution per channel	
• Resolution with overrange (bit including sign), max.	16 bit
• Integration time, parameterizable	Yes; channel by channel
• Integration time (ms)	0,3 / 16,7 / 20 / 60
• Interference voltage suppression for interference frequency f1 in Hz	3 600 / 60 / 50 / 16.7
• Conversion time (per channel)	2 / 18 / 21 / 61 ms
Smoothing of measured values	
• parameterizable	Yes
Encoder	
Connection of signal encoders	
• for voltage measurement	Yes
• for current measurement as 2-wire transducer	Yes
• for current measurement as 4-wire transducer	Yes
• for resistance measurement with two-wire connection	Yes
• for resistance measurement with three-wire connection	Yes
Errors/accuracies	
Linearity error (relative to input range), (+/-)	0.025 %
Temperature error (relative to input range), (+/-)	0.01 %/K
Crosstalk between the inputs, max.	-70 dB
Repeat accuracy in steady state at 25 °C (relative to input range), (+/-)	0.01 %
Operational error limit in overall temperature range	
• Voltage, relative to input range, (+/-)	0.35 %
• Current, relative to input range, (+/-)	0.45 %
• Resistance, relative to input range, (+/-)	0.25 %
• Resistance thermometer, relative to input range, (+/-)	0.25 %
Basic error limit (operational limit at 25 °C)	
• Voltage, relative to input range, (+/-)	0.25 %
• Current, relative to input range, (+/-)	0.25 %
• Resistance, relative to input range, (+/-)	0.15 %
• Resistance thermometer, relative to input range, (+/-)	0.15 %
Interference voltage suppression for f = n x (f1 +/- 0.5 %), f1 = interference frequency	
• Series mode interference (peak value of interference < rated value of input range), min.	40 dB

Article number	**6ES7144-5KD00-0BA0**
	ET 200AL, AI 4xU/I/RTD, 4xM12
Interrupts/diagnostics/ status information	
Alarms	
• Diagnostic alarm	Yes; Parameterizable
• Limit value alarm	Yes; Parameterizable
Diagnostic messages	
• Wire-break	Yes; at 4 mA to 20 mA and 1 V to 5 V
• Short-circuit	Yes; Encoder supply to M, channel by channel
• Overflow/underflow	Yes
Diagnostics indication LED	
• Channel status display	Yes; Green LED
• for module diagnostics	Yes; Green/red LED
Potential separation	
between the load voltages	Yes
Potential separation channels	
• between the channels	No
• between the channels and backplane bus	Yes
• between the channels and the power supply of the electronics	No
Degree and class of protection	
IP degree of protection	IP65/67
Standards, approvals, certificates	
Suitable for safety-related tripping of standard modules	Yes; From FS02
Highest safety class achievable for safety-related tripping of standard modules	
• Performance level according to ISO 13849-1	PL d
• Category according to ISO 13849-1	Cat. 3
• SILCL according to IEC 62061	SILCL 2
Ambient conditions	
Ambient temperature during operation	
• min.	-25 °C
• max.	55 °C
Connection method	
Design of electrical connection for the inputs and outputs	M12, 5-pole
Design of electrical connection for supply voltage	M8, 4-pole
ET-Connection	
• ET-Connection	M8, 4-pin, shielded
Dimensions	
Width	30 mm
Height	159 mm
Depth	40 mm
Weights	
Weight, approx.	168 g

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Technical specifications (continued)

Article number	**6ES7145-5ND00-0BA0** ET 200AL, AQ 4xU/I, 4xM12
General information	
Product type designation	AQ 4xU/I
Engineering with	
• STEP 7 TIA Portal configurable/ integrated as of version	STEP 7 V14 or higher
• STEP 7 configurable/integrated as of version	V5.5 SP4 Hotfix 7 or higher
• PROFIBUS as of GSD version/ GSD revision	GSD as of Revision 5
• PROFINET as of GSD version/ GSD revision	GSDML V2.3.1
Supply voltage	
Load voltage 1L+	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes; Against destruction; actuator power supply outputs applied with reversed polarity
Input current	
Current consumption (rated value)	110 mA; without load
from load voltage 1L+ (unswitched voltage)	4 A; Maximum value
from load voltage 2L+, max.	4 A; Maximum value
Actuator supply	
Number of outputs	4
Short-circuit protection	Yes; per module, electronic
Output current	
• Rated value	Total current 1 A up to 45 °C; 0.5 A up to 55 °C
Analog outputs	
Number of analog outputs	4
Voltage output, short-circuit protection	Yes
Voltage output, short-circuit current, max.	24 mA
Current output, no-load voltage, max.	15 V
Cycle time (all channels) max.	1 ms
Output ranges, voltage	
• 0 to 10 V	Yes; 15 bit
• 1 V to 5 V	Yes; 14 bit
• -10 V to +10 V	Yes; 16 bit incl. sign
Output ranges, current	
• 0 to 20 mA	Yes; 15 bit
• -20 mA to +20 mA	Yes; 16 bit incl. sign
• 4 mA to 20 mA	Yes; 14 bit
Connection of actuators	
• for voltage output two-wire connection	Yes
• for voltage output four-wire connection	Yes
• for current output two-wire connection	Yes
• for current output four-wire connection	Yes
Load impedance (in rated range of output)	
• with voltage outputs, min.	1 kΩ
• with voltage outputs, capacitive load, max.	1 µF
• with current outputs, max.	500 Ω
• with current outputs, inductive load, max.	1 mH

Article number	**6ES7145-5ND00-0BA0** ET 200AL, AQ 4xU/I, 4xM12
Cable length	
• shielded, max.	30 m
Settling time	
• for resistive load	1 ms
• for capacitive load	1 ms
• for inductive load	1 ms
Errors/accuracies	
Output ripple (relative to output range, bandwidth 0 to 50 kHz), (+/-)	0.02 %
Linearity error (relative to output range), (+/-)	0.1 %
Temperature error (relative to output range), (+/-)	0.005 %/K
Crosstalk between the outputs, max.	-70 dB
Repeat accuracy in steady state at 25 °C (relative to output range), (+/-)	0.03 %
Operational error limit in overall temperature range	
• Voltage, relative to output range, (+/-)	0.25 %
• Current, relative to output range, (+/-)	0.25 %
Basic error limit (operational limit at 25 °C)	
• Voltage, relative to output range, (+/-)	0.15 %
• Current, relative to output range, (+/-)	0.15 %
Interrupts/diagnostics/ status information	
Substitute values connectable	Yes; channel by channel, parameterizable
Alarms	
• Diagnostic alarm	Yes; Parameterizable
Diagnostic messages	
• Wire-break	Yes; channel-by-channel, only for output type "current"
• Short-circuit	Yes; Actuator supply module by module; channel by channel for output type "voltage"
Diagnostics indication LED	
• Channel status display	Yes; Green LED
• for module diagnostics	Yes; Green/red LED
Potential separation	
between the load voltages	Yes
Potential separation channels	
• between the channels	No
• between the channels and backplane bus	Yes
• between the channels and the power supply of the electronics	No
Degree and class of protection	
IP degree of protection	IP65/67
Ambient conditions	
Ambient temperature during operation	
• min.	-25 °C
• max.	55 °C

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Technical specifications (continued)

Article number	**6ES7145-5ND00-0BA0**
	ET 200AL, AQ 4xU/I, 4xM12
Connection method	
Design of electrical connection for the inputs and outputs	M12, 5-pole
Design of electrical connection for supply voltage	M8, 4-pole
ET-Connection	
• ET-Connection	M8, 4-pin, shielded

Article number	**6ES7145-5ND00-0BA0**
	ET 200AL, AQ 4xU/I, 4xM12
Dimensions	
Width	30 mm
Height	159 mm
Depth	40 mm
Weights	
Weight, approx.	175 g

Ordering data

	Article No.
Analog input modules	
AI 4xU/I/RTD, 4XM12	**6ES7144-5KD00-0BA0**
AQ 4xU/I, 4xM12	**6ES7145-5ND00-0BA0**
Accessories	
Bus cable for backplane bus (ET connection)	
4-pin, shielded	
Pre-assembled at both ends, 2 M8 connectors	
0.19 m	**6ES7194-2LH02-0AA0**
0.3 m	**6ES7194-2LH03-0AA0**
1 m	**6ES7194-2LH10-0AA0**
2 m	**6ES7194-2LH20-0AA0**
5 m	**6ES7194-2LH50-0AA0**
10 m	**6ES7194-2LN10-0AA0**
15 m	**6ES7194-2LN15-0AA0**
Pre-assembled at both ends, 2 M8 connectors, angled	
0.3 m	**6ES7194-2LH03-0AB0**
1 m	**6ES7194-2LH10-0AB0**
2 m	**6ES7194-2LH20-0AB0**
5 m	**6ES7194-2LH50-0AB0**
10 m	**6ES7194-2LN10-0AB0**
15 m	**6ES7194-2LN15-0AB0**
Pre-assembled at one end, 1 M8 connector	
2 m	**6ES7194-2LH20-0AC0**
5 m	**6ES7194-2LH50-0AC0**
10 m	**6ES7194-2LN10-0AC0**
15 m	**6ES7194-2LN15-0AC0**

	Article No.
Power cable M8	
4-pin	
Pre-assembled at both ends, M8 connector and M8 socket	
0.19 m	**6ES7194-2LH02-1AA0**
0.3 m	**6ES7194-2LH03-1AA0**
1 m	**6ES7194-2LH10-1AA0**
2 m	**6ES7194-2LH20-1AA0**
5 m	**6ES7194-2LH50-1AA0**
10 m	**6ES7194-2LN10-1AA0**
15 m	**6ES7194-2LN15-1AA0**
Pre-assembled at both ends, angled M8 connector and angled M8 socket	
0.3 m	**6ES7194-2LH03-1AB0**
1 m	**6ES7194-2LH10-1AB0**
2 m	**6ES7194-2LH20-1AB0**
5 m	**6ES7194-2LH50-1AB0**
10 m	**6ES7194-2LN10-1AB0**
15 m	**6ES7194-2LN15-1AB0**
Pre-assembled at one end, M8 socket	
2 m	**6ES7194-2LH20-1AC0**
5 m	**6ES7194-2LH50-1AC0**
10 m	**6ES7194-2LN10-1AC0**
15 m	**6ES7194-2LN15-1AC0**
M8 connector for ET connection	**6ES7194-2AB00-0AA0**
4-pin, shielded	
M8 power connector	
Male contact insert, 4-pin	**6ES7194-2AA00-0AA0**
Female contact insert, 4-pin	**6ES7194-2AC00-0AA0**
ET connection FastConnect stripping tool	**6ES7194-2KA00-0AA0**
Stripping tool for stripping the ET connection bus cable	
Labels	**6ES7194-2BA00-0AA0**
10 x 5 mm, RAL 9016; 5 frames with 40 labels each	

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Overview



- 30 mm-wide CM IO-Link communication module
- For the connection of up to 4 IO-Link devices according to IO-Link specification V1.0 and V1.1 and port Class B
- The IO-Link parameters are configured using the S7-PCT Port Configuration Tool, V3.2 and higher.

Technical specifications

Article number	**6ES7147-5JD00-0BA0** ET 200AL, CM 4x IO-Link, 4xM12
General information	
Product type designation	CM 4x IO-Link
Product function	
• I&M data	Yes; I&M0 to I&M3
Engineering with	
• STEP 7 TIA Portal configurable/ integrated as of version	STEP 7 V13 SP1 or higher
• STEP 7 configurable/integrated as of version	From V5.5 SP4 Hotfix 3
• PROFIBUS as of GSD version/ GSD revision	GSD as of Revision 5
• PROFINET as of GSD version/ GSD revision	GSDML V2.3.1
Supply voltage	
Load voltage 1L+	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes
Load voltage 2L+	
• Rated value (DC)	24 V
• Reverse polarity protection	Yes; against destruction; load increasing
Input current	
Current consumption (rated value)	40 mA; without load
from load voltage 1L+ (unswitched voltage)	4 A; Maximum value
from load voltage 2L+, max.	4 A; Maximum value
Encoder supply	
Number of outputs	4
24 V encoder supply	
• Short-circuit protection	Yes; per module, electronic
• Output current, max.	1.4 A; Total current of all ports

Article number	**6ES7147-5JD00-0BA0** ET 200AL, CM 4x IO-Link, 4xM12
IO-Link	
Number of ports	4
• of which simultaneously controllable	4
IO-Link protocol 1.0	Yes
IO-Link protocol 1.1	Yes
Transmission rate	4.8 kBaud (COM1); 38.4 kBaud (COM2), 230 kBaud (COM3)
Size of process data, input per port	32 byte
Size of process data, input per module	32 byte
Size of process data, output per port	32 byte
Size of process data, output per module	32 byte
Memory size for device parameter	2 kbyte; for each port
Master backup	Possible with function block IO_LINK_MASTER
Configuration without S7-PCT	Possible; autostart/manual function
Cable length unshielded, max.	20 m
Operating modes	
• IO-Link	Yes
• DI	Yes
• DQ	Yes; max. 100 mA
Connection of IO-Link devices	
• Port type A	Yes; via 3-core cable
• Port type B	Yes; Additional device supply: 1.6 A total current of all ports

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Technical specifications (continued)

Article number	**6ES7147-5JD00-0BA0** ET 200AL, CM 4x IO-Link, 4xM12
Interrupts/diagnostics/ status information	
Alarms	
• Diagnostic alarm	Yes; Parameterizable
Diagnostic messages	
• Monitoring the supply voltage	Yes
• Wire-break	Yes
• Short-circuit	Yes
Diagnostics indication LED	
• Channel status display	Yes; Green LED
• for module diagnostics	Yes; Green/red LED
• For load voltage monitoring	Yes; Green LED
Potential separation	
between the load voltages	Yes
Potential separation channels	
• between the channels	No
• between the channels and backplane bus	Yes
• between the channels and the power supply of the electronics	No
Degree and class of protection	
IP degree of protection	IP65/67

Article number	**6ES7147-5JD00-0BA0** ET 200AL, CM 4x IO-Link, 4xM12
Standards, approvals, certificates	
Suitable for safety-related tripping of standard modules	Yes; From FS01
Highest safety class achievable for safety-related tripping of standard modules	
• Performance level according to ISO 13849-1	PL d
• Category according to ISO 13849-1	Cat. 3
• SILCL according to IEC 62061	SILCL 2
Ambient conditions	
Ambient temperature during operation	
• min.	-25 °C
• max.	55 °C
Connection method	
Design of electrical connection for the inputs and outputs	M12, 5-pole
Design of electrical connection for supply voltage	M8, 4-pole
ET-Connection	
• ET-Connection	M8, 4-pin, shielded
Dimensions	
Width	30 mm
Height	159 mm
Depth	40 mm
Weights	
Weight, approx.	145 g

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Ordering data	Article No.
CM IO-Link	
CM 4X IO-Link, 4XM12; for the connection of up to 4 IO-Link devices according to IO-Link specification V1.0 and V1.1 and port Class B	**6ES7147-5JD00-0BA0**
Accessories	
Bus cable for backplane bus (ET connection)	
4-pin, shielded	
Pre-assembled at both ends, 2 M8 connectors	
0.19 m	**6ES7194-2LH02-0AA0**
0.3 m	**6ES7194-2LH03-0AA0**
1 m	**6ES7194-2LH10-0AA0**
2 m	**6ES7194-2LH20-0AA0**
5 m	**6ES7194-2LH50-0AA0**
10 m	**6ES7194-2LN10-0AA0**
15 m	**6ES7194-2LN15-0AA0**
Pre-assembled at both ends, 2 M8 connectors, angled	
0.3 m	**6ES7194-2LH03-0AB0**
1 m	**6ES7194-2LH10-0AB0**
2 m	**6ES7194-2LH20-0AB0**
5 m	**6ES7194-2LH50-0AB0**
10 m	**6ES7194-2LN10-0AB0**
15 m	**6ES7194-2LN15-0AB0**
Pre-assembled at one end, 1 M8 connector	
2 m	**6ES7194-2LH20-0AC0**
5 m	**6ES7194-2LH50-0AC0**
10 m	**6ES7194-2LN10-0AC0**
15 m	**6ES7194-2LN15-0AC0**

Ordering data	Article No.
Power cable M8	
4-pin	
Pre-assembled at both ends, M8 connector and M8 socket	
0.19 m	**6ES7194-2LH02-1AA0**
0.3 m	**6ES7194-2LH03-1AA0**
1 m	**6ES7194-2LH10-1AA0**
2 m	**6ES7194-2LH20-1AA0**
5 m	**6ES7194-2LH50-1AA0**
10 m	**6ES7194-2LN10-1AA0**
15 m	**6ES7194-2LN15-1AA0**
Pre-assembled at both ends, angled M8 connector and angled M8 socket	
0.3 m	**6ES7194-2LH03-1AB0**
1 m	**6ES7194-2LH10-1AB0**
2 m	**6ES7194-2LH20-1AB0**
5 m	**6ES7194-2LH50-1AB0**
10 m	**6ES7194-2LN10-1AB0**
15 m	**6ES7194-2LN15-1AB0**
Pre-assembled at one end, M8 socket	
2 m	**6ES7194-2LH20-1AC0**
5 m	**6ES7194-2LH50-1AC0**
10 m	**6ES7194-2LN10-1AC0**
15 m	**6ES7194-2LN15-1AC0**
M8 connector for ET connection	**6ES7194-2AB00-0AA0**
4-pin, shielded	
M8 power connector	
Male contact insert, 4-pin	**6ES7194-2AA00-0AA0**
Female contact insert, 4-pin	**6ES7194-2AC00-0AA0**
ET connection FastConnect stripping tool	**6ES7194-2KA00-0AA0**
Stripping tool for stripping the ET connection bus cable	
Labels	**6ES7194-2BA00-0AA0**
10 x 5 mm, RAL 9016; 5 frames with 40 labels each	

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Overview

- Pre-assembled cables in various designs and lengths:
  - For connecting the interface modules and I/O modules via the internal backplane bus (ET connection).
  - For power supply.

Technical specifications

Article number	**6ES7194-2LH02-0AA0**	**6ES7194-2LH03-0AA0**	**6ES7194-2LH10-0AA0**	**6ES7194-2LH20-0AA0**
	Bus cable for ET connection, 0.19m	Bus cable for ET connection, 0.3m	Bus cable for ET connection, 1.0M	Bus cable for ET connection, 2.0M
General information				
Product description	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, 4-pin, shielded	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, 4-pin, shielded	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, 4-pin, shielded	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, 4-pin, shielded
Suitability for use	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67
Degree and class of protection				
Degree of protection acc. to EN 60529				
• IP65	Yes	Yes	Yes	Yes
• IP67	Yes	Yes	Yes	Yes
Ambient conditions				
Ambient temperature during assembly, min.	-30 °C	-30 °C	-30 °C	-30 °C
Ambient temperature during assembly, max.	80 °C	80 °C	80 °C	80 °C
Ambient temperature during storage/transportation				
• min.	-40 °C	-40 °C	-40 °C	-40 °C
• max.	80 °C	80 °C	80 °C	80 °C
Cables				
Cable designation	2Y(ST)CY 1x4x0.5/ 1.0-100-GN	2Y(ST)CY 1x4x0.5/ 1.0-100-GN	2Y(ST)CY 1x4x0.5/ 1.0-100-GN	2Y(ST)CY 1x4x0.5/ 1.0-100-GN
Design of shield	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires
Cable length	0.19 m	0.3 m	1 m	2 m
Number of electrical cores	4	4	4	4
Outer diameter of inner conductor	0.5 mm	0.5 mm	0.5 mm	0.5 mm
Outer diameter of core insulation	1 mm	1 mm	1 mm	1 mm
Outer diameter of cable sheath	5 mm	5 mm	5 mm	5 mm
Number of bending cycles	1 000 000; Cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s^2	1 000 000; Cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s^2	1 000 000; Cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s^2	1 000 000; Cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s^2
Permissible bending radius, single bend, min.	20 mm	20 mm	20 mm	20 mm
Permissible bending radius, multiple bends, min.	40 mm	40 mm	40 mm	40 mm
Bending radius for continuous bending	100 mm	100 mm	100 mm	100 mm
Color of cable sheath	Green	Green	Green	Green
Color of core insulation of data cores	white / yellow / blue / orange	white / yellow / blue / orange	white / yellow / blue / orange	white / yellow / blue / orange
Weight per length	34 kg/km	34 kg/km	34 kg/km	34 kg/km
Mechanics/material				
Type of cable outlet	180 degree cable outlet	180 degree cable outlet	180 degree cable outlet	180 degree cable outlet
Material of housing	metal	metal	metal	metal
Material of cable sheath	PVC	PVC	PVC	PVC
Material of core insulation	PE	PE	PE	PE
Material property				
• Halogen-free	No	No	No	No
• Silicone-free	Yes	Yes	Yes	Yes

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Technical specifications (continued)

Article number	**6ES7194-2LH50-0AA0**	**6ES7194-2LN10-0AA0**	**6ES7194-2LN15-0AA0**
	Bus cable for ET connection, 5.0M	Bus cable for ET connection, 10m	Bus cable for ET connection, 15m
General information			
Product description	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, 4-pin, shielded	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, 4-pin, shielded	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, 4-pin, shielded
Suitability for use	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67
Degree and class of protection			
Degree of protection acc. to EN 60529			
• IP65	Yes	Yes	Yes
• IP67	Yes	Yes	Yes
Ambient conditions			
Ambient temperature during assembly, min.	-30 °C	-30 °C	-30 °C
Ambient temperature during assembly, max.	80 °C	80 °C	80 °C
Ambient temperature during storage/transportation			
• min.	-40 °C	-40 °C	-40 °C
• max.	80 °C	80 °C	80 °C
Cables			
Cable designation	2Y(ST)CY 1x4x0.5/1.0-100-GN	2Y(ST)CY 1x4x0.5/1.0-100-GN	2Y(ST)CY 1x4x0.5/1.0-100-GN
Design of shield	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires
Cable length	5 m	10 m	15 m
Number of electrical cores	4	4	4
Outer diameter of inner conductor	0.5 mm	0.5 mm	0.5 mm
Outer diameter of core insulation	1 mm	1 mm	1 mm
Outer diameter of cable sheath	5 mm	5 mm	5 mm
Number of bending cycles	1 000 000; Cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s^2	1 000 000; Cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s^2	
Permissible bending radius, single bend, min.	20 mm	20 mm	20 mm
Permissible bending radius, multiple bends, min.	40 mm	40 mm	40 mm
Bending radius for continuous bending	100 mm	100 mm	100 mm
Color of cable sheath	Green	Green	Green
Color of core insulation of data cores	white / yellow / blue / orange	white / yellow / blue / orange	white / yellow / blue / orange
Weight per length	34 kg/km	34 kg/km	34 kg/km
Mechanics/material			
Type of cable outlet	180 degree cable outlet	180 degree cable outlet	180 degree cable outlet
Material of housing	metal	metal	metal
Material of cable sheath	PVC	PVC	PVC
Material of core insulation	PE	PE	PE
Material property			
• Halogen-free	No	No	No
• Silicone-free	Yes	Yes	Yes

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Technical specifications (continued)

Article number	**6ES7194-2MH02-0AA0**	**6ES7194-2MH03-0AA0**	**6ES7194-2MH10-0AA0**	**6ES7194-2MH20-0AA0**
	Bus cable for ET connection, 0.19m	Bus cable for ET connection, 0.3m	Bus cable for ET connection, 1.0M	Bus cable for ET connection, 2.0M
General information				
Product description	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, 4-pin, shielded	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, 4-pin, shielded	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, 4-pin, shielded	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, 4-pin, shielded
Suitability for use	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67
Degree and class of protection				
Degree of protection acc. to EN 60529				
• IP65	Yes	Yes	Yes	Yes
• IP67	Yes	Yes	Yes	Yes
Ambient conditions				
Ambient temperature during assembly, min.	-30 °C	-30 °C	-30 °C	-30 °C
Ambient temperature during assembly, max.	80 °C	80 °C	80 °C	80 °C
Ambient temperature during storage/transportation				
• min.	-40 °C	-40 °C	-40 °C	-40 °C
• max.	80 °C	80 °C	80 °C	80 °C
Cables				
Cable designation	2Y(ST)C11Y 2x2x0.5/1.0-100-GN	2Y(ST)C11Y 2x2x0.5/1.0-100-GN	2Y(ST)C11Y 2x2x0.5/1.0-100-GN	2Y(ST)C11Y 2x2x0.5/1.0-100-GN
Design of shield	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires
Cable length	0.19 m	0.3 m	1 m	2 m
Number of electrical cores	4	4	4	4
Outer diameter of inner conductor	0.5 mm	0.5 mm	0.5 mm	0.5 mm
Outer diameter of core insulation	1 mm	1 mm	1 mm	1 mm
Outer diameter of cable sheath	5 mm	5 mm	5 mm	5 mm
Number of bending cycles	1 000 000; Cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s^2	1 000 000; Cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s^2	1 000 000; Cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s^2	1 000 000; Cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s^2
Permissible bending radius, single bend, min.	20 mm	20 mm	20 mm	20 mm
Permissible bending radius, multiple bends, min.	40 mm	40 mm	40 mm	40 mm
Bending radius for continuous bending	100 mm	100 mm	100 mm	100 mm
Color of cable sheath	Green	Green	Green	Green
Color of core insulation of data cores	white / yellow / blue / orange	white / yellow / blue / orange	white / yellow / blue / orange	white / yellow / blue / orange
Weight per length	34 kg/km	34 kg/km	34 kg/km	34 kg/km
Mechanics/material				
Type of cable outlet	180 degree cable outlet	180 degree cable outlet	180 degree cable outlet	180 degree cable outlet
Material of housing	metal	metal	metal	metal
Material of cable sheath	PUR	PUR	PUR	PUR
Material of core insulation	PE	PE	PE	PE
Material property				
• Halogen-free	Yes	Yes	Yes	Yes
• Silicone-free	Yes	Yes	Yes	Yes

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Technical specifications (continued)

Article number	**6ES7194-2MH50-0AA0**	**6ES7194-2MN10-0AA0**	**6ES7194-2MN15-0AA0**
	Bus cable for ET connection, 5.0M	Bus cable for ET connection, 10m	Bus cable for ET connection, 15m
General information			
Product description	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, 4-pin, shielded	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, 4-pin, shielded	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, 4-pin, shielded
Suitability for use	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67
Degree and class of protection			
Degree of protection acc. to EN 60529			
• IP65	Yes	Yes	Yes
• IP67	Yes	Yes	Yes
Ambient conditions			
Ambient temperature during assembly, min.	-30 °C	-30 °C	-30 °C
Ambient temperature during assembly, max.	80 °C	80 °C	80 °C
Ambient temperature during storage/transportation			
• min.	-40 °C	-40 °C	-40 °C
• max.	80 °C	80 °C	80 °C
Cables			
Cable designation	2Y(ST)C11Y 2x2x0.5/1.0-100-GN	2Y(ST)C11Y 2x2x0.5/1.0-100-GN	2Y(ST)C11Y 2x2x0.5/1.0-100-GN
Design of shield	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires
Cable length	5 m	10 m	15 m
Number of electrical cores	4	4	4
Outer diameter of inner conductor	0.5 mm	0.5 mm	0.5 mm
Outer diameter of core insulation	1 mm	1 mm	1 mm
Outer diameter of cable sheath	5 mm	5 mm	5 mm
Number of bending cycles	1 000 000; Cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s^2	1 000 000; Cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s^2	
Permissible bending radius, single bend, min.	20 mm	20 mm	20 mm
Permissible bending radius, multiple bends, min.	40 mm	40 mm	40 mm
Bending radius for continuous bending	100 mm	100 mm	100 mm
Color of cable sheath	Green	Green	Green
Color of core insulation of data cores	white / yellow / blue / orange	white / yellow / blue / orange	white / yellow / blue / orange
Weight per length	34 kg/km	34 kg/km	34 kg/km
Mechanics/material			
Type of cable outlet	180 degree cable outlet	180 degree cable outlet	180 degree cable outlet
Material of housing	metal	metal	metal
Material of cable sheath	PUR	PUR	PUR
Material of core insulation	PE	PE	PE
Material property			
• Halogen-free	Yes	Yes	Yes
• Silicone-free	Yes	Yes	Yes

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Technical specifications (continued)

Article number	**6ES7194-2LH03-0AB0**	**6ES7194-2LH10-0AB0**	**6ES7194-2LH20-0AB0**
	Bus cable for ET connection, angled, 0.3m	Bus cable for ET connection, angled, 1.0M	Bus cable for ET connection, angled, 2.0M
General information			
Product description	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, angled, 4-pin, shielded	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, angled, 4-pin, shielded	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, angled, 4-pin, shielded
Suitability for use	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67
Degree and class of protection			
Degree of protection acc. to EN 60529			
• IP65	Yes	Yes	Yes
• IP67	Yes	Yes	Yes
Ambient conditions			
Ambient temperature during assembly, min.	-30 °C	-30 °C	-30 °C
Ambient temperature during assembly, max.	80 °C	80 °C	80 °C
Ambient temperature during storage/transportation			
• min.	-40 °C	-40 °C	-40 °C
• max.	80 °C	80 °C	80 °C
Cables			
Cable designation	2Y(ST)CY 1x4x0.5/1.0-100-GN	2Y(ST)CY 1x4x0.5/1.0-100-GN	2Y(ST)CY 1x4x0.5/1.0-100-GN
Design of shield	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires
Cable length	0.3 m	1 m	2 m
Number of electrical cores	4	4	4
Outer diameter of inner conductor	0.5 mm	0.5 mm	0.5 mm
Outer diameter of core insulation	1 mm	1 mm	1 mm
Outer diameter of cable sheath	5 mm	5 mm	5 mm
Number of bending cycles	1 000 000; Cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s^2	1 000 000; Cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s^2	1 000 000; Cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s^2
Permissible bending radius, single bend, min.	20 mm	20 mm	20 mm
Permissible bending radius, multiple bends, min.	40 mm	40 mm	40 mm
Bending radius for continuous bending	100 mm	100 mm	100 mm
Color of cable sheath	Green	Green	Green
Color of core insulation of data cores	white / yellow / blue / orange	white / yellow / blue / orange	white / yellow / blue / orange
Weight per length	34 kg/km	34 kg/km	34 kg/km
Mechanics/material			
Type of cable outlet	90 degree cable outlet	90 degree cable outlet	90 degree cable outlet
Material of housing	metal	metal	metal
Material of cable sheath	PVC	PVC	PVC
Material of core insulation	PE	PE	PE
Material property			
• Halogen-free	No	No	No
• Silicone-free	Yes	Yes	Yes

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Technical specifications (continued)

Article number	**6ES7194-2LH50-0AB0** Bus cable for ET connection, angled, 5.0M	**6ES7194-2LN10-0AB0** Bus cable for ET connection, angled, 10m	**6ES7194-2LN15-0AB0** Bus cable for ET connection, angled, 15m
General information			
Product description	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, angled, 4-pin, shielded	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, angled, 4-pin, shielded	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, angled, 4-pin, shielded
Suitability for use	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67
Degree and class of protection			
Degree of protection acc. to EN 60529			
• IP65	Yes	Yes	Yes
• IP67	Yes	Yes	Yes
Ambient conditions			
Ambient temperature during assembly, min.	-30 °C	-30 °C	-30 °C
Ambient temperature during assembly, max.	80 °C	80 °C	80 °C
Ambient temperature during storage/transportation			
• min.	-40 °C	-40 °C	-40 °C
• max.	80 °C	80 °C	80 °C
Cables			
Cable designation	2Y(ST)CY 1x4x0.5/1.0-100-GN	2Y(ST)CY 1x4x0.5/1.0-100-GN	2Y(ST)CY 1x4x0.5/1.0-100-GN
Design of shield	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires
Cable length	5 m	10 m	15 m
Number of electrical cores	4	4	4
Outer diameter of inner conductor	0.5 mm	0.5 mm	0.5 mm
Outer diameter of core insulation	1 mm	1 mm	1 mm
Outer diameter of cable sheath	5 mm	5 mm	5 mm
Number of bending cycles	1 000 000; Cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s^2	1 000 000; Cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s^2	
Permissible bending radius, single bend, min.	20 mm	20 mm	20 mm
Permissible bending radius, multiple bends, min.	40 mm	40 mm	40 mm
Bending radius for continuous bending	100 mm	100 mm	100 mm
Color of cable sheath	Green	Green	Green
Color of core insulation of data cores	white / yellow / blue / orange	white / yellow / blue / orange	white / yellow / blue / orange
Weight per length	34 kg/km	34 kg/km	34 kg/km
Mechanics/material			
Type of cable outlet	90 degree cable outlet	90 degree cable outlet	90 degree cable outlet
Material of housing	metal	metal	metal
Material of cable sheath	PVC	PVC	PVC
Material of core insulation	PE	PE	PE
Material property			
• Halogen-free	No	No	No
• Silicone-free	Yes	Yes	Yes

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Technical specifications (continued)

Article number	**6ES7194-2MH03-0AB0**	**6ES7194-2MH10-0AB0**	**6ES7194-2MH20-0AB0**
	Bus cable for ET connection, angled, 0.3m	Bus cable for ET connection, angled, 1.0M	Bus cable for ET connection, angled, 2.0M
General information			
Product description	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, angled, 4-pin, shielded	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, angled, 4-pin, shielded	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, angled, 4-pin, shielded
Suitability for use	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67
Degree and class of protection			
Degree of protection acc. to EN 60529			
• IP65	Yes	Yes	Yes
• IP67	Yes	Yes	Yes
Ambient conditions			
Ambient temperature during assembly, min.	-30 °C	-30 °C	-30 °C
Ambient temperature during assembly, max.	80 °C	80 °C	80 °C
Ambient temperature during storage/transportation			
• min.	-40 °C	-40 °C	-40 °C
• max.	80 °C	80 °C	80 °C
Cables			
Cable designation	2Y(ST)C11Y 2x2x0.5/1.0-100-GN	2Y(ST)C11Y 2x2x0.5/1.0-100-GN	2Y(ST)C11Y 2x2x0.5/1.0-100-GN
Design of shield	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires
Cable length	0.3 m	1 m	2 m
Number of electrical cores	4	4	4
Outer diameter of inner conductor	0.5 mm	0.5 mm	0.5 mm
Outer diameter of core insulation	1 mm	1 mm	1 mm
Outer diameter of cable sheath	5 mm	5 mm	5 mm
Number of bending cycles	1 000 000; Cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s^2	1 000 000; Cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s^2	1 000 000; Cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s^2
Permissible bending radius, single bend, min.	20 mm	20 mm	20 mm
Permissible bending radius, multiple bends, min.	40 mm	40 mm	40 mm
Bending radius for continuous bending	100 mm	100 mm	100 mm
Color of cable sheath	Green	Green	Green
Color of core insulation of data cores	white / yellow / blue / orange	white / yellow / blue / orange	white / yellow / blue / orange
Weight per length	34 kg/km	34 kg/km	34 kg/km
Mechanics/material			
Type of cable outlet	90 degree cable outlet	90 degree cable outlet	90 degree cable outlet
Material of housing	metal	metal	metal
Material of cable sheath	PUR	PUR	PUR
Material of core insulation	PE	PE	PE
Material property			
• Halogen-free	Yes	Yes	Yes
• Silicone-free	Yes	Yes	Yes

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Technical specifications (continued)

Article number	**6ES7194-2MH50-0AB0** Bus cable for ET connection, angled, 5.0M	**6ES7194-2MN10-0AB0** Bus cable for ET connection, angled, 10m	**6ES7194-2MN15-0AB0** Bus cable for ET connection, angled, 15m
General information			
Product description	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, angled, 4-pin, shielded	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, angled, 4-pin, shielded	Flexible cable (4-core), preassembled at both ends with 2x M8 plugs, angled, 4-pin, shielded
Suitability for use	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67
Degree and class of protection			
Degree of protection acc. to EN 60529			
• IP65	Yes	Yes	Yes
• IP67	Yes	Yes	Yes
Ambient conditions			
Ambient temperature during assembly, min.	-30 °C	-30 °C	-30 °C
Ambient temperature during assembly, max.	80 °C	80 °C	80 °C
Ambient temperature during storage/transportation			
• min.	-40 °C	-40 °C	-40 °C
• max.	80 °C	80 °C	80 °C
Cables			
Cable designation	2Y(ST)C11Y 2x2x0.5/1.0-100-GN	2Y(ST)C11Y 2x2x0.5/1.0-100-GN	2Y(ST)C11Y 2x2x0.5/1.0-100-GN
Design of shield	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires
Cable length	5 m	10 m	15 m
Number of electrical cores	4	4	4
Outer diameter of inner conductor	0.5 mm	0.5 mm	0.5 mm
Outer diameter of core insulation	1 mm	1 mm	1 mm
Outer diameter of cable sheath	5 mm	5 mm	5 mm
Number of bending cycles	1 000 000; Cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s²	1 000 000; Cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s²	
Permissible bending radius, single bend, min.	20 mm	20 mm	20 mm
Permissible bending radius, multiple bends, min.	40 mm	40 mm	40 mm
Bending radius for continuous bending	100 mm	100 mm	100 mm
Color of cable sheath	Green	Green	Green
Color of core insulation of data cores	white / yellow / blue / orange	white / yellow / blue / orange	white / yellow / blue / orange
Weight per length	34 kg/km	34 kg/km	34 kg/km
Mechanics/material			
Type of cable outlet	90 degree cable outlet	90 degree cable outlet	90 degree cable outlet
Material of housing	metal	metal	metal
Material of cable sheath	PUR	PUR	PUR
Material of core insulation	PE	PE	PE
Material property			
• Halogen-free	Yes	Yes	Yes
• Silicone-free	Yes	Yes	Yes

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Technical specifications (continued)

Article number	**6ES7194-2LH20-0AC0**	**6ES7194-2LH50-0AC0**	**6ES7194-2LN10-0AC0**	**6ES7194-2LN15-0AC0**
	Bus cable for ET connection, 2.0M	Bus cable for ET connection, 5.0M	Bus cable for ET connection, 10m	Bus cable for ET connection, 15m
General information				
Product description	Flexible cable (4-core), preassembled at one end with 1x M8 plug, 4-pin, shielded	Flexible cable (4-core), preassembled at one end with 1x M8 plug, 4-pin, shielded	Flexible cable (4-core), preassembled at one end with 1x M8 plug, 4-pin, shielded	Flexible cable (4-core), preassembled at one end with 1x M8 plug, 4-pin, shielded
Suitability for use	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67
Degree and class of protection				
Degree of protection acc. to EN 60529				
• IP65	Yes	Yes	Yes	Yes
• IP67	Yes	Yes	Yes	Yes
Ambient conditions				
Ambient temperature during assembly, min.	-30 °C	-30 °C	-30 °C	-30 °C
Ambient temperature during assembly, max.	80 °C	80 °C	80 °C	80 °C
Ambient temperature during storage/transportation				
• min.	-40 °C	-40 °C	-40 °C	-40 °C
• max.	80 °C	80 °C	80 °C	80 °C
Cables				
Cable designation	2Y(ST)CY 1x4x0.5/ 1.0-100-GN	2Y(ST)CY 1x4x0.5/ 1.0-100-GN	2Y(ST)CY 1x4x0.5/ 1.0-100-GN	2Y(ST)CY 1x4x0.5/ 1.0-100-GN
Design of shield	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires
Cable length	2 m	5 m	10 m	15 m
Number of electrical cores	4	4	4	4
Outer diameter of inner conductor	0.5 mm	0.5 mm	0.5 mm	0.5 mm
Outer diameter of core insulation	1 mm	1 mm	1 mm	1 mm
Outer diameter of cable sheath	5 mm	5 mm	5 mm	5 mm
Number of bending cycles	1 000 000; Cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s²	1 000 000; Cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s²	1 000 000; Cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s²	
Permissible bending radius, single bend, min.	20 mm	20 mm	20 mm	20 mm
Permissible bending radius, multiple bends, min.	40 mm	40 mm	40 mm	40 mm
Bending radius for continuous bending	100 mm	100 mm	100 mm	100 mm
Color of cable sheath	Green	Green	Green	Green
Color of core insulation of data cores	white / yellow / blue / orange	white / yellow / blue / orange	white / yellow / blue / orange	white / yellow / blue / orange
Weight per length	34 kg/km	34 kg/km	34 kg/km	34 kg/km
Mechanics/material				
Type of cable outlet	180 degree cable outlet	180 degree cable outlet	180 degree cable outlet	180 degree cable outlet
Material of housing	metal	metal	metal	metal
Material of cable sheath	PVC	PVC	PVC	PVC
Material of core insulation	PE	PE	PE	PE
Material property				
• Halogen-free	No	No	No	No
• Silicone-free	Yes	Yes	Yes	Yes

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Technical specifications (continued)

Article number	6ES7194-2MH20-0AC0	6ES7194-2MH50-0AC0	6ES7194-2MN10-0AC0	6ES7194-2MN15-0AC0
	Bus cable for ET connection, 2.0M	Bus cable for ET connection, 5.0M	Bus cable for ET connection, 10m	Bus cable for ET connection, 15m
General information				
Product description	Flexible cable (4-core), preassembled at one end with 1x M8 plug, 4-pin, shielded	Flexible cable (4-core), preassembled at one end with 1x M8 plug, 4-pin, shielded	Flexible cable (4-core), preassembled at one end with 1x M8 plug, 4-pin, shielded	Flexible cable (4-core), preassembled at one end with 1x M8 plug, 4-pin, shielded
Suitability for use	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67
Degree and class of protection				
Degree of protection acc. to EN 60529				
• IP65	Yes	Yes	Yes	Yes
• IP67	Yes	Yes	Yes	Yes
Ambient conditions				
Ambient temperature during assembly, min.	-30 °C	-30 °C	-30 °C	-30 °C
Ambient temperature during assembly, max.	80 °C	80 °C	80 °C	80 °C
Ambient temperature during storage/transportation				
• min.	-40 °C	-40 °C	-40 °C	-40 °C
• max.	80 °C	80 °C	80 °C	80 °C
Cables				
Cable designation	2Y(ST)C11Y 2x2x0.5/ 1.0-100-GN	2Y(ST)C11Y 2x2x0.5/ 1.0-100-GN	2Y(ST)C11Y 2x2x0.5/ 1.0-100-GN	2Y(ST)C11Y 2x2x0.5/ 1.0-100-GN
Design of shield	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires	Overlapped aluminum-clad foil, sheathed in a braid of tin-plated copper wires
Cable length	2 m	5 m	10 m	15 m
Number of electrical cores	4	4	4	4
Outer diameter of inner conductor	0.5 mm	0.5 mm	0.5 mm	0.5 mm
Outer diameter of core insulation	1 mm	1 mm	1 mm	1 mm
Outer diameter of cable sheath	5 mm	5 mm	5 mm	5 mm
Number of bending cycles	1 000 000; Cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s²	1 000 000; Cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s²	1 000 000; Cable carrier compliant for 1 million bending cycles with a bending radius of 100 mm, a speed of 4 m/s and an acceleration of 4 m/s²	
Permissible bending radius, single bend, min.	20 mm	20 mm	20 mm	20 mm
Permissible bending radius, multiple bends, min.	40 mm	40 mm	40 mm	40 mm
Bending radius for continuous bending	100 mm	100 mm	100 mm	100 mm
Color of cable sheath	Green	Green	Green	Green
Color of core insulation of data cores	white / yellow / blue / orange	white / yellow / blue / orange	white / yellow / blue / orange	white / yellow / blue / orange
Weight per length	34 kg/km	34 kg/km	34 kg/km	34 kg/km
Mechanics/material				
Type of cable outlet	180 degree cable outlet	180 degree cable outlet	180 degree cable outlet	180 degree cable outlet
Material of housing	metal	metal	metal	metal
Material of cable sheath	PUR	PUR	PUR	PUR
Material of core insulation	PE	PE	PE	PE
Material property				
• Halogen-free	Yes	Yes	Yes	Yes
• Silicone-free	Yes	Yes	Yes	Yes

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Technical specifications (continued)

Article number	**6ES7194-2LH02-1AA0**	**6ES7194-2LH03-1AA0**	**6ES7194-2LH10-1AA0**	**6ES7194-2LH20-1AA0**
	Power Cable M8, 0.19m	Power Cable M8, 0.3m	Power Cable M8, 1.0M	Power Cable M8, 2.0M
General information				
Product description	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector
Suitability for use	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply
Degree and class of protection				
Degree of protection acc. to EN 60529				
• IP65	Yes	Yes	Yes	Yes
• IP67	Yes	Yes	Yes	Yes
Ambient conditions				
Ambient temperature during assembly, min.	-30 °C	-30 °C	-30 °C	-30 °C
Ambient temperature during assembly, max.	80 °C	80 °C	80 °C	80 °C
Ambient temperature during storage/transportation				
• min.	-40 °C	-40 °C	-40 °C	-40 °C
• max.	80 °C	80 °C	80 °C	80 °C
Cables				
Cable designation	4 Li9Y 0.50 mm^2 Y	4 Li9Y 0.50 mm^2 Y	4 Li9Y 0.50 mm^2 Y	4 Li9Y 0.50 mm^2 Y
Cable length	0.19 m	0.3 m	1 m	2 m
Number of electrical cores	4	4	4	4
Outer diameter of inner conductor	0.8 mm	0.8 mm	0.8 mm	0.8 mm
Outer diameter of core insulation	1.46 mm	1.46 mm	1.46 mm	1.46 mm
Outer diameter of cable sheath	5.2 mm	5.2 mm	5.2 mm	5.2 mm
Number of bending cycles	2 500 000; Cable carrier compliant for 2.5 million bending cycles with a bending radius of 52 mm, a speed of 3 m/s and an acceleration of 10 m/s^2	2 500 000; Cable carrier compliant for 2.5 million bending cycles with a bending radius of 52 mm, a speed of 3 m/s and an acceleration of 10 m/s^2	2 500 000; Cable carrier compliant for 2.5 million bending cycles with a bending radius of 52 mm, a speed of 3 m/s and an acceleration of 10 m/s^2	2 500 000; Cable carrier compliant for 2.5 million bending cycles with a bending radius of 52 mm, a speed of 3 m/s and an acceleration of 10 m/s^2
Permissible bending radius, single bend, min.	26 mm	26 mm	26 mm	26 mm
Permissible bending radius, multiple bends, min.	52 mm	52 mm	52 mm	52 mm
Bending radius for continuous bending	52 mm	52 mm	52 mm	52 mm
Color of cable sheath	gray	gray	gray	gray
Color of core insulation of energy core	white / brown / blue / black	white / brown / blue / black	white / brown / blue / black	white / brown / blue / black
Weight per length	44 kg/km	44 kg/km	44 kg/km	44 kg/km
Mechanics/material				
Type of cable outlet	180 degree cable outlet	180 degree cable outlet	180 degree cable outlet	180 degree cable outlet
Material of housing	plastic	plastic	plastic	plastic
Material of cable sheath	PVC	PVC	PVC	PVC
Material of core insulation	PP	PP	PP	PP
Material property				
• Silicone-free	Yes	Yes	Yes	Yes

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Technical specifications (continued)

Article number	**6ES7194-2LH50-1AA0**	**6ES7194-2LN10-1AA0**	**6ES7194-2LN15-1AA0**
	Power Cable M8, 5.0M	Power Cable M8, 10m	Power Cable M8, 15m
General information			
Product description	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector
Suitability for use	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply
Degree and class of protection			
Degree of protection acc. to EN 60529			
• IP65	Yes	Yes	Yes
• IP67	Yes	Yes	Yes
Ambient conditions			
Ambient temperature during assembly, min.	-30 °C	-30 °C	-30 °C
Ambient temperature during assembly, max.	80 °C	80 °C	80 °C
Ambient temperature during storage/transportation			
• min.	-40 °C	-40 °C	-40 °C
• max.	80 °C	80 °C	80 °C
Cables			
Cable designation	4 Li9Y 0.50 mm^2 Y	4 Li9Y 0.50 mm^2 Y	4 Li9Y 0.50 mm^2 Y
Cable length	5 m	10 m	15 m
Number of electrical cores	4	4	4
Outer diameter of inner conductor	0.8 mm	0.8 mm	0.8 mm
Outer diameter of core insulation	1.46 mm	1.46 mm	1.46 mm
Outer diameter of cable sheath	5.2 mm	5.2 mm	5.2 mm
Number of bending cycles	2 500 000; Cable carrier compliant for 2.5 million bending cycles with a bending radius of 52 mm, a speed of 3 m/s and an acceleration of 10 m/s^2	2 500 000; Cable carrier compliant for 2.5 million bending cycles with a bending radius of 52 mm, a speed of 3 m/s and an acceleration of 10 m/s^2	2 500 000; Cable carrier compliant for 2.5 million bending cycles with a bending radius of 52 mm, a speed of 3 m/s and an acceleration of 10 m/s^2
Permissible bending radius, single bend, min.	26 mm	26 mm	26 mm
Permissible bending radius, multiple bends, min.	52 mm	52 mm	52 mm
Bending radius for continuous bending	52 mm	52 mm	52 mm
Color of cable sheath	gray	gray	gray
Color of core insulation of energy core	white / brown / blue / black	white / brown / blue / black	white / brown / blue / black
Weight per length	44 kg/km	44 kg/km	44 kg/km
Mechanics/material			
Type of cable outlet	180 degree cable outlet	180 degree cable outlet	180 degree cable outlet
Material of housing	plastic	plastic	plastic
Material of cable sheath	PVC	PVC	PVC
Material of core insulation	PP	PP	PP
Material property			
• Silicone-free	Yes	Yes	Yes

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Technical specifications (continued)

Article number	**6ES7194-2MH50-1AA0**	**6ES7194-2MN10-1AA0**	**6ES7194-2MN15-1AA0**
	Power Cable M8, 5.0M	Power Cable M8, 10m	Power Cable M8, 15m
General information			
Product description	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector
Suitability for use	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply
Degree and class of protection			
Degree of protection acc. to EN 60529			
• IP65	Yes	Yes	Yes
• IP67	Yes	Yes	Yes
Ambient conditions			
Ambient temperature during assembly, min.	-25 °C	-25 °C	-25 °C
Ambient temperature during assembly, max.	80 °C	80 °C	80 °C
Ambient temperature during storage/transportation			
• min.	-25 °C	-25 °C	-25 °C
• max.	80 °C	80 °C	80 °C
Cables			
Cable designation	LIF9Y11YFHF 4x0.50 mm^2	LIF9Y11YFHF 4x0.50 mm^2	LIF9Y11YFHF 4x0.50 mm^2
Cable length	5 m	10 m	15 m
Number of electrical cores	4	4	4
Outer diameter of inner conductor	1 mm	1 mm	1 mm
Outer diameter of core insulation	1.46 mm	1.46 mm	1.46 mm
Outer diameter of cable sheath	5.1 mm	5.1 mm	5.1 mm
Number of bending cycles	2 000 000; Cable carrier compliant for 2 million bending cycles with a bending radius of 51 mm, a speed of 5 m/s and an acceleration of 5 m/s^2	2 000 000; Cable carrier compliant for 2 million bending cycles with a bending radius of 51 mm, a speed of 5 m/s and an acceleration of 5 m/s^2	2 000 000; Cable carrier compliant for 2 million bending cycles with a bending radius of 51 mm, a speed of 5 m/s and an acceleration of 5 m/s^2
Permissible bending radius, single bend, min.	26 mm	26 mm	26 mm
Permissible bending radius, multiple bends, min.	51 mm	51 mm	51 mm
Bending radius for continuous bending	51 mm	51 mm	51 mm
Color of cable sheath	gray	gray	gray
Color of core insulation of energy core	white / brown / blue / black	white / brown / blue / black	white / brown / blue / black
Weight per length	44 kg/km	44 kg/km	44 kg/km
Mechanics/material			
Type of cable outlet	180 degree cable outlet	180 degree cable outlet	180 degree cable outlet
Material of housing	plastic	plastic	plastic
Material of cable sheath	PE-PUR	PE-PUR	PE-PUR
Material of core insulation	PP	PP	PP
Material property			
• Halogen-free	Yes	Yes	Yes
• Silicone-free	Yes	Yes	Yes

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Technical specifications (continued)

Article number	**6ES7194-2LH03-1AB0**	**6ES7194-2LH10-1AB0**	**6ES7194-2LH20-1AB0**
	Power Cable M8, angled, 0.3m	Power Cable M8, angled, 1.0M	Power Cable M8, angled, 2.0M
General information			
Product description	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector, angled	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector, angled	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector, angled
Suitability for use	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply
Degree and class of protection			
Degree of protection acc. to EN 60529			
• IP65	Yes	Yes	Yes
• IP67	Yes	Yes	Yes
Ambient conditions			
Ambient temperature during assembly, min.	-30 °C	-30 °C	-30 °C
Ambient temperature during assembly, max.	80 °C	80 °C	80 °C
Ambient temperature during storage/transportation			
• min.	-40 °C	-40 °C	-40 °C
• max.	80 °C	80 °C	80 °C
Cables			
Cable designation	4 Li9Y 0.50 mm^2 Y	4 Li9Y 0.50 mm^2 Y	4 Li9Y 0.50 mm^2 Y
Cable length	0.3 m	1 m	2 m
Number of electrical cores	4	4	4
Outer diameter of inner conductor	0.8 mm	0.8 mm	0.8 mm
Outer diameter of core insulation	1.46 mm	1.46 mm	1.46 mm
Outer diameter of cable sheath	5.2 mm	5.2 mm	5.2 mm
Number of bending cycles	2 500 000; Cable carrier compliant for 2.5 million bending cycles with a bending radius of 52 mm, a speed of 3 m/s and an acceleration of 10 m/s^2	2 500 000; Cable carrier compliant for 2.5 million bending cycles with a bending radius of 52 mm, a speed of 3 m/s and an acceleration of 10 m/s^2	2 500 000; Cable carrier compliant for 2.5 million bending cycles with a bending radius of 52 mm, a speed of 3 m/s and an acceleration of 10 m/s^2
Permissible bending radius, single bend, min.	26 mm	26 mm	26 mm
Permissible bending radius, multiple bends, min.	52 mm	52 mm	52 mm
Bending radius for continuous bending	52 mm	52 mm	52 mm
Color of cable sheath	gray	gray	gray
Color of core insulation of energy core	white / brown / blue / black	white / brown / blue / black	white / brown / blue / black
Weight per length	44 kg/km	44 kg/km	44 kg/km
Mechanics/material			
Type of cable outlet	90 degree cable outlet	90 degree cable outlet	90 degree cable outlet
Material of housing	plastic	plastic	plastic
Material of cable sheath	PVC	PVC	PVC
Material of core insulation	PP	PP	PP
Material property			
• Silicone-free	Yes	Yes	Yes

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Technical specifications (continued)

Article number	**6ES7194-2LH50-1AB0**	**6ES7194-2LN10-1AB0**	**6ES7194-2LN15-1AB0**
	Power Cable M8, angled, 5.0M	Power Cable M8, angled, 10m	Power Cable M8, angled, 15m
General information			
Product description	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector, angled	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector, angled	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector, angled
Suitability for use	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply
Degree and class of protection			
Degree of protection acc. to EN 60529			
• IP65	Yes	Yes	Yes
• IP67	Yes	Yes	Yes
Ambient conditions			
Ambient temperature during assembly, min.	-30 °C	-30 °C	-30 °C
Ambient temperature during assembly, max.	80 °C	80 °C	80 °C
Ambient temperature during storage/transportation			
• min.	-40 °C	-40 °C	-40 °C
• max.	80 °C	80 °C	80 °C
Cables			
Cable designation	4 Li9Y 0.50 mm^2 Y	4 Li9Y 0.50 mm^2 Y	4 Li9Y 0.50 mm^2 Y
Cable length	5 m	10 m	15 m
Number of electrical cores	4	4	4
Outer diameter of inner conductor	0.8 mm	0.8 mm	0.8 mm
Outer diameter of core insulation	1.46 mm	1.46 mm	1.46 mm
Outer diameter of cable sheath	5.2 mm	5.2 mm	5.2 mm
Number of bending cycles	2 500 000; Cable carrier compliant for 2.5 million bending cycles with a bending radius of 52 mm, a speed of 3 m/s and an acceleration of 10 m/s^2	2 500 000; Cable carrier compliant for 2.5 million bending cycles with a bending radius of 52 mm, a speed of 3 m/s and an acceleration of 10 m/s^2	2 500 000; Cable carrier compliant for 2.5 million bending cycles with a bending radius of 52 mm, a speed of 3 m/s and an acceleration of 10 m/s^2
Permissible bending radius, single bend, min.	26 mm	26 mm	26 mm
Permissible bending radius, multiple bends, min.	52 mm	52 mm	52 mm
Bending radius for continuous bending	52 mm	52 mm	52 mm
Color of cable sheath	gray	gray	gray
Color of core insulation of energy core	white / brown / blue / black	white / brown / blue / black	white / brown / blue / black
Weight per length	44 kg/km	44 kg/km	44 kg/km
Mechanics/material			
Type of cable outlet	90 degree cable outlet	90 degree cable outlet	90 degree cable outlet
Material of housing	plastic	plastic	plastic
Material of cable sheath	PVC	PVC	PVC
Material of core insulation	PP	PP	PP
Material property			
• Silicone-free	Yes	Yes	Yes

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Technical specifications (continued)

Article number	**6ES7194-2MH50-1AB0**	**6ES7194-2MN10-1AB0**	**6ES7194-2MN15-1AB0**
	Power Cable M8, angled, 5.0M	Power Cable M8, angled, 10m	Power Cable M8, angled, 15m
General information			
Product description	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector, angled	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector, angled	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector, angled
Suitability for use	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply
Degree and class of protection			
Degree of protection acc. to EN 60529			
• IP65	Yes	Yes	Yes
• IP67	Yes	Yes	Yes
Ambient conditions			
Ambient temperature during assembly, min.	-25 °C	-25 °C	-25 °C
Ambient temperature during assembly, max.	80 °C	80 °C	80 °C
Ambient temperature during storage/transportation			
• min.	-25 °C	-25 °C	-25 °C
• max.	80 °C	80 °C	80 °C
Cables			
Cable designation	LIF9Y11YFHF 4x0.50 mm^2	LIF9Y11YFHF 4x0.50 mm^2	LIF9Y11YFHF 4x0.50 mm^2
Cable length	5 m	10 m	15 m
Number of electrical cores	4	4	4
Outer diameter of inner conductor	1 mm	1 mm	1 mm
Outer diameter of core insulation	1.46 mm	1.46 mm	1.46 mm
Outer diameter of cable sheath	5.1 mm	5.1 mm	5.1 mm
Number of bending cycles	2 000 000; Cable carrier compliant for 2 million bending cycles with a bending radius of 51 mm, a speed of 5 m/s and an acceleration of 5 m/s^2	2 000 000; Cable carrier compliant for 2 million bending cycles with a bending radius of 51 mm, a speed of 5 m/s and an acceleration of 5 m/s^2	2 000 000; Cable carrier compliant for 2 million bending cycles with a bending radius of 51 mm, a speed of 5 m/s and an acceleration of 5 m/s^2
Permissible bending radius, single bend, min.	26 mm	26 mm	26 mm
Permissible bending radius, multiple bends, min.	51 mm	51 mm	51 mm
Bending radius for continuous bending	51 mm	51 mm	51 mm
Color of cable sheath	gray	gray	gray
Color of core insulation of energy core	white / brown / blue / black	white / brown / blue / black	white / brown / blue / black
Weight per length	44 kg/km	44 kg/km	44 kg/km
Mechanics/material			
Type of cable outlet	90 degree cable outlet	90 degree cable outlet	90 degree cable outlet
Material of housing	plastic	plastic	plastic
Material of cable sheath	PE-PUR	PE-PUR	PE-PUR
Material of core insulation	PP	PP	PP
Material property			
• Halogen-free	Yes	Yes	Yes
• Silicone-free	Yes	Yes	Yes

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Technical specifications (continued)

Article number	**6ES7194-2MH03-1AB0**	**6ES7194-2MH10-1AB0**	**6ES7194-2MH20-1AB0**
	Power Cable M8, angled, 0.3m	Power Cable M8, angled, 1.0M	Power Cable M8, angled, 2.0M
General information			
Product description	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector, angled	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector, angled	Flexible cable (4-core), preassembled at each end with a 4-pin M8 male / female connector, angled
Suitability for use	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply
Degree and class of protection			
Degree of protection acc. to EN 60529			
• IP65	Yes	Yes	Yes
• IP67	Yes	Yes	Yes
Ambient conditions			
Ambient temperature during assembly, min.	-25 °C	-25 °C	-25 °C
Ambient temperature during assembly, max.	80 °C	80 °C	80 °C
Ambient temperature during storage/transportation			
• min.	-25 °C	-25 °C	-25 °C
• max.	80 °C	80 °C	80 °C
Cables			
Cable designation	LIF9Y11YFHF 4x0.50 mm^2	LIF9Y11YFHF 4x0.50 mm^2	LIF9Y11YFHF 4x0.50 mm^2
Cable length	0.3 m	1 m	2 m
Number of electrical cores	4	4	4
Outer diameter of inner conductor	1 mm	1 mm	1 mm
Outer diameter of core insulation	1.46 mm	1.46 mm	1.46 mm
Outer diameter of cable sheath	5.1 mm	5.1 mm	5.1 mm
Number of bending cycles	2 000 000; Cable carrier compliant for 2 million bending cycles with a bending radius of 51 mm, a speed of 5 m/s and an acceleration of 5 m/s^2	2 000 000; Cable carrier compliant for 2 million bending cycles with a bending radius of 51 mm, a speed of 5 m/s and an acceleration of 5 m/s^2	2 000 000; Cable carrier compliant for 2 million bending cycles with a bending radius of 51 mm, a speed of 5 m/s and an acceleration of 5 m/s^2
Permissible bending radius, single bend, min.	26 mm	26 mm	26 mm
Permissible bending radius, multiple bends, min.	51 mm	51 mm	51 mm
Bending radius for continuous bending	51 mm	51 mm	51 mm
Color of cable sheath	gray	gray	gray
Color of core insulation of energy core	white / brown / blue / black	white / brown / blue / black	white / brown / blue / black
Weight per length	44 kg/km	44 kg/km	44 kg/km
Mechanics/material			
Type of cable outlet	90 degree cable outlet	90 degree cable outlet	90 degree cable outlet
Material of housing	plastic	plastic	plastic
Material of cable sheath	PE-PUR	PE-PUR	PE-PUR
Material of core insulation	PP	PP	PP
Material property			
• Halogen-free	Yes	Yes	Yes
• Silicone-free	Yes	Yes	Yes

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Technical specifications (continued)

Article number	6ES7194-2LH20-1AC0	6ES7194-2LH50-1AC0	6ES7194-2LN10-1AC0	6ES7194-2LN15-1AC0
	Power Cable M8, 2.0M	Power Cable M8, 5.0M	Power Cable M8, 10m	Power Cable M8, 15m
General information				
Product description	Flexible cable (4-core), preassembled at one end with 1x M8 female connector	Flexible cable (4-core), preassembled at one end with 1x M8 female connector	Flexible cable (4-core), preassembled at one end with 1x M8 plug, 4-pin, shielded	Flexible cable (4-core), preassembled at one end with 1x M8 plug, 4-pin, shielded
Suitability for use	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply
Degree and class of protection				
Degree of protection acc. to EN 60529				
• IP65	Yes	Yes	Yes	Yes
• IP67	Yes	Yes	Yes	Yes
Ambient conditions				
Ambient temperature during assembly, min.	-30 °C	-30 °C	-30 °C	-30 °C
Ambient temperature during assembly, max.	80 °C	80 °C	80 °C	80 °C
Ambient temperature during storage/transportation				
• min.	-40 °C	-40 °C	-40 °C	-40 °C
• max.	80 °C	80 °C	80 °C	80 °C
Cables				
Cable designation	4 Li9Y 0.50 mm^2 Y	4 Li9Y 0.50 mm^2 Y	4 Li9Y 0.50 mm^2 Y	4 Li9Y 0.50 mm^2 Y
Cable length	2 m	5 m	10 m	15 m
Number of electrical cores	4	4	4	4
Outer diameter of inner conductor	0.8 mm	0.8 mm	0.8 mm	0.8 mm
Outer diameter of core insulation	1.46 mm	1.46 mm	1.46 mm	1.46 mm
Outer diameter of cable sheath	5.2 mm	5.2 mm	5.2 mm	5.2 mm
Number of bending cycles	2 500 000; Cable carrier compliant for 2.5 million bending cycles with a bending radius of 52 mm, a speed of 3 m/s and an acceleration of 10 m/s^2	2 500 000; Cable carrier compliant for 2.5 million bending cycles with a bending radius of 52 mm, a speed of 3 m/s and an acceleration of 10 m/s^2	2 500 000; Cable carrier compliant for 2.5 million bending cycles with a bending radius of 52 mm, a speed of 3 m/s and an acceleration of 10 m/s^2	2 500 000; Cable carrier compliant for 2.5 million bending cycles with a bending radius of 52 mm, a speed of 3 m/s and an acceleration of 10 m/s^2
Permissible bending radius, single bend, min.	26 mm	26 mm	26 mm	26 mm
Permissible bending radius, multiple bends, min.	52 mm	52 mm	52 mm	52 mm
Bending radius for continuous bending	52 mm	52 mm	52 mm	52 mm
Color of cable sheath	gray	gray	gray	gray
Color of core insulation of energy core	white / brown / blue / black	white / brown / blue / black	white / brown / blue / black	white / brown / blue / black
Weight per length	44 kg/km	44 kg/km	44 kg/km	44 kg/km
Mechanics/material				
Type of cable outlet	180 degree cable outlet	180 degree cable outlet	180 degree cable outlet	180 degree cable outlet
Material of housing	plastic	plastic	plastic	plastic
Material of cable sheath	PVC	PVC	PVC	PVC
Material of core insulation	PP	PP	PP	PP
Material property				
• Silicone-free	Yes	Yes	Yes	Yes

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Technical specifications (continued)

Article number	**6ES7194-2MH20-1AC0**	**6ES7194-2MH50-1AC0**	**6ES7194-2MN10-1AC0**	**6ES7194-2MN15-1AC0**
	Power Cable M8, 2.0M	Power Cable M8, 5.0M	Power Cable M8, 10m	Power Cable M8, 15m
General information				
Product description	Flexible cable (4-core), preassembled at one end with 1x M8 female connector	Flexible cable (4-core), preassembled at one end with 1x M8 female connector	Flexible cable (4-core), preassembled at one end with 1x M8 female connector	Flexible cable (4-core), preassembled at one end with 1x M8 female connector
Suitability for use	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply
Degree and class of protection				
Degree of protection acc. to EN 60529				
• IP65	Yes	Yes	Yes	Yes
• IP67	Yes	Yes	Yes	Yes
Ambient conditions				
Ambient temperature during assembly, min.	-25 °C	-25 °C	-25 °C	-25 °C
Ambient temperature during assembly, max.	80 °C	80 °C	80 °C	80 °C
Ambient temperature during storage/transportation				
• min.	-25 °C	-25 °C	-25 °C	-25 °C
• max.	80 °C	80 °C	80 °C	80 °C
Cables				
Cable designation	LIF9Y11YFHF 4x0.50 mm^2	LIF9Y11YFHF 4x0.50 mm^2	LIF9Y11YFHF 4x0.50 mm^2	LIF9Y11YFHF 4x0.50 mm^2
Cable length	2 m	5 m	10 m	15 m
Number of electrical cores	4	4	4	4
Outer diameter of inner conductor	1 mm	1 mm	1 mm	1 mm
Outer diameter of core insulation	1.46 mm	1.46 mm	1.46 mm	1.46 mm
Outer diameter of cable sheath	5.1 mm	5.1 mm	5.1 mm	5.1 mm
Number of bending cycles	2 000 000; Cable carrier compliant for 2 million bending cycles with a bending radius of 51 mm, a speed of 5 m/s and an acceleration of 5 m/s^2	2 000 000; Cable carrier compliant for 2 million bending cycles with a bending radius of 51 mm, a speed of 5 m/s and an acceleration of 5 m/s^2	2 000 000; Cable carrier compliant for 2 million bending cycles with a bending radius of 51 mm, a speed of 5 m/s and an acceleration of 5 m/s^2	2 000 000; Cable carrier compliant for 2 million bending cycles with a bending radius of 51 mm, a speed of 5 m/s and an acceleration of 5 m/s^2
Permissible bending radius, single bend, min.	26 mm	26 mm	26 mm	26 mm
Permissible bending radius, multiple bends, min.	51 mm	51 mm	51 mm	51 mm
Bending radius for continuous bending	51 mm	51 mm	51 mm	51 mm
Color of cable sheath	gray	gray	gray	gray
Color of core insulation of energy core	white / brown / blue / black	white / brown / blue / black	white / brown / blue / black	white / brown / blue / black
Weight per length	44 kg/km	44 kg/km	44 kg/km	44 kg/km
Mechanics/material				
Type of cable outlet	180 degree cable outlet	180 degree cable outlet	180 degree cable outlet	180 degree cable outlet
Material of housing	plastic	plastic	plastic	plastic
Material of cable sheath	PE-PUR	PE-PUR	PE-PUR	PE-PUR
Material of core insulation	PP	PP	PP	PP
Material property				
• Halogen-free	Yes	Yes	Yes	Yes
• Silicone-free	Yes	Yes	Yes	Yes

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Technical specifications (continued)

Article number	**6ES7194-2AA00-0AA0**	**6ES7194-2AC00-0AA0**
	M8 Power Connector	M8 Power Connector, Socket
General information		
Product type designation	Power connector	Power connector
Product description	M8 plug connector with high degree of protection, 4-pin, plastic version	M8 plug connector with high degree of protection, socket insert, 4-pin, plastic version
Suitability for use	For connection to ET 200AL for 24 V DC power supply	For connection to ET 200AL for 24 V DC power supply
Degree and class of protection		
Degree of protection acc. to EN 60529		
• IP65	Yes	Yes
• IP67	Yes	Yes
Ambient conditions		
Ambient temperature during assembly, min.	-30 °C	-30 °C
Ambient temperature during assembly, max.	85 °C	85 °C
Ambient temperature during storage/transportation		
• min.	-40 °C	-40 °C
• max.	85 °C	85 °C
Mechanics/material		
Type of cable outlet	180 degree cable outlet	180 degree cable outlet
Material of housing	plastic	plastic
Dimensions		
Width	14 mm	14 mm
Depth	47 mm	47 mm

Article number	**6ES7194-2AB00-0AA0**
	M8 Connector ET-Connection
General information	
Product type designation	Connector
Product description	M8 plug connector with high degree of protection, 4-pin, metal version
Suitability for use	for connecting ET-CONNECTION nodes (e.g. SIMATIC ET 200AL) in degree of protection IP65 / 67
Degree and class of protection	
Degree of protection acc. to EN 60529	
• IP65	Yes
• IP67	Yes

Article number	**6ES7194-2AB00-0AA0**
	M8 Connector ET-Connection
Ambient conditions	
Ambient temperature during assembly, min.	-30 °C
Ambient temperature during assembly, max.	80 °C
Ambient temperature during storage/transportation	
• min.	-40 °C
• max.	80 °C
Mechanics/material	
Type of cable outlet	180 degree cable outlet
Material of housing	metal
Dimensions	
Width	14 mm
Depth	47 mm

Ordering data

	Article No.
Bus cable for backplane bus (ET connection)	
4-pin, shielded	
Pre-assembled at both ends, 2 M8 connectors	
0.19 m	**6ES7194-2LH02-0AA0**
0.3 m	**6ES7194-2LH03-0AA0**
1 m	**6ES7194-2LH10-0AA0**
2 m	**6ES7194-2LH20-0AA0**
5 m	**6ES7194-2LH50-0AA0**
10 m	**6ES7194-2LN10-0AA0**
15 m	**6ES7194-2LN15-0AA0**

	Article No.
PUR line, pre-assembled at both ends, 2 M8 connectors	
0.19 m	**6ES7194-2MH02-0AA0**
0.3 m	**6ES7194-2MH03-0AA0**
1 m	**6ES7194-2MH10-0AA0**
2 m	**6ES7194-2MH20-0AA0**
5 m	**6ES7194-2MH50-0AA0**
10 m	**6ES7194-2MN10-0AA0**
15 m	**6ES7194-2MN15-0AA0**

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Ordering data	Article No.
Bus cable for backplane bus (ET connection) (continued)	
PUR line, pre-assembled at both ends, 2 M8 connectors, angled	
0.3 m	**6ES7194-2MH03-0AB0**
1 m	**6ES7194-2MH10-0AB0**
2 m	**6ES7194-2MH20-0AB0**
5 m	**6ES7194-2MH50-0AB0**
10 m	**6ES7194-2MN10-0AB0**
15 m	**6ES7194-2MN15-0AB0**
Pre-assembled at both ends, 2 M8 connectors, angled	
0.3 m	**6ES7194-2LH03-0AB0**
1 m	**6ES7194-2LH10-0AB0**
2 m	**6ES7194-2LH20-0AB0**
5 m	**6ES7194-2LH50-0AB0**
10 m	**6ES7194-2LN10-0AB0**
15 m	**6ES7194-2LN15-0AB0**
Pre-assembled at one end, 1 M8 connector	
2 m	**6ES7194-2LH20-0AC0**
5 m	**6ES7194-2LH50-0AC0**
10 m	**6ES7194-2LN10-0AC0**
15 m	**6ES7194-2LN15-0AC0**
PUR line, pre-assembled at one end, 1 M8 connector	
2 m	**6ES7194-2MH20-0AC0**
5 m	**6ES7194-2MH50-0AC0**
10 m	**6ES7194-2MN10-0AC0**
15 m	**6ES7194-2MN15-0AC0**
Connecting cable for bus cable for backplane bus (ET connection)	
4-pin, shielded	
Pre-assembled at both ends, 2 M8 connectors. 0.2 m	**6ES7194-2LH02-0AD0**
PUR line, pre-assembled at both ends, 2 M8 connectors. 0.2 m	**6ES7194-2MH02-0AD0**
Power cable M8	
4-pin	
Pre-assembled at both ends, M8 connector and M8 socket	
0.19 m	**6ES7194-2LH02-1AA0**
0.3 m	**6ES7194-2LH03-1AA0**
1 m	**6ES7194-2LH10-1AA0**
2 m	**6ES7194-2LH20-1AA0**
5 m	**6ES7194-2LH50-1AA0**
10 m	**6ES7194-2LN10-1AA0**
15 m	**6ES7194-2LN15-1AA0**
PUR line, pre-assembled at both ends, M8 connector and M8 socket	
0.19 m	**6ES7194-2MH02-1AA0**
0.3 m	**6ES7194-2MH03-1AA0**
1 m	**6ES7194-2MH10-1AA0**
2 m	**6ES7194-2MH20-1AA0**
5 m	**6ES7194-2MH50-1AA0**
10 m	**6ES7194-2MN10-1AA0**
15 m	**6ES7194-2MN15-1AA0**
Pre-assembled at both ends, angled M8 connector and angled M8 socket	
0.3 m	**6ES7194-2LH03-1AB0**
1 m	**6ES7194-2LH10-1AB0**
2 m	**6ES7194-2LH20-1AB0**
5 m	**6ES7194-2LH50-1AB0**
10 m	**6ES7194-2LN10-1AB0**
15 m	**6ES7194-2LN15-1AB0**
PUR line, pre-assembled at both ends, angled M8 connector and angled M8 socket	
0.3 m	**6ES7194-2MH03-1AB0**
1 m	**6ES7194-2MH10-1AB0**
2 m	**6ES7194-2MH20-1AB0**
5 m	**6ES7194-2MH50-1AB0**
10 m	**6ES7194-2MN10-1AB0**
15 m	**6ES7194-2MN15-1AB0**
Pre-assembled at one end, M8 socket	
2 m	**6ES7194-2LH20-1AC0**
5 m	**6ES7194-2LH50-1AC0**
10 m	**6ES7194-2LN10-1AC0**
15 m	**6ES7194-2LN15-1AC0**
PUR line, pre-assembled at one end, M8 socket	
2 m	**6ES7194-2MH20-1AC0**
5 m	**6ES7194-2MH50-1AC0**
10 m	**6ES7194-2MN10-1AC0**
15 m	**6ES7194-2MN15-1AC0**
M8 connector for ET connection	**6ES7194-2AB00-0AA0**
4-pin, shielded	
M8 power connector	
Male contact insert, 4-pin	**6ES7194-2AA00-0AA0**
Female contact insert, 4-pin	**6ES7194-2AC00-0AA0**
ET connection FastConnect stripping tool	**6ES7194-2KA00-0AA0**
Stripping tool for stripping the ET connection bus cable	

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Overview

- Labels for the identification of channels, modules and slots of ET 200AL components
- Can be used for interface modules and I/O modules

Ordering data

	Article No.
Labels 10 x 5 mm, RAL 9016; 5 frames with 40 labels each	**6ES7194-2BA00-0AA0**

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Overview



- Compact block I/O for processing digital, fail-safe digital, analog and IO-Link signals for connecting to the PROFINET bus system
- Cabinet-free design in IP65/66/67 degree of protection with M12 connections
- Extremely rugged and resistant metal enclosure and casting
- Compact module in two types of enclosures:
  - 30 mm x 200 mm x 37 mm (W x H x D, long and narrow enclosure), with 4 x M12 for digital signals
  - 60 mm x 175 mm x 37 mm (W x H x D, short and wide enclosure), with 8 x M12 for digital and fail-safe digital signals and IO-Link
  - 60 mm x 175 mm x 37 mm (W x H x D, short and wide enclosure) with 4 x M12 or 8 x M12 for analog signals
- PROFINET connection: 2 x M12 and automatic PROFINET address assignment
- Data transmission rate 100 Mbps
- LLDP proximity detection without PG and fast startup (boot up within approx. 0.5 seconds)
- Supply and load voltage connection: 2 x M12
- Module variance:
  - 8 DI
  - 16 DI
  - 8 DO (2 A)
  - 8 DO (1.3 A)
  - 8 DO (0.5 A)
  - 16 DO (1.3 A)
  - 8 DI/DO (1.3 A)
  - 8 F-DI/3 F-DO (2 A)
  - 8 AI (U, I, TC, RTD)
  - 8 AI (TC, RTD)
  - 4 AO (U, I)
  - 4 IO-Link
  - 4 IO-Link + 8 DI + 4 DO (1.3 A)
- Channel-specific diagnostics
- Ambient temperature range -40 °C to 60 °C

Technical specifications

Article number	**6ES7141-6BF00-0AB0**	**6ES7141-6BG00-0AB0**	**6ES7141-6BH00-0AB0**
	ET200eco PN, 8DI, 24VDC, 4xM12	ET200eco PN, 8DI, 24VDC, 8xM12	ET200eco PN, 16DI, 24VDC, 8xM12
Supply voltage			
Rated value (DC)	24 V	24 V	24 V
Reverse polarity protection	Yes	Yes	Yes
Input current			
Current consumption, typ.	100 mA	100 mA	100 mA
Encoder supply			
Number of outputs	4	8	8
24 V encoder supply			
• Short-circuit protection	Yes; Electronic	Yes; Electronic	Yes; Electronic
• Output current, max.	100 mA; per output	100 mA; per output	100 mA; per output
Digital inputs			
Number of digital inputs	8	8	16
• in groups of	2	1	2
Input characteristic curve in accordance with IEC 61131, type 3	Yes	Yes	Yes
Number of simultaneously controllable inputs			
all mounting positions			
- up to 60 °C, max.	8	8	16
Input voltage			
• Rated value (DC)	24 V	24 V	24 V
• for signal "0"	-3 to +5V	-3 to +5V	-3 to +5V
• for signal "1"	+11 to +30V	+11 to +30V	+11 to +30V
Input current			
• for signal "1", typ.	7 mA	7 mA	7 mA
Cable length			
• unshielded, max.	30 m	30 m	30 m

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Technical specifications (continued)

Article number	6ES7141-6BF00-0AB0 ET200eco PN, 8DI, 24VDC, 4xM12	6ES7141-6BG00-0AB0 ET200eco PN, 8DI, 24VDC, 8xM12	6ES7141-6BH00-0AB0 ET200eco PN, 16DI, 24VDC, 8xM12
Encoder			
Connectable encoders			
• 2-wire sensor	Yes	Yes	Yes
- permissible quiescent current (2-wire sensor), max.	1.5 mA	1.5 mA	1.5 mA
Interfaces			
Transmission procedure	100BASE-TX	100BASE-TX	100BASE-TX
Number of PROFINET interfaces	1	1	1
1. Interface			
Interface types			
• integrated switch	Yes	Yes	Yes
• M12 port	Yes	Yes	Yes
Interface types			
M12 port			
• Transmission procedure	100BASE-TX	100BASE-TX	100BASE-TX
• Autonegotiation	Yes	Yes	Yes
• Autocrossing	Yes	Yes	Yes
• Transmission rate, max.	100 Mbit/s	100 Mbit/s	100 Mbit/s
Protocols			
Supports protocol for PROFINET IO	Yes	Yes	Yes
PROFINET CBA	No	No	No
PROFIsafe	No	No	No
PROFINET IO Device			
Services			
- IRT with the option "high flexibility"	Yes	Yes	Yes
- Prioritized startup	Yes	Yes	Yes
Open IE communication			
• TCP/IP	No	No	No
• SNMP	Yes	Yes	Yes
• DCP	Yes	Yes	Yes
• LLDP	Yes	Yes	Yes
• ping	Yes	Yes	Yes
• ARP	Yes	Yes	Yes
Interrupts/diagnostics/ status information			
Diagnostics function	Yes	Yes	Yes
Alarms			
• Diagnostic alarm	Yes	Yes	Yes
Diagnostic messages			
• Diagnostic information readable	Yes	Yes	Yes
• Monitoring the supply voltage	Yes; Green "ON" LED	Yes; Green "ON" LED	Yes; Green "ON" LED
• Wire-break in signal transmitter cable	Yes	Yes	Yes
• Short-circuit encoder supply	Yes; Per channel group	Yes; Per channel group	Yes; Per channel group
• Group error	Yes; Red/yellow "SF/MT" LED	Yes; Red/yellow "SF/MT" LED	Yes; Red/yellow "SF/MT" LED
Potential separation			
between the load voltages	Yes	Yes	Yes
between load voltage and all other switching components	No	No	No
between Ethernet and electronics	Yes	Yes	Yes
Potential separation channels			
• between the channels	No	No	No

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Technical specifications (continued)

Article number	**6ES7141-6BF00-0AB0** ET200eco PN, 8DI, 24VDC, 4xM12	**6ES7141-6BG00-0AB0** ET200eco PN, 8DI, 24VDC, 8xM12	**6ES7141-6BH00-0AB0** ET200eco PN, 16DI, 24VDC, 8xM12
Degree and class of protection			
IP degree of protection	IP65/67	IP67	IP67
Connection method			
Design of electrical connection	4/5-pin M12 circular connectors	4/5-pin M12 circular connectors	4/5-pin M12 circular connectors
Dimensions			
Width	30 mm	60 mm	60 mm
Height	200 mm	175 mm	175 mm
Depth	49 mm	49 mm	49 mm
Weights			
Weight, approx.	550 g	910 g	910 g

Article number	**6ES7142-6BF50-0AB0** ET200eco PN, 8DO, 24VDC/0.5A, 4xM12	**6ES7142-6BF00-0AB0** ET200eco PN, 8DO, 24VDC/1.3A, 4xM12	**6ES7142-6BG00-0AB0** ET200eco PN, 8DO, 24VDC/1.3A, 8xM12	**6ES7142-6BR00-0AB0** ET200eco PN, 8 DO, 24VDC/2A, 8xM12	**6ES7142-6BH00-0AB0** ET200eco PN, 16DO 24VDC/1.3A, 8xM12
Supply voltage					
Rated value (DC)	24 V	24 V	24 V	24 V	24 V
Reverse polarity protection	Yes	Yes	Yes	Yes	Yes
Load voltage 2L+					
• Rated value (DC)	24 V	24 V	24 V	24 V	24 V
• Reverse polarity protection	Yes	Yes	Yes	Yes	Yes
Input current					
Current consumption, typ.	100 mA	100 mA	100 mA	100 mA	100 mA
from supply voltage 1L+, max.	4 A	4 A	4 A	4 A	4 A
from load voltage 2L+, max.	4 A	4 A	4 A	4 A	4 A
Digital outputs					
Number of digital outputs	8	8	8	8	16
• in groups of	8	4	4	4	8
Short-circuit protection	Yes	Yes	Yes	Yes	Yes
Limitation of inductive shutdown voltage to	Typ. (L1+, L2+) -47 V	Typ. (L1+, L2+) -47 V	Typ. (L1+, L2+) -47 V	Typ. (L1+, L2+) -47 V	Typ. (L1+, L2+) -47 V
Controlling a digital input	Yes	Yes	Yes	Yes	Yes
Switching capacity of the outputs					
• on lamp load, max.	5 W	5 W	5 W	10 W	5 W
Output current					
• for signal "1" rated value	0.5 A	1.3 A; Maximum	1.3 A; Maximum	2 A	1.3 A; Maximum
• for signal "0" residual current, max.	1.5 mA	1.5 mA	1.5 mA	1.5 mA	1.5 mA
Parallel switching of two outputs					
• for uprating	No	No	No	No	No
• for redundant control of a load	Yes	Yes	Yes	Yes	Yes
Switching frequency					
• with resistive load, max.	100 Hz	100 Hz	100 Hz	100 Hz	100 Hz
• with inductive load, max.	0.5 Hz	0.5 Hz	0.5 Hz	0.5 Hz	0.5 Hz
• on lamp load, max.	1 Hz	1 Hz	1 Hz	1 Hz	1 Hz
Total current of the outputs (per group)					
all mounting positions					
- up to 55 °C, max.		3.9 A			
- up to 60 °C, max.	4 A	2.6 A	3.9 A	3.9 A	3.9 A
Cable length					
• unshielded, max.	30 m	30 m	30 m	30 m	30 m

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Technical specifications (continued)

Article number	**6ES7142-6BF50-0AB0**	**6ES7142-6BF00-0AB0**	**6ES7142-6BG00-0AB0**	**6ES7142-6BR00-0AB0**	**6ES7142-6BH00-0AB0**
	ET200eco PN, 8DO, 24VDC/0.5A, 4xM12	ET200eco PN, 8DO, 24VDC/1.3A, 4xM12	ET200eco PN, 8DO, 24VDC/1.3A, 8xM12	ET200eco PN, 8 DO, 24VDC/2A, 8xM12	ET200eco PN, 16DO 24VDC/1.3A, 8xM12
Interfaces					
Transmission procedure	100BASE-TX	100BASE-TX	100BASE-TX	100BASE-TX	100BASE-TX
Number of PROFINET interfaces	1	1	1	1	1
1. Interface					
Interface types					
• integrated switch	Yes	Yes	Yes	Yes	Yes
• M12 port		Yes			
Interface types					
M12 port					
• Transmission procedure	100BASE-TX	100BASE-TX	100BASE-TX	100BASE-TX	100BASE-TX
• Autonegotiation	Yes	Yes	Yes	Yes	Yes
• Autocrossing	Yes	Yes	Yes	Yes	Yes
• Transmission rate, max.	100 Mbit/s	100 Mbit/s	100 Mbit/s	100 Mbit/s	100 Mbit/s
Protocols					
Supports protocol for PROFINET IO	Yes	Yes	Yes	Yes	Yes
PROFINET CBA	No	No	No	No	No
PROFIsafe	No	No	No	No	No
PROFINET IO Device					
Services					
- IRT with the option "high flexibility"	Yes	Yes	Yes	Yes	Yes
- Prioritized startup	Yes	Yes	Yes	Yes	Yes
Open IE communication					
• TCP/IP	No	No	No	No	No
• SNMP	Yes	Yes	Yes	Yes	Yes
• DCP	Yes	Yes	Yes	Yes	Yes
• LLDP	Yes	Yes	Yes	Yes	Yes
• ping	Yes	Yes	Yes	Yes	Yes
• ARP	Yes	Yes	Yes	Yes	Yes
Interrupts/diagnostics/ status information					
Diagnostics function	Yes	Yes	Yes	Yes	Yes
Alarms					
• Diagnostic alarm	Yes	Yes	Yes	Yes	Yes
Diagnostic messages					
• Diagnostic information readable	Yes	Yes	Yes	Yes	Yes
• Monitoring the supply voltage	Yes; Green "ON" LED	Yes; Green "ON" LED	Yes; Green "ON" LED	Yes; Green "ON" LED	Yes; Green "ON" LED
• Wire-break in actuator cable	Yes	Yes	Yes	Yes	Yes
• Short-circuit	Yes	Yes	Yes	Yes	Yes
• Group error	Yes; Red/yellow "SF/MT" LED	Yes; Red/yellow "SF/MT" LED	Yes; Red/yellow "SF/MT" LED	Yes; Red/yellow "SF/MT" LED	Yes; Red/yellow "SF/MT" LED
Potential separation					
between the load voltages	Yes	Yes	Yes	Yes	Yes
between load voltage and all other switching components	No	No	No	No	No
between Ethernet and electronics	Yes	Yes	Yes	Yes	Yes
Potential separation channels					
• between the channels	No	No	No	No	No
Degree and class of protection					
IP degree of protection	IP67	IP65/67	IP67	IP67	IP67

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Technical specifications (continued)

Article number	**6ES7142-6BF50-0AB0**	**6ES7142-6BF00-0AB0**	**6ES7142-6BG00-0AB0**	**6ES7142-6BR00-0AB0**	**6ES7142-6BH00-0AB0**
	ET200eco PN, 8DO, 24VDC/0.5A, 4xM12	ET200eco PN, 8DO, 24VDC/1.3A, 4xM12	ET200eco PN, 8DO, 24VDC/1.3A, 8xM12	ET200eco PN, 8 DO, 24VDC/2A, 8xM12	ET200eco PN, 16DO 24VDC/1.3A, 8xM12
Standards, approvals, certificates					
Suitable for safety-related tripping of standard modules	Yes	Yes	Yes	Yes	Yes
Highest safety class achievable for safety-related tripping of standard modules					
• Performance level according to ISO 13849-1	PL d	PL d	PL d	PL d	PL d
• Category according to ISO 13849-1	Cat. 3	Cat. 3	Cat. 3	Cat. 3	Cat. 3
• SILCL according to IEC 62061	SILCL 2	SILCL 2	SILCL 2	SILCL 2	SILCL 2
Connection method					
Design of electrical connection	4/5-pin M12 circular connectors	4/5-pin M12 circular connectors	4/5-pin M12 circular connectors	4/5-pin M12 circular connectors	4/5-pin M12 circular connectors
Dimensions					
Width	30 mm	30 mm	60 mm	60 mm	60 mm
Height	200 mm	200 mm	175 mm	175 mm	175 mm
Depth	49 mm	49 mm	49 mm	49 mm	49 mm
Weights					
Weight, approx.	550 g	550 g	910 g	910 g	910 g

Article number	**6ES7147-6BG00-0AB0**	**6ES7146-6FF00-0AB0**
	ET200eco PN, 8 DIO, 24VDC/1.3A, 8xM12	ET 200eco PN, F-DI 8x24V /F-DQ 3x24V 2A
Engineering with		
• STEP 7 TIA Portal configurable/ integrated as of version		V15 with HSP 204
Operating mode		
• DI		Yes
• DQ		Yes
Supply voltage		
Rated value (DC)	24 V	24 V
Reverse polarity protection	Yes	Yes
Load voltage 1L+		
• Rated value (DC)		24 V
• Reverse polarity protection		Yes
Load voltage 2L+		
• Rated value (DC)	24 V	24 V
• Reverse polarity protection	Yes	Yes
Input current		
Current consumption, typ.	100 mA	200 mA
from supply voltage 1L+, max.	4 A	4 A
from load voltage 2L+, max.	4 A	4 A
Encoder supply		
Number of outputs	8	2
24 V encoder supply		
• Short-circuit protection	Yes; Electronic	Yes; Electronic
• Output current, max.	100 mA; per output	300 mA; per output

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Technical specifications (continued)

Article number	**6ES7147-6BG00-0AB0** ET200eco PN, 8 DIO, 24VDC/1.3A, 8xM12	**6ES7146-6FF00-0AB0** ET 200eco PN, F-DI 8x24V /F-DQ 3x24V 2A
Digital inputs		
Number of digital inputs	8	8; 8 (one-channel); 4 (two-channel)
• in groups of	4	
Digital inputs, parameterizable		Yes
Input characteristic curve in accordance with IEC 61131, type 1		Yes
Input characteristic curve in accordance with IEC 61131, type 3	Yes	
Number of simultaneously controllable inputs		
all mounting positions		
- up to 60 °C, max.	8	8
Input voltage		
• Rated value (DC)	24 V	24 V
• for signal "0"	-3 to +5V	-30 V DC to +5 V DC
• for signal "1"	+11 to +30V	15 V DC to 30 V DC
Input current		
• for signal "1", typ.	7 mA	
Input delay (for rated value of input voltage)		
for standard inputs		
- parameterizable		Yes; 0.8 / 1.6 / 3.2 / 6.4 / 12.8 ms
Cable length		
• unshielded, max.	30 m	30 m
Digital outputs		
Number of digital outputs	8	3
• in groups of	4	3
Short-circuit protection	Yes; Electronic	Yes; Electronic
Limitation of inductive shutdown voltage to	Typ. (L1+, L2+) -47 V	PM-switching: Typ. -26 V to (-48 V)
Controlling a digital input	Yes	No
Switching capacity of the outputs		
• on lamp load, max.	5 W	10 W
Output current		
• for signal "1" rated value	1.3 A; Maximum	2 A
• for signal "0" residual current, max.	1.5 mA	0.5 mA
Parallel switching of two outputs		
• for uprating	No	No
• for redundant control of a load	Yes	No
Switching frequency		
• with resistive load, max.	100 Hz	30 Hz
• with inductive load, max.	0.5 Hz	0.1 Hz
• on lamp load, max.	1 Hz	10 Hz
Total current of the outputs (per group)		
all mounting positions		
- up to 60 °C, max.	3.9 A	3.9 A
Cable length		
• unshielded, max.	30 m	30 m
Encoder		
Connectable encoders		
• 2-wire sensor	Yes	No
- permissible quiescent current (2-wire sensor), max.	1.5 mA	0.5 mA

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Technical specifications (continued)

Article number	**6ES7147-6BG00-0AB0** ET200eco PN, 8 DIO, 24VDC/1.3A, 8xM12	**6ES7146-6FF00-0AB0** ET 200eco PN, F-DI 8x24V /F-DQ 3x24V 2A
Interfaces		
Transmission procedure	100BASE-TX	100BASE-TX
Number of PROFINET interfaces	1	1
1. Interface		
Interface types		
• integrated switch	Yes	Yes
• M12 port	Yes	Yes
Interface types		
M12 port		
• Transmission procedure	100BASE-TX	100BASE-TX
• Autonegotiation	Yes	Yes
• Autocrossing	Yes	Yes
• Transmission rate, max.	100 Mbit/s	100 Mbit/s
Protocols		
Supports protocol for PROFINET IO	Yes	Yes
PROFINET CBA	No	No
PROFIsafe	No	Yes
PROFINET IO Device		
Services		
- IRT with the option "high flexibility"	Yes	No; module will participate within an IRT topology
- Prioritized startup	Yes	No
Open IE communication		
• TCP/IP	No	No
• SNMP	Yes	Yes
• DCP	Yes	Yes
• LLDP	Yes	Yes
• ping	Yes	Yes
• ARP	Yes	Yes
Interrupts/diagnostics/ status information		
Diagnostics function	Yes	Yes
Alarms		
• Diagnostic alarm	Yes	Yes
Diagnostic messages		
• Diagnostic information readable	Yes	Yes
• Monitoring the supply voltage	Yes; Green "ON" LED	Yes; Green "ON" LED
• Wire-break in actuator cable	Yes	Yes
• Wire-break in signal transmitter cable	Yes	Yes
• Short-circuit	Yes	Yes
• Short-circuit encoder supply	Yes	Yes
• Group error	Yes; Red/yellow "SF/MT" LED	Yes; Red/yellow "SF/MT" LED
Potential separation		
between the load voltages	Yes	Yes
between load voltage and all other switching components	No	No
between Ethernet and electronics	Yes	Yes
Potential separation channels		
• between the channels	No	No
Degree and class of protection		
IP degree of protection	IP65/67	IP65/67

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Technical specifications (continued)

Article number	**6ES7147-6BG00-0AB0** ET200eco PN, 8 DIO, 24VDC/1.3A, 8xM12	**6ES7146-6FF00-0AB0** ET 200eco PN, F-DI 8x24V /F-DQ 3x24V 2A
Standards, approvals, certificates		
Suitable for safety-related tripping of standard modules	Yes	No
Highest safety class achievable in safety mode		
• Performance level according to ISO 13849-1		PLe
• SIL acc. to IEC 61508		SIL 2 (single-channel), SIL 3 (two-channel)
• SILCL according to IEC 62061		SIL 3
Highest safety class achievable for safety-related tripping of standard modules		
• Performance level according to ISO 13849-1	PL d	
• Category according to ISO 13849-1	Cat. 3	
• SILCL according to IEC 62061	SILCL 2	
Ambient conditions		
Ambient temperature during operation		
• min.		-25 °C
• max.		60 °C
Connection method		
Design of electrical connection	4/5-pin M12 circular connectors	Connector
Dimensions		
Width	60 mm	60 mm
Height	175 mm	175 mm
Depth	49 mm	49 mm
Weights		
Weight, approx.	910 g	940 g

Article number	**6ES7144-6KD00-0AB0** ET200eco PN, 8AI; 4 U/I; 4 RTD/TC 8xM12	**6ES7144-6KD50-0AB0** ET200eco PN, 8AI RTD/TC 8xM12
Supply voltage		
Rated value (DC)	24 V	24 V
Reverse polarity protection	Yes	Yes; against destruction
Input current		
Current consumption, typ.	110 mA	110 mA
Encoder supply		
Number of outputs	4	
Analog inputs		
Number of analog inputs	8	8
• For voltage/current measurement	4	
• For resistance/resistance thermometer measurement	4	8
permissible input voltage for voltage input (destruction limit), max.	28.8 V permanent, 35 V for max. 500 ms	
Input ranges (rated values), voltages		
• 0 to +10 V	Yes	
• 1 V to 5 V	Yes	
• -10 V to +10 V	Yes	
• -80 mV to +80 mV	Yes	Yes
Input ranges (rated values), currents		
• 0 to 20 mA	Yes	
• -20 mA to +20 mA	Yes	
• 4 mA to 20 mA	Yes	

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Technical specifications (continued)

Article number	**6ES7144-6KD00-0AB0** ET200eco PN, 8AI; 4 U/I; 4 RTD/TC 8xM12	**6ES7144-6KD50-0AB0** ET200eco PN, 8AI RTD/TC 8xM12
Input ranges (rated values), thermocouples		
• Type E	Yes	Yes
• Type J	Yes	Yes
• Type K	Yes	Yes
• Type N	Yes	Yes
Input ranges (rated values), resistance thermometer		
• Ni 100	Yes	Yes
• Ni 1000	Yes	Yes
• Ni 120	Yes	Yes
• Ni 200	Yes	Yes
• Ni 500	Yes	Yes
• Pt 100	Yes	Yes
• Pt 1000	Yes	Yes
• Pt 200	Yes	Yes
• Pt 500	Yes	Yes
Input ranges (rated values), resistors		
• 0 to 150 ohms	Yes	Yes
• 0 to 300 ohms	Yes	Yes
• 0 to 600 ohms	Yes	Yes
• 0 to 3000 ohms	Yes	Yes
Thermocouple (TC)		
Temperature compensation		
- parameterizable	Yes	Yes
- internal temperature compensation	Yes	Yes
- external temperature compensation with Pt100		Yes
- external temperature compensation with compensations socket	Yes	Yes
- dynamic reference temperature value		Yes
- for definable comparison point temperature		Yes
Cable length		
• shielded, max.	30 m	30 m
Analog value generation for the inputs		
Analog value display	SIMATIC S7 format	SIMATIC S7 format
Measurement principle	integrating	integrating
Integration and conversion time/ resolution per channel		
• Resolution with overrange (bit including sign), max.	16 bit	16 bit
• Integration time, parameterizable	Yes	Yes
• Integration time (ms)	2/16.67/20/100 ms	2/16.67/20/100 ms
• Interference voltage suppression for interference frequency f1 in Hz	500 / 60 / 50 / 10 Hz	500 / 60 / 50 / 10 Hz
• Conversion time (per channel)	4 / 19 / 22 / 102 ms	4 / 19 / 22 / 102 ms
Smoothing of measured values		
• parameterizable	Yes	Yes

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Technical specifications (continued)

Article number	**6ES7144-6KD00-0AB0** ET200eco PN, 8AI; 4 U/I; 4 RTD/TC 8xM12	**6ES7144-6KD50-0AB0** ET200eco PN, 8AI RTD/TC 8xM12
Encoder		
Number of connectable encoders, max.	8	8
Connection of signal encoders		
• for voltage measurement	Yes	
• for current measurement as 2-wire transducer	Yes	
• for current measurement as 4-wire transducer	Yes	
• for resistance measurement with two-wire connection	Yes	Yes
• for resistance measurement with three-wire connection	Yes	Yes
• for resistance measurement with four-wire connection	Yes	Yes
Errors/accuracies		
Linearity error (relative to input range), (+/-)	0.01 %	0.01 %
Temperature error (relative to input range), (+/-)	U: 0.0035%/°C; I:0.006%/°C; RTD: 0.0005%/°C; TC: 0.0035%/°C	RTD: 0.0005%/°C; TC: 0.0035%/°C
Crosstalk between the inputs, min.	85 dB	-85 dB
Repeat accuracy in steady state at 25 °C (relative to input range), (+/-)	0.008 %	0.008 %
Interference voltage suppression for f = n x (f1 +/- 1 %), f1 = interference frequency		
• Series mode interference (peak value of interference < rated value of input range), min.	46 dB	46 dB
• Common mode interference, min.	70 dB	70 dB
Interfaces		
Transmission procedure	100BASE-TX	100BASE-TX
Number of PROFINET interfaces	1	1
1. Interface		
Interface types		
• integrated switch	Yes	Yes
• M12 port	Yes	
Interface types		
M12 port		
• Transmission procedure	100BASE-TX	100BASE-TX
• Autonegotiation	Yes	Yes
• Autocrossing	Yes	Yes
• Transmission rate, max.	100 Mbit/s	100 Mbit/s
Protocols		
Supports protocol for PROFINET IO	Yes	Yes
PROFINET CBA	No	No
PROFIsafe	No	No
PROFINET IO Device		
Services		
- IRT with the option "high flexibility"	Yes	
- Prioritized startup	Yes	Yes
Open IE communication		
• TCP/IP	No	No
• SNMP	Yes	Yes
• DCP	Yes	Yes
• LLDP	Yes	Yes
• ping	Yes	Yes
• ARP	Yes	Yes

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Technical specifications (continued)

Article number	**6ES7144-6KD00-0AB0** ET200eco PN, 8AI; 4 U/I; 4 RTD/TC 8xM12	**6ES7144-6KD50-0AB0** ET200eco PN, 8AI RTD/TC 8xM12
Interrupts/diagnostics/ status information		
Diagnostics function	Yes	Yes
Alarms		
• Diagnostic alarm	Yes	Yes
Diagnostic messages		
• Diagnostic information readable	Yes	Yes
• Monitoring the supply voltage	Yes; Green "ON" LED	Yes; Green "ON" LED
• Short-circuit encoder supply	Yes; per module	
• Group error	Yes; Red/yellow "SF/MT" LED	Yes; Red/yellow "SF/MT" LED
• Overflow/underflow	Yes	Yes
Potential separation		
between the load voltages	Yes	Yes
between load voltage and all other switching components	No	No
between Ethernet and electronics	Yes	Yes
Potential separation channels		
• between the channels	No	No
Degree and class of protection		
IP degree of protection	IP65/67	IP65/67
Standards, approvals, certificates		
Suitable for applications according to AMS 2750	Yes; Declaration of Conformity, see online support entry 109757262	Yes; Declaration of Conformity, see online support entry 109757262
Suitable for applications according to CQI-9	Yes; Based on AMS 2750 E	Yes; Based on AMS 2750 E
Connection method		
Design of electrical connection	4/5-pin M12 circular connectors	4/5-pin M12 circular connectors
Dimensions		
Width	60 mm	60 mm
Height	175 mm	175 mm
Depth	49 mm	49 mm
Weights		
Weight, approx.	930 g	930 g

Article number	**6ES7145-6HD00-0AB0** ET200eco PN, 4AO U/I 4xM12
Supply voltage	
Rated value (DC)	24 V
Reverse polarity protection	Yes
Input current	
Current consumption, typ.	280 mA
Actuator supply	
Number of outputs	4
Short-circuit protection	Yes; Electronic at 1.4 A
Output current	
• Rated value	1 A; Maximum
Analog outputs	
Number of analog outputs	4
Voltage output, short-circuit protection	Yes
Voltage output, short-circuit current, max.	30 mA
Current output, no-load voltage, max.	20 V
Output ranges, voltage	
• 0 to 10 V	Yes
• 1 V to 5 V	Yes
• -10 V to +10 V	Yes

Article number	**6ES7145-6HD00-0AB0** ET200eco PN, 4AO U/I 4xM12
Output ranges, current	
• 0 to 20 mA	Yes
• -20 mA to +20 mA	Yes
• 4 mA to 20 mA	Yes
Connection of actuators	
• for voltage output two-wire connection	Yes
• for current output two-wire connection	Yes
Load impedance (in rated range of output)	
• with voltage outputs, min.	1 kΩ
• with voltage outputs, capacitive load, max.	1 µF
• with current outputs, max.	600 Ω
• with current outputs, inductive load, max.	1 mH
Cable length	
• shielded, max.	30 m

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Technical specifications (continued)

Article number	**6ES7145-6HD00-0AB0**
	ET200eco PN, 4AO U/I 4xM12
Analog value generation for the outputs	
Analog value display	SIMATIC S7 format
Conversion principle	Resistor network
Integration and conversion time/ resolution per channel	
• Resolution (incl. overrange)	15 bit + sign
• Conversion time (per channel)	1 ms
Settling time	
• for resistive load	2 ms
• for capacitive load	1.8 ms
• for inductive load	2 ms
Errors/accuracies	
Output ripple (relative to output range, bandwidth 0 to 50 kHz), (+/-)	U: ±0.6 mVrms; I: ±0.4 nArms
Linearity error (relative to output range), (+/-)	0.02 %
Temperature error (relative to output range), (+/-)	U: 0.001%/°C; I: 0.0025%/°C
Crosstalk between the outputs, min.	70 dB
Repeat accuracy in steady state at 25 °C (relative to output range), (+/-)	0.008 %
Interfaces	
Transmission procedure	100BASE-TX
Number of PROFINET interfaces	1
1. Interface	
Interface types	
• integrated switch	Yes
• M12 port	Yes
Interface types	
M12 port	
• Transmission procedure	100BASE-TX
• Autonegotiation	Yes
• Autocrossing	Yes
• Transmission rate, max.	100 Mbit/s
Protocols	
Supports protocol for PROFINET IO	Yes
PROFINET CBA	No
PROFIsafe	No
PROFINET IO Device	
Services	
- IRT with the option "high flexibility"	Yes
- Prioritized startup	Yes
Open IE communication	
• TCP/IP	No
• SNMP	Yes
• DCP	Yes
• LLDP	Yes
• ping	Yes
• ARP	Yes

Article number	**6ES7145-6HD00-0AB0**
	ET200eco PN, 4AO U/I 4xM12
Interrupts/diagnostics/ status information	
Diagnostics function	Yes
Substitute values connectable	Yes
Alarms	
• Diagnostic alarm	Yes
Diagnostic messages	
• Diagnostic information readable	Yes
• Monitoring the supply voltage	Yes; Green "ON" LED
• Wire-break	Yes; Channel-by-channel with current output
• Short-circuit	Yes; Channel-by-channel with voltage output
• Group error	Yes; Red/yellow "SF/MT" LED
Potential separation	
between the load voltages	Yes
between load voltage and all other switching components	No
between Ethernet and electronics	Yes
Potential separation channels	
• between the channels	No
Degree and class of protection	
IP degree of protection	IP65/67
Connection method	
Design of electrical connection	4/5-pin M12 circular connectors
Dimensions	
Width	60 mm
Height	175 mm
Depth	49 mm
Weights	
Weight, approx.	930 g

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Technical specifications (continued)

Article number	**6ES7148-6JA00-0AB0** ET 200eco PN: IO-Link Master	**6ES7148-6JD00-0AB0** ET 200eco PN: IO-Link Master
Supply voltage		
Rated value (DC)	24 V	24 V
Reverse polarity protection	Yes	Yes
Load voltage 2L+		
• Rated value (DC)	24 V	24 V
• Reverse polarity protection	Yes	Yes; against destruction; load increasing
Input current		
Current consumption, typ.	200 mA	100 mA
from supply voltage 1L+, max.	4 A	4 A
from load voltage 2L+, max.	4 A	4 A
Encoder supply		
Number of outputs	6	4
24 V encoder supply		
• Short-circuit protection	Yes	Yes; per channel, electronic
• Output current, max.	200 mA; 100 mA per output to X5-X6	500 mA; Per channel
Digital inputs		
Number of digital inputs	8	
Input characteristic curve in accordance with IEC 61131, type 3	Yes	
Number of simultaneously controllable inputs		
all mounting positions		
- up to 60 °C, max.	8	
Input voltage		
• Rated value (DC)	24 V	
• for signal "0"	-3 to +5V	
• for signal "1"	+11 to +30V	
Input current		
• for signal "0", max. (permissible quiescent current)	1.5 mA	
• for signal "1", typ.	7 mA	
Input delay (for rated value of input voltage)		
for standard inputs		
- at "0" to "1", max.	typically 3 ms	
- at "1" to "0", max.	typically 3 ms	
Cable length		
• unshielded, max.	30 m	
Digital outputs		
Number of digital outputs	4	
Short-circuit protection	Yes; Electronic	
• Response threshold, typ.	1.8 A	
Limitation of inductive shutdown voltage to	Typ. (L1+, L2+) -47 V	
Controlling a digital input	Yes	
Switching capacity of the outputs		
• on lamp load, max.	5 W	
Output current		
• for signal "1" rated value	1.3 A; Maximum	
• for signal "0" residual current, max.	1.5 mA	
Parallel switching of two outputs		
• for uprating	No	
• for redundant control of a load	Yes	
Switching frequency		
• with resistive load, max.	100 Hz	
• with inductive load, max.	0.5 Hz	
• on lamp load, max.	1 Hz	

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Technical specifications (continued)

Article number	**6ES7148-6JA00-0AB0** ET 200eco PN: IO-Link Master	**6ES7148-6JD00-0AB0** ET 200eco PN: IO-Link Master
Total current of the outputs (per group)		
all mounting positions		
- up to 60 °C, max.	3.9 A	
Cable length		
• unshielded, max.	30 m	
IO-Link		
Number of ports	4	4
• of which simultaneously controllable	4	4
IO-Link protocol 1.0	Yes	Yes
IO-Link protocol 1.1		Yes
Transmission rate	4.8 kBd (COM1); 38.4 kBd (COM2)	4.8 kBaud (COM1); 38.4 kBaud (COM2), 230 kBaud (COM3)
Size of process data, input per port	32 byte	32 byte
Size of process data, input per module	32 byte	128 bytes + 4 bytes PQI
Size of process data, output per port	32 byte	32 byte
Size of process data, output per module	32 byte	128 byte
Memory size for device parameter		2 kbyte; for each port
Master backup		Possible with function block IO_LINK_MASTER
Configuration without S7-PCT		Possible; autostart/manual function
Cable length unshielded, max.	20 m	20 m
Operating modes		
• IO-Link	Yes	Yes
• DI	Yes	Yes
• DQ	Yes	Yes; max. 100 mA
Connection of IO-Link devices		
• Port type A	Yes	Yes; via 3-core cable
• Port type B		Yes; Additional device supply: max. 2 A per port, max. 4 A per module
• via three-wire connection	Yes	
Interfaces		
Transmission procedure	100BASE-TX	100BASE-TX
Number of PROFINET interfaces	1	1
1. Interface		
Interface types		
• integrated switch	Yes	Yes
• M12 port	Yes	Yes
Interface types		
M12 port		
• Transmission procedure	100BASE-TX	
• Autonegotiation	Yes	Yes
• Autocrossing	Yes	Yes
• Transmission rate, max.	100 Mbit/s	100 Mbit/s
Protocols		
Supports protocol for PROFINET IO	Yes	Yes
PROFINET CBA	No	No
PROFIsafe	No	No
PROFINET IO Device		
Services		
- IRT with the option "high flexibility"	Yes	Yes
Open IE communication		
• TCP/IP	No	No
• SNMP	Yes	Yes
• DCP	Yes	Yes
• LLDP	Yes	Yes
• ping	Yes	Yes
• ARP	Yes	Yes

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Technical specifications (continued)

Article number	**6ES7148-6JA00-0AB0** ET 200eco PN: IO-Link Master	**6ES7148-6JD00-0AB0** ET 200eco PN: IO-Link Master
Interrupts/diagnostics/ status information		
Diagnostics function	Yes	Yes
Alarms		
• Diagnostic alarm	Yes	Yes
Diagnostic messages		
• Diagnostic information readable	Yes	Yes
• Monitoring the supply voltage	Yes; Green "ON" LED	Yes; Green "ON" LED
• Wire-break in actuator cable	Yes	
• Wire-break in signal transmitter cable	Yes	
• Short-circuit	Yes	Yes; Device supply to M
• Short-circuit encoder supply	Yes	
• Group error	Yes; Red/yellow "SF/MT" LED	Yes; Red/yellow "SF/MT" LED
Potential separation		
between the load voltages	Yes	Yes
between load voltage and all other switching components	No	No
between Ethernet and electronics	Yes	Yes
Potential separation channels		
• between the channels	No	
Degree and class of protection		
IP degree of protection	IP65/67	IP65/67
Standards, approvals, certificates		
Suitable for safety-related tripping of standard modules		No
Connection method		
Design of electrical connection		3/5-pin M12 round connectors
Dimensions		
Width	60 mm	30 mm
Height	175 mm	200 mm
Depth	49 mm	49 mm
Weights		
Weight, approx.	910 g	550 g

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Ordering data	Article No.
ET 200eco PN digital input modules	
• 8 DI 24 V DC; 4 x M12, dual assignment, degree of protection IP67	**6ES7141-6BF00-0AB0**
• 8 DI 24 V DC; 8 x M12, degree of protection IP67	**6ES7141-6BG00-0AB0**
• 16 DI 24 V DC; 8 x M12, dual assignment, degree of protection IP67	**6ES7141-6BH00-0AB0**
ET 200eco PN digital output modules	
• 8 DO 24 V DC/0.5 A; 4 x M12, dual assignment, 1 load voltage supply DO; degree of protection IP67	**6ES7142-6BF50-0AB0**
• 8 DO 24 V DC/1.3 A; 4 x M12, dual assignment, degree of protection IP67	**6ES7142-6BF00-0AB0**
• 8 DO 24 V DC/1.3 A; 8 x M12, degree of protection IP67	**6ES7142-6BG00-0AB0**
• 8 DO 24 V DC/2 A; 8 x M12, degree of protection IP67	**6ES7142-6BR00-0AB0**
• 16 DO 24 V DC/1.3 A; 8 x M12, dual assignment, degree of protection IP67	**6ES7142-6BH00-0AB0**
ET 200eco PN digital input/output modules	
• 8 DI/DO 24 V DC/1.3 A; 8 x M12, degree of protection IP67	**6ES7147-6BG00-0AB0**
• 8 F-DI 24 V DC/3 F-DO 24 V DC/ 2 A; PROFIsafe, certified up to SIL 3 (IEC 61508), PL e (ISO 13849); 4 x M12/3 x M12, degree of protection IP65/67	**6ES7146-6FF00-0AB0**
ET 200eco PN analog input modules	
• 8 AI 4 U/I + 4 RTD/TC; 8 x M12, degree of protection IP67	**6ES7144-6KD00-0AB0**
• 8 AI RTD/TC; 8 x M12, degree of protection IP67	**6ES7144-6KD50-0AB0**
ET 200eco PN analog output modules	
• 4 AO U/I; 4 x M12, degree of protection IP67	**6ES7145-6HD00-0AB0**
ET 200eco PN IO-Link master modules	
• 4 IO-L + 8 DI + 4 DO, 24 V DC/ 1.3 A; 8 x M12, degree of protection IP67, enclosure width 60 mm; for connecting up to 4 IO-Link devices according to IO-Link specification V1.0 and port Class A as well as 8 digital inputs and 4 digital outputs	**6ES7148-6JA00-0AB0**
• 4 IO-L; 4 x M12, degree of protection IP67, enclosure width 30 mm; for connecting up to 4 IO-Link devices according to IO-Link specification V1.0 and V1.1 and port Class B	**6ES7148-6JD00-0AB0**
Accessories	
• PD voltage distributor, 24 V DC; 1 X 7/8", 4 X M12	**6ES7148-6CB00-0AA0**
• Terminal block for ET 200eco PN, 10 A insulation displacement terminals	**6ES7194-6CA00-0AA0**
• Spare fuses for terminal block, 10 units	**6ES7194-6HB00-0AA0**
• Standard rail 0.5 m	**6ES7194-6GA00-0AA0**
• Profile screw for mounting rail, 50 units	**6ES7194-6MA00-0AA0**
• Sealing cap M12 for IP67 modules, 10 units	**3RX9802-0AA00**
• Labels 10 × 7 mm, pastel turquoise, 816 units	**3RT1900-1SB10**
• Labels 10 x 7 mm, yellow, 816 units	**6ES7194-6HA00-0AA0**

	Article No.
PROFINET M12 connector, for user assembly	
IE FC M12 PRO connector, for user assembly	
• 1 unit	**6GK1901-0DB20-6AA0**
• 8 units	**6GK1901-0DB20-6AA8**
PROFINET M12 connecting cables	
Pre-assembled connecting cables with 2 M12 connectors (D-coded) in various lengths:	
0.3 m	**6XV1870-8AE30**
0.5 m	**6XV1870-8AE50**
1.0 m	**6XV1870-8AH10**
1.5 m	**6XV1870-8AH15**
2.0 m	**6XV1870-8AH20**
3.0 m	**6XV1870-8AH30**
5.0 m	**6XV1870-8AH50**
10.0 m	**6XV1870-8AN10**
15.0 m	**6XV1870-8AN15**
M12 connector for 24 V DC load power supply	
Connection socket for 24 V DC incoming supply; 4-pin, A-coded, 3 units	**6GK1907-0DC10-6AA3**
Connector for loop-through of 24 V DC; 4-pin, A-coded, 3 units	**6GK1907-0DB10-6AA3**
M12 plug-in power cables	
Pre-assembled plug-in power cables, fitted at each end with M12 socket and plug 4 x 0.75 mm^2, in various lengths:	
0.3 m	**6XV1801-5DE30**
0.5 m	**6XV1801-5DE50**
1.0 m	**6XV1801-5DH10**
1.5 m	**6XV1801-5DH15**
2.0 m	**6XV1801-5DH20**
3.0 m	**6XV1801-5DH30**
5.0 m	**6XV1801-5DH50**
10.0 m	**6XV1801-5DN10**
15.0 m	**6XV1801-5DN15**
M12 coupler plug	
Can be assembled, for connecting actuators or sensors, 5-pin	**3RK1902-4BA00-5AA0**
Y cable M12	
• For double connection of I/O by means of single cable to ET 200, 5-pin	**6ES7194-6KA00-0XA0**
• For connection of single-channel sensors (1oo1 evaluation), 5-pin	**6ES7194-6KB00-0XA0**
E-coding plug for fail-safe ET 200 distributed I/Os	**6ES7194-6KB00-0AA0**
Spare part; IP65/67, M12, 5-pin; 1 unit per packaging unit	

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Overview



The ET 200eco PN IO-Link master module is part of the ET 200eco PN compact block I/O range and is characterized by:

- Compact block I/O for connection to IO-Link devices and the PROFINET bus system
- Cabinet-free installation in IP67 degree of protection with M12 connection system
- Extremely rugged and resistant metal enclosure and casting
- Compact module with enclosure width of 30 mm or 60 mm
- PROFINET connection: 2 x M12 and automatic PROFINET address assignment
- Data transmission rate 100 Mbps
- LLDP proximity detection without the need for a programming device
- Supply and load voltage connection: 2 x M12
- Channel-specific diagnostics

Technical specifications

Article number	**6ES7148-6JA00-0AB0** ET 200eco PN: IO-Link Master	**6ES7148-6JD00-0AB0** ET 200eco PN: IO-Link Master
Supply voltage		
Rated value (DC)	24 V	24 V
Reverse polarity protection	Yes	Yes
Load voltage 2L+		
• Rated value (DC)	24 V	24 V
• Reverse polarity protection	Yes	Yes; against destruction; load increasing
Input current		
Current consumption, typ.	200 mA	100 mA
from supply voltage 1L+, max.	4 A	4 A
from load voltage 2L+, max.	4 A	4 A
Encoder supply		
Number of outputs	6	4
24 V encoder supply		
• Short-circuit protection	Yes	Yes; per channel, electronic
• Output current, max.	200 mA; 100 mA per output to X5-X6	500 mA; Per channel
Digital inputs		
Number of digital inputs	8	
Input characteristic curve in accordance with IEC 61131, type 3	Yes	
Number of simultaneously controllable inputs		
all mounting positions		
- up to 60 °C, max.	8	
Input voltage		
• Rated value (DC)	24 V	
• for signal "0"	-3 to +5V	
• for signal "1"	+11 to +30V	
Input current		
• for signal "0", max. (permissible quiescent current)	1.5 mA	
• for signal "1", typ.	7 mA	
Input delay (for rated value of input voltage)		
for standard inputs		
- at "0" to "1", max.	typically 3 ms	
- at "1" to "0", max.	typically 3 ms	
Cable length		
• unshielded, max.	30 m	

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Technical specifications (continued)

Article number	6ES7148-6JA00-0AB0 ET 200eco PN: IO-Link Master	6ES7148-6JD00-0AB0 ET 200eco PN: IO-Link Master
Digital outputs		
Number of digital outputs	4	
Short-circuit protection	Yes; Electronic	
• Response threshold, typ.	1.8 A	
Limitation of inductive shutdown voltage to	Typ. (L1+, L2+) -47 V	
Controlling a digital input	Yes	
Switching capacity of the outputs		
• on lamp load, max.	5 W	
Output current		
• for signal "1" rated value	1.3 A; Maximum	
• for signal "0" residual current, max.	1.5 mA	
Parallel switching of two outputs		
• for uprating	No	
• for redundant control of a load	Yes	
Switching frequency		
• with resistive load, max.	100 Hz	
• with inductive load, max.	0.5 Hz	
• on lamp load, max.	1 Hz	
Total current of the outputs (per group)		
all mounting positions		
- up to 60 °C, max.	3.9 A	
Cable length		
• unshielded, max.	30 m	
IO-Link		
Number of ports	4	4
• of which simultaneously controllable	4	4
IO-Link protocol 1.0	Yes	Yes
IO-Link protocol 1.1		Yes
Transmission rate	4.8 kBd (COM1); 38.4 kBd (COM2)	4.8 kBaud (COM1); 38.4 kBaud (COM2), 230 kBaud (COM3)
Size of process data, input per port	32 byte	32 byte
Size of process data, input per module	32 byte	128 bytes + 4 bytes PQI
Size of process data, output per port	32 byte	32 byte
Size of process data, output per module	32 byte	128 byte
Memory size for device parameter		2 kbyte; for each port
Master backup		Possible with function block IO_LINK_MASTER
Configuration without S7-PCT		Possible; autostart/manual function
Cable length unshielded, max.	20 m	20 m
Operating modes		
• IO-Link	Yes	Yes
• DI	Yes	Yes
• DQ	Yes	Yes; max. 100 mA
Connection of IO-Link devices		
• Port type A	Yes	Yes; via 3-core cable
• Port type B		Yes; Additional device supply: max. 2 A per port, max. 4 A per module
• via three-wire connection	Yes	
Interfaces		
Transmission procedure	100BASE-TX	100BASE-TX
Number of PROFINET interfaces	1	1

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Technical specifications (continued)

Article number	**6ES7148-6JA00-0AB0** ET 200eco PN: IO-Link Master	**6ES7148-6JD00-0AB0** ET 200eco PN: IO-Link Master
1. Interface		
Interface types		
• integrated switch	Yes	Yes
• M12 port	Yes	Yes
Interface types		
M12 port		
• Transmission procedure	100BASE-TX	
• Autonegotiation	Yes	Yes
• Autocrossing	Yes	Yes
• Transmission rate, max.	100 Mbit/s	100 Mbit/s
Protocols		
Supports protocol for PROFINET IO	Yes	Yes
PROFINET CBA	No	No
PROFIsafe	No	No
PROFINET IO Device		
Services		
- IRT with the option "high flexibility"	Yes	Yes
Open IE communication		
• TCP/IP	No	No
• SNMP	Yes	Yes
• DCP	Yes	Yes
• LLDP	Yes	Yes
• ping	Yes	Yes
• ARP	Yes	Yes
Interrupts/diagnostics/ status information		
Diagnostics function	Yes	Yes
Alarms		
• Diagnostic alarm	Yes	Yes
Diagnostic messages		
• Diagnostic information readable	Yes	Yes
• Monitoring the supply voltage	Yes; Green "ON" LED	Yes; Green "ON" LED
• Wire-break in actuator cable	Yes	
• Wire-break in signal transmitter cable	Yes	
• Short-circuit	Yes	Yes; Device supply to M
• Short-circuit encoder supply	Yes	
• Group error	Yes; Red/yellow "SF/MT" LED	Yes; Red/yellow "SF/MT" LED
Potential separation		
between the load voltages	Yes	Yes
between load voltage and all other switching components	No	No
between Ethernet and electronics	Yes	Yes
Potential separation channels		
• between the channels	No	
Degree and class of protection		
IP degree of protection	IP65/67	IP65/67
Standards, approvals, certificates		
Suitable for safety-related tripping of standard modules		No
Connection method		
Design of electrical connection		3/5-pin M12 round connectors
Dimensions		
Width	60 mm	30 mm
Height	175 mm	200 mm
Depth	49 mm	49 mm
Weights		
Weight, approx.	910 g	550 g

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ET 200eco PN IO-Link master

Ordering data	Article No.
ET 200eco PN IO-Link master	
• 4 IO-L + 8 DI + 4 DO, 24 V DC/1.3 A; 8 x M12, degree of protection IP67, enclosure width 60 mm; for connecting up to 4 IO-Link devices according to IO-Link specification V1.0 and port Class A as well as 8 digital inputs and 4 digital outputs	**6ES7148-6JA00-0AB0**
• 4 IO-L; 4 x M12, degree of protection IP67, enclosure width 30 mm; for connecting up to 4 IO-Link devices according to IO-Link specification V1.0 and V1.1 and port Class B	**6ES7148-6JD00-0AB0**
Accessories	
• PD voltage distributor, 24 V DC; 1 X 7/8", 4 X M12	**6ES7148-6CB00-0AA0**
• Terminal block for ET 200eco PN, 10 A insulation-displacement connector	**6ES7194-6CA00-0AA0**
• Spare fuses for terminal block, 10 units	**6ES7194-6HB00-0AA0**
• Mounting rail 0.5 m	**6ES7194-6GA00-0AA0**
• Profile screw for mounting rail, 50 units	**6ES7194-6MA00-0AA0**
• Sealing cap M12 for IP67 modules, 10 units	**3RK1901-1KA00**
• Labels 10 × 7 mm, pastel turquoise, 816 units	**3RT1900-1SB10**
PROFINET M12 connector, for user assembly	
IE FC M12 connector PRO, for user assembly	
• 1 unit	**6GK1901-0DB20-6AA0**
• 8 units	**6GK1901-0DB20-6AA8**
PROFINET M12 connecting cables	
Preassembled connecting cables with 2 M12 connectors (D-coded), in various lengths:	
0.3 m	**6XV1870-8AE30**
0.5 m	**6XV1870-8AE50**
1.0 m	**6XV1870-8AH10**
1.5 m	**6XV1870-8AH15**
2.0 m	**6XV1870-8AH20**
3.0 m	**6XV1870-8AH30**
5.0 m	**6XV1870-8AH50**
10.0 m	**6XV1870-8AN10**
15.0 m	**6XV1870-8AN15**

	Article No.
M12 connector for 24 V DC load power supply	
Connection socket for 24 V DC incoming supply; 4-pin, A-coded, 3 units	**6GK1907-0DC10-6AA3**
Connector for loop-through of 24 V DC; 4-pin, A-coded, 3 units	**6GK1907-0DB10-6AA3**
M12 plug-in power cables	
Preassembled plug-in power cables, fitted at each end with M12 socket and plug 4 x 0.75 mm^2, in various lengths:	
0.3 m	**6XV1801-5DE30**
0.5 m	**6XV1801-5DE50**
1.0 m	**6XV1801-5DH10**
1.5 m	**6XV1801-5DH15**
2.0 m	**6XV1801-5DH20**
3.0 m	**6XV1801-5DH30**
5.0 m	**6XV1801-5DH50**
10.0 m	**6XV1801-5DN10**
15.0 m	**6XV1801-5DN15**
Y cable M12	
For double connection of I/O by means of single cable to ET 200, 5-pin	**6ES7194-6KA00-0XA0**

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Overview



SIPLUS HCS family

SIPLUS HCS heating control systems: Industrial heating processes – maximum precision and efficiency

In manufacturing processes where temperature plays a crucial role, deviations of just a few degrees can cause enormous quality problems. To avoid this and to minimize rejection rates, high-precision and reliable, individual control of the electrical heating elements is essential.

Nearly all industrially manufactured products undergo heat treatment. Even small deviations in the heating process can result in enormous negative effects on product quality.

To increase the quality and quantity of a heat-treated product, it is important to be able to focus the energy required with the highest level of spatial and temporal precision. The SIPLUS HCS ensures utmost precision in the control of electric heating elements such as infrared heaters.

Three heating control systems are available:

- With integrated power outputs – compact design
- With integrated power outputs - modular design
- Without integrated power outputs

The SIPLUS HCS family of heating control systems saves time, costs and resources when it comes to configuring, commissioning, operation and maintenance.

This is achieved by:

- Simple integration into existing automation systems such as SIMATIC and SIMOTION
- Lower wiring costs and user-friendly engineering
- Intelligent diagnostics options for swift fault detection
- Service-friendly design thanks to ready-to-use function and data blocks
- Reduced volume in the control cabinet with space savings of up to 50%

For more information, see http://www.siemens.com/siplus-hcs.

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SIPLUS HCS3200 heating control system

Overview



SIPLUS HCS3200 heating control system with fixing brackets

The SIPLUS HCS3200 heating control system was developed as a compact solution for controlling linear heat emitter arrays.

Thanks to the high IP65 degree of protection, it can be used independently of a control cabinet at a distributed location near the emitters.

- HCS3200 fan: For controlling 9 emitters and 1 output for switching an external fan on/off
- HCS3200: With UL Recognized Component certification for controlling 9 emitters

Technical specifications

Article number	**6BK1932-0BA00-0AA0** SIPLUS HCS3200 Fan	**6BK1932-0AA00-0AA0** SIPLUS HCS3200
General information		
Product brand name	SIPLUS	
Type of control of the heating elements	Half-wave control	
Installation type/mounting		
Mounting type	screw fixing	
Mounting position	vertical	
Type of ventilation	Self-ventilation	
Supply voltage		
Type of supply voltage	AC	
Rated value (AC)	400 V	
Relative negative tolerance	10 %	
Relative positive tolerance	10 %	
Line frequency		
• Rated value 1	50 Hz	
• Rated value 2	60 Hz	
• Relative symmetrical tolerance	5 %	
Connection method		
• Design of electrical connection for supply voltage	Connector, 4-pole + PE	Connector, 2-pole + PE
- Connectable conductor cross-sections, finely stranded with wire end processing	3x (6 ... 25 mm^2) and 1x PE (6 ... 16 mm^2)	2x (6 ... 25 mm^2) and 1x PE (6 ... 16 mm^2)
- Connectable conductor cross-sections for AWG cables	3x (8 ... 4)	2x (8 ... 4)
Input voltage		
Design of the power supply	external	
Type of voltage	DC	
Supply voltage for electronics	24 V	
Relative symmetrical tolerance of the input voltage	20 %	
Input current		
Current consumption for the electronics, max.	0.25 A	

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Technical specifications (continued)

Article number	**6BK1932-0BA00-0AA0** SIPLUS HCS3200 Fan	**6BK1932-0AA00-0AA0** SIPLUS HCS3200
Power electronics		
Type of load	Ohmic load	
Power capacity, max.	25.2 kW	
Switching capacity current per phase, max.	63 A	
Breaking capacity maximum short-circuit current (Icu) at 400 V	25 kA	
Heating power		
• Number of digital outputs	9	
• Number of heating elements per output, max.	1	
• Output voltage for heating power	400 V	
• Power carrying capacity per output, min.	200 W	
• Power carrying capacity per output, max.	4 000 W	
• Output current for heating power	10 A	
• Design of short-circuit protection per output	Fuse 16 A	Fuse 15 A
Fan control		
• Number of digital outputs	1	0
• Output voltage for fan	230 V	
• Power carrying capacity per output, min.	60 W	
• Power carrying capacity per output, max.	500 W	
• Design of short-circuit protection	Fuse 4 A	
Connection method		
• Design of electrical connection at output for heating and fan	Connector, 20-pole + PE	
- Connectable conductor cross-sections, finely stranded with wire end processing	20x (1.5 ... 4 mm^2), 1x PE (1.5 ... 16 mm^2)	18x (1.5 ... 4 mm^2), 1x PE (1.5 ... 16 mm^2)
- Connectable conductor cross-sections for AWG cables, stranded	20x (18 ... 12)	18x (18 ... 12)
Interfaces		
Interfaces/bus type	PROFIBUS DP	
PROFIBUS DP		
• Transmission rate, max.	12 Mbit/s	
• Design of electrical connection of PROFIBUS interface	ECOFAST	
Protocols		
PROFIBUS DP	Yes	
Interrupts/diagnostics/ status information		
Number of status displays	2	
LED status display	LED green = status indicator, LED red = fault indicator	
Diagnostics function	Voltage diagnostics	
Diagnostic messages		
• Wire-break	Yes	
• Fuse blown	Yes	
• Load failure	Yes	
Integrated Functions		
Monitoring functions		
• Temperature monitoring	Yes	
• Type of temperature monitoring	NTC thermistor	
Measuring functions		
• Voltage measurement	Yes	
Potential separation		
Design of electrical isolation	Optocoupler between main circuit and PELV	
between the outputs	No	

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Technical specifications (continued)

Article number	6BK1932-0BA00-0AA0 SIPLUS HCS3200 Fan	6BK1932-0AA00-0AA0 SIPLUS HCS3200
Isolation		
Overvoltage category	III	
Degree of pollution	2	
EMC		
EMC interference emission	in accordance with IEC 61000-6-4:2007 + A1:2011	
Electrostatic discharge acc. to IEC 61000-4-2	4 kV contact discharge / 8 kV air discharge	
Field-related interference acc. to IEC 61000-4-3	10 V/m (80 ... 1 000 MHz), 3 V/m (1.4 ... 2.0 GHz), 1 V/m (2.0 ... 2.7 GHz)	
Conducted interference due to burst acc. to IEC 61000-4-4	2 kV power supply lines / 1 kV signal lines	
Conducted interference due to surge acc. to IEC 61000-4-5	On supply lines: 1 kV symmetrical, 2 kV asymmetrical, (24 V DC supply only with external protective measure) for PROFIBUS cable : asymmetrical 1 kV	
Conducted interference due to high-frequency radiation acc. to IEC 61000-4-6	10 V (0.15 ... 80 MHz)	
Degree and class of protection		
IP degree of protection	IP65	
Standards, approvals, certificates		
Certificate of suitability	CE	CE, UL
Reference designation according to DIN EN 81346-2	Q	
Ambient conditions		
Ambient temperature during operation		
• min.	0 °C	
• max.	50 °C	
Ambient temperature during storage/transportation		
• Storage, min.	-40 °C	
• Storage, max.	70 °C	
• Transportation, min.	-40 °C	
• Transportation, max.	70 °C	
Air pressure acc. to IEC 60068-2-13		
• Operation, min.	860 hPa	
• Operation, max.	1 080 hPa	
• Storage, min.	660 hPa	
• Storage, max.	1 080 hPa	
Altitude during operation relating to sea level		
• Installation altitude above sea level, max.	2 000 m	
Relative humidity		
• Operation at 50 °C, max.	50 %	
Vibrations		
• Vibration resistance during operation acc. to IEC 60068-2-6	10 ... 58 Hz / 0.15 mm, 58 ... 150 Hz / 1 g	
• Vibration resistance during storage acc. to IEC 60068-2-6	5 ... 9 Hz / 3.5 mm, 9 ... 500 Hz / 1 g	
Dimensions		
Width	300 mm	
Height	380 mm	
Depth	200 mm	

Ordering data

	Article No.
SIPLUS HCS3200 heating control system	
SIPLUS HCS3200 UL-certified	**6BK1932-0AA00-0AA0**
SIPLUS HCS3200 fan, degree of protection IP65	**6BK1932-0BA00-0AA0**

	Article No.
Accessories	
SIPLUS HCS3200 fan	**6BK1932-6AA00-0AA0**
as spare part	
Installation kit for wall mounting	**6BK1932-6BA00-0AA0**

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Overview



SIPLUS HCS4200 rack for 12/4 POMs

The SIPLUS HCS4200 heating control system controls and switches heat emitter arrays and other resistive loads in power supply systems in industrial environments for the voltage ranges 45 VAC, 70 VAC, 110 VAC, 230 VAC, 277 VAC, 400 VAC, and 480 VAC.

Communication takes place via PROFINET, PROFIBUS or EtherNet/IP and, in combination with SIMATIC S7, SIMOTION or an industrial PC, forms a high-performance, state-of-the-art automation system. The modular, compact and space-saving distributed I/O system can be individually adapted to suit the application.

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Overview



SIPLUS HCS4200 heating control system

The rack constitutes the basic mechanical structure of the SIPLUS HCS4200.

Technical specifications

Article number	**6BK1942-0AA00-0AA0** HCS Rack4200 for 12 POM	**6BK1942-0BA00-0AA0** HCS Rack4200 for 4 POM
General information		
Product brand name	SIPLUS	
Installation type/mounting		
Mounting type	Control cabinet backplane	
Mounting position	Horizontal	
Type of ventilation	Self ventilation or forced ventilation	
Hardware configuration		
Type of power output connectable	POM4220	
Slots		
• Number of slots	12	4
Interfaces		
Interfaces/bus type	system interface	
Isolation		
Degree of pollution	2	
EMC		
EMC interference emission	Limit value in accordance with IEC 61000-6-4:2007 + A1:2011	
Electrostatic discharge acc. to IEC 61000-4-2	4 kV contact discharge / 8 kV air discharge	
Field-related interference acc. to IEC 61000-4-3	10 V/m (80 ... 1 000 MHz), 3 V/m (1.4 ... 2.0 GHz), 1 V/m (2.0 ... 2.7 GHz)	
Degree and class of protection		
IP degree of protection	IP20	
Standards, approvals, certificates		
Reference designation according to DIN EN 81346-2	K	

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Technical specifications (continued)

Article number	**6BK1942-0AA00-0AA0** HCS Rack4200 for 12 POM	**6BK1942-0BA00-0AA0** HCS Rack4200 for 4 POM
Ambient conditions		
Ambient temperature during operation		
• min.	0 °C	
• max.	55 °C	
Ambient temperature during storage/transportation		
• Storage, min.	-25 °C	
• Storage, max.	70 °C	
• Transportation, min.	-25 °C	
• Transportation, max.	70 °C	
Air pressure acc. to IEC 60068-2-13		
• Operation, min.	860 Pa	
• Operation, max.	1 080 Pa	
• Storage, min.	660 Pa	
• Storage, max.	1 080 Pa	
Altitude during operation relating to sea level		
• Installation altitude above sea level, max.	2 000 m	
Relative humidity		
• Operation at 25 ?, max.	95 %	
• Operation at 50 ?, max.	50 %; 95 % at 25 °C, decreasing linearly to 50 % at 50 °C	
Vibrations		
• Vibration resistance during operation acc. to IEC 60068-2-6	10 ... 58 Hz / 0.075 mm, 58 ... 150 Hz / 1 g	
• Vibration resistance during storage acc. to IEC 60068-2-6	5 ... 8.5 Hz / 3.5 mm, 8.5 ... 500 Hz / 1 g	
Shock testing		
• Shock resistance during operation acc. to IEC 60068-2-27	15 g / 11 ms / 3 shocks/axis	
• Shock resistance during storage acc. to IEC 60068-2-29	25 g / 6 ms / 1 000 shocks/axis	
Dimensions		
Width	488 mm	204 mm
Height	285 mm	
Depth	293 mm	

Ordering data

	Article No.
SIPLUS HCS Rack 4200 for 12 POMs Rack for accommodating up to 12 POM4320 Power Output Modules	**6BK1942-0AA00-0AA0**
SIPLUS HCS Rack 4200 for 4 POMs Rack for accommodating up to 4 POM4320 Power Output Modules	**6BK1942-0BA00-0AA0**

	Article No.
Accessories	
SIPLUS HCS4200 fan module Is attached to the top of the rack for accommodating up to 4 Power Output Modules	**6BK1942-4AA00-0AA0**
Blanking cover (10 items) For covering unoccupied slots in the rack	**6BK1942-6DA00-0AA0**

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Overview



The Central Interface Module (CIM) is the intelligent processor module of the SIPLUS HCS4200 heating control system.

Technical specifications

Article number	**6BK1942-1AA00-0AA0** HCS CIM4210 PROFINET	**6BK1942-1BA00-0AA0** HCS CIM4210 PROFIBUS	**6BK1942-1CA00-0AA0** HCS CIM4210 EtherNet/IP
General information			
Product brand name	SIPLUS		
Installation type/mounting			
Mounting type	Screw mounting to rack		
Mounting position	vertical		
Type of ventilation	Forced ventilation		
Supply voltage			
Type of supply voltage	DC		
Rated value (DC)	24 V		
Relative negative tolerance	20 %		
Relative positive tolerance	20 %		
Connection method			
• Design of electrical connection for supply voltage	Connector 2x 2-pin with tension spring connection		
- Connectable conductor cross-sections, solid	1x (0.2 ... 2.5 mm^2)		
- Connectable conductor cross-sections, finely stranded with wire end processing	1x (0.2 ... 2.5 mm^2)		
- Connectable conductor cross-sections for AWG cables	1x (26 ... 12)		
Power			
Active power input	3 W		
Hardware configuration			
Type of power output connectable	POM4220		
Slots			
• Number of slots	1		

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Technical specifications (continued)

Article number	**6BK1942-1AA00-0AA0** HCS CIM4210 PROFINET	**6BK1942-1BA00-0AA0** HCS CIM4210 PROFIBUS	**6BK1942-1CA00-0AA0** HCS CIM4210 EtherNet/IP
Interfaces			
Interfaces/bus type	PROFINET IO	PROFIBUS DP	EtherNet/IP
PROFIBUS DP			
• Transmission rate, max.		12 Mbit/s	
• Design of electrical connection of PROFIBUS interface		9-pin sub D socket	
Supports protocol for PROFINET IO			
• Transmission rate, max.	100 Mbit/s		
• Design of electrical connection of PROFINET interface	2x RJ45		
EtherNet/IP			
• Transmission rate, max.			100 Mbit/s
• Design of EtherNet/IP interface electrical connection			2 x RJ45
Protocols			
Supports protocol for PROFINET IO	Yes	No	
PROFIBUS DP	No	Yes	No
Further protocols			
• EtherNet/IP	No		Yes
Interrupts/diagnostics/ status information			
Number of status displays	3		
LED status display	LED green = ready, LED yellow = heating on/off, LED red = error display		
Isolation			
Overvoltage category	III		
Degree of pollution	2		
EMC			
EMC interference emission	Limit value in accordance with IEC 61000-6-4:2007 + A1:2011		
Electrostatic discharge acc. to IEC 61000-4-2	4 kV contact discharging, 8 kV air discharging		
Field-related interference acc. to IEC 61000-4-3	10 V/m (80 ... 1 000 MHz), 3 V/m (1.4 ... 2.0 GHz), 1 V/m (2.0 ... 2.7 GHz)		
Conducted interference due to burst acc. to IEC 61000-4-4	2 kV power supply lines, 2 kV PROFINET cables	2 kV power supply lines / 2 kV PROFIBUS cables	2 kV power supply lines, 2 kV PROFINET cables
Conducted interference due to surge acc. to IEC 61000-4-5	DC supply lines: 0.5 kV symmetric and unsymmetric PROFINET cables: 1 kV unsymmetric	DC supply lines: 0.5 kV symmetrical and asymmetrical, PROFIBUS lines: 1 kV asymmetrical	DC supply lines: 0.5 kV symmetric and unsymmetric PROFINET cables: 1 kV unsymmetric
Conducted interference due to high-frequency radiation acc. to IEC 61000-4-6	10 V (0.15 ... 80 MHz)		
Degree and class of protection			
IP degree of protection	IP20		
Standards, approvals, certificates			
Reference designation according to DIN EN 81346-2	K		

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Technical specifications (continued)

Article number	6BK1942-1AA00-0AA0 HCS CIM4210 PROFINET	6BK1942-1BA00-0AA0 HCS CIM4210 PROFIBUS	6BK1942-1CA00-0AA0 HCS CIM4210 EtherNet/IP
Ambient conditions			
Ambient temperature during operation			
• min.	0 °C		
• max.	55 °C		
Ambient temperature during storage/transportation			
• Storage, min.	-25 °C		
• Storage, max.	70 °C		
• Transportation, min.	-25 °C		
• Transportation, max.	70 °C		
Air pressure acc. to IEC 60068-2-13			
• Operation, min.	860 hPa		
• Operation, max.	1 080 hPa		
• Storage, min.	660 hPa		
• Storage, max.	1 080 hPa		
Altitude during operation relating to sea level			
• Installation altitude above sea level, max.	2 000 m		
Relative humidity			
• Operation at 25 °C, max.	95 %		
• Operation at 50 °C, max.	50 %; 95 % at 25 °C, decreasing linearly to 50 % at 50 °C		
Vibrations			
• Vibration resistance during operation acc. to IEC 60068-2-6	10 ... 58 Hz / 0.075 mm, 58 ... 150 Hz / 1 g		
• Vibration resistance during storage acc. to IEC 60068-2-6	5 ... 8.5 Hz / 3.5 mm, 8.5 ... 500 Hz / 1 g		
Shock testing			
• Shock resistance during operation acc. to IEC 60068-2-27	15 g / 11 ms / 3 shocks/axis		
• Shock resistance during storage acc. to IEC 60068-2-29	25 g / 6 ms / 1 000 shocks/axis		
Dimensions			
Width	43 mm		
Height	285 mm		
Depth	136 mm		

Ordering data

	Article No.
SIPLUS HCS4200 CIM4210 PROFINET Central Interface Module with PROFINET communication	**6BK1942-1AA00-0AA0**
SIPLUS HCS4200 CIM4210 PROFIBUS Central Interface Module with PROFIBUS communication	**6BK1942-1BA00-0AA0**
SIPLUS HCS4200 CIM4210 EtherNet/IP Central Interface Module with EtherNet/IP	**6BK1942-1CA00-0AA0**

	Article No.
Accessories	
SIPLUS HCS4200 connector set As spare part, consisting of 20 x 2-pole connectors (24 V DC power supply)	**6BK1942-6FA00-0AA0**
SIPLUS HCS4000 temperature I/O module For recording temperatures using temperature sensors, thermocouples and pyrometers	**6BK1900-0AA00-0AA0**
SIPLUS HCS4000 DI/DO I/O module With 8 digital outputs and 8 configurable inputs/outputs	**6BK1900-0BA00-0AA0**
SIPLUS HCS4000 U/I I/O module For current and voltage measurement (line voltage compensation)	**6BK1900-0CA00-0AA0**

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Overview



The Power Output Modules (POMs) are an essential component of the SIPLUS HCS4200 heating control system. Up to 24 Power Output Modules can be operated on one Central Interface Module (CIM), split over 2 racks.

There are 5 Power Output Module versions:

- POM4220 Lowend
- POM4220 Midrange
- POM4220 Midrange Phase Control
- POM4220 Highend
- POM4220 Flexible

Technical specifications

Article number	**6BK1942-2AA00-0AA0** HCS POM4220 Lowend	**6BK1942-2CA00-0AA0** HCS POM4220 Midrange	**6BK1942-2CA00-0AA1** HCS POM4220 Midrange phase angle control	**6BK1942-2DA00-0AA0** HCS POM4220 Highend	**6BK1942-2FA00-0AA0** HCS POM4220 Flexible
General information					
Product type designation	POM4220 Lowend	POM4220 Midrange	POM4220 mid-range phase control	POM4220 High-end	POM4220 Flexible
Installation type/mounting					
Mounting type	Screw mounting to rack				
Mounting position	vertical				
Type of ventilation	Self ventilation or forced ventilation				
Supply voltage					
Type of supply voltage	AC				
Rated value (AC)	230 V				
Relative negative tolerance	10 %				
Relative positive tolerance	10 %	30 %			
2nd rated value (AC)		277 V			
Relative negative tolerance		25 %			
Relative positive tolerance		8 %			
3rd rated value (AC)				400 V	110 V
Relative negative tolerance				10 %	
Relative positive tolerance				30 %	50 %
4th rated value (AC)				480 V	70 V
Relative negative tolerance				25 %	10 %
Relative positive tolerance				8 %	15 %
5th rated value (AC)					45 V
Relative negative tolerance					10 %
Relative positive tolerance					15 %
Line frequency					
• Rated value 50 Hz	Yes				
• Rated value 60 Hz	Yes				
• Relative symmetrical tolerance	5 %				
Mains buffering					
• Recovery time after power failure, typ.	1 s				

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Technical specifications (continued)

Article number	**6BK1942-2AA00-0AA0** HCS POM4220 Lowend	**6BK1942-2CA00-0AA0** HCS POM4220 Midrange	**6BK1942-2CA00-0AA1** HCS POM4220 Midrange phase angle control	**6BK1942-2DA00-0AA0** HCS POM4220 Highend	**6BK1942-2FA00-0AA0** HCS POM4220 Flexible
Connection method					
• Design of electrical connection for supply voltage	Connector, 3-pole with spring-loaded connection				
- Connectable conductor cross-sections, solid	1x (0.2 ... 10 mm²)	1x (0.75 ... 16 mm²)			
- Connectable conductor cross-sections, finely stranded with wire end processing	1x (0.25 ... 6 mm²)	1x (0.75 ... 16 mm²)			
- Connectable conductor cross-sections for AWG cables	1x (24 ... 8)	1x (18 ... 4)			
Input voltage					
Design of the power supply	Power supply via rack				
Power					
Active power input, max.	1 W				
Power electronics					
Type of load	Ohmic load				
Type of control of the heating elements	Half-wave control	Half-wave control and soft start	Half-wave control, phase control and soft start		Half-wave control
Power capacity, max.	16.1 kW; At 230 V AC	23 kW; At 230 V AC		40 kW; At 400 V AC	23 kW; At 230 V AC
• For phase against phase with fan at 40 °C, max.				40 kW; At 400 V AC	
• For phase against phase without fan at 40 °C, max.				12.5 kW; At 400 V AC	
• For phase against neutral with fan at 40 °C, max.	16.1 kW; At 230 V AC	23 kW; At 230 V AC			
• For phase against neutral without fan at 40 °C, max.	7.3 kW; At 230 V AC				
Switching capacity current per phase, max.	35 A	50 A			
Short-time withstand current (SCCR) acc. to UL 508A	50 kA		100 kA		100 kA
Heating power					
• Number of digital outputs	16	12		8	12
• Number of heating elements per output, max.	1			5; Recommended, depends on tolerance of heating elements	1
• Output voltage for heating power	230 V				
• 2nd output voltage for heating power		277 V			
• 3rd output voltage for heating power				400 V	110 V
• 4th output voltage for heating power				480 V	70 V
• 5th output voltage for heating power					45 V
• Power carrying capacity per output, min.	40 W; At 230 V AC	100 W; At 230 V AC		400 W; At 230 V AC	100 W; At 230 V AC
• Power carrying capacity per output, max.	1 449 W; At 230 V AC	2 760 W; At 230 V AC	3 680 W; At 230 V AC	4 600 W; At 230 V AC	3 680 W; At 230 V AC
- for heating elements with high inrush current, max.	750 W; At 230 V AC	1 600 W; At 230 V AC		2 700 W; At 230 V AC	1 600 W; At 230 V AC
• Output current for heating power	6.3 A; max.	12 A; max.	16 A; max.	20 A; max.	16 A; max.
• Melting I2t value	57 $A^2 \cdot s$	68 $A^2 \cdot s$	20 $A^2 \cdot s$	120 $A^2 \cdot s$	20 $A^2 \cdot s$
• Design of short-circuit protection per output	Safety fuse 6.3 A	Fuse 16 A		Melting fuse 25 A	Fuse 16 A
• Design of overvoltage protection	Transil Diode				

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Technical specifications (continued)

Article number	**6BK1942-2AA00-0AA0** HCS POM4220 Lowend	**6BK1942-2CA00-0AA0** HCS POM4220 Midrange	**6BK1942-2CA00-0AA1** HCS POM4220 Midrange phase angle control	**6BK1942-2DA00-0AA0** HCS POM4220 Highend	**6BK1942-2FA00-0AA0** HCS POM4220 Flexible
Connection method					
• Design of electrical connection at output for heating and fan	Connector, 8-pin with tension spring connection	Connector, 6-pole with spring-loaded connection		Plug, 4-pole, with spring-loaded connection	Connector, 6-pole with spring-loaded connection
- Connectable conductor cross-sections, solid	1x (0.2 ... 10 mm²)				
- Connectable conductor cross-sections, finely stranded with wire end processing	1x (0.25 ... 6 mm²)				
- Connectable conductor cross-sections for AWG cables, stranded	1x (24 ... 8)				
Interfaces					
Interfaces/bus type	system interface				
Interrupts/diagnostics/ status information					
Number of status displays	19	15		11	15
LED status display	LED green = ready, LED yellow = heating on/off, LED red = error display, LED red = error for each channel				
Diagnostics function	Voltage diagnostics			Voltage and current diagnosis	Voltage diagnostics
Diagnostic messages					
• Fuse blown	Yes				
• Load failure	Yes				
• Triac error	Yes				
• Switch-off threshold for internal device temperature	Yes				
• Parallel-connected heating elements	No			Yes	No
• Rotating field fault	Yes				
• Communication error	Yes				
• Supply voltage not connected	Yes				
• Line voltage outside the permissible range	Yes				
• Frequency outside the permissible range	Yes				
Integrated Functions					
Monitoring functions					
• Temperature monitoring	Yes				
• Type of temperature monitoring	NTC thermistor				
Measuring functions					
• Voltage measurement	No			Yes	No
• Current measurement	No			Yes	No
Potential separation					
Design of electrical isolation	Optocoupler and/or protective impedance between main circuit and PELV				
between the outputs	No				
Isolation					
Overvoltage category	III				
Degree of pollution	2				

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Technical specifications (continued)

Article number	**6BK1942-2AA00-0AA0** HCS POM4220 Lowend	**6BK1942-2CA00-0AA0** HCS POM4220 Midrange	**6BK1942-2CA00-0AA1** HCS POM4220 Midrange phase angle control	**6BK1942-2DA00-0AA0** HCS POM4220 Highend	**6BK1942-2FA00-0AA0** HCS POM4220 Flexible
EMC					
EMC interference emission	Limit value in accordance with IEC 61000-6-4:2007 + A1:2011				
Electrostatic discharge acc. to IEC 61000-4-2	4 kV contact discharge / 8 kV air discharge				
Field-related interference acc. to IEC 61000-4-3	10 V/m (80 ... 1 000 MHz), 3 V/m (1.4 ... 2.0 GHz), 1 V/m (2.0 ... 2.7 GHz)				
Conducted interference due to burst acc. to IEC 61000-4-4	2 kV power supply lines, 2 kV load lines				
Conducted interference due to surge acc. to IEC 61000-4-5	Supply and load lines: 1 kV symmetrical, 2 kV asymmetrical				
Conducted interference due to high-frequency radiation acc. to IEC 61000-4-6	10 V (0.15 ... 80 MHz)				
Degree and class of protection					
IP degree of protection	IP20				
Standards, approvals, certificates					
Reference designation according to DIN EN 81346-2	Q				
Ambient conditions					
Ambient temperature during operation					
• min.	0 °C				
• max.	55 °C				
Ambient temperature during storage/transportation					
• Storage, min.	-25 °C				
• Storage, max.	70 °C				
• Transportation, min.	-25 °C				
• Transportation, max.	70 °C				
Air pressure acc. to IEC 60068-2-13					
• Operation, min.	860 hPa				
• Operation, max.	1 080 hPa				
• Storage, min.	660 hPa				
• Storage, max.	1 080 hPa				
Altitude during operation relating to sea level					
• Installation altitude above sea level, max.	2 000 m				
Relative humidity					
• Operation at 25 ?, max.	95 %				
• Operation at 50 ?, max.	50 %; 95 % at 25 °C, decreasing linearly to 50 % at 50 °C				
Vibrations					
• Vibration resistance during operation acc. to IEC 60068-2-6	10 ... 58 Hz / 0.075 mm, 58 ... 150 Hz / 1 g				
• Vibration resistance during storage acc. to IEC 60068-2-6	5 ... 8.5 Hz / 3.5 mm, 8.5 ... 500 Hz / 1 g				
Shock testing					
• Shock resistance during operation acc. to IEC 60068-2-27	15 g / 11 ms / 3 shocks/axis				
• Shock resistance during storage acc. to IEC 60068-2-29	25 g / 6 ms / 1 000 shocks/axis				
Dimensions					
Width	36 mm				
Height	285 mm				
Depth	281 mm				

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Ordering data	Article No.
SIPLUS HCS4200 POM4220 Lowend Power Output Module with 16 outputs for connecting resistive loads	**6BK1942-2AA00-0AA0**
SIPLUS HCS4200 POM4220 Midrange Power Output Module with 12 outputs for connecting resistive loads	**6BK1942-2CA00-0AA0**
SIPLUS HCS4200 POM4220 Midrange phase control Power Output Module with 12 outputs for connecting resistive loads	**6BK1942-2CA00-0AA1**
SIPLUS HCS4200 POM4220 Highend Power Output Module with 8 outputs for connecting resistive loads	**6BK1942-2DA00-0AA0**
SIPLUS HCS4200 POM4220 Flexible Power Output Module with 12 outputs for connecting resistive loads	**6BK1942-2FA00-0AA0**

Accessories	Article No.
Spare fuse, 6.3 A/250 V, for POM4220 Lowend	**6BK1942-6AA00-0AA0**
Spare fuse, 16 A/500 V, for the POM4220 Midrange	**6BK1942-6BA00-0AA0**
Spare fuse, 16 A/500 V, for the POM4220 Midrange	**6BK1942-6HA00-0AA0**
Spare fuse, 25 A/600 V, for the POM4220 Highend	**6BK1942-6KA00-0AA0**
SIPLUS HCS4200 connector set as accessory comprising 10 connectors, 3-pin, for incoming supply, POM4220 Lowend	**6BK1943-6AA00-0AA0**
SIPLUS HCS4200 connector set as accessory comprising 5 connectors, 8-pin, for power outputs, POM4220 Lowend	**6BK1942-6CA00-0AA0**
SIPLUS HCS4200 connector set as accessory comprising 6 connectors, 3-pin, for incoming supply, POM4220 Midrange	**6BK1942-6GA00-0AA0**
SIPLUS HCS4200 connector set as accessory comprising 5 connectors, 6-pin, for power outputs, POM4220 Midrange	**6BK1942-6EA00-0AA0**
SIPLUS HCS4200 connector set as accessory comprising 5 connectors, 4-pin, for power outputs, POM4220 Highend	**6BK1942-6LA00-0AA0**

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SIPLUS HCS4300 heating control system

Overview



SIPLUS HCS4300 heating control systems

The SIPLUS HCS4300 heating control system controls and switches heat emitter arrays and other resistive loads in 400 V/480 V voltage supply systems in industrial environments.

Communication takes place via PROFINET or PROFIBUS and can be used together with SIMATIC S7, for example, to form a highly modern and powerful automation system.

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Overview



The Central Interface Module (CIM) is the intelligent processor module of the SIPLUS HCS4300 heating control system.

Technical specifications

Article number	**6BK1943-1AA00-0AA0** HCS CIM4310 PROFINET	**6BK1943-1BA00-0AA0** HCS CIM4310 PROFIBUS	**6BK1943-1CA00-0AA0** HCS CIM4310 EtherNet/IP
General information			
Product brand name	SIPLUS		
Installation type/mounting			
Mounting type	Screw mounting to POM		
Mounting position	vertical		
Type of ventilation	Forced ventilation		
Supply voltage			
Type of supply voltage	DC		
Rated value (DC)	24 V		
Relative negative tolerance	20 %		
Relative positive tolerance	20 %		
Connection method			
• Design of electrical connection for supply voltage	Connector 2x 2-pin with tension spring connection		
- Connectable conductor cross-sections, solid	1x (0.2 ... 2.5 mm^2)		
- Connectable conductor cross-sections, finely stranded with wire end processing	1x (0.2 ... 2.5 mm^2)		
- Connectable conductor cross-sections for AWG cables	1x (26 ... 12)		
Power			
Active power input	3 W		
Hardware configuration			
Type of power output connectable	POM4320		
Slots			
• Number of slots	1		

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Technical specifications (continued)

Article number	6BK1943-1AA00-0AA0 HCS CIM4310 PROFINET	6BK1943-1BA00-0AA0 HCS CIM4310 PROFIBUS	6BK1943-1CA00-0AA0 HCS CIM4310 EtherNet/IP
Interfaces			
Interfaces/bus type	PROFINET IO	PROFIBUS DP	EtherNet/IP
PROFIBUS DP			
• Transmission rate, max.		12 Mbit/s	
• Design of electrical connection of PROFIBUS interface		9-pin sub D socket	
Supports protocol for PROFINET IO			
• Transmission rate, max.	100 Mbit/s		
• Design of electrical connection of PROFINET interface	2 x RJ45		
EtherNet/IP			
• Transmission rate, max.			100 Mbit/s
• Design of EtherNet/IP interface electrical connection			2 x RJ45
Protocols			
Supports protocol for PROFINET IO	Yes	No	
PROFIBUS DP	No	Yes	No
Further protocols			
• EtherNet/IP	No		Yes
Interrupts/diagnostics/ status information			
Number of status displays	3		
LED status display	LED green = ready, LED yellow = heating on/off, LED red = error display		
Isolation			
Overvoltage category	III		
Degree of pollution	2		
EMC			
EMC interference emission	Limit value in accordance with IEC 61000-6-4:2007 + A1:2011		
Electrostatic discharge acc. to IEC 61000-4-2	4 kV contact discharge / 8 kV air discharge		
Field-related interference acc. to IEC 61000-4-3	10 V/m (80 ... 1 000 MHz), 3 V/m (1.4 ... 2.0 GHz), 1 V/m (2.0 ... 2.7 GHz)		
Conducted interference due to burst acc. to IEC 61000-4-4	2 kV power supply lines, 2 kV PROFINET cables	2 kV power supply lines / 2 kV PROFIBUS cables	2 kV power supply lines, 2 kV PROFINET cables
Conducted interference due to surge acc. to IEC 61000-4-5	DC supply lines: 0.5 kV symmetric and unsymmetric PROFINET cables: 1 kV unsymmetric	DC supply lines: 0.5 kV symmetrical and asymmetrical, PROFIBUS lines: 1 kV asymmetrical	DC supply lines: 0.5 kV symmetric and unsymmetric PROFINET cables: 1 kV unsymmetric
Conducted interference due to high-frequency radiation acc. to IEC 61000-4-6	10 V (0.15 ... 80 MHz)		
Degree and class of protection			
IP degree of protection	IP20		
Standards, approvals, certificates			
Reference designation according to DIN EN 81346-2	K		
Ambient conditions			
Ambient temperature during operation			
• min.	0 °C		
• max.	55 °C		
Ambient temperature during storage/transportation			
• Storage, min.	-25 °C		
• Storage, max.	70 °C		
• Transportation, min.	-25 °C		
• Transportation, max.	70 °C		

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Technical specifications (continued)

Article number	**6BK1943-1AA00-0AA0** HCS CIM4310 PROFINET	**6BK1943-1BA00-0AA0** HCS CIM4310 PROFIBUS	**6BK1943-1CA00-0AA0** HCS CIM4310 EtherNet/IP
Air pressure acc. to IEC 60068-2-13			
• Operation, min.	860 hPa		
• Operation, max.	1 080 hPa		
• Storage, min.	660 hPa		
• Storage, max.	1 080 hPa		
Altitude during operation relating to sea level			
• Installation altitude above sea level, max.	2 000 m		
Relative humidity			
• Operation at 25 ?, max.	95 %		
• Operation at 50 ?, max.	50 %; 95 % at 25 °C, decreasing linearly to 50 % at 50 °C		
Vibrations			
• Vibration resistance during operation acc. to IEC 60068-2-6	10 ... 58 Hz / 0.075 mm, 58 ... 150 Hz / 1 g		
• Vibration resistance during storage acc. to IEC 60068-2-6	5 ... 8.5 Hz / 3.5 mm, 8.5 ... 500 Hz / 1 g		
Shock testing			
• Shock resistance during operation acc. to IEC 60068-2-27	15 g / 11 ms / 3 shocks/axis		
• Shock resistance during storage acc. to IEC 60068-2-29	25 g / 6 ms / 1 000 shocks/axis		
Dimensions			
Width	56 mm		
Height	285 mm		
Depth	136 mm		

Ordering data

	Article No.
SIPLUS HCS4300 CIM4310	
Central Interface Module with PROFINET communication	**6BK1943-1AA00-0AA0**
Central Interface Module with PROFIBUS communication	**6BK1943-1BA00-0AA0**
Central Interface module with EtherNet/IP	**6BK1943-1CA00-0AA0**

	Article No.
Accessories	
SIPLUS HCS4300 EM4315 Expansion module for SIPLUS HCS4300, extends the configuration with 8 power output modules	**6BK1943-1AA50-0AA0**
SIPLUS HCS4000 I/O module temperature For recording temperatures using temperature sensors, thermocouples and pyrometers	**6BK1900-0AA00-0AA0**
SIPLUS HCS4000 I/O module DI/DO With 8 digital outputs and 8 configurable inputs/outputs	**6BK1900-0BA00-0AA0**
SIPLUS HCS4000 I/O module U/I For current and voltage measurement (line voltage compensation)	**6BK1900-0CA00-0AA0**

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Design



- Module (encapsulated) in a metal enclosure
- 9 outputs for connecting resistive loads
- There are four versions:
  - POM4320 busbar mounting (IEC):
    a current of up to 16 A can be used per output
  - POM4320 busbar mounting (UL):
    a current of up to 15 A can be used per output
  - POM4320 rear panel mounting (IEC):
    a current of up to 16 A can be used per output
  - POM4320 rear panel mounting (UL):
    a current of up to 15 A can be used per output
- Connection of the phases via rear busbar adapter or connecting terminals
- Two-pole connection of heat emitters using mating connectors (mating connectors are included in the scope of supply!)
- Two fuses per output for supply and return line in a fuse module which can be plugged on and pulled off
- Heat dissipation by fan fitted to top of module
- Internal serial interface
- Three diagnostics LEDs for displaying module faults
- Nine diagnostics LEDs for displaying output errors

Technical specifications

Article number	**6BK1943-2AA00-0AA0** HCS POM4320 busbar mounting (IEC)	**6BK1943-2AA00-0AA2** HCS POM4320 busbar mounting (IEC)	**6BK1943-2BA00-0AA0** HCS POM4320 busbar mounting (UL)	**6BK1943-2BA00-0AA2** HCS POM4320 busbar mounting (UL)	**6BK1943-2CA00-0AA0** HCS POM4320 panel mounting (IEC)	**6BK1943-2CA00-0AA2** HCS POM4320 panel mounting (IEC)	**6BK1943-2DA00-0AA0** HCS POM4320 panel mounting (UL)	**6BK1943-2DA00-0AA2** HCS POM4320 panel mounting (UL)
General information								
Product type designation	POM4320							
Installation type/mounting								
Mounting type	Busbar mounting				Panel mounting			
Mounting position	vertical							
Type of ventilation	Self-ventilation							
Supply voltage								
Type of supply voltage	AC							
Rated value (AC)	400 V							
Relative negative tolerance	10 %							
Relative positive tolerance	30 %							
2nd rated value (AC)	480 V							
Relative negative tolerance	25 %							
Relative positive tolerance	8 %							
Line frequency								
• Rated value 50 Hz	Yes							
• Rated value 60 Hz	Yes							
• Relative symmetrical tolerance	5 %							
Mains buffering								
• Recovery time after power failure, typ.	1 s							

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Technical specifications (continued)

Article number	6BK1943-2AA00-0AA0	6BK1943-2AA00-0AA2	6BK1943-2BA00-0AA0	6BK1943-2BA00-0AA2	6BK1943-2CA00-0AA0	6BK1943-2CA00-0AA2	6BK1943-2DA00-0AA0	6BK1943-2DA00-0AA2
	HCS POM4320 busbar mounting (IEC)	HCS POM4320 busbar mounting (IEC)	HCS POM4320 busbar mounting (UL)	HCS POM4320 busbar mounting (UL)	HCS POM4320 panel mounting (IEC)	HCS POM4320 panel mounting (IEC)	HCS POM4320 panel mounting (UL)	HCS POM4320 panel mounting (UL)
Connection method								
• Design of electrical connection for supply voltage	Busbar mounting, 3-pole + PE				Terminal, 3-pin			
- Connectable conductor cross-sections, solid					1x (1.5 ... 50 mm²)			
- Connectable conductor cross-sections, finely stranded with wire end processing					1x (1.5 ... 35 mm²)			
- Connectable conductor cross-sections for AWG cables					1x (16 ... 1)			
Input voltage								
Design of the power supply	Power supply via CIM							
Power								
Active power input, max.	8 W							
Power electronics								
Type of load	Ohmic load							
Type of control of the heating elements	Half-wave control and soft start	Half-wave control, phase control and soft start	Half-wave control and soft start	Half-wave control, phase control and soft start	Half-wave control and soft start	Half-wave control, phase control and soft start	Half-wave control and soft start	Half-wave control, phase control and soft start
Power capacity, max.	57.6 kW; At 400 V AC		51.8 kW; At 480 V AC	64.8 kW; At 480 V AC	57.6 kW; At 400 V AC		51.8 kW; At 480 V AC	64.8 kW; At 480 V AC
• For phase against phase with fan at 40 °C, max.	57.6 kW; At 400 V AC		51.8 kW; At 480 V AC	64.8 kW; At 480 V AC	57.6 kW; At 400 V AC		51.8 kW; At 480 V AC	64.8 kW; At 480 V AC
Switching capacity current per phase, max.	83 A		63 A	80 A	83 A		63 A	80 A
Short-time withstand current (SCCR) acc. to UL 508A			50 kA	100 kA			50 kA	100 kA
Heating power								
• Number of digital outputs	9							
• Number of heating elements per output, max.	1							
• Output voltage for heating power	400 V							
• 2nd output voltage for heating power	480 V							
• Power carrying capacity per output, min.	200 W; At 400 V AC		200 W; At 480 V AC		200 W; At 400 V AC		200 W; At 480 V AC	
• Power carrying capacity per output, max.	6 400 W; At 400 V AC		5 760 W; At 480 V AC	7 200 W; At 480 V AC	6 400 W; At 400 V AC		5 760 W; At 480 V AC	7 200 W; At 480 V AC
- for heating elements with high inrush current, max.	4 000 W; At 400 V AC		3 000 W; At 480 V AC	4 000 W; At 480 V AC	4 000 W; At 400 V AC		3 000 W; At 480 V AC	4 000 W; At 480 V AC
• Output current for heating power	16 A; max.		12 A; max.	15 A; max.	16 A; max.		12 A; max.	15 A; max.
• Melting I2t value	250 A²·s		225 A²·s	400 A²·s	250 A²·s		225 A²·s	400 A²·s
• Design of short-circuit protection per output	Fuse 16 A		Fuse 15 A	Melting fuse 20 A	Fuse 16 A		Fuse 15 A	Melting fuse 20 A
• Design of overvoltage protection	Transil Diode							
Connection method								
• Design of electrical connection at output for heating and fan	Connector, 3-pole with spring-loaded connection							
- Connectable conducto r cross-sections, solid	1x (0.2 ... 10 mm²)							
- Connectable conductor cross-sections, finely stranded with wire end processing	1x (0.25 ... 6 mm²)							
- Connectable conductor cross-sections for AWG cables, stranded	1x (24 ... 8)							

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Technical specifications (continued)

Article number	6BK1943-2AA00-0AA0	6BK1943-2AA00-0AA2	6BK1943-2BA00-0AA0	6BK1943-2BA00-0AA2	6BK1943-2CA00-0AA0	6BK1943-2CA00-0AA2	6BK1943-2DA00-0AA0	6BK1943-2DA00-0AA2
	HCS POM4320 busbar mounting (IEC)	HCS POM4320 busbar mounting (IEC)	HCS POM4320 busbar mounting (UL)	HCS POM4320 busbar mounting (UL)	HCS POM4320 panel mounting (IEC)	HCS POM4320 panel mounting (IEC)	HCS POM4320 panel mounting (UL)	HCS POM4320 panel mounting (UL)
Interfaces								
Interfaces/bus type	system interface							
Interrupts/diagnostics/ status information								
Number of status displays	12							
LED status display	LED green = ready, LED yellow = heating on/off, LED red = error display, LED red = error for each channel							
Diagnostics function	Voltage diagnostics							
Diagnostic messages								
• Fuse blown	Yes							
• Load failure	Yes							
• Triac error	Yes							
• Switch-off threshold for internal device temperature	Yes							
• Parallel-connected heating elements	No							
• Rotating field fault	Yes							
• Communication error	Yes							
• Supply voltage not connected	Yes							
• Line voltage outside the permissible range	Yes							
• Frequency outside the permissible range	Yes							
Integrated Functions								
Monitoring functions								
• Temperature monitoring	Yes							
• Type of temperature monitoring	NTC thermistor							
Measuring functions								
• Voltage measurement	Yes							
• Current measurement	No							
Potential separation								
Design of electrical isolation	Optocoupler and/or protective impedance between main circuit and PELV							
between the outputs	No							
Isolation								
Overvoltage category	III							
Degree of pollution	2							
EMC								
EMC interference emission	Limit value in accordance with IEC 61000-6-4:2007 + A1:2011							
Electrostatic discharge acc. to IEC 61000-4-2	4 kV contact discharge / 8 kV air discharge							
Field-related interference acc. to IEC 61000-4-3	10 V/m (80 ... 1 000 MHz), 3 V/m (1.4 ... 2.0 GHz), 1 V/m (2.0 ... 2.7 GHz)							
Conducted interference due to burst acc. to IEC 61000-4-4	2 kV power supply lines, 2 kV load lines							
Conducted interference due to surge acc. to IEC 61000-4-5	on supply and load lines: 1 kV symmetric, 2 kV unsymmetric							
Conducted interference due to high-frequency radiation acc. to IEC 61000-4-6	10 V (0.15 ... 80 MHz)							
Degree and class of protection								
IP degree of protection	IP20							
Standards, approvals, certificates								
Reference designation according to DIN EN 81346-2	Q							

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Technical specifications (continued)

Article number	6BK1943-2AA00-0AA0	6BK1943-2AA00-0AA2	6BK1943-2BA00-0AA0	6BK1943-2BA00-0AA2	6BK1943-2CA00-0AA0	6BK1943-2CA00-0AA2	6BK1943-2DA00-0AA0	6BK1943-2DA00-0AA2
	HCS POM4320 busbar mounting (IEC)	HCS POM4320 busbar mounting (IEC)	HCS POM4320 busbar mounting (UL)	HCS POM4320 busbar mounting (UL)	HCS POM4320 panel mounting (IEC)	HCS POM4320 panel mounting (IEC)	HCS POM4320 panel mounting (UL)	HCS POM4320 panel mounting (UL)
Ambient conditions								
Ambient temperature during operation								
• min.	0 °C							
• max.	55 °C							
Ambient temperature during storage/transportation								
• Storage, min.	-25 °C							
• Storage, max.	70 °C							
• Transportation, min.	-25 °C							
• Transportation, max.	70 °C							
Air pressure acc. to IEC 60068-2-13								
• Operation, min.	860 hPa							
• Operation, max.	1 080 hPa							
• Storage, min.	660 hPa							
• Storage, max.	1 080 hPa							
Altitude during operation relating to sea level								
• Installation altitude above sea level, max.	2 000 m							
Relative humidity								
• Operation at 25 ?, max.	95 %							
• Operation at 50 ?, max.	50 %; 95 % at 25 °C, decreasing linearly to 50 % at 50 °C							
Vibrations								
• Vibration resistance during operation acc. to IEC 60068-2-6	10 ... 58 Hz / 0.075 mm, 58 ... 150 Hz / 1 g							
• Vibration resistance during storage acc. to IEC 60068-2-6	5 ... 8.5 Hz / 3.5 mm, 8.5 ... 500 Hz / 1 g							
Shock testing								
• Shock resistance during operation acc. to IEC 60068-2-27	15 g / 11 ms / 3 shocks/axis							
• Shock resistance during storage acc. to IEC 60068-2-29	25 g / 6 ms / 1 000 shocks/axis							
Dimensions								
Width	104 mm							
Height	340 mm				344 mm			
Depth	250 mm				217 mm			

Ordering data

	Article No.
SIPLUS HCS4300 POM4320	
Power output module with 9 outputs for connecting resistive loads	
IEC, busbar mounting	**6BK1943-2AA00-0AA0**
IEC, busbar mounting, redesign version with enhanced interference immunity	**6BK1943-2AA00-0AA2**
UL, busbar mounting	**6BK1943-2BA00-0AA0**
UL, busbar mounting, redesign version with enhanced interference immunity and 100 kA SCCR	**6BK1943-2BA00-0AA2**
IEC, rear panel mounting	**6BK1943-2CA00-0AA0**
IEC, rear panel mounting, redesign version with enhanced interference immunity	**6BK1943-2CA00-0AA2**
UL, rear panel mounting	**6BK1943-2DA00-0AA0**
UL, rear panel mounting, redesign version with enhanced interference immunity and 100 kA SCCR	**6BK1943-2DA00-0AA2**

	Article No.
Accessories	
SIPLUS HCS4300 connecting cable from POM to POM	
• Consisting of 10 items, 10 cm long	**6BK1943-5AA00-0AA0**
• Consisting of 10 items, 25 cm long	**6BK1943-5BA00-0AA0**
SIPLUS HCS4300 connector set	**6BK1943-6AA00-0AA0**
• Consisting of 10 x 3-pole connectors	
Spare fuse, 16 A/500 V, for POM4320	**6BK1943-6BA00-0AA0**
Fan as spare part	**6BK1700-2GA00-0AA0**

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Power Rail Booster

Overview



- The device for low-cost PROFIBUS DP transfer over contact conductors and slip rings in IP20 degree of protection
- Permissible baud rates from 9600 bps to 500 kbps, self-optimizing
- Permissible busbar length:
  from 25 m at 500 kbps to 1200 m at 9600 bps
- Configuring with PRB Checker software
- Up to 125 nodes per segment
- Transparent for data communication:
  The Power Rail Booster does not reserve DP addresses
- Easy to install due to connection without terminating resistor and filter element
- Diagnostics LED for power supply, bus activity and group errors
- Isolated electronic changeover contact for external group error display or diagnostic alarm
- Uninterruptible communication beyond segment limits using the "PRB segment controller"

Technical specifications

Degree of protection	**IP20**
Dimensions (W x H x D, with connector) in mm	90 x 132 x 75
Supply voltage	24 V DC
Power consumption	max. 20 W
Data transmission rate, max.	500 Kbps, self-adjusting
Cable length (depends on baud rate), max.	1200 m
Shock-hazard protected voltage	Yes, to EN 61131-2
Stations per PRB segment, max.	125
Operation without terminating resistance	Yes
Operation without filter	Yes
Wiring options: Line / star	Yes / Yes

Ordering data

	Article No.
Power Rail Booster Signal amplifier for PROFIBUS DP transmission over contact cables, max. 500 Kbps	**6ES7972-4AA02-0XA0**
PRB segment controller Automatic change-over switch between PRB segments	**6ES7972-4AA50-0XA0**

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Overview



- RS 485 repeater with online line diagnostics for PROFIBUS DP
- PROFIBUS DP standard slaves (DP-V1)
- Automatic determination of fault types and locations
- Data transmission rate 9.6 kbps to 12 Mbps
- Connection via FastConnect using IDC

Technical specifications

Article number	**6ES7972-0AB01-0XA0**
	Diagnostic repeater f. PROFIBUS-DP,
Supply voltage	
Rated value (DC)	24 V
permissible range, lower limit (DC)	20.4 V
permissible range, upper limit (DC)	28.8 V
Interfaces	
PROFIBUS DP	
• Transmission rate, max.	12 Mbit/s; 9.6 kbit/s to 12 Mbit/s
Degree and class of protection	
Degree of protection acc. to EN 60529	
• IP20	Yes
Ambient conditions	
Ambient temperature during operation	
• min.	0 °C
• max.	60 °C
Ambient temperature during storage/transportation	
• min.	-40 °C
• max.	70 °C
Relative humidity	
• Operation, max.	95 %; at 25 °C

Article number	**6ES7972-0AB01-0XA0**
	Diagnostic repeater f. PROFIBUS-DP,
Connection method	
Design of electrical connection for supply voltage	Terminal block
Design of electrical connection for PROFIBUS cables	FastConnect insulation displacement, 10 clamping cycles possible
Dimensions	
Width	80 mm
Height	125 mm
Depth	67.5 mm
Weights	
Weight, approx.	300 g

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Diagnostic repeater for PROFIBUS DP

Ordering data	Article No.
RS 485 diagnostics repeater For connection of 1 or 2 segments to PROFIBUS DP; with online diagnostics functions for monitoring the bus lines	**6ES7972-0AB01-0XA0**
Accessories	
RS 485 bus connector with 90° cable outlet With screw terminals, max. transfer rate 12 Mbps	
• Without PG interface	**6ES7972-0BA12-0XA0**
• With PG interface	**6ES7972-0BB12-0XA0**
PROFIBUS FastConnect bus connector RS 485 with 90° cable outlet With insulation displacement terminals, max. transfer rate 12 Mbps	
Without PG interface	
• 1 unit	**6ES7972-0BA52-0XA0**
• 100 units	**6ES7972-0BA52-0XB0**
With PG interface	
• 1 unit	**6ES7972-0BB52-0XA0**
• 100 units	**6ES7972-0BB52-0XB0**
Without PG interface, grounding via control cabinet cover	
• 1 unit	**6ES7972-0BA70-0XA0**
With PG interface, grounding via control cabinet cover	
• 1 unit	**6ES7972-0BB70-0XA0**
RS 485 bus connector with angled cable outlet (35°) With screw terminals, max. transfer rate 12 Mbps	
• Without PG interface	**6ES7972-0BA42-0XA0**
• With PG interface	**6ES7972-0BB42-0XA0**
PROFIBUS FastConnect RS 485 bus connector with angular cable outlet (35°) With insulation displacement terminals, max. transfer rate 12 Mbps	
• Without PG interface	**6ES7972-0BA61-0XA0**
• With PG interface	**6ES7972-0BB61-0XA0**

	Article No.
PROFIBUS FastConnect stripping tool Preadjusted stripping tool for fast stripping of PROFIBUS FastConnect bus cables	**6GK1905-6AA00**
PROFIBUS FC standard cable Standard type with special design for quick mounting, 2-wire, shielded, sold by the meter, max. delivery unit 1000 m, minimum order quantity 20 m	**6XV1830-0EH10**
S7 Manual Collection Electronic manuals on DVD, multilingual: S7-200, TD 200, S7-300, M7-300, C7, S7-400, M7-400, STEP 7, Engineering Tools, Runtime Software, SIMATIC DP (distributed I/O), SIMATIC HMI (Human Machine Interface), SIMATIC NET (Industrial Communication)	**6ES7998-8XC01-8YE0**
S7 Manual Collection update service for 1 year Scope of supply: Current DVD "S7 Manual Collection" and the three subsequent updates	**6ES7998-8XC01-8YE2**
Connecting cable for PROFIBUS 12 Mbps, for PG connection to PROFIBUS DP, pre-assembled with 2 x 9-pin sub D plug, 3.0 m	**6ES7901-4BD00-0XA0**

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Overview



- RS 485 repeater with online line diagnostics for PROFIBUS DP
- PROFIBUS DP standard slave (DP-V1)
- Automatic determination of fault type and location
- Transmission rate from 9.6 kbps to 12 Mbps
- Connection via FastConnect IDC

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

For technical documentation on SIPLUS, see:

http://www.siemens.com/siplus-extreme

Technical specifications

Article number	**6AG1972-0AB01-4XA0**
Based on	**6ES7972-0AB01-0XA0** SIPLUS diagnostic repeater for PROFIBUS
Ambient conditions	
Ambient temperature during operation	
• min.	0 °C; = Tmin (incl. condensation/ frost)
• max.	60 °C; = Tmax
Ambient temperature during storage/transportation	
• min.	-40 °C
• max.	70 °C
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)

Article number	**6AG1972-0AB01-4XA0**
Based on	**6ES7972-0AB01-0XA0** SIPLUS diagnostic repeater for PROFIBUS
Resistance	
Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
Remark	
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A

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SIPLUS diagnostic repeater for PROFIBUS

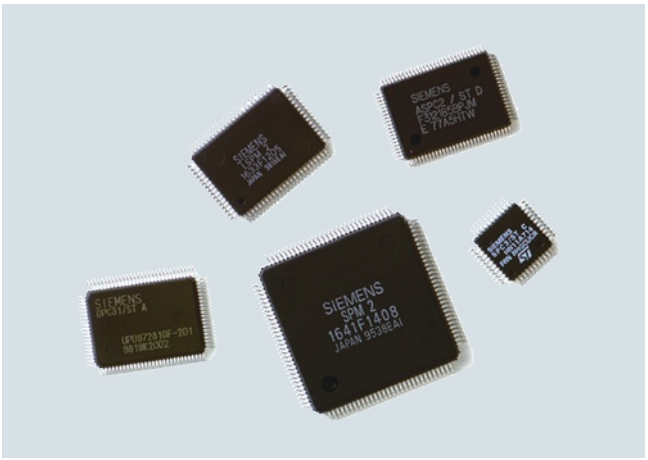
Ordering data

	Article No.
SIPLUS RS 485 diagnostics repeater	
To connect up to 2 segments to PROFIBUS DP, with online diagnostics functions for monitoring the bus lines	
Exposure to media	**6AG1972-0AB01-4XA0**

	Article No.
Accessories	
RS 485 bus connector with 90° cable outlet	
Max. transfer rate 12 Mbps	
Extended temperature range and exposure to media	
• without PG interface	**6AG1972-0BA12-2XA0**
• with PG interface	**6AG1972-0BB12-2XA0**
RS 485 bus connector with angled cable outlet	
(Extended temperature range -40 °C ... +70 °C and exposure to media)	
Max. transfer rate 12 Mbps	
• without PG interface	**6AG1972-0BA42-7XA0**
• with PG interface	**6AG1972-0BB42-7XA0**
Additional accessories	See SIMATIC RS 485 diagnostics repeater, page 9/416

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Overview



- Easy connection of field devices to PROFIBUS
- Integrated low-power management
- Different ASICs for the different functional requirements and application areas

Technical specifications

	LSPM 2	SPC 3	SPC 3LV	DPC 31
Protocol	PROFIBUS DP	PROFIBUS DP	PROFIBUS DP	PROFIBUS DP, PROFIBUS PA
Application range	simple slave application	intelligent slave application	intelligent slave application	intelligent slave application
Transmission rate, max.	12 Mbps	12 Mbps	12 Mbps	12 Mbps
Bus access	in ASIC	in ASIC	in ASIC	in ASIC
Automatic determination of transmission rate	yes	yes	yes	yes
Microprocessor required	no	yes	yes	integrated
Scope of firmware	not required	6 to 24 KB	6 to 24 KB	approx. 38 KB
Message buffer	-	1.5 KB	1.5 KB	6 KB
Power supply	5 V DC	5 V DC	3.3 V DC	3.3 V DC
Power loss, max.	0.35 W	0.5 W	<0.5 W	0.2 W
Permissible ambient temperature	-40 °C … +75 °C	-40 °C … +85 °C	-40 °C … +85 °C	-40 °C … +85 °C
Housing	MQFP, 80-pin	PQFP, 44-pin	PQFP, 44-pin	PQFP, 100-pin
Frame size	4 cm^2	2 cm^2	2 cm^2	4 cm^2
Delivery quantities (pcs.)	6/66/330/4950	6/96/750/960/4800	5/160/800/1000/4800	STEP B: 6/60/300/5100 STEP C1: 6/66/660/4620

	SPC 4-2	ASPC 2	SIM 1-2	FOCSI
Protocol	PROFIBUS DP PROFIBUS FMS PROFIBUS PA	PROFIBUS DP PROFIBUS FMS PROFIBUS PA	PROFIBUS PA	-
Application range	Intelligent slave application	Master application	Medium Attachment	Medium Management Unit
Transmission rate, max.	12 Mbps	12 Mbps	31.25 Kbps	12 Mbps
Bus access	in ASIC	in ASIC	-	-
Automatic determination of transmission rate	yes	yes	-	-
Microprocessor required	yes	yes	-	-
Scope of firmware	3 … 30 KB	80 KB	not required	not required
Message buffer	3 KB	1 MB (external)	-	-
Voltage supply	5 V DC, 3.3 V	5 V DC	via bus	3.3 V DC
Power loss, max.	0.6 W at 5V 0.01 W at 3.3 V	0.9 W	0.05 W	0.75 W
Permissible ambient temperature	-40 °C … +85 °C	-40 °C … +85 °C	-40 °C … +85 °C	-40 °C … +85 °C
Housing	TQFP, 44-pin	P-MQFP, 100-pin	MLPQ, 40-pin	TQFP, 44-pin
Frame size	2 cm^2	4 cm^2	36 mm^2	2 cm^2
Delivery quantities (pcs.)	5/160	6/66/660/4620	30/60/1000	40

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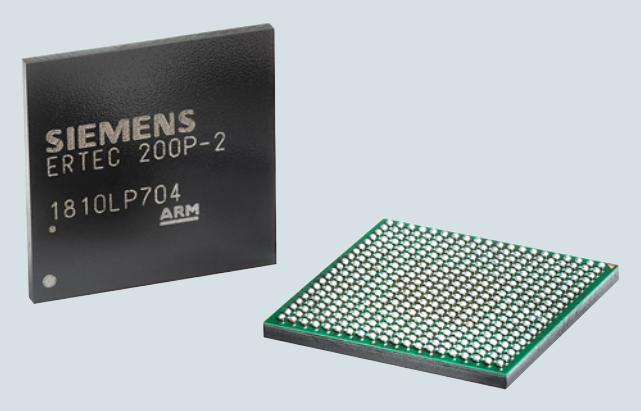
PROFIBUS DP ASICs

Ordering data	Article No.
ASIC ASPC 2	
For constructing master interfaces (quantity discount)	
• 6 units (lead-free)	**6ES7195-0AA05-0XA0**
• 66 units (lead-free)	**6ES7195-0AA15-0XA0**
• 660 units (lead-free)	**6ES7195-0AA25-0XA0**
• 4620 units (lead-free)	**6ES7195-0AA35-0XA0**
ASIC LSPM 2	
For constructing simple slave interfaces (quantity discount)	
• 6 units (lead-free)	**6ES7195-0BA02-0XA0**
• 66 units (lead-free)	**6ES7195-0BA12-0XA0**
• 330 units (lead-free)	**6ES7195-0BA22-0XA0**
• 4950 units (lead-free)	**6ES7195-0BA32-0XA0**
ASIC SPC 3	
For constructing intelligent DP slave interfaces (quantity discount)	
• 6 units (lead-free)	**6ES7195-0BD04-0XA0**
• 96 units (lead-free)	**6ES7195-0BD14-0XA0**
• 960 units (lead-free)	**6ES7195-0BD24-0XA0**
• 4800 units (lead-free)	**6ES7195-0BD34-0XA0**
• 750 units (lead-free) (tape & reel)	**6ES7195-0BD44-0XA0**
ASIC SPC 3LV	
For constructing intelligent DP slave interfaces (quantity discount)	
• 5 units (lead-free)	**6ES7195-0BG00-0XA0**
• 160 units (lead-free)	**6ES7195-0BG10-0XA0**
• 800 units (lead-free)	**6ES7195-0BG20-0XA0**
• 4800 units (lead-free)	**6ES7195-0BG30-0XA0**
• 1000 units (lead-free) (tape & reel)	**6ES7195-0BG40-0XA0**
ASIC DPC 31 STEP B	
For constructing intelligent DP slave interfaces (quantity discount)	
• 6 units (lead-free)	**6ES7195-0BE02-0XA0**
• 60 units (lead-free)	**6ES7195-0BE12-0XA0**
• 300 units (lead-free)	**6ES7195-0BE22-0XA0**
• 5100 units (lead-free)	**6ES7195-0BE32-0XA0**

	Article No.
ASIC DPC 31 STEP C1	
For constructing intelligent DP slave interfaces (quantity discount)	
• 6 units (lead-free)	**6ES7195-0BF02-0XA0**
• 66 units (lead-free)	**6ES7195-0BF12-0XA0**
• 660 units (lead-free)	**6ES7195-0BF22-0XA0**
• 4620 units (lead-free)	**6ES7195-0BF32-0XA0**
ASIC SPC 4-2	
For constructing intelligent DP slave interfaces (quantity discount)	
• 5 units for laboratory development (lead-free)	**6GK1588-3AA00**
• 160 units (lead-free, 1 tray)	**6GK1588-3AA15**
ASIC SIM 1-2	
For connection according to IEC H1 for PROFIBUS PA with a transmission rate of 31.25 kbps	
• 60 units (in tube)	**6GK1588-3BB02**
• 1000 units (tape & reel)	**6GK1588-3BB21**
Accessories	
Firmware for Siemens ASIC SPC 3	
• DP firmware	**6ES7195-2BA00-0XA0**
• DPV1 firmware	**6ES7195-2BA01-0XA0**
• DPV1 firmware upgrade	**6ES7195-2BA02-0XA0**
Firmware for Siemens ASIC DPC 31	
• DPV1 firmware	**6ES7195-2BB00-0XA0**

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Overview



Innovative and well-proven

As a dedicated PI member, Siemens has been actively advancing the development of PROFINET from the beginning. Siemens technology components benefit from the accumulated know-how. They have been field-proven in countless products, provide maximum performance capability and can be scaled to exact requirements.

And that is not all. Siemens Competence Centers offer advice for choosing the right technology component for the device, training opportunities and support throughout the development process, up to and including successful certification.

ERTEC 200P-2 – Your path to the fastest PROFINET

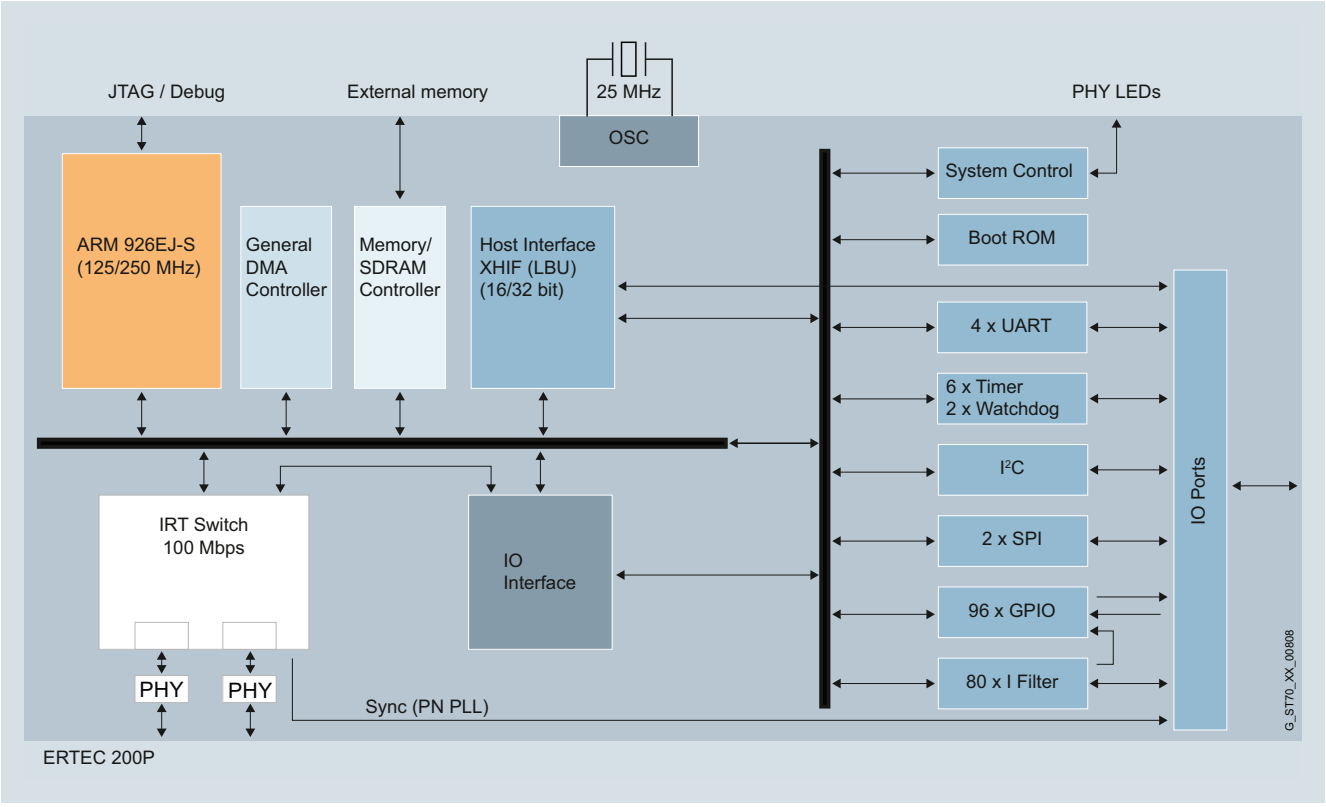
The ERTEC 200P-2 (Enhanced Real-Time Controller) sets new standards for communication.
Designed for cycle times as low as 125 µs, the performance upgrade for PROFINET has been integrated in the ERTEC 200P-2. With its 250 MHz ARM9 CPU and integrated IRT (isochronous real-time) switch, field devices with demanding performance requirements can be implemented. The reduced chip size simplifies integration into compact field devices. The CPU also allows integration of a user's own applications, which makes an external host CPU unnecessary depending on the application.

Development kit for ERTEC 200P-2

The development kit includes an evaluation board with sample applications so that commissioning can be completed in minimum time. The PROFINET stack is delivered as source code and includes the eCos open source real-time operating system and all development tools, analysis programs and documentation. Field devices with RT (real-time) and IRT (isochronous real-time) can be implemented with the ERTEC ASICs. The integrated switch allows the construction of field devices with two ports.

Functions:

- Isochronous mode
- Shared device for 4 controllers
- S2 system redundancy
- PROFINET performance upgrade with a minimum cycle time of 125 µs.
- MRP/MRPD
- Regular, no-cost updates
- Current technology certificate



Internal structure of ERTEC 200P-2

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Enhanced Real-Time Ethernet Controller ERTEC

Technical specifications

	ERTEC 200P-2
Integrated IRT switch	2-port
Integrated PHYs	Yes
Copper and fiber-optic cable supported	Yes
Minimum cycle time	125 µs
ARM CPU	ARM 926
Clock frequency	250 MHz
Configurable IOs, general purpose IOs	96
Enclosure size	17x17 mm
Ball pitch	0.8 mm

Ordering data

	Article No.
ERTEC 200P-2	
ASIC for connection to switched Ethernet 100 Mbps, Ethernet controller with integrated 2-port switch, ARM 926 processor and integrated PHYs; recommended for new developments	
• 10 units (evaluation pack)	**6ES7195-0BH02-0XA0**
• 90 units (single tray)	**6ES7195-0BH12-0XA0**
• 450 units (drypack, 5 trays)	**6ES7195-0BH22-0XA0**
• 1 000 units (tape & reel)	**6ES7195-0BH32-0XA0**
EK-ERTEC 200P PN IO evaluation kit with ERTEC 200P-2	**6ES7195-3BE00-0YA0**
ERTEC 200P	
ASIC for connection to Switched Ethernet 100 Mbps, Ethernet controller with integral 2-port switch, ARM 926 processor and integral PHYs	
• 10 units (evaluation pack)	**6ES7195-0BH00-0XA0**
• 90 units (single tray)	**6ES7195-0BH10-0XA0**
• 450 units (drypack, 5 trays)	**6ES7195-0BH20-0XA0**
• 1 000 units (tape & reel)	**6ES7195-0BH30-0XA0**
ERTEC 200	
ASIC ERTEC 200 for connection to Switched Ethernet 10/100 Mbps, Ethernet controller with integral 2-port switch, ARM 946 processor and integral PHYs	
• 70 units (single tray)	**6GK1182-0BB01-0AA1**
• 350 units (drypack, 5 trays)	**6GK1182-0BB01-0AA2**
• 3500 units (package, 10 drypacks)	**6GK1182-0BB01-0AA3**
• 1050 units (tape & reel)	**6GK1182-0BB01-0AA4**
ERTEC 400	
ASIC ERTEC 400 for connection to Switched Ethernet 10/100 Mbps, Ethernet controller with integrated 4-port switch, ARM 946 processor and PCI interface (V2.2), data preparation for real-time and isochronous real-time for PROFINET IO	
• 70 units (single tray)	**6GK1184-0BB01-0AA1**
• 350 units (drypack, 5 trays)	**6GK1184-0BB01-0AA2**

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Overview



With the development packages for PROFINET, compact or modular PROFINET field devices can be developed quickly and with little effort. Depending on the application, different development packages are available.

The development packages for the ASICs of the ERTEC family (Enhanced Real-Time Ethernet Controller) are suitable for the development of field devices with an integrated IRT switch (Isochronous Real-Time). The demand for real-time capability, linear topology capability, and for IT integration is therefore met perfectly.

With the help of the development package for standard Ethernet controllers, PROFINET devices can be developed on the basis of a standard Ethernet controller. Devices with RT (Real-Time) can be implemented in the field device without special hardware.

The PROFIsafe starter kit permits the implementation of fail-safe devices. In so doing, the PROFIsafe stack applicatively builds on the PROFINET stack.

Ordering data

	Article No.
ERTEC development kits / evaluation kits	
EK-ERTEC 200P PN IO evaluation kit for ERTEC 200P-2	**6ES7195-3BE00-0YA0**
Development kit for standard Ethernet controllers	**6ES7195-3BC00-0YA0**
PROFIsafe starter kit V3.5 according to the PROFIsafe V2.6.1 profile	**6ES7195-3BF03-0YA0**
ERTEC ASICs	
ERTEC 200P-2	
ASIC for connection to Switched Ethernet 100 Mbps, Ethernet controller with integral 2-port switch, ARM 926 processor and integral PHYs	
• 10 units (evaluation pack)	**6ES7195-0BH02-0XA0**
• 90 units (single tray)	**6ES7195-0BH12-0XA0**
• 450 units (drypack, 5 trays)	**6ES7195-0BH22-0XA0**
• 1 000 units (tape & reel)	**6ES7195-0BH32-0XA0**
Accessories	
PROFINET IO product line license for one product line	**6ES7195-3BC10-0YA0**

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Overview

PROFINET driver for controllers

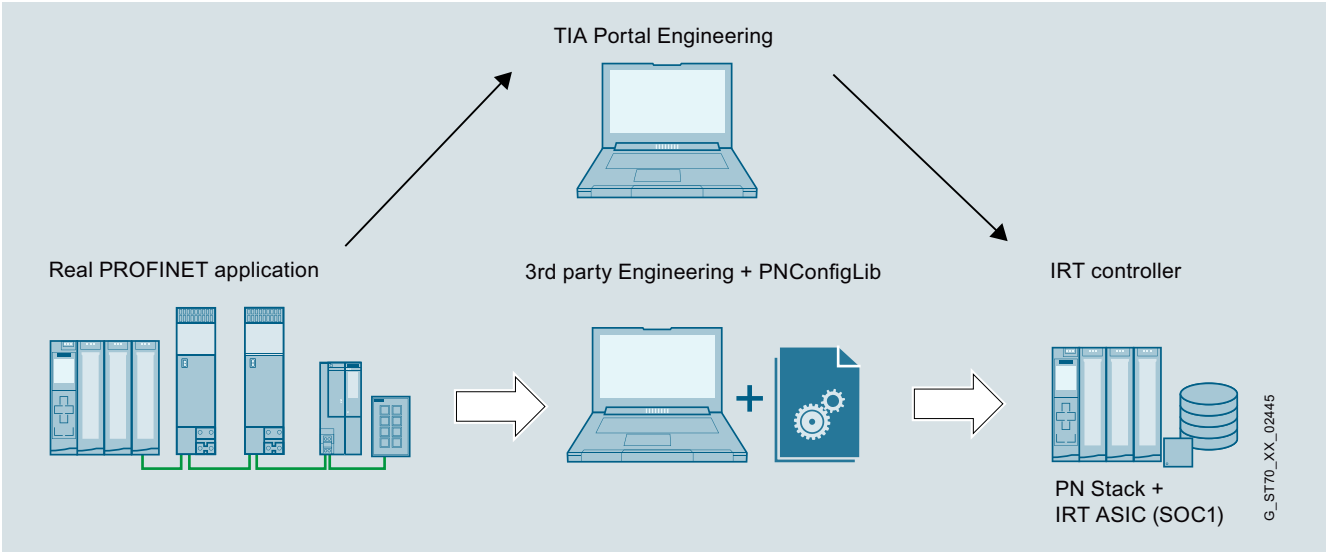
Reasonably priced components are a major competitive advantage, especially in series machine building. Here, users often develop in-house control software. For reasons of performance, flexibility and cost, the individual application is then implemented on standard PCs. The PROFINET driver supports this in-house development and requires no special hardware thanks to its conventional Ethernet interface.

Because the PROFINET driver is delivered as source code, proprietary solutions can be ported into various operating systems and hardware platforms. As a result, the PROFINET driver can also be optimally used in embedded systems for in-house controller solutions. Design and configuration is easy and takes place via an open XML interface without the need for engineering tools. The well-proven PROFINET stack from SIMATIC forms the centerpiece.

The PROFINET driver is suitable for both simple applications, such as individual PROFINET lines, as well as for complex machines. It supports PROFINET RT for cycle times starting from 1 ms via a standard Ethernet interface. Alternatively, PROFINET IRT can also be used for cycle times starting from 500 µs, in connection with the CP1625 controller development kit.

PROFINET ConfigLib

PROFINET networks must be planned. This can be carried out for the PROFINET driver using the TIA Portal. A license is not required. ConfigLib is a standalone API for generating PROFINET hardware configurations. It can be used to create RT and IRT projects, whereby ConfigLib takes over the planning algorithm.



PNConfigLib – Efficient creation of hardware configurations without the TIA Portal

CP1625 Controller Development Kit

Siemens SOC1 gives you the hardware support required to build an IRT controller. The CP1625 Controller Development Kit is suitable for both standalone and host modes.

- Stand-alone mode: PN stack and application run on the CP1625
- Host mode: Application runs on the PC or, for example, ARM. The stack runs on the CP1625



SIMATIC CP1625

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Ordering data	Article No.
PROFINET Driver V2.1	
For connecting distributed I/O and drives to user-specific control applications via PROFINET	
PN Driver V2.1 development license and PN ConfigLib	**6ES7195-3AA00-0YA0**
SIMATIC CP1625 Development Board; PCIe card for PROFINET IRT	**6ES7648-2CF10-1BA0**
Runtime licenses	
• 1 unit	**6ES7195-3AA05-0XA0**
• 10 units	**6ES7195-3AA10-0XA0**
• 50 units	**6ES7195-3AA20-0XA0**
• 200 units	**6ES7195-3AA30-0XA0**
• 500 units	**6ES7195-3AA40-0XA0**

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Active RS 485 terminating element

Overview



- Terminates bus segments at data transmission rates of 9.6 Kbps to 12 Mbps
- Power supply independent of bus stations.

Designed for Industry

- Terminal-independent bus termination through onboard power supply

Technical specifications

Article number	**6ES7972-0DA00-0AA0** RS485 Termin. resistor f. PROFIBUS/MPI,
Supply voltage	
Rated value (DC)	24 V
permissible range, lower limit (DC)	20.4 V
permissible range, upper limit (DC)	28.8 V
Input current	
Current consumption, typ.	30 mA
Power loss	
Power loss, max.	0.72 W
Interfaces	
PROFIBUS DP	
• Transmission rate, max.	12 Mbit/s; 9.6 kbit/s to 12 Mbit/s
Degree and class of protection	
Degree of protection acc. to EN 60529	
• IP20	Yes
Ambient conditions	
Ambient temperature during operation	
• min.	0 °C
• max.	60 °C
Ambient temperature during storage/transportation	
• min.	-40 °C
• max.	70 °C
Relative humidity	
• Operation, max.	95 %; at +25 °C
Connection method	
Design of electrical connection for supply voltage	Screw terminal block
Design of electrical connection for PROFIBUS cables	Screw terminal block
Dimensions	
Width	60 mm
Height	70 mm
Depth	43 mm
Weights	
Weight, approx.	95 g

Ordering data

	Article No.
Active RS 485 terminating element for PROFIBUS For terminating bus segments at transmission rates of 9.6 kbps to 12 Mbps	**6ES7972-0DA00-0AA0**

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Overview



- Automatic detection of transmission rates
- Transmission rates from 9.6 kbps to 12 Mbps are possible, incl. 45.45 kbps
- 24 V DC voltage display
- Indication of segment 1 and 2 bus activity
- The separation of segment 1 and segment 2 by means of switches is possible
- Separation of the right segment with an inserted terminating resistor
- Decoupling of segment 1 and segment 2 in the case of static interference

Designed for Industry

- For increasing the expansion
- Galvanic isolation of segments
- Commissioning support
  - Switches for separation of segments
  - Bus activity display
  - Segment separation in the case of an incorrectly inserted terminating resistor

In this context, please also note the diagnostics repeater that provides extensive diagnostics functions for physical line diagnostics in addition to the normal repeater functionality. This is described on page 9/415.

Technical specifications

Article number	**6ES7972-0AA02-0XA0**
	Repeater RS 485 f. PROFIBUS/MPI
Supply voltage	
Rated value (DC)	24 V
permissible range, lower limit (DC)	20.4 V
permissible range, upper limit (DC)	28.8 V
Input current	
Current consumption, max.	100 mA; 100 mA without loads at PG/OP socket; 130 mA load at PG/OP socket (5 V/90 mA); 200 mA load at PG/OP socket (24 V/100 mA)
Power loss	
Power loss, typ.	0.7 W
Interfaces	
PROFIBUS DP	
• Transmission rate, max.	12 Mbit/s; 9.6 kbit/s to 12 Mbit/s
Degree and class of protection	
Degree of protection acc. to EN 60529	
• IP20	Yes
Ambient conditions	
Ambient temperature during operation	
• min.	0 °C
• max.	60 °C
Ambient temperature during storage/transportation	
• min.	-40 °C
• max.	70 °C
Relative humidity	
• Operation, max.	95 %; at 25 °C
Connection method	
Design of electrical connection for supply voltage	Terminal block
Design of electrical connection for PROFIBUS cables	2 terminal blocks
Dimensions	
Width	45 mm
Height	128 mm
Depth	67 mm
Weights	
Weight, approx.	350 g

Ordering data

	Article No.
RS 485 repeater for PROFIBUS	**6ES7972-0AA02-0XA0**
Transfer rate up to max. 12 Mbps, 24 V DC, IP20 enclosure	

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SIPLUS DP active RS 485 terminating element

Overview



- Used to terminate bus segments at rates of 9.6 kbps to 12 Mbps
- Power supply independent of the bus participants

Designed for Industry

- End-device independent bus termination thanks to own power supply

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

For technical documentation on SIPLUS, see:

http://www.siemens.com/siplus-extreme

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Technical specifications

Article number	**6AG1972-0DA00-2AA0**
Based on	**6ES7972-0DA00-0AA0**
	SIPLUS Profibus Terminator
Ambient conditions	
Ambient temperature during operation	
• min.	-25 °C; = Tmin (incl. condensation/frost)
• max.	60 °C; = Tmax
Ambient temperature during storage/transportation	
• min.	-40 °C
• max.	70 °C
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)

Article number	**6AG1972-0DA00-2AA0**
Based on	**6ES7972-0DA00-0AA0**
	SIPLUS Profibus Terminator
Resistance	
Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
Remark	
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A

Ordering data

	Article No.
SIPLUS active RS 485 terminating element for PROFIBUS	
To terminate bus segments at transmission rates of 9.6 kbps to 12 Mbps	
Extended temperature range and exposure to media	**6AG1972-0DA00-2AA0**

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Overview



- Automatically detects transmission rate
- 45.45 kbps transmission rate is possible
- 24 V DC voltage display
- Indication of segment 1 and 2 bus activity
- The separation of segment 1 and segment 2 by means of switches is possible
- Separation of the right segment with an inserted terminating resistor
- Decoupling of segment 1 and segment 2 in the case of static interference

Designed for Industry

- For increasing the number of participants and the expansion
- Electric isolation of segments
- Commissioning support
  - Segment separation switch
  - Bus activity display
  - Segment separation in the case of an incorrectly inserted terminating resistor

In this context, please also note the diagnostics repeater that provides extensive diagnostics functions for physical line diagnostics in addition to the normal repeater functionality. This is described on page 9/415.

Note:

SIPLUS extreme products are based on SIMATIC standard products. The contents listed here were taken from the respective standard products. SIPLUS extreme specific information was added.

For technical documentation on SIPLUS, see:

http://www.siemens.com/siplus-extreme

Technical specifications

Article number	**6AG1972-0AA02-7XA0**
Based on	**6ES7972-0AA02-0XA0**
	SIPLUS DP RS 485 repeater
Ambient conditions	
Ambient temperature during operation	
• min.	-25 °C; = Tmin (incl. condensation/frost)
• max.	70 °C; = Tmax
Ambient temperature during storage/transportation	
• min.	-40 °C
• max.	70 °C
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m
• Ambient air temperature-barometric pressure-altitude	Tmin ... Tmax at 1 140 hPa ... 795 hPa (-1 000 m ... +2 000 m) // Tmin ... (Tmax - 10 K) at 795 hPa ... 658 hPa (+2 000 m ... +3 500 m) // Tmin ... (Tmax -20 K) at 658 hPa ... 540 hPa (+3 500 m ... +5 000 m)
Relative humidity	
• With condensation, tested in accordance with IEC 60068-2-38, max.	100 %; RH incl. condensation/frost (no commissioning under condensation conditions)
Resistance	
Use in stationary industrial systems	
- to biologically active substances according to EN 60721-3-3	Yes; Class 3B2 mold, fungus and dry rot spores (with the exception of fauna); Class 3B3 on request
- to chemically active substances according to EN 60721-3-3	Yes; Class 3C4 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-3	Yes; Class 3S4 incl. sand, dust, *
Use on ships/at sea	
- to biologically active substances according to EN 60721-3-6	Yes; Class 6B2 mold and fungal spores (excluding fauna); Class 6B3 on request
- to chemically active substances according to EN 60721-3-6	Yes; Class 6C3 (RH < 75 %) incl. salt spray acc. to EN 60068-2-52 (severity degree 3); *
- to mechanically active substances according to EN 60721-3-6	Yes; Class 6S3 incl. sand, dust; *
Remark	
- Note regarding classification of environmental conditions acc. to EN 60721	* The supplied plug covers must remain in place over the unused interfaces during operation!
Conformal coating	
• Coatings for printed circuit board assemblies acc. to EN 61086	Yes; Class 2 for high availability
• Protection against fouling acc. to EN 60664-3	Yes; Type 1 protection
• Military testing according to MIL-I-46058C, Amendment 7	Yes; Discoloration of coating possible during service life
• Qualification and Performance of Electrical Insulating Compound for Printed Board Assemblies according to IPC-CC-830A	Yes; Conformal coating, Class A

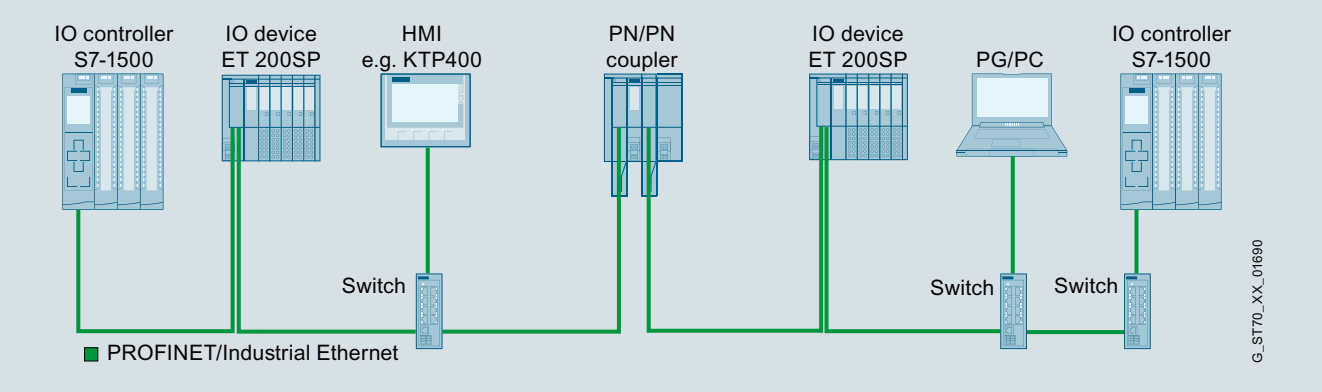
Ordering data

	Article No.
SIPLUS RS 485 repeater for PROFIBUS	
Transfer rate up to max. 12 Mbps, 24 V DC, enclosure IP20	
Extended temperature range and exposure to media	**6AG1972-0AA02-7XA0**

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Overview

- Fast deterministic data exchange between CPUs with PROFINET controller, even beyond network boundaries
- Configuration with two PROFINET devices completely independent of the communication technology



Data transmission between two S7-1500 IO controllers beyond a PROFINET limit

- Very simple configuration of the data exchange via virtual IO modules or alternatively via data records for larger amounts of data
- Simultaneous data transfer to up to 3 CPUs on own network side and/or up to 4 CPUs on opposite network side
- Easy to integrate into any PROFINET network with 2 ports per network side
- Fieldbus connection via a SIMATIC BusAdapter; this allows free selection of the connection system (RJ45, FC cable direct connection) and connection hardware (copper, POF, PCF, glass fiber). FO-to-copper media conversion can also be realized economically and without external converters.

Additional functions

- Quantity structures
  - Cyclic transmission: Up to 1 440 bytes each for input and output data
  - Data record transfer: Up to 4 096 bytes per slot. Buffering of up to eight data records per slot
  - Maximum 16 input/output areas for data exchange
  - Max. 254 bytes of input and 253 bytes of output data per module
- Exchange of fail-safe data between two F-CPUs via F-SendDP and F_ReceiveDP
- Shared device with up to four IO controllers per network side
- Module-internal shared input / shared output (MSI/MSO)
- Device replacement without programming device
  - With topological configuration via proximity detection (LLDP)
  - Without topological configuration via redundant storage of the station name in the BusAdapter. A separate removable memory card is not required.
- Reset button for restoring the factory settings
- Redundant power supply
- Galvanic isolation between the two PROFINET IO subnets
- Media redundancy (MRP and MRPD)
- I&M data
- Firmware update
- Support for Ethernet services (ping, arp, SNMP, MIP-2, LLDP)
- Comprehensive diagnostics via LED displays and interrupts
- Extensive compatibility with the PN/PN coupler up to firmware version V3.0

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Technical specifications

Article number	**6ES7158-3AD10-0XA0** SIMATIC PN/PN Coupler
General information	
Product function	
• I&M data	Yes; I&M0 to I&M3
• Tool changer	Yes; Docking station and docking unit
• Local coupling, IO data	Yes
- Number of coupling modules	16
- Number of coupling submodules per module	4; 1x write, 3x read
• Local coupling, data records	Yes
- Number of coupling modules	16
- Number of coupling submodules per module	4; 1x write, 3x read
- Record length, max.	4 096 byte
- FIFO depth in storage mode	8
Engineering with	
• STEP 7 TIA Portal configurable/ integrated as of version	STEP 7 V15.1 or higher
• PROFINET as of GSD version/ GSD revision	V2.3
Installation type/mounting	
Mounting	Mounting rail 7.5 mm and 15 mm
Supply voltage	
Rated value (DC)	24 V
permissible range, lower limit (DC)	19.2 V
permissible range, upper limit (DC)	28.8 V
Reverse polarity protection	Yes
Mains buffering	
• Mains/voltage failure stored energy time	10 ms
Input current	
Current consumption, max.	360 mA; For 19.2 V input voltage at the right-hand supply terminal, including 2 plugged BA 2x LC
from supply voltage 1L+, max.	320 mA; For 19.2 V input voltage at the left-hand supply terminal, including 2 plugged BA 2x LC
Power loss	
Power loss, typ.	4 W; For 24 V input voltage and 2 plugged BA 2x RJ45 If BusAdapters with an optical interface are plugged, there is an additional 750 mW per optical interface (3 W with 2 plugged BA 2x LC)
Address area	
Address space per module	
• Address space per module, max.	254 byte; max. 254 bytes of input data and 253 bytes of output data
Address space per station	
• Address space per station, max.	1 440 byte; per input / output
Hardware configuration	
Submodules	
• Number of submodules per station, max.	116

Article number	**6ES7158-3AD10-0XA0** SIMATIC PN/PN Coupler
Interfaces	
Number of PROFINET interfaces	2; One PROFINET interface per line side
With optical interface	Yes; Via SIMATIC BusAdapter
Supports protocol for PROFINET IO	
• automatic detection of transmission rate	Yes
• Transmission rate, max.	100 Mbit/s
1. Interface	
Interface types	
• Number of ports	2; via BusAdapter
• integrated switch	Yes
• BusAdapter (PROFINET)	Yes; Compatible BusAdapter: BA 2x RJ45, BA 2x FC, BA 2x SCRJ, BA SCRJ / RJ45, BA SCRJ / FC, BA 2x LC, BA LC / RJ45, BA LC / FC
Protocols	
• PROFINET IO Device	Yes
• Open IE communication	Yes
• Media redundancy	Yes; As MRP or MRPD client; max. 50 or 30 devices in the ring
2. Interface	
Interface types	
• Number of ports	2; via BusAdapter
• integrated switch	Yes
Protocols	
• PROFINET IO Device	Yes
• Open IE communication	Yes
• Media redundancy	Yes; As MRP or MRPD client; max. 50 or 30 devices in the ring
Interface types	
RJ 45 (Ethernet)	
• Transmission procedure	PROFINET with 100 Mbit/s full duplex (100BASE-TX)
• 10 Mbps	No
• 100 Mbps	Yes; PROFINET with 100 Mbit/s full duplex (100BASE-TX)
• Autonegotiation	Yes
• Autocrossing	Yes

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Technical specifications (continued)

Article number	6ES7158-3AD10-0XA0 SIMATIC PN/PN Coupler
Protocols	
Supports protocol for PROFINET IO	Yes
Protocols (Ethernet)	
• TCP/IP	Yes
• SNMP	Yes
• LLDP	Yes
• ping	Yes
• ARP	Yes
PROFINET IO Device	
Services	
- Isochronous mode	No
- Open IE communication	Yes
- IRT	Yes
- PROFIenergy	No
- Prioritized startup	Yes
- Shared device	Yes
- Number of IO Controllers with shared device, max.	4; per line side
Open IE communication	
• TCP/IP	Yes
• SNMP	Yes
• LLDP	Yes
Isochronous mode	
Isochronous operation (application synchronized up to terminal)	No; For operation on isochronous bus
Interrupts/diagnostics/ status information	
Status indicator	Yes
Alarms	Yes
Diagnostics function	Yes; Parameterizable
Diagnostics indication LED	
• RUN LED	Yes; Green LED
• ERROR LED	Yes; Red LED
• MAINT LED	Yes; yellow LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
• Connection to network LINK (green)	Yes; 2x green link LEDs on BusAdapter
Isolation	
Isolation tested with	707 V DC (type test)
Standards, approvals, certificates	
Network loading class	3
Security level	According to Security Level 1 Test Cases V1.1.4

Article number	6ES7158-3AD10-0XA0 SIMATIC PN/PN Coupler
Ambient conditions	
Ambient temperature during operation	
• min.	0 °C
• max.	60 °C; = Tmax for horizontal installation; for vertical installation Tmax = 50 °C
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	2 000 m
• Ambient air temperature-barometric pressure-altitude	On request: Ambient temperatures lower than 0 °C (without condensation) and/or installation altitudes greater than 2 000 m
Mechanics/material	
Strain relief	Yes; Optional, for RJ45 and FC BusAdapter only
Dimensions	
Width	100 mm; Minimized with good handling
Height	117 mm
Depth	74 mm; with mounting rail
Weights	
Weight, approx.	200 g; without BusAdapter

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Ordering data	Article No.
PN/PN coupler For deterministic data exchange between max. 4 PN controllers per side, also beyond network boundaries Transfer of PROFIsafe, I/O, MSI, MSO and data record communication, redundant power supply; PN connection via SIMATIC BusAdapter (BA) Delivery without BusAdapter	**6ES7158-3AD10-0XA0**
Accessories	
Standard rail 35 mm	
• Length: 483 mm for 19" cabinets	**6ES5710-8MA11**
• Length: 530 mm for 600 mm cabinets	**6ES5710-8MA21**
• Length: 830 mm for 900 mm cabinets	**6ES5710-8MA31**
• Length: 2 m	**6ES5710-8MA41**
BusAdapter BA 2xRJ45 PROFINET BusAdapter with standard Ethernet socket	**6ES7193-6AR00-0AA0**
BusAdapter BA 2xFC PROFINET BusAdapter with FastConnect Ethernet connection; for increased vibration and EMC load capacity	**6ES7193-6AF00-0AA0**
BusAdapter BA 2xSCRJ PROFINET BusAdapter with fiber-optic connection for POF or PCF cables up to 250 m, with monitoring of damping	**6ES7193-6AP00-0AA0**
BusAdapter BA SCRJ/RJ45 PROFINET BusAdapter; with media converter FO-Cu; 1 x SCRJ FO connection, 1 x RJ45 connection	**6ES7193-6AP20-0AA0**
BusAdapter BA SCRJ/FC PROFINET BusAdapter; with media converter FO-Cu; 1 x SCRJ FO connection, 1 x FastConnect connection for direct connection of the bus cable	**6ES7193-6AP40-0AA0**

	Article No.
BA 2XLC BusAdapter PROFINET BusAdapter; 2 glass fiber-optic connections	**6ES7193-6AG00-0AA0**
BA LC/RJ45 BusAdapter PROFINET BusAdapter; with media converter glass FO-CU; 1 x LC connection, 1 x RJ45 connection	**6ES7193-6AG20-0AA0**
BA LC/FC BusAdapter PROFINET BusAdapter; with media converter glass FO-CU; 1 x LC connection, 1 x FastConnect connection for direct connection of the bus cable	**6ES7193-6AG40-0AA0**
Equipment labeling plate 10 sheets of 16 labels each	**6ES7193-6LF30-0AW0**
Labeling strips	
500 labeling strips on roll, light gray, for inscription with thermal transfer roll printer	**6ES7193-6LR10-0AA0**
500 labeling strips on roll, yellow, for inscription with thermal transfer roll printer	**6ES7193-6LR10-0AG0**
1 000 labeling strips DIN A4, light gray, card, for inscription with laser printer	**6ES7193-6LA10-0AA0**
1 000 labeling strips DIN A4, yellow, card, for inscription with laser printer	**6ES7193-6LA10-0AG0**
Spare parts	
Cover for bus adapter interface 5 units	**6ES7591-3AA00-0AA0**
Power supply connector For connecting the 24 V DC supply voltage	
• With push-in terminals	**6ES7193-4JB00-0AA0**
• With screw-type terminals	**6ES7193-4JB50-0AA0**

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PN/CAN LINK

Overview



- For data exchange between PROFINET and CAN Bus 2.0A/B or CANopen Manager or Slave (according to CiA 301 & 302)
- CANopen features:
  - Node / lifeguarding
  - Heartbeat
  - SYNC (producer / consumer)
- Integrated in TIA via HSP, TIA Portal V14 or higher
- PROFINET switch and 9-pin D-sub plug integrated for CAN
- Up to 126 CAN nodes
- 512 receiver/transmitter PDOs
- Galvanic isolation between the two networks
- Diagnostic interrupts
- Controllers supported: S7-1200, S7-1500, ET 200SP, Open Controller

Technical specifications

Article number	**6BK1620-0AA00-0AA0** SIMATIC PN/CAN LINK
General information	
Product type designation	PN/CAN Link
Engineering with	
• STEP 7 TIA Portal configurable/ integrated as of version	STEP 7 V14 or higher
Installation type/mounting	
Mounting	DIN rail, wall mounting, portrait mounting
Mounting position	Any
Recommended mounting position	Horizontal
Supply voltage	
Type of supply voltage	24 V DC
Rated value (DC)	24 V
permissible range, lower limit (DC)	20.4 V
permissible range, upper limit (DC)	28.8 V
Reverse polarity protection	Yes
Overvoltage protection	Yes
Short-circuit protection	Yes
Mains buffering	
• Mains/voltage failure stored energy time	10 ms
Input current	
Current consumption (rated value)	0.09 A
Current consumption, max.	0.11 A
Power loss	
Power loss, typ.	2.2 W

Article number	**6BK1620-0AA00-0AA0** SIMATIC PN/CAN LINK
Interfaces	
Interfaces/bus type	2x Ethernet (RJ45), 1x Sub-D (9-pin)
Supports protocol for PROFINET IO	
• automatic detection of transmission rate	No
• Transmission rate, max.	100 Mbit/s
• Number of RJ45 ports	2
• Number of FC (FastConnect) connections	2
PROFINET functions	
• Assignment of the IP address, supported	Yes
• Assignment of the device name, supported	Yes
CAN	
• CAN operating modes	CAN Standard CAN 2.0A/B; CANopen Manager / Slave acc. to CiA
• Specification acc. to CiA	CiA 301 & CiA 302
• Transmission rate, min.	50 kbit/s
• Transmission rate, max.	1 000 kbit/s
• Number of slaves, max.	126
• Number of SDOs in parallel	16; Parallel
• Number of PDOs	512; Send / receive
Services	
- Node/life-guarding	Yes
- Heartbeat	Yes
- SYNC	Yes

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Technical specifications (continued)

Article number	**6BK1620-0AA00-0AA0**
	SIMATIC PN/CAN LINK
1. Interface	
Interface type	CAN according to CiA 303-1
Physics	9-pin sub D socket
Isolated	Yes; 500 V AC or 707 V DC
Interface types	
• Number of ports	1
2. Interface	
Interface type	PROFINET
Physics	Ethernet, 2-port switch, 2*RJ45
Isolated	Yes; 1 500 V AC or 2 250 V DC
Interface types	
• Number of ports	2
• integrated switch	Yes
Protocols	
• PROFINET IO Device	Yes
Interrupts/diagnostics/ status information	
Status indicator	Yes
Alarms	Yes
Diagnostics function	Yes
Diagnostics indication LED	
• RUN LED	Yes
• ERROR LED	Yes
• MAINT LED	Yes
• LINK LED	Yes
• RX/TX LED	Yes
Potential separation	
Potential separation exists	Yes
Degree and class of protection	
Degree of protection acc. to EN 60529	IP20
Standards, approvals, certificates	
CE mark	Yes
UL approval	Yes
cULus	Yes
RCM (formerly C-TICK)	Yes
KC approval	Yes
EAC (formerly Gost-R)	Yes
PNO certificate	Yes
RoHS conformity	Yes
Marine approval	
• Germanischer Lloyd (GL)	Yes
• American Bureau of Shipping (ABS)	Yes

Article number	**6BK1620-0AA00-0AA0**
	SIMATIC PN/CAN LINK
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-25 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	-25 °C
• vertical installation, max.	55 °C
• ceiling installation, min.	-25 °C
• ceiling installation, max.	45 °C
• floor installation, min.	-25 °C
• floor installation, max.	45 °C
Ambient temperature during storage/transportation	
• min.	-40 °C
• max.	85 °C
Relative humidity	
• Operation, max.	95 %
Software	
Runtime software	
Target system	
- ET 200SP	Yes
- Open Controller	Yes
- S7-1200	Yes
- S7-1500	Yes
Dimensions	
Width	70 mm
Height	112 mm
Depth	75 mm
Weights	
Weight, approx.	212 g

Ordering data

	Article No.
SIMATIC PN/CAN LINK PROFINET network transition according to CAN Bus 2.0A/B, CANopen Manager according to CiA301/302, CANopen Slave according to CiA301/302; IP20	**6BK1620-0AA00-0AA0**

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SIMATIC PN/J1939 LINK

Overview



- For data exchange between PROFINET and SAE J1939 networks
- J1939 functions:
  - Broadcast Announce Message (BAM)
  - Connection Mode Data Transfer (CMDT)
  - PDU 1 & 2
- Integrated into Totally Integrated Automation via gsdml file in TIA Portal. No separate software required
- Integrated PROFINET switch with 9-pin Sub-D socket for J1939
- Up to 253 logical nodes
- Up to 30 addressable ECUs
- Galvanic isolation between the two networks
- Diagnostic interrupts
- Controllers supported: S7-1200, S7-1500, ET 200SP, Open Controller

Technical specifications

Article number	**6BK1623-0AA00-0AA0** SIMATIC PN/J1939 LINK
General information	
Product type designation	PN/J1939 LINK
Product function	
• I&M data	Yes
• Isochronous mode	No
Engineering with	
• STEP 7 TIA Portal configurable/ integrated as of version	STEP 7 V14 SP1 or higher
Installation type/mounting	
Mounting	DIN rail, wall mounting, portrait mounting
Mounting position	Any
Recommended mounting position	Horizontal
Supply voltage	
Type of supply voltage	24 V DC
Rated value (DC)	24 V
permissible range, lower limit (DC)	20.4 V
permissible range, upper limit (DC)	28.8 V
Reverse polarity protection	Yes
Overvoltage protection	Yes
Short-circuit protection	Yes
Mains buffering	
• Mains/voltage failure stored energy time	10 ms; PN side
Input current	
Current consumption (rated value)	0.09 A
Current consumption, max.	0.11 A
Power loss	
Power loss, typ.	2.2 W

Article number	**6BK1623-0AA00-0AA0** SIMATIC PN/J1939 LINK
Interfaces	
Interfaces/bus type	2x Ethernet (RJ45), 1x Sub-D (9-pin)
Supports protocol for PROFINET IO	
• automatic detection of transmission rate	No
• Transmission rate, max.	100 Mbit/s
• Number of RJ45 ports	2
• Number of FC (FastConnect) connections	2
PROFINET functions	
• Assignment of the IP address, supported	Yes
• Assignment of the device name, supported	Yes
CAN	
• CAN operating modes	J1939 according to the standard "SAE J1939"
• Transmission rate, min.	100 kbit/s
• Transmission rate, max.	500 kbit/s
• Number of slaves, max.	30
J1939	
• Addressable ECUs, max.	30
• Logical nodes, max.	253
• PDU 1	Yes
• PDU 2	Yes
• DM – data	Yes
• BAM	Yes
• CMDT	Yes

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Technical specifications (continued)

Article number	**6BK1623-0AA00-0AA0**
	SIMATIC PN/J1939 LINK
1. Interface	
Interface type	J1939 according to the standard "SAE J1939"
Physics	9-pin sub D socket
Isolated	Yes; 500 V AC or 707 V DC
Interface types	
• Number of ports	1
2. Interface	
Interface type	PROFINET
Physics	Ethernet, 2-port switch, 2*RJ45
Isolated	Yes; 1 500 V AC or 2 250 V DC
Interface types	
• Number of ports	2
• integrated switch	Yes
Protocols	
• PROFINET IO Device	Yes
Isochronous mode	
Isochronous operation (application synchronized up to terminal)	No
Interrupts/diagnostics/ status information	
Status indicator	Yes
Alarms	Yes
Diagnostics function	Yes
Diagnostics indication LED	
• RUN LED	Yes
• ERROR LED	Yes
• MAINT LED	Yes
• LINK LED	Yes
• RX/TX LED	Yes
Potential separation	
Potential separation exists	Yes
Degree and class of protection	
Degree of protection acc. to EN 60529	IP20
Standards, approvals, certificates	
CE mark	Yes
UL approval	Yes
cULus	Yes
RCM (formerly C-TICK)	Yes
KC approval	Yes
EAC (formerly Gost-R)	Yes
PNO certificate	Yes
RoHS conformity	Yes
Marine approval	
• Germanischer Lloyd (GL)	Yes
• Det Norske Veritas (DNV)	Yes

Article number	**6BK1623-0AA00-0AA0**
	SIMATIC PN/J1939 LINK
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-25 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	-25 °C
• vertical installation, max.	55 °C
• ceiling installation, min.	-25 °C
• ceiling installation, max.	45 °C
• floor installation, min.	-25 °C
• floor installation, max.	45 °C
Ambient temperature during storage/transportation	
• min.	-40 °C
• max.	85 °C
Relative humidity	
• Operation, max.	95 %
Software	
Runtime software	
Target system	
- ET 200SP	Yes
- Open Controller	Yes
- S7-1200	Yes
- S7-1500	Yes
Dimensions	
Width	70 mm
Height	112 mm
Depth	75 mm
Weights	
Weight, approx.	212 g

Ordering data

	Article No.
SIMATIC PN/J1939 LINK	**6BK1623-0AA00-0AA0**
Network transition from PROFINET to J1939 networks; IP20	

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PN/BACnet LINK

Overview



- Gateway between PROFINET and BACnet/IP networks according to EN ISO16484-5 and Addendum ANSI/ASHRAE Standard 135-2012.
- Integrated in Totally Integrated Automation via HSP, TIA Portal V14 or higher
- Integrated PROFINET switch and RJ45 socket for BACnet
- 1 000 BACnet objects/object references
- 1 000 subscribe services
- BACnet features:
  - Client & Server
  - Device profile: B-GW
  - Change of value / cyclic and acyclic data exchange
  - Scan of BACnet/IP network
- Supported BACnet object types:
  - Device
  - Binary input
  - Binary output
  - Analog input
  - Analog output
- Supported BACnet services:
  - DS-COV-A/B
  - DM-DDB-A/B
  - DM-DOB-B
  - DS-RP-A/B
  - DS-WP-A/P
  - GW-EO-B
- Galvanic isolation between the two networks
- Diagnostic interrupts
- Controllers supported: S7-1200, S7-1500, ET 200SP, Open Controller

Technical specifications

Article number	**6BK1621-0AA00-0AA0**
	SIMATIC PN/BACnet LINK
General information	
Product type designation	PN/BACnet Link
Product function	
• I&M data	Yes
Engineering with	
• STEP 7 TIA Portal configurable/ integrated as of version	V14 SP1
Installation type/mounting	
Mounting	DIN rail, wall mounting, portrait mounting
Mounting position	Any
Recommended mounting position	Horizontal
Supply voltage	
Type of supply voltage	24 V DC
Rated value (DC)	24 V
permissible range, lower limit (DC)	20.4 V
permissible range, upper limit (DC)	28.8 V
Reverse polarity protection	Yes
Overvoltage protection	Yes
Short-circuit protection	Yes
Mains buffering	
• Mains/voltage failure stored energy time	10 ms
Input current	
Current consumption (rated value)	0.11 A
Current consumption, max.	0.13 A
Power loss	
Power loss, typ.	2.7 W

Article number	**6BK1621-0AA00-0AA0**
	SIMATIC PN/BACnet LINK
Interfaces	
Supports protocol for PROFINET IO	
• automatic detection of transmission rate	No
• Transmission rate, max.	100 Mbit/s
• Number of RJ45 ports	2
• Number of FC (FastConnect) connections	2
PROFINET functions	
• Assignment of the IP address, supported	Yes
• Assignment of the device name, supported	Yes
BACnet	
• BACnet device profile	B-GW
• Supported character sets	ISO 10646 (UTF-8)
• Network Security	No
1. Interface	
Interface type	BACnet/IP
Physics	RJ45
Isolated	Yes; 1 500 V AC or 2 250 V DC
Interface types	
• Number of ports	1
2. Interface	
Interface type	PROFINET
Physics	Ethernet, 2-port switch, 2*RJ45
Isolated	Yes; 1 500 V AC or 2 250 V DC
Interface types	
• Number of ports	2
• integrated switch	Yes
Protocols	
• PROFINET IO Device	Yes

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Technical specifications (continued)

Article number	**6BK1621-0AA00-0AA0**
	SIMATIC PN/BACnet LINK
Isochronous mode	
Isochronous operation (application synchronized up to terminal)	No
Interrupts/diagnostics/ status information	
Status indicator	Yes
Alarms	Yes
Diagnostics function	Yes
Diagnostics indication LED	
• RUN LED	Yes
• ERROR LED	Yes
• MAINT LED	Yes
• LINK LED	Yes
• RX/TX LED	Yes
Potential separation	
Potential separation exists	Yes
Degree and class of protection	
Degree of protection acc. to EN 60529	IP20
Standards, approvals, certificates	
CE mark	Yes
UL approval	Yes
cULus	Yes
RCM (formerly C-TICK)	Yes
KC approval	Yes
PNO certificate	Yes
BTL certificate	Yes
RoHS conformity	Yes

Article number	**6BK1621-0AA00-0AA0**
	SIMATIC PN/BACnet LINK
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-25 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	-25 °C
• vertical installation, max.	55 °C
• ceiling installation, min.	-25 °C
• ceiling installation, max.	45 °C
• floor installation, min.	-25 °C
• floor installation, max.	45 °C
Ambient temperature during storage/transportation	
• min.	-40 °C
• max.	85 °C
Relative humidity	
• Operation, max.	95 %
Software	
Runtime software	
Target system	
- ET 200SP	Yes
- Open Controller	Yes
- S7-1200	Yes
- S7-1500	Yes
Connection method	
Design of electrical connection	Screw connection
Dimensions	
Width	70 mm
Height	112 mm
Depth	75 mm
Weights	
Weight, approx.	210 g

Ordering data

	Article No.
SIMATIC PN/BACnet LINK	**6BK1621-0AA00-0AA0**
Network transition of PROFINET to BACnet/IP networks, device profile B-GW, IP20	

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PN/M-Bus LINK

Overview



- For data exchange between PROFINET and M-Bus networks
- M-Bus functions:
  - M-Bus master
  - Primary address
  - Secondary address
  - Read-only access to M-Bus slaves
  - Short-circuit detection
- Integrated into Totally Integrated Automation via gsdml file in TIA Portal. No separate software required
- Integrated PROFINET switch with 3-pin screw terminal for M-Bus
- Up to 40 slaves (loads/units)
- Diagnostic interrupts
- Controllers supported: S7-1200, S7-1500, ET 200SP, Open Controller

Technical specifications

Article number	**6BK1622-0AA00-0AA0** SIMATIC PN/M-Bus LINK
General information	
Product type designation	PN/M-Bus LINK
Product function	
• I&M data	Yes
Engineering with	
• STEP 7 TIA Portal configurable/ integrated as of version	STEP 7 V15 or higher
Installation type/mounting	
Mounting	DIN rail, wall mounting, portrait mounting
Mounting position	Any
Recommended mounting position	Horizontal
Supply voltage	
Type of supply voltage	24 V DC
Rated value (DC)	24 V
permissible range, lower limit (DC)	20.4 V
permissible range, upper limit (DC)	28.8 V
Reverse polarity protection	Yes
Overvoltage protection	Yes
Short-circuit protection	Yes
Mains buffering	
• Mains/voltage failure stored energy time	10 ms; PN side
Input current	
Current consumption (rated value)	0.11 A; At 24 V and 5 loads
Current consumption, max.	0.4 A; At 20.4 V, 40 loads + 100 mA short-circuit current
Power loss	
Power loss, typ.	2.4 W

Article number	**6BK1622-0AA00-0AA0** SIMATIC PN/M-Bus LINK
Interfaces	
Supports protocol for PROFINET IO	
• automatic detection of transmission rate	No
• Transmission rate, max.	100 Mbit/s
• Number of RJ45 ports	2
• Number of FC (FastConnect) connections	2
PROFINET functions	
• Assignment of the IP address, supported	Yes
• Assignment of the device name, supported	Yes
M-Bus	
• Bus voltage, typ.	36 V
• Transmission rate, min.	300 bit/s
• Transmission rate, max.	9 600 bit/s
• Number of slaves, max.	40
• Short-circuit detection	Yes
• short-circuit proof	Yes
• Connectable conductor cross-section	1.5 mm^2
• Cable length, max.	300 m
1. Interface	
Interface type	M-Bus master
Physics	3-wire screw-type terminal
Isolated	No
Interface types	
• Number of ports	1
2. Interface	
Interface type	PROFINET
Physics	Ethernet, 2-port switch, 2*RJ45
Isolated	Yes; 1 500 V AC or 2 250 V DC
Interface types	
• Number of ports	2
• integrated switch	Yes
Protocols	
• PROFINET IO Device	Yes
Isochronous mode	
Isochronous operation (application synchronized up to terminal)	No

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Technical specifications (continued)

Article number	**6BK1622-0AA00-0AA0** SIMATIC PN/M-Bus LINK
Interrupts/diagnostics/ status information	
Status indicator	Yes
Alarms	Yes
Diagnostics function	Yes
Diagnostics indication LED	
• RUN LED	Yes
• ERROR LED	Yes
• MAINT LED	Yes
• LINK LED	Yes
• RX/TX LED	Yes
Potential separation	
Potential separation exists	Yes
Degree and class of protection	
Degree of protection acc. to EN 60529	IP20
Standards, approvals, certificates	
CE mark	Yes
RoHS conformity	Yes

Article number	**6BK1622-0AA00-0AA0** SIMATIC PN/M-Bus LINK
Ambient conditions	
Ambient temperature during operation	
• horizontal installation, min.	-25 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	-25 °C
• vertical installation, max.	55 °C
• ceiling installation, min.	-25 °C
• ceiling installation, max.	45 °C
• floor installation, min.	-25 °C
• floor installation, max.	45 °C
Ambient temperature during storage/transportation	
• min.	-40 °C
• max.	70 °C
Relative humidity	
• Operation, max.	95 %
Software	
Runtime software	
Target system	
- ET 200SP	Yes
- Open Controller	Yes
- S7-1200	Yes
- S7-1500	Yes
Dimensions	
Width	70 mm
Height	112 mm
Depth	75 mm
Weights	
Weight, approx.	215 g

Ordering data

	Article No.
SIMATIC PN/M-Bus LINK PROFINET gateway to M-Bus networks; M-Bus master, IP20	**6BK1622-0AA00-0AA0**

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Overview



IE/AS-i Link PN IO: Single master (left) and Double master (right)

PN	DP-M	DP-S	AS-i M		
●			●		

IK10_10193a

The IE/AS-i Link PN IO is a compact router between PROFINET and AS-Interface, with the following features:

- Single and double AS-Interface master (according to AS-Interface Specification V3.0) for connection of 62 AS-Interface slaves or 124 AS-Interface slaves (with a double master)
- Integrated analog value transmission
- Integrated ground-fault monitoring for the AS-Interface cable
- User-friendly local diagnostics and start-up by means of a full graphic display and control keys or through a web interface with a standard browser on the PC screen
- Vertical integration (standard web interface) through Industrial Ethernet
- Supply via AS-Interface cable or with 24 V DC
- Suitable for AS-Interface with 30-V voltage and AS-i Power24V
- Module exchange without entering the PROFINET connection parameters when using the C-PLUG (optional)
- Costs saved by the double AS-Interface master when large volumes of project data are involved

Note:

As an alternative to the IE/AS-i Link PN IO, a high-performance router can be set up between PROFINET and AS-Interface by combining the CM AS-i Master ST and F-CM AS-i Safety ST modules in an ET 200SP station (for safety-related applications), see page 9/122 and page 9/174

Design

- Compact plastic enclosure in degree of protection IP20 for standard rail mounting
- COMBICON plug-in screw terminals
- Compact design
- Pixel graphics display in the front panel for detailed display of the operating state and readiness for operation of all connected AS-Interface slaves
- Six pushbuttons for starting up and testing the AS-Interface line directly on the IE/AS-i Link PN IO
- LED display of the operating state of PROFINET IO and AS-Interface
- Integrated 2-port switch (RJ45 socket) for connection to Industrial Ethernet
- Small mounting depth thanks to recessed plug mounting
- Operation without fans and batteries

Functionality

Communication

The IE/AS-i Link PN IO allows a PROFINET IO controller to cyclically access the I/O data of all slaves of a subordinate AS-Interface segment. Also supported are the expanded slave types with higher I/O data volume according to AS-i Specification V3.0.

The IE/AS-i Link PN IO occupies the following address area:

- As a single master with full expansion: 62 bytes of input data and 62 bytes of output data in which the digital I/O data of the connected AS-Interface slaves (standard and A/B addressing) of an AS-i line is stored.
- Double the number of bytes as double master
- Optional additional I/O bytes for data from analog slaves

The size of the input/output image can be compressed so that only the actually required I/O address area is occupied in the system of the IO controller.

The integrated evaluation of analog signals is just as easy as access to digital values because the analog process data also lie directly in the I/O address area of the CPU.

PROFINET IO controllers are additionally able to initiate AS-Interface master calls (e.g. to write parameters, change addresses, read diagnostic values) through the acyclic PROFINET services.

Using an operating display in AS-Interface Link it is possible to fully commission the lower-level AS-i line.

The IE/AS-i Link PN IO is equipped with two Ethernet ports, which are connected by an internal switch. With the Ethernet it is possible in addition to use the integrated web server. The web server can be called up with any standard web browser (e.g. Internet Explorer) without additional software. It enables the PC to present all diagnostics information and to display the set bus configuration and parameters as well as their adaptation where applicable. Firmware updates are also possible using this port.

The optional C-PLUG supports module replacement without manually entering the connection parameters (PROFINET device name), keeping downtimes to a minimum in the event of a fault.

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Overview (continued)

Diagnostics

The following diagnostics is possible using the display and control keys, web interface or STEP 7:

- Operating state of the IE/AS-i Link PN IO
- State of the link as a PROFINET IO device
- Diagnostics of the AS-Interface network
- Message frame statistics
- Standard diagnostics pages in the web interface for fast diagnostics access through Ethernet using a standard browser
- Reporting of diagnostic events is optionally possible via email or SNMP trap. The integrated diagnostic buffer saves the events including time stamp.

Notes on security

In order to protect plants, systems, machines and networks against cyber threats, it is necessary to implement – and continuously maintain – a holistic, state-of-the-art industrial security concept. Siemens products and solutions only represent one component of such a concept.

For more information on Industrial Security, see http://www.siemens.com/industrialsecurity.

Configuration

The IE/AS-i Link PN IO is configured as follows:

- With STEP 7 (TIA Portal) V15 or higher or STEP 7 (classic) V5.4 or higher: When configuring in STEP 7, the AS-Interface configuration can be uploaded in STEP 7 V5.4 SP2 and higher. Furthermore, AS-Interface slaves from Siemens can also be conveniently configured in HW Config (slave selection dialog).
- Alternatively, IE/AS-i Link PN IO can be integrated in the engineering tool by means of the PROFINET GSD file (e.g. for TIA Portal versions lower than V15, for STEP 7 versions lower than V5.4 SP2, or for non-Siemens engineering tools).

Benefits

- Short startup times through simple configuration at the touch of a button and testing the AS-Interface line using the display or web interface
- Reduction of standstill and servicing times in the event of a slave failure thanks to user-friendly diagnostics using the display or web interface
- Costs saved by the double AS-Interface master when large volumes of project data are involved
- Simple operation with AS-Interface power supply unit (see https://mall.industry.siemens.com/mall/en/WW/Catalog/Products/8200165?tree=CatalogTree) without restrictions, no further operating voltage is required.
- Alternatively: No need for the AS-i power supply unit with AS-i Power24V. The AS-Interface cable is powered through an existing 24 V DC PELV power supply unit. An S22.5 AS-i data decoupling module (e.g. 3RK1901-1DE12-1AA0) is required for the decoupling, see https://mall.industry.siemens.com/mall/en/WW/Catalog/Products/10057533?tree=CatalogTree.
- For diagnostics during ongoing operation, diagnostics blocks with clearly arranged visualization on the SIMATIC HMI panel are available or can be downloaded free of charge via a web browser, see https://support.industry.siemens.com/cs/ww/en/view/61892138.

Application

The DP/AS-i Link PN IO is a PROFINET IO device (according to IEC 61158 / IEC 61784) and an AS-Interface master (based on AS-Interface Specification V3.0 according to IEC 62026-2). It enables transparent data access to AS-Interface from Industrial Ethernet.

Exchanging data with PROFINET IO controllers

PROFINET IO controllers can exchange I/O data with AS-Interface in cyclic mode and can perform AS-i master calls in addition with acyclic services (e.g. reading/writing the AS-i configuration during normal operation). IE/AS-i Link PN IO is, therefore, suitable for distributed configurations and for integrating a lower-level AS-Interface network.

Single master

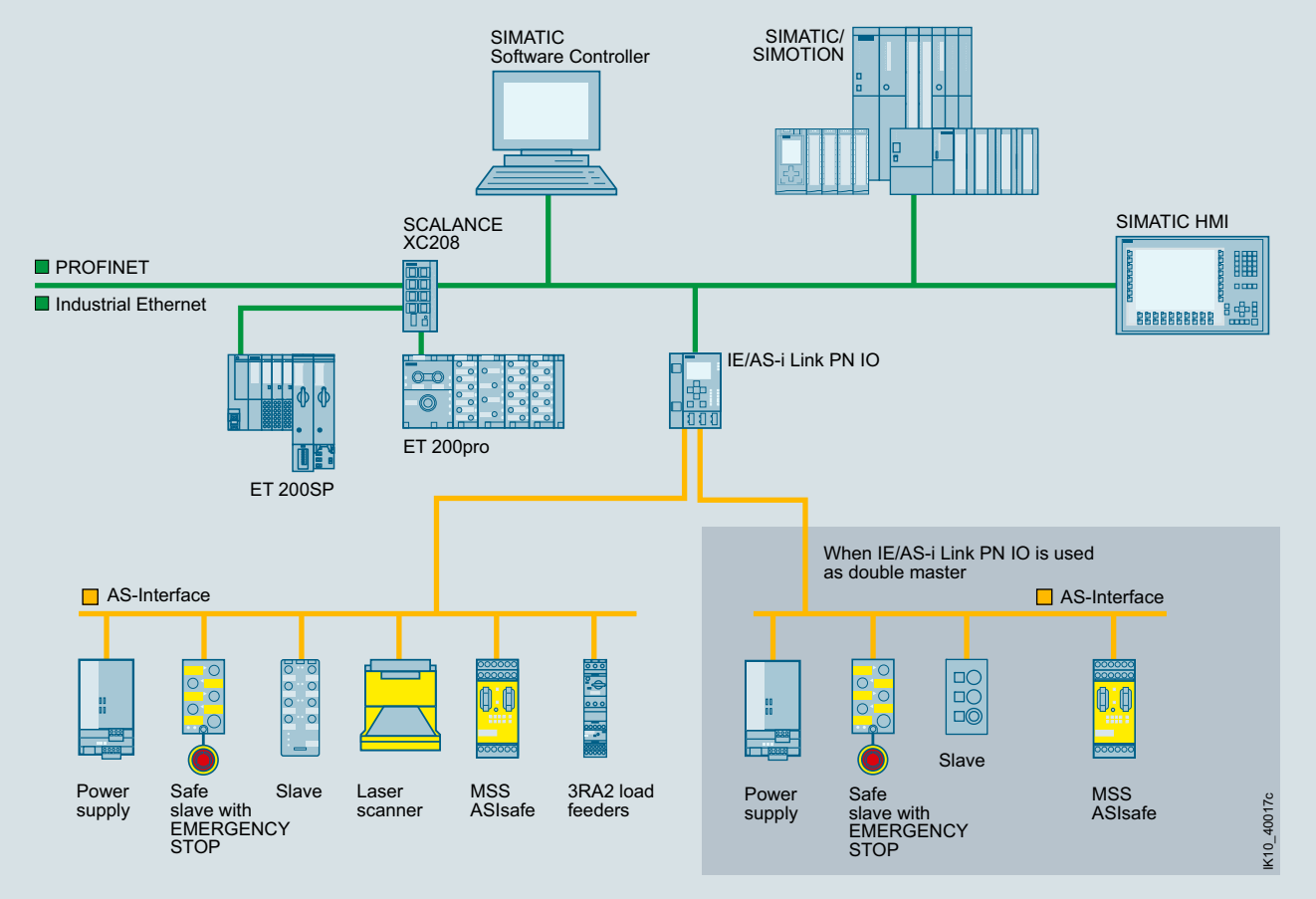
The AS-i single master version of IE/AS-i Link PN IO is suitable for applications with typical volumes of data. The single master can operate up to 248 DI / 248 DO, using 62 A/B slaves with 4 DI / 4 DO each.

Double master

The AS-i double master version of IE/AS-i Link PN IO is suitable for applications with large volumes of data. In this case, twice the volume of project data can be used on two AS-i lines running independently of each other. The double master can operate up to 496 DI / 496 DO, using two AS-i networks each with 62 A/B slaves with 4 DI / 4 DO each.

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Application (continued)



Integration of AS-Interface on PROFINET through IE/AS-i Link PN IO as single/double master

Ordering data

	Article No.
IE/AS-i Link PN IO	
Router between PROFINET and AS-Interface in degree of protection IP20; including COMBICON plug-in screw terminals for connecting an AS-Interface cable (two AS-Interface cables for a double master) and the optional 24 V supply; complies with AS-Interface Specification V3.0; dimensions (W x H x D / mm): 90 x 132 x 88.5	
COMBICON connection	
• Single master with display	**6GK1411-2AB10**
• Double master with display	**6GK1411-2AB20**

	Article No.
Accessories	
C-PLUG	
Exchange medium for the simple exchange of devices in the event of a fault; for accommodating configuration and application data; can be used in SIMATIC NET products with a C-PLUG slot	**6GK1900-0AB00**
IE FC RJ45 plug 90	
RJ45 plug-in connector for Industrial Ethernet, with rugged metal enclosure and integrated insulation displacement contacts for connection of Industrial Ethernet FC installation cables; with 90° cable feeder	
• 1 pack = 1 unit	**6GK1901-1BB20-2AA0**
• 1 pack = 10 units	**6GK1901-1BB20-2AB0**
• 1 pack = 50 units	**6GK1901-1BB20-2AE0**

More information

Manual, see
https://support.industry.siemens.com/cs/ww/en/view/22712154

AS-Interface block library for SIMATIC PCS 7 for simple connection of AS-Interface to PCS 7, see
https://support.industry.siemens.com/cs/ww/en/view/109759605

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Overview



- For interconnecting two PROFIBUS DP networks
- The interchange of data between both DP networks takes place by internal copying in the coupler

Technical specifications

DP/DP coupler	
PROFIBUS transmission rate	max. 12 Mbit/s
Interfaces	
• PROFIBUS DP	9-pin Sub-D connector
Supply voltage	24 V DC
Current consumption typ.	150 mA
Mounting	Upright (DIP switches above)
Perm. environmental conditions	
• Operating temperature	
- horizontal mounting	0°C … +60°C
- all other mounting positions	0°C … +40°C
• Transport/storage temperature	-40 °C … +70 °C
• Relative humidity	10-95 % at +25 °C
Design	
• Dimensions (W x H x D) in mm	40 x 127 x 117
• Weight	approx. 250 g
Degree of protection	IP20

Ordering data

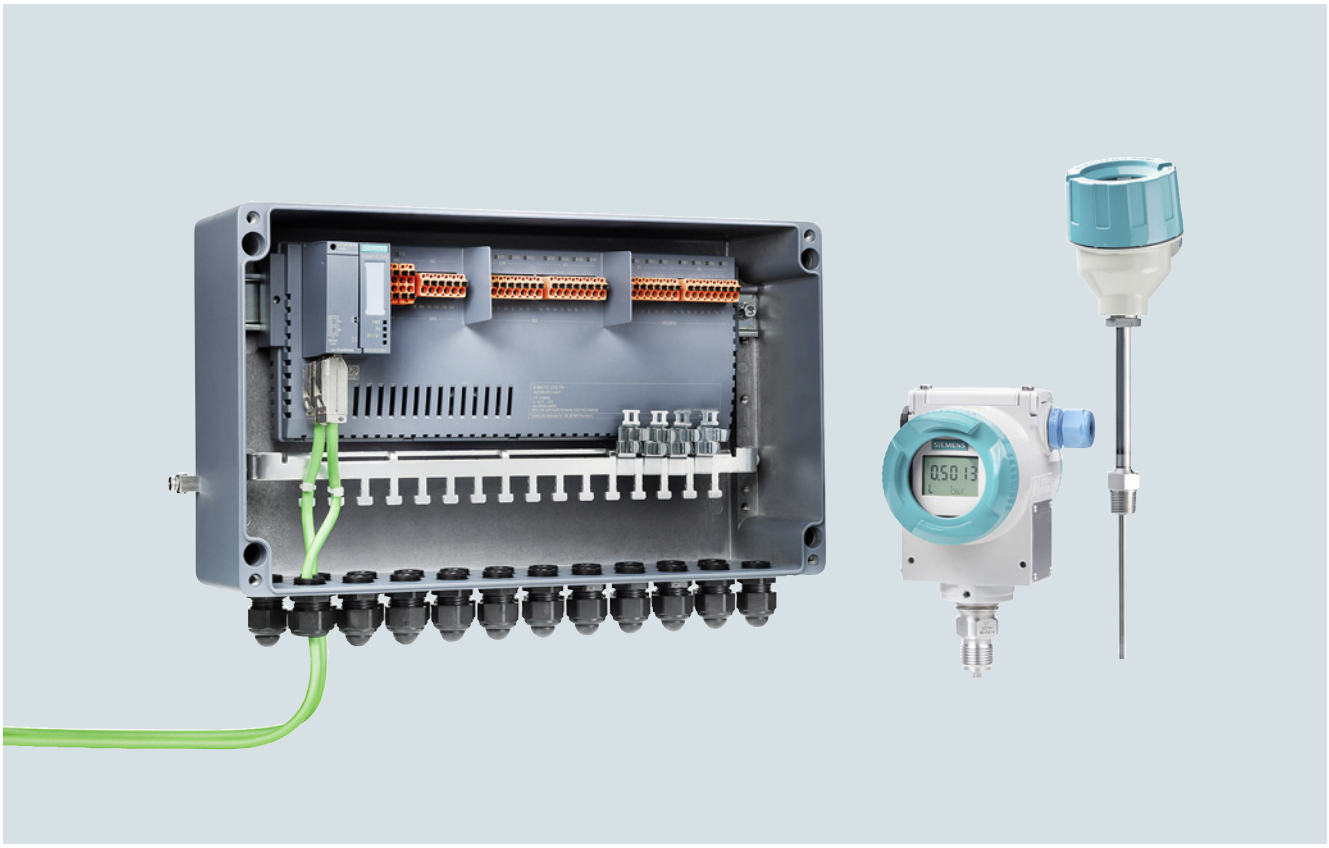
	Article No.
DP/DP coupler	**6ES7158-0AD01-0XA0**

Note:

The manual is available free on the Internet.

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Overview



The SIMATIC Compact Field Unit (SIMATIC CFU) is a smart field distributor for use as an I/O device on PROFINET of an automation system. SIMATIC CFU has the following interfaces:

- Fieldbus connections for PROFIBUS PA field devices
- Freely configurable channels (digital inputs/outputs for sensors or actuators)

The SIMATIC CFU is a real game changer in field device connection and offers entirely new prospects regarding simplicity and flexibility. This compact field distributor is installed at the process level and is connected via PROFINET directly to the controller to form the foundation for digitalization in the field. Utilization of digital fieldbus communication simplifies device interfacing considerably compared to conventional 4 to 20 mA engineering.

Plug-and-produce simplicity

Digitalization requires a digital infrastructure facilitating integrated digital communication right down to the sensors and actuators. This can be built up using the tried and tested, standard PROFIBUS PA which has been incorporated into the PA Edition of the SIMATIC CFU, thus combining ruggedness and simplified handling with all the advantages of the PROFINET standard based on Industrial Ethernet. Connected devices are addressed automatically, and integration is simple via standardized communication profiles.

This innovative new implementation of the PROFIBUS PA concept makes it possible to combine the simplicity of a point-to-point wiring system with the scalability of digital PROFIBUS PA fieldbus communication.

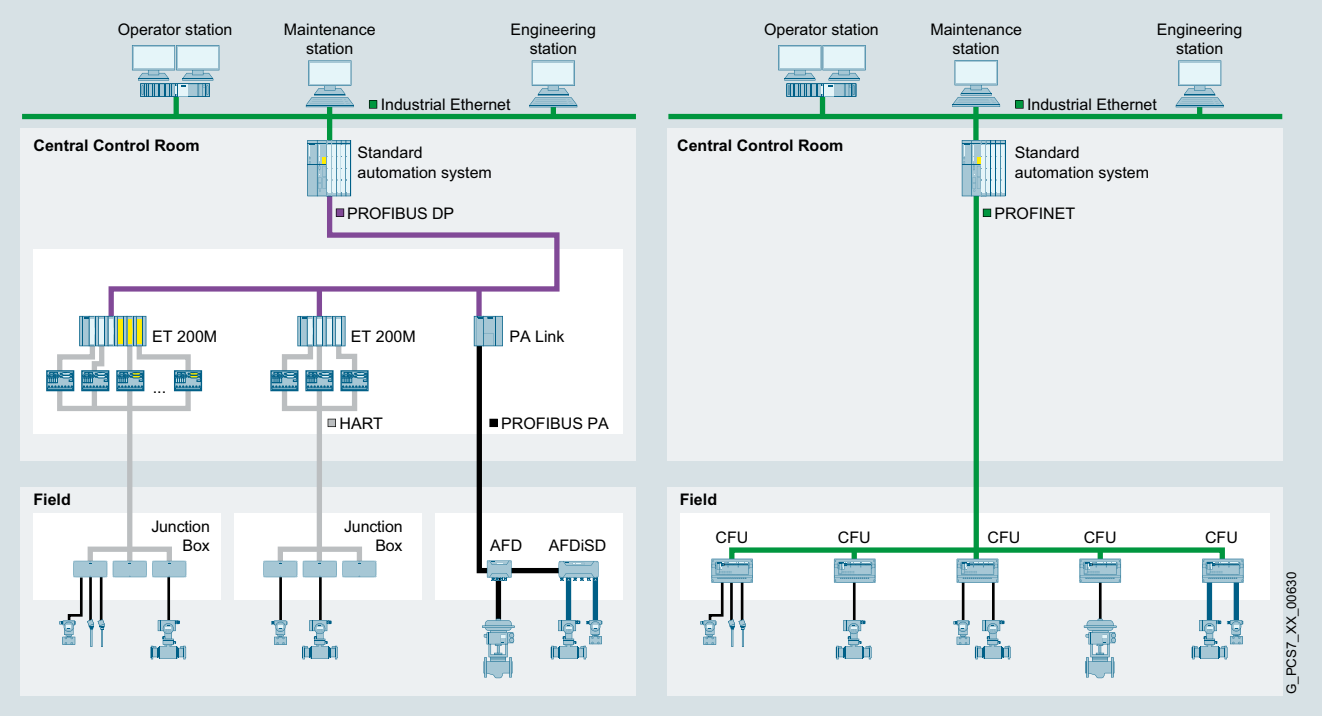
As with digital field devices, it is not necessary to know prior to connection whether the discrete field device is a sensor or actuator – this can be easily configured afterwards with software.

Greater flexibility thanks to consistent decentralization

Thanks to the distributed installation of the SIMATIC CFU, classic control cabinets are no longer required and you can make considerable savings in cabling and the number of terminal points as well as reducing planning and documentation overheads. The high granularity (16 I/O per SIMATIC CFU) enables flexible assignment to the higher-level controllers.

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Overview (continued)



Field device connection with previous technology (left) and with SIMATIC CFU (right)

Most important functions

System interfacing over the Industrial Ethernet standard

- Redundant PROFINET connection (S2) for maximum availability
- Connection versatility with PROFINET BusAdapter (for example electrical, optical or mixed)

Combination of digital fieldbus and discrete I/Os

- 8 × digital fieldbus (PROFIBUS PA)
- 8 × digital inputs/outputs, freely configurable

Ready for distributed use

- For installation in hazardous areas up to zone 2-22
- Extended temperature range of -40 to +70 °C
- Conformal coating
- Can be used at altitudes of up to 4 000 meters
- Enhanced interference immunity in accordance with NAMUR recommendation NE21

Easy to use

- Automatic addressing of PROFIBUS PA field devices
- System-supported detection and integration of PROFIBUS PA field devices into the process control system with the use of standardized PA profiles and commissioning, device replacement and service wizards
- Implementation of diagnostic messages in accordance with NAMUR recommendation NE107
- 35-mm mounting onto standard rail

Configuring with SIMATIC PCS 7 and third-party systems

See information in the Siemens Industry Online Support

https://support.industry.siemens.com/cs/ww/en/view/109749357

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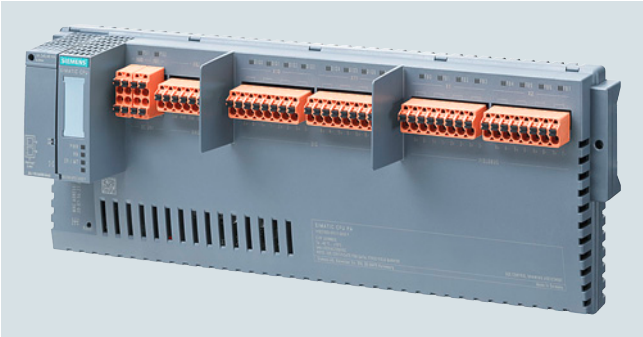
Overview Bundles

For SIMATIC CFU PA, a pre-installed bundle is offered, with SIMATIC CFU PA basic device and SIMATIC CFU push-in terminals.

SIMATIC CFU PA bundle

Comprising:

- SIMATIC CFU PA, Article no. 6ES7655-5PX11-0XX0
- SIMATIC CFU push-in terminals, Article no. 6ES7655-5PX00-1XX0



SIMATIC CFU PA bundle

Ordering data

	Article No.
SIMATIC CFU PA bundle Comprising: • SIMATIC CFU PA, Article No. 6ES7655-5PX11-0XX0 • SIMATIC CFU push-in terminals, Article No. 6ES7655-5PX00-1XX0 pre-assembled and tested	**6ES7655-5PX11-1XX0**
SIMATIC CFU PA bundle with aluminum enclosure Comprising: • SIMATIC CFU PA, Article No. 6ES7655-5PX11-0XX0 • SIMATIC CFU push-in terminals, Article No. 6ES7655-5PX00-1XX0 • Aluminum enclosure with cable glands, shield busbar, shield connection clamps pre-assembled and tested	**6ES7655-5PX11-1AX0**

Overview Accessories



BusAdapter BA 2×RJ45, 2×FC and 2×LC

BusAdapter

A BusAdapter as a separate component allows a free choice of SIMATIC CFU connection to PROFINET:

- BA 2×RJ45:
  2 electrical connections for bus cable with standard RJ45 connector
- BA 2×FC:
  2 electrical connections for direct connection of FastConnect bus cable
- BA 2×LC:
  2 optical ports for fiber-optic cables

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Technical specifications

Article number	**6DL1193-6AR00-0AA0** ET 200SP HA, BUSADAPTER BA 2XRJ45	**6DL1193-6AF00-0AA0** ET 200SP HA, BUSADAPTER BA 2XFC	**6DL1193-6AG00-0AA0** ET 200SP HA, BUSADAPTER BA 2XLC
General information			
Product type designation	BA 2x RJ45	BA 2xFC	BA 2xLC
Interfaces			
Number of PROFINET interfaces	1; 2 ports (switch) RJ45	1; 2 ports (switch) FC	1; 2 ports (switch) LC Multimode Glass Fibre
Supports protocol for PROFINET IO			
• Number of RJ45 ports	2		
• Number of FC (FastConnect) connections		2	
• Number of LC ports			2
Cable length			
- Cu conductors	100 m	100 m	
- Multimode graded-index fiber 50/125 µm			3 km
- Multimode graded-index fiber 62.5/125 µm			3 km
Ambient conditions			
Ambient temperature during operation			
• min.	-40 °C	-40 °C	-40 °C
• max.	70 °C	70 °C	65 °C; Redundant design (2x 6DL1155-6AU00-0PM0): max. 60 °C horizontal, max. 50 °C vertical. When using different I/O devices, the derating specified there must be observed.
Dimensions			
Width	20 mm	20 mm	20 mm
Height	69.5 mm	69.5 mm	75 mm; Without protective caps (approx. 8 mm)
Depth	59 mm	59 mm	59 mm
Weights			
Weight, approx.	46 g	53 g	60 g

Ordering data

	Article No.
BusAdapter	
BusAdapter BA 2×RJ45 2 × RJ45 connections for PROFINET (standard Ethernet socket)	**6DL1193-6AR00-0AA0**
BusAdapter BA 2×FC 2 × FastConnect (FC) connections for PROFINET	**6DL1193-6AF00-0AA0**
BusAdapter BA 2×LC 2 × glass fiber-optic connections	**6DL1193-6AG00-0AA0**
Shield terminals for aluminum field enclosure	
SIMATIC CFU shield terminals 4 shield terminals as an optional accessory for SIMATIC CFU aluminum field housing, for simple and secure shielding of up to 8 PROFIBUS PA field devices	Not yet available **6ES7655-5PX00-0XX1**

	Article No.
Connection technology	
SIMATIC CFU screw-type terminals Complete set of screw-type terminals for SIMATIC CFU: two-tier 2×2 (24 V), single-tier 1×6 (GND) and single-tier 4×8 (IO)	**6ES7655-5PX00-2XX0**
SIMATIC CFU push-in terminals Complete set of push-in terminals for SIMATIC CFU: two-tier 2×2 (24 V), single-tier 1×6 (GND) and single-tier 4×8 (IO)	**6ES7655-5PX00-1XX0**

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Notes

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10/2 **FM 458-1 DP application module**
10/2 Introduction
10/3 FM 458-1 DP basic module
10/5 EXM 438-1 input/output expansion
10/7 EXM 448-2 universal communication expansion module
10/8 D7-SYS

10/9 **SIMATIC TDC multiprocessor control system**
10/9 Introduction, UR6021 rack
10/10 CPU555 and CPU551 processor modules
10/11 MC5xx program memory module
10/11 CP50M1 communications module
10/12 CP51M1 communications module
10/12 CP53M0 coupling module
10/13 SM500 I/O module
10/15 GlobalDataMemory
10/16 Accessories

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Introduction

Overview



SIMATIC FM 458-1 DP integrated in SIMATIC S7-400

- Designed for high-performance and user-configurable closed-loop control tasks in the SIMATIC S7-400.
- Can be adapted to individual requirements as required, such as:
  Controlling, computing, closed-loop control as well as motion control. Can therefore be used flexibly for a wide variety of applications.
- Extensive library with approx. 300 function blocks:
  E.g. simple functions such as AND, ADD and OR through to complex GMC (general motion control) blocks as virtual master or gear functions.
- User-friendly graphical configuration with the SIMATIC engineering tool CFC (Continuous Function Chart) and the D7-SYS add-on software package:
  Optimum code generation by the compiler, therefore SCL is not required.
- PROFIBUS DP interface onboard.

SIMATIC FM 458-1 DP is based on more than 15 years experience with high-performance control systems and combines this know-how with the advantages of SIMATIC – the leading automation system for decades. In contrast to other function modules with static structures/functions, the FM 458-1 DP application module can be configured flexibly and adapted to individual requirements.

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Overview



- Basic module for computing, closed-loop control and open-loop control tasks
- PROFIBUS DP interface for connection of distributed I/O and drives
- Modular design with expansion modules for I/O and communication

Technical specifications

Article number	**6DD1607-0AA2** FM458-1 DP Application Module
Supply voltage	
Rated value (DC)	
• 5 V DC	Yes
• 24 V DC	Yes
permissible range (ripple included), lower limit (DC)	4.8 V
permissible range (ripple included), upper limit (DC)	5.25 V
Input current	
Current consumption, typ.	1.5 A
Current consumption, max.	3 A
Memory	
Backup	
• present	Yes; SRAM
Battery	
Backup battery	
• Backup current, max.	15 µA
Hardware configuration	
Slots	
• required slots	1
Time of day	
Clock	
• Hardware clock (real-time)	Yes
Digital inputs	
Number of digital inputs	8; Connector X2
Input voltage	
• Rated value (DC)	24 V
• for signal "0"	-1 to +6V
• for signal "1"	13.5 to 33V
Input current	
• for signal "0", max. (permissible quiescent current)	0 mA
• for signal "1", typ.	3 mA; at 24 V
Input delay (for rated value of input voltage)	
for standard inputs	
- at "0" to "1", max.	5 µs
Interfaces	
PROFIBUS DP	
• Equidistance	Yes; With connection to interrupt tasks
• Direct data exchange (slave-to-slave communication)	Yes
Interrupts/diagnostics/ status information	
Alarms	Yes
Potential separation	
Potential separation digital inputs	
• Potential separation digital inputs	No; only via optional interface modules
Weights	
Weight, approx.	1 000 g

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FM 458-1 DP basic module

Ordering data	Article No.
FM 458-1 DP application module Basic module for computing, closed-loop control and open-loop control tasks; with PROFIBUS DP interface	**6DD1607-0AA2**
Micro Memory Card For FM 458-1 DP basic module	
2 MB	**6ES7953-8LL31-0AA0**
4 MB	**6ES7953-8LM31-0AA0**
8 MB	**6ES7953-8LP31-0AA0**
FM 458-1 DP Know-How-Protect For protection of technological application modules against unauthorized copying	**6DD1607-0GA0**
SC64 interface cable To connect FM 458-1 to the serial port of a programming device/ PC	**6DD1684-0GE0**
SB10 interface module To connect 8 binary I/Os to FM 458-1 DP	**6DD1681-0AE2**
SB61 interface module To connect 8 binary I/Os to FM 458-1 DP, input voltage: 24/48 V DC	**6DD1681-0EB3**
SU12 interface module To connect 10 signals to FM 458-1 DP	**6DD1681-0AJ1**

	Article No.
RS 485 bus connector with 90° cable outlet	
Max. transfer rate 12 Mbps	
Without PG interface	**6ES7972-0BA12-0XA0**
With PG interface	**6ES7972-0BB12-0XA0**
RS 485 bus connector with angled cable outlet	
Max. transfer rate 12 Mbps	
Without PG interface	**6ES7972-0BA42-0XA0**
With PG interface	**6ES7972-0BB42-0XA0**
RS 485 bus connector with 90° cable outlet for FastConnect connection system	
Max. transfer rate 12 Mbps	
Without PG interface	
• 1 unit	**6ES7972-0BA52-0XA0**
• 100 units	**6ES7972-0BA52-0XB0**
With PG interface	
• 1 unit	**6ES7972-0BB52-0XA0**
• 100 units	**6ES7972-0BB52-0XB0**
PROFIBUS FastConnect bus cable	
Standard type with special design for quick mounting, 2-wire, shielded, sold by the meter; max. delivery unit 1000 m, minimum ordering quantity 20 m	**6XV1830-0EH10**
Preferred lengths:	
20 m	**6XV1830-0EN20**
50 m	**6XV1830-0EN50**
100 m	**6XV1830-0ET10**

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Overview



- Optional plug-in expansion module for the FM 458-1 DP basic module
- Used to read in and output time-critical signals
- With digital and analog inputs/outputs
- Incremental and absolute encoders can be connected
- 4 high-resolution analog outputs
- Fan-free operation up to 40 °C

Technical specifications

Article number	**6DD1607-0CA1** EXM 438-1 I/O Expansion
Supply voltage	
Rated value (DC)	
• 5 V DC	Yes
• 24 V DC	Yes; to be set up externally
Input current	
Current consumption, typ.	1.5 A
Encoder supply	
Type of output voltage	about 14 V (non-isolated)
Short-circuit protection	Yes; Electronic
Output current	
• Rated value	100 mA
Power loss	
Power loss, typ.	7.5 W
Hardware configuration	
Slots	
• required slots	1
Digital inputs	
Number of digital inputs	16
Input voltage	
• Rated value (DC)	24 V
• for signal "0"	-1 to +6 V or input open
• for signal "1"	+13 to +33V
Input current	
• for signal "0", max. (permissible quiescent current)	0 mA
• for signal "1", typ.	3 mA
Input delay (for rated value of input voltage)	
for standard inputs	
- at "0" to "1", max.	200 µs

Article number	**6DD1607-0CA1** EXM 438-1 I/O Expansion
Digital outputs	
Number of digital outputs	8
Short-circuit protection	Yes; electronic/thermal
• Response threshold, typ.	250 mA
Limitation of inductive shutdown voltage to	Supply voltage +1 V
Output voltage	
• for signal "0", max.	3 V
• for signal "1", max.	Supply voltage -2.5 V
Output current	
• for signal "1" rated value	50 mA
• for signal "1" permissible range for 0 to 40 °C, min.	100 mA
• for signal "0" residual current, max.	20 µA
• Total switching current	80% at 50 °C all outputs 50 mA
Output delay with resistive load	
• "0" to "1", max.	15 µs
Analog inputs	
Number of analog inputs	5; Differential inputs
Input ranges (rated values), voltages	
• -10 V to +10 V	Yes; -10 V: ±4 LSB; to +10 V: ±4 LSB (1 LSB = 4.88 mV)
• Input resistance (-10 V to +10 V)	470 kΩ
Analog outputs	
Number of analog outputs	8; 4 outputs 16 bit; 4 outputs12 bit
Voltage output, short-circuit protection	Yes; relative to frame
Voltage output, short-circuit current, max.	16 bit: 27 mA; 12 bit: 100 mA
Output ranges, voltage	
• -10 V to +10 V	Yes
Analog value generation for the inputs	
Integration and conversion time/ resolution per channel	
• Resolution with overrange (bit including sign), max.	12 bit
• Conversion time (per channel)	45 µs
Analog value generation for the outputs	
Integration and conversion time/ resolution per channel	
• Resolution with overrange (bit including sign), max.	4 AO: 16 bit, 4 AO: 12 bit
• Conversion time (per channel)	4 AO (16 bit): 2 µs; 4 AO (12 bit): 4 µs

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EXM 438-1 input/output expansion

Technical specifications (continued)

Article number	**6DD1607-0CA1** EXM 438-1 I/O Expansion
Encoder	
Number of connectable encoders, max.	12; 8 incremental encoders (synchronizable), 4 absolute encoders
Connectable encoders	
• Incremental encoder (symmetrical)	Yes
• Incremental encoder (asymmetrical)	Yes
• Absolute encoder (SSI)	Yes; Single or multiturn encoder with SSI (synchronous serial) or EnDat interface
Encoder signals, incremental encoder (symmetrical)	
• Trace mark signals	1) for tracks A and B (90° out of phase), poss. with zero pulse N; 2) for separate forward and backward track
• Input voltage	With 0 signal: -5 to 0 V; with 1 signal: +3 to +5 V; permissible input voltage range: differential voltage -5 to +5 V; max. input current: 15 mA (important: not limited on module side!)
Encoder signals, incremental encoder (asymmetrical)	
• Trace mark signals	Track A and B (phase-shifted by 90 degrees), possibly with zero pulse N
• Input voltage	with 0 signal: -30 to +4 V (at 15 mA load); with 1 signal: +8 to 30 V (at 15 mA load); permissible input voltage range: differential voltage -30 to +30 V
Encoder signals, absolute encoder (SSI)	
• Input signal	5 V acc. to RS 422
• Data signal	Dual-, Gray-, Gray-Excess-Code
• Clock frequency, max.	2 MHz; 100 kHz to 2 MHz (depending on cable length)
Errors/accuracies	
Linearity error (relative to output range), (+/-)	(±1 LSB)
Potential separation	
Potential separation digital inputs	
• Potential separation digital inputs	No
Potential separation digital outputs	
• Potential separation digital outputs	No
Potential separation analog inputs	
• Potential separation analog inputs	No
Potential separation analog outputs	
• Potential separation analog outputs	No
Weights	
Weight, approx.	1 kg

Ordering data

	Article No.
EXM 438-1 input/output expansion For direct exchange of digital and analog signals between FM 458-1 DP and the plant	**6DD1607-0CA1**
SB10 interface module To connect 8 binary inputs or outputs to FM 458-1 DP	**6DD1681-0AE2**
SB61 interface module To connect 8 binary inputs to FM 458-1 DP, input voltage: 24/48 V DC	**6DD1681-0EB3**
SB71 interface module To connect 8 binary outputs to FM 458-1 DP, output voltage: 24/48 V DC	**6DD1681-0DH1**
SU12 interface module To connect 10 signals to FM 458-1 DP	**6DD1681-0AJ1**
SU13 interface module To connect 50 signals to FM 458-1 DP	**6DD1681-0GK0**
SC62 interface cable To connect EXM 438-1 with up to 5 SBxx or SU12	**6DD1684-0GC0**
SC63 interface cable To connect EXM 438-1 with an SU13	**6DD1684-0GD0**

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Overview



- Optional plug-in expansion module for the FM 458-1 DP basic module
- For high-speed communication over up to 2 SIMOLINK interfaces
- For coupling several FM 458-1 DP application modules in synchronism with the sampling time

Technical specifications

Article number	**6DD1607-0EA2** SIMATIC S7-400 EXM 448-2 Comm.-Expans.
Supply voltage	
Rated value (DC)	
• 5 V DC	Yes
Input current	
Current consumption, typ.	0.6 A
Hardware configuration	
Slots	
• required slots	1
Weights	
Weight, approx.	0.9 kg

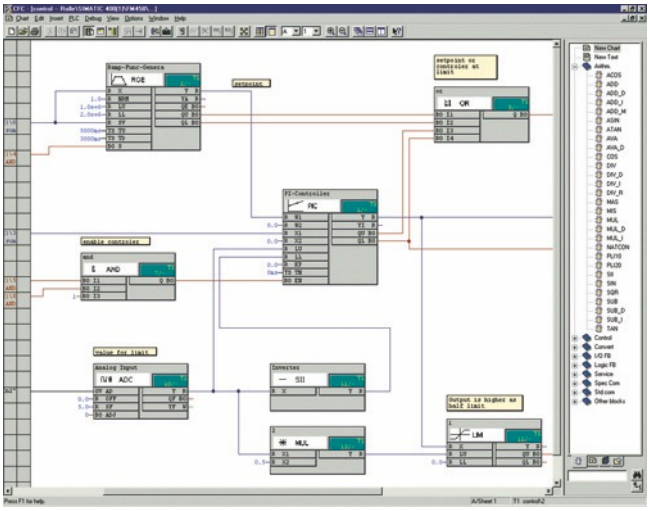
Ordering data

	Article No.
EXM 448-2 universal communication expansion For high-speed communication with drives; for establishing two SIMOLINK fiber optic connections	**6DD1607-0EA2**

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D7-SYS

Overview



- Optional package for STEP 7 V5.6 for configuring closed-loop control and automation tasks with SIMATIC TDC, FM 458-1 DP and T400
- Extensive block library
- Generation of user libraries in ANSI C with D7-FB-GEN function block generator

Licensing

- D7-SYS is delivered with a floating license. The floating license allows installation of the software on any number of computers. This means one user per license can use the software independently of the computer used or from a specific workstation. The number of existing licenses determines the number of computers on which the software can be used simultaneously.
- An upgrade to version 9.0 is available for users of the previous 8.x version.
- A separate update service can be purchased for D7-SYS.
- As of version 8.1, the D7-FB-GEN block generator that was previously sold separately is included in the D7-SYS scope of delivery.

You can find more information on the Software Update Service, license types, online software delivery and handling your SW licenses with the Automation License Manager:

http://www.siemens.com/simatic-licenses

Ordering data

	Article No.
SIMATIC D7-SYS V9.0 Reference hardware: SIMATIC TDC, FM 458-1 DP, T400 Requirement: MS Windows 7 Professional with SP1 (64-bit) (English language version only) MS Windows 7 Ultimate and Enterprise with SP1 (64-bit) MS Windows 10 Pro and Enterprise (64-bit) MS Windows Server 2008 R2 Standard Edition with SP1 (64-bit) MS Windows Server 2012 R2 Standard Edition (64-bit) MS Windows Server 2016 Standard Edition (64-bit) STEP 7 V5.6 Type of delivery: On DVD, en, de, with electronic documentation	
Floating license	**6ES7852-0CC06-0YA5**
Upgrade license from V8.x to V9.0	**6ES7852-0CC06-0YE5**
Software Update Service[1]	**6ES7852-0CC01-0YL5**
SIMATIC Manual Collection Electronic manuals on DVD, multi-language: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC Distributed I/O, SIMATIC HMI, SIMATIC sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	**6ES7998-8XC01-8YE0**
SIMATIC Manual Collection update service for 1 year Current "Manual Collection" DVD and the three subsequent updates	**6ES7998-8XC01-8YE2**

[1] For more information on the software update service, see page 11/2.

Accessories

Overview

- Interface modules and interface cables for the FM 458-1 DP application modules

Note:

For information on interface cables SC 62, SC 63, SC 64 and interface modules SB10, SB61, SB71, SU12 and SU13, see SIMATIC TDC multiprocessor control system, accessories, page 10/16.

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Overview



SIMATIC TDC (Technology and Drives Control) is a digital automation system featuring very high computing power and the ability to process very large programs. An extensive library with approx. 300 ready-made function blocks is available for fast engineering.

Overview UR6021 rack



- UR6021 rack as the base component for SIMATIC TDC
- Integrated system power supply and system fan
- With high-performance 64-bit backplane bus for high-speed data exchange between the inserted modules
- Requirement for operating the CPU555

Ordering data

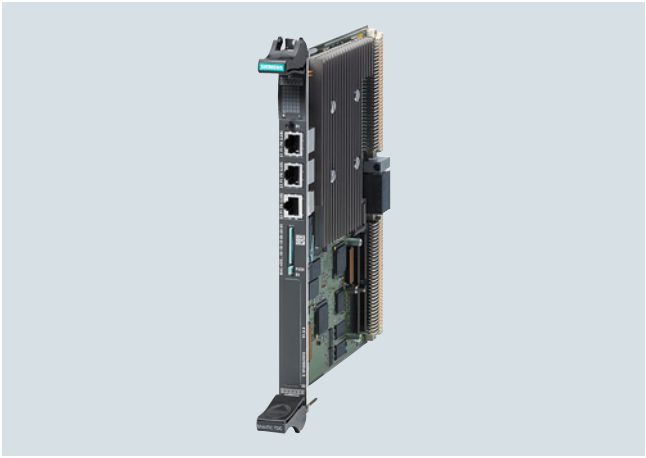
	Article No.
UR6021 racks Spare-part compatible successor of 6DD1682-0CH2	**6DD1682-0CH3**
Accessories	
SR51 slot cover	**6DD1682-0DA1**
Spare parts	
Backup battery	**6ES7971-0BA00**
Fan insert for UR6021	**6DD1683-0CH3**

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CPU555 and CPU551 processor modules

Overview CPU555 processor module

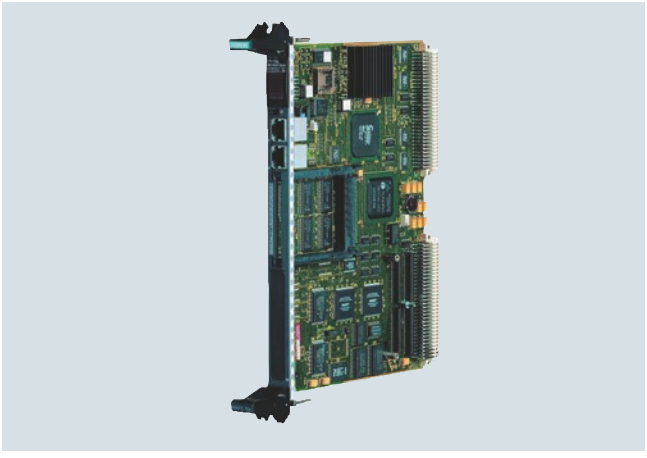


- Graphic freely configurable processor module
- For implementing highly dynamic open and closed-loop control functions

Ordering data

	Article No.
CPU555 processor module	**6DD1600-0BB0**
Accessories	
SIMATIC Micro Memory Card	
2 MB	**6ES7953-8LL31-0AA0**
4 MB	**6ES7953-8LM31-0AA0**
8 MB	**6ES7953-8LP31-0AA0**
Crossed twisted pair cables 4x2 with RJ45 connectors	
0.5 m	**6XV1870-3RE50**
1 m	**6XV1870-3RH10**
2 m	**6XV1870-3RH20**
6 m	**6XV1870-3RH60**
10 m	**6XV1870-3RN10**

Overview CPU551 processor module



High-performance CPU module for open and closed-loop control and arithmetic tasks.

Technical specifications

CPU551	
Required space / width	1 slot
Weight	0.6 kg
Display	5x7 LED
Local service interface	Serial RS232 interface
Sampling intervals	from 100 µs
SDRAM	128 MB
Synchronous cache	8 MB
Clock frequency	500 MHz
CPU	64 Bit RISC CPU with floating point unit
SRAM	512 KB, battery buffered
Power supply	
Voltage / Power supply (at 250°C)	+3.3 V, 2.0 A typical +5 V, 1.5 A typical +12 V, 0.04 A typical –12 V, 0.04 A typical
Buffer battery	3.0 V, 3 µA typical
Power loss, typical	15 W
Digital inputs	
Number	8 inputs, 4 with alarm capability
Galvanic isolation	Only through optional interf. modules
Input voltage • Rated voltage • For 0-signal • For 1-signal	 24 V -1 V ... +6 V +13.5 V ... +33 V
Input power • At 0-signal • At 1-signal	 0 mA 3 mA
Delay time	100 µs
Real-time clock, resolution	0.1 ms

Ordering data

	Article No.
CPU551 processor module	**6DD1600-0BA3**
Accessories	
MC500 memory module (4 MB)	**6DD1610-0AH4**
MC510 memory module (8 MB)	**6DD1610-0AH6**
MC521 memory module (2 MB)	**6DD1610-0AH3**

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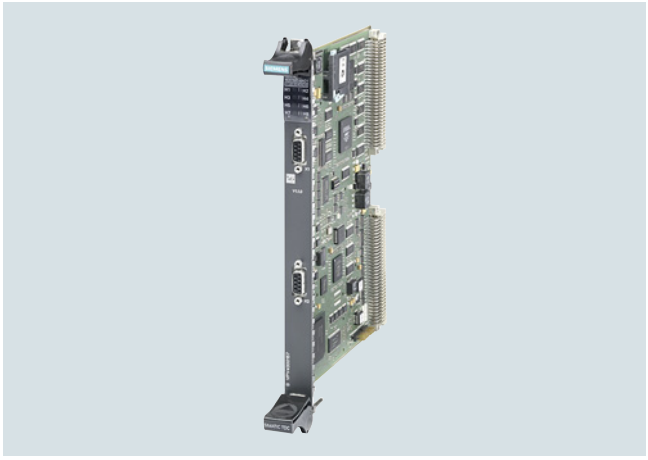
Overview MC5xx program memory module

Program memory module for the program designed with CFC.

Ordering data

	Article No.
MC500 memory module (4 MB)	**6DD1610-0AH4**
MC510 memory module (8 MB)	**6DD1610-0AH6**
MC521 memory module (2 MB)	**6DD1610-0AH3**

Overview CP50M1 communications module



The CP50M1 communications module provides two PROFIBUS DP/MPI interfaces and an 8 MB interprocessor memory for inter-CPU communication. The interfaces can be used as PROFIBUS DP master, slave, as master and slave simultaneously or as MPI node.

Technical specifications

Power supply	
Voltage / Power supply	+5 V, 1.0 A typical
Power loss, typical	5 W
Required space / width	1 slot
Weight	0.34 kg

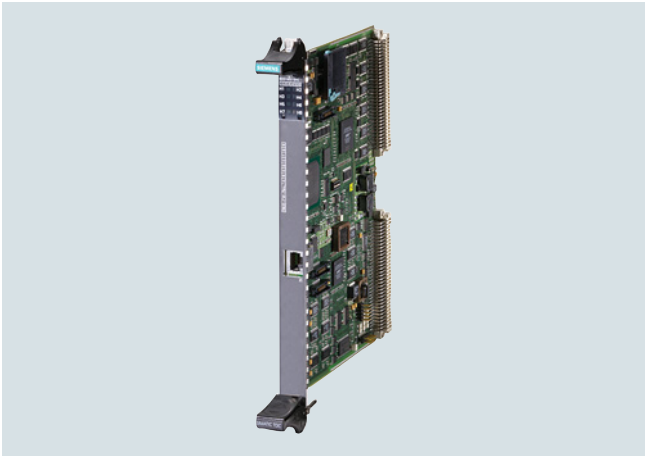
Ordering data

	Article No.
CP50M1 communications module	**6DD1661-0AD1**

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CP51M1 communications module, CP53M0 coupling module

Overview CP51M1 communications module



The CP51M1 communications module is an Industrial Ethernet interface for the SIMATIC TDC automation system.

Technical specifications

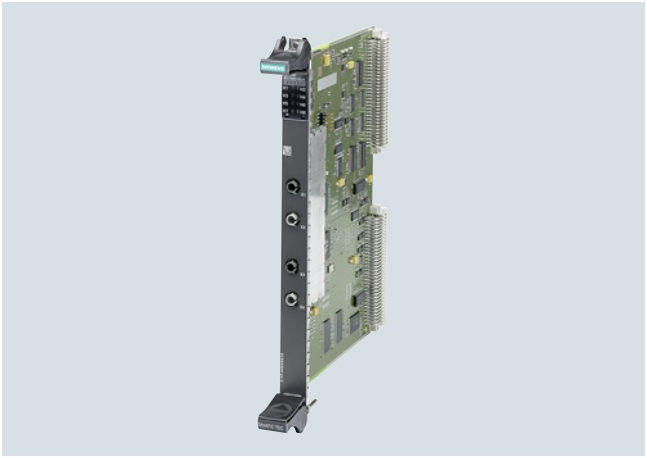
Up-to-date technical specifications can be taken from the user documentation provided at the start of delivery

Required space / width	**1 slot**
Weight	
Connection for Industrial Ethernet	RJ45
Protocols	TCP/IP and/or UDP
Message frame lengths	also larger than 2 KB
Modes of transfer	Refresh, Handshake, Multiple and Select
Autosensing	for 10 Mbit or 100 Mbit network
Default router	adjustable

Ordering data

	Article No.
CP51M1 communications module	**6DD1661-0AE1**

Overview CP53M0 coupling module



The CP53M0 coupling module allows coupling of a SIMATIC TDC system to a SIMADYN D system for fast data exchange, e.g. when expanding existing SIMADYN D systems.

Technical specifications

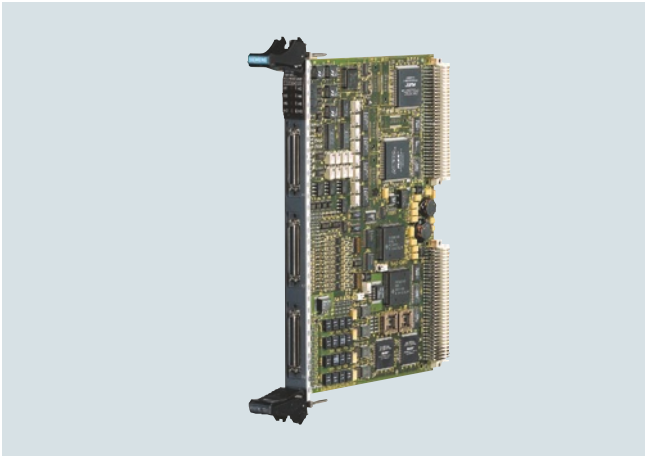
CP53M0 coupling module	
Memory	
Communication memory	SRAM, 128 KB
Communications buffer	SDRAM, 8 MB
FOC interface	
Number	2 (master mode) 1 (slave mode)
Data transfer rate	96 Mbps
Coding	5B/6B
Voltage, currents	
Voltages / currents	+5 V / 0.3 A 3.3 V / 0.5 A
Power loss	
Power loss, typical	3.1 W
Dimensions	
Number of slots required in rack	1
Dimensions W x H x D (in mm)	20 x 233 x 160
Weight	0.6 kg

Ordering data

	Article No.
CP53M0 coupling module For connection of a SIMATIC TDC system to a SIMADYN D system or to two further SIMATIC TDC racks	**6DD1660-0BJ0**

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Overview



The SM500 I/O module provides analog and digital inputs/ outputs as well as incremental and absolute value encoder connections.

Technical specifications

Power supply	
Voltage / Power supply (at 25°C)	+5 V typically 1.0 A +3.3 V typically 0.05 A +12 V typically 0.3 A –12 V typically 0.3 A
Typical power loss	12.5 W
Required space / width	1 slot
Weight	0.7 kg
Analog outputs	
Number	8
Version	Output with associated ground
Galvanic isolation	No
Output voltage range	–10 V to +10 V
Output current	±10 mA
Resolution	12 bit
Typical conversion time per channel	4 µs
Accuracy: • Max. differential linearity error • Max. amplification error • Max. offset error	 ± 1 LSB (monotony guaranteed) ± 0.3 % ± 24 LSB
Slew rate	Approx. 3.5 V/µs
Voltage output: • Short-circuit protection to ground • Short-circuit current	 yes Approximately 100 mA

Analog inputs	
Number	8
Version	Differential inputs
Galvanic isolation	No
Input voltage range	-10 V to +10V
Resolution	12 bit
Max. conversion time per channel	Approx. 20 µs
Accuracy: • Max. differential linearity error • Max. amplification error • Max. offset error	 ± 1 LSB (no missing code) ± 0.3 % ± 5 LSB
Input resistance	20 kΩ
Input filter	34 kHz
Reverse polarity protection	Yes, as differential inputs are used
Integrating analog inputs (V/f)	
Number	4
Version	Differential inputs
Galvanic isolation	No
Input voltage range	-10 V to +10 V
Resolution	Depending on the integration time, e.g. 15 bits for a 4 ms integration time.
Max. integration time per channel	Configurable
Accuracy: • Max. amplification error • Max. integral linearity error • Max. offset error	 0.05 % 1 % ± 2 LSB (software adjustment)
Input resistance	470 kΩ
Input filter	2 kHz
Reverse polarity protection	Yes, as differential inputs are used
Digital outputs	
Number	16
Galvanic isolation	Only through optional interface modules
External power supply: • Nominal voltage • Permissible range • Short-term • Max. current consumption, without load	 24 V 20 to 30 35 V for max. 0.5 s 40mA
Output voltage range: • With 0 signal, max. • With 1 signal, min.	 3 V ext. supply voltage -2.5 V
Output current: • With 0 signal, min. • With 1 signal - Rated value - Permissible range, max.	 - 20 µA 50 mA 100 mA
Delay time	100µs
Max. switching frequency of the outputs under resistive load	6 kHz
Short-circuit protection to • Mass • Ext. power supply	 yes No
Max. short-circuit current	250 mA
Total current of outputs (up to 60°C)	16 x 50mA
Limiting of inductive cut-off voltage.	External power supply +1 V

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Technical specifications (continued)

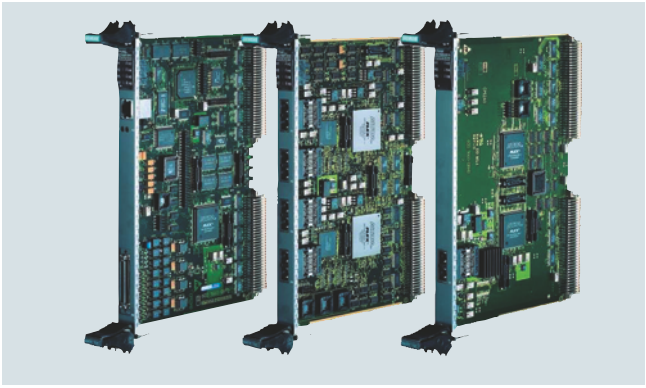
Digital inputs	
Number	16
Electrical isolation	Only through optional interface modules
Input voltage:	
• Nominal voltage	24 V
• For 0-signal	-1 V to +6 V
• For 1-signal	+13.5 V to +33 V
Input current:	
• With 0 signal	0 mA
• With 1 signal	3 mA
Delay time	100 µs
Incremental encoder	
Number	4
Connectable types	Incremental encoders with 90 degree track phase offset
Version	Differential inputs, switchable between 15 V (HTL) and 5 V (TTL) encoder signals
Track signals	Tracks A, B with or without zero pulse
Min. phase difference of the track signals	200 ns
Max. pulse frequency (track frequency)	1 MHz
Input voltage:	
• 15 V encoder	
- Permissible range	- 30 V to + 30 V
- With 0 signal	- 30 V to + 4 V
- With 1 signal	+ 8 V to +30 V
• 5 V encoder	
- Permissible range	- 7 V to + 7 V
- With 0 signal	- 7 V to - 0.7 V
- With 1 signal	+1.5 V to + 7 V
Input current	
• With 15 V encoder (typical, absolute)	5.0 mA
• With 5 V encoder (typical, absolute)	1.5 mA
Monitoring output	Not available
Monitoring input	Specification as for digital input
Interrupt reset output	
• Short-circuit protection against ground	yes
- Ext. power supply	No
- Max. short-circuit current	20 mA
Alarm input:	
• Input voltage (permissible range)	0 V to 5 V
- 0 signal, max.	< 0.5 V
- 1 signal, min.	> 2.0 V
• Input current	
- 0 signal	- 2.8 mA
- 1 signal	1.6 mA
Sensor supply voltage	
Number	1
Electrical isolation	No
Typical output voltage	13.5 V
Max. output current	150 mA, short-circuit-proof against ground, short-circuit current approx. 250 mA
Absolute encoder inputs	
Number	4
Version	Differential inputs, RS485 signal level
Connectable types	Single or multiturn encoder
Protocols	SSI, EnDat
Data formats	Gray code, binary
Data direction	
• Unidirectional	SSI
• Bi-directional	EnDat
Data bits	SSI: 13+Parity, 25+Parity EnDat: variable
Max. pulse frequency	2 MHz, depending on cable length
Input voltage	
• Permissible range	RS485 signal level

Ordering data

	Article No.
SM500 I/O module	**6DD1640-0AH0**

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Overview



GlobalDataMemory

Data can be exchanged between all of the CPU modules in the system, over all of the networked subracks, using the memory in the GlobalDataMemory (GDM). Up to 44 subracks can be coupled in synchronism through the central memory. This means that a maximum of 836 CPU modules can be used.

Technical specifications

CP52M0	
Power supply	
Voltage/current supply (at 25 °C)	+5 V typ. 0.4 A +3.3 V typ. 0.7 A +12 V typ. 0.01 A –12 V typ. 0.01 A
Power loss, typical	4.5 W
Space requirement / width	1 slot
Weight	0.6 kg
Digital outputs	
Number	16
Electrical isolation	No
External power supply voltage • Rated value • Permissible range • Briefly • Max. current drain (without load)	 24 V 20 to 30 35 V, for max. 0.5 s 40 mA
Output voltage range • For a 0-signal, max. • For a 1-signal min • Output current • For a 0-signal, min. • For a 1-signal - Nominal value - Permissible range, max.	 3 V External power supply -2.5 V -20 µA 50 mA 100 mA
Delay time	100 µs
Max. switching frequency of the outputs for an ohmic load	6 kHz
Short-circuit protection with respect to • Ground • Ext. power supply	 Yes No
Max. short-circuit current	250 mA
Summed current of the outputs (up to 60 °C)	16 x 50 mA
Limiting, of inductive switch-off voltages	External power supply voltage + 1 V

CP52IO	
Power supply	
Voltage/current supply (at 25 °C)	+5 V typ. 3 A +3.3 V typ. 0.8 A
Power loss, typical	18 W
Space requirement / width	1 slot
Weight	0.6 kg

CP52A0	
Power supply	
Voltage/current supply (at 25 °C)	+5 V typ. 1.5 A +3,3 V typ. 0.4 A
Power loss, typical	9 W
Space requirement / width	1 slot
Weight	0.6 kg

Ordering data

	Article No.
CP52M0 memory module	**6DD1660-0BF0**
CP52IO interface module	**6DD1660-0BG0**
CP52A0 access module	**6DD1660-0BH1**

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Overview SB10 interface module



Similar to figure.

The interface module is used to connect 8 digital inputs or outputs.

Overview SB70 interface module



The interface module is used to connect 8 digital outputs with conversion of the 24 V DC voltage on the module side to a max. of 120 V DC/AC on the plant side using relays.

Overview SB60 interface module



Interface module for connecting 8 digital inputs with 120 V DC/AC to 24 V DC conversion.

Overview SB71 interface module



The interface module is used to connect 8 digital outputs with conversion of the 24 V DC voltage on the module side to a max. of 24/48 V DC/AC on the plant side using transistors.

Overview SB61 interface module



It is used to connect 8 digital inputs with conversion from 24/48 V DC to 24 V DC.

Overview SC62 interface cable



Cable for connecting the SIMATIC TDC SM500 I/O module or SIMATIC S7-400 EXM 438-1 expansion module with up to five SB10, SB60, SB70, SB61 SB71 and/or SU12 interface modules.

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Overview SC63 interface cable



Cable for connecting the SIMATIC TDC SM500 I/O module or SIMATIC S7-400 EXM 438-1 expansion module with an SU13 interface module.

Overview SC64 interface cable



(Similar to figure)

Interface cable for FM 458-1 DP basic module and SB10, SB60, SB61 and SU12 interface modules.

Overview SC66 interface cable



Interface cable for the SIMATIC TDC CPU551 processor module and the SB10, SB60, SB61 and SU12 interface modules

Overview SC67 service cable



Service cable for the SIMATIC TDC CPU551 processor module and a local configuration / service PC.

Overview SU12 interface module



The interface module is used to connect 10 signals; there is no electronic conversion.

Overview SU13 interface module



This interface module can be used to connect 50 signals; there is no electronic conversion.

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Technical specifications

Technical data for interface module SB 10	
Number of digital inputs/outputs	8
Galvanic isolation	No
Connectable conductor cross-section	1.5 mm²
Dimensions (W x H x D) in mm	45 x 130 x 156
Weight	0.3 kg
Technical data for interface module SB 60	
Number of digital inputs • Input voltage	8 120 V DC/AC
Insulation voltage	• Safe isolation assured between inputs and outputs • Galvanic isolation assured between input circuits • 1125 V AC test voltage
Connectable conductor cross-section	1.5 mm²
Dimensions (W x H x D) in mm	45 x 130 x 156
Weight	0.31 kg
Technical data for interface module SB 61	
Number of digital inputs • Input voltage	8 24/48 V DC
Galvanic isolation	Yes, via optocoupler
Connectable conductor cross-section	1.5 mm²
Dimensions (W x H x D) in mm	45 x 130 x 156
Weight	0.32 kg
Technical data for interface module SB 70	
Number of digital outputs • Output voltage, max.	8 120 V DC/AC
Relay switching current • At 120 V AC • At 120 V DC	 2 A 0.2 A
Galvanic isolation	via relay
Insulation voltage	• Safe isolation assured between inputs and outputs • Galvanic isolation assured between input circuits • 1125 V AC test voltage
Connectable conductor cross-section	1.5 mm²
Dimensions (W x H x D) in mm	45 x 130 x 156
Weight	0.32 kg
Technical data for interface module SB 71	
Number of digital outputs • Output voltage, max.	8 24/48 V DC
Output current, max.	40 mA, short-circuit proof
Galvanic isolation	Yes, via optocoupler
Connectable conductor cross-section	1.5 mm²
Dimensions (W x H x D) in mm	45 x 130 x 156
Weight	0.32 kg

Technical data for interface module SU 12	
Number of connectable signal lines	10
Signal strength per signal, max.	60 V, 0.5 A
Galvanic isolation	No
Connectable conductor cross-section	1.5 mm²
Dimensions (W x H x D) in mm	45 x 130 x 156
Weight	0.28 kg
Technical data for interface module SU 13	
Number of connectable signal lines	50
Signal strength per signal, max.	60 V, 0.5 A
Galvanic isolation	No
Connectable conductor cross-section	1.5 mm²
Dimensions (W x H x D) in mm	45 x 130 x 156
Weight	0.3 kg

Ordering data

	Article No.
SB10 interface module 8 digital inputs/outputs, 24 V DC	**6DD1681-0AE2**
SB60 interface module 8 digital inputs, 120 V AC	**6DD1681-0AF4**
SB61 interface module 8 digital inputs, 24/48 V DC	**6DD1681-0EB3**
SB70 interface module 8 digital outputs with relays	**6DD1681-0AG2**
SB71 interface module 8 digital outputs with transistors, 24/48 V DC	**6DD1681-0DH1**
SC62 interface cable between SM500 or EXM 438-1 module and max. 5 SB10, SB60, SB70, SB61, SB71 and/or SU12 interface modules, 2 m long	**6DD1684-0GC0**
SC63 interface cable between SM500 or EXM 438-1 module and SU13 interface module, 2 m long	**6DD1684-0GD0**
SC64 interface cable between FM 458-1 DP (X2) module with SBxx or SU12 interface module, 2 m long	**6DD1684-0GE0**
SC66 interface cable between CPU551 and interface module SB10, SB60, SB61 or SU12, 2 m long	**6DD1684-0GG0**
SC67 service cable between CPU551 and PG/PC, 7 m long	**6DD1684-0GH0**
SU12 interface module with plug-in connector, 10-pole	**6DD1681-0AJ1**
SU13 interface module with screw-type plug-in connector	**6DD1681-0GK0**

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11/12 - ODK 1500S
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11/17 TIA Portal options
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11/20 SIMATIC Visualization Architect
11/21 SIMATIC ProDiag

11/22 STEP 7 V5.x
11/22 Basic software and editors
11/22 STEP 7
11/24 STEP 7 Professional
11/27 S7-SCL
11/29 S7-GRAPH
11/31 S7-PLCSIM
11/32 Options for programming and design
11/32 CFC
11/34 S7 Distributed Safety
11/35 S7 F/FH Systems
11/37 - SIMATIC S7 F Systems
11/38 - SIMATIC S7 Safety Matrix
11/39 Software redundancy
11/40 SIMATIC iMap
11/42 DOCPRO
11/43 Options for diagnostics and service
11/43 S7-PDIAG
11/44 PRODAVE
11/45 Options for technology and drive systems
11/45 Loadable function blocks
11/45 - Standard PID Control
11/47 - Modular PID Control
11/50 - PID Self-Tuner
11/51 S7 Technology
11/52 Easy Motion Control
11/53 D7-SYS
11/54 Drive ES engineering software

11/55 Software for common tasks
11/55 For network planning/commissioning
11/55 SINETPLAN network planning
11/56 For maintenance
11/56 SIMATIC Automation Tool
11/57 SIMATIC PDM
11/62 For administration
11/62 SIMATIC Version Cross Manager
11/63 Version Trail

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Information on software licensing, Software Update Service

Overview Licensing

Software types

Siemens Digital Factory offers various types of software license.

For more information, see catalog section 16, page 16/14.

Overview Software Update Service

- Service for automatic dispatch of all new software versions during contract lifetime
- Reduced logistics effort thanks to automatic contract extension
- Reduced costs as updates are provided free of charge

Ordering

- The Software Update Service is ordered in the same way as any other product. The corresponding order number is given in the ordering information of the software product in question.
- You must own the current version of the software.
- One Software Update Service is ordered for each software license installed.
- The Software Update Service runs for 1 year from date of order.
- It is extended automatically by a further year in each case, as long as it is not canceled 3 months before it expires.
- An annual lump sum is invoiced per license.

Application

SIMATIC Software is continuously enhanced and improved. The **Software Update Service** (previously: software maintenance service) is the easiest way to regularly take advantage of these improvements. It ensures automatic delivery of all new software versions that are released after ordering the Software Update Service so that your software is always up to date.

The Software Update Service

- Saves time and effort:
  Once it is ordered, the Software Update Service is automatically renewed every year.
- Lowers costs:
  The service pays for itself after the first update as it costs less than an individually ordered update.
- Makes budgeting easier:
  Software expenditures can be accounted for early in the budgeting process and they are easier to write off.

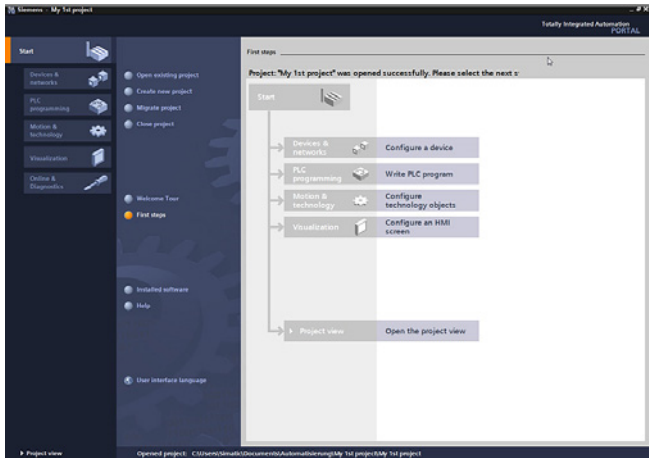
Design

Scope of supply

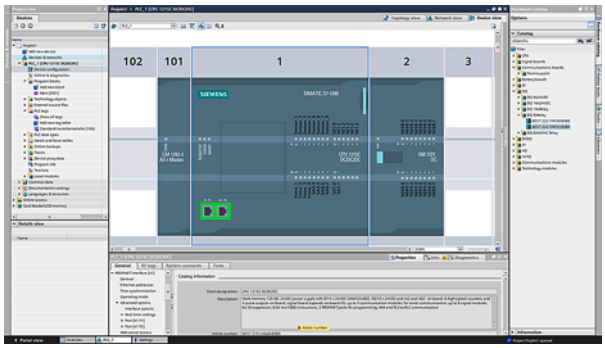
- All software versions released after ordering the Software Update Service (usually several consignments per year)
- SIMATIC Customer Support Knowledge Base CD-ROM with FAQs, tips & tricks and downloads (several issues per year)

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Overview



STEP 7 Basic V15.1 (TIA Portal), portal view



STEP 7 Basic V15.1 (TIA Portal), device view: configuring and parameterizing in realistic photo-quality representation

Intuitive, efficient and future-oriented - the engineering software for programming SIMATIC controllers

SIMATIC STEP 7 Basic V15.1 is the engineering system for the SIMATIC S7-1200.

STEP 7 Basic V15.1 is based on the Totally Integrated Automation Portal (TIA Portal) central engineering framework which offers users a uniform, efficient and intuitive solution for all automation tasks.

New with V15.1

- Optional display of SCL block interfaces in SCL notation (instead of tabular view)
- Enhancement of the cross-reference display for interface parameters
- Simplified handling of the diagram configurations in the trace
- User-defined keyboard shortcuts
- Improved importing and exporting of project texts

Licensing

- STEP 7 Basic V15.1 is supplied with a floating license. The floating license allows the software to be used on any number of computers. This means one user per license can use the software independently of the computer used and without being tied to a specific workstation. The number of existing licenses determines the number of computers on which the software can be used simultaneously.
- STEP 7 Basic V15 and V15.1 are both enabled with the same STEP 7 Basic V15 license.
- Existing STEP 7 Basic licenses of versions V11 to V14 can be upgraded to V15.1. This requires an upgrade license.
- A STEP 7 Basic V15.1 license can be upgraded to a STEP 7 Professional V15.1 license with a Powerpack.

You can find more information on the Software Update Service, license types, online software delivery and handling your SW licenses with the Automation License Manager here:

http://www.siemens.com/simatic-licenses

Technical specifications

	STEP 7 Basic V15.1 (TIA Portal)
License type	Floating license
Software class	A
Current version	V15.1
Target system	SIMATIC S7-1200
Operating systems	Windows 7 (64-bit) • Windows 7 Home Premium SP1 • Windows 7 Professional SP1 • Windows 7 Enterprise SP1 • Windows 7 Ultimate SP1 Windows 10 (64-bit) • Windows 10 Home Version 1709, 1803 • Windows 10 Professional Version 1709, 1803 • Windows 10 Enterprise Version 1709, 1803 • Windows 10 Enterprise 2016 LTSB • Windows 10 IoT Enterprise 2015 LTSB • Windows 10 IoT Enterprise 2016 LTSB Windows Server (64-bit) • Windows Server 2012 R2 StdE (full installation) • Windows Server 2016 Standard (full installation)
Recommended PC hardware	
Computer	SIMATIC Field PG M5 Advanced or higher (or comparable PC)
Processor	Intel Core i5-6440EQ (up to 3.4 GHz)
RAM	16 GB or more (min. 8 GB, 32 GB for large projects)
Hard disk	SSD with at least 50 GB storage space available
Network	1 Gbit (for multi-user)
Screen	15.6" full HD display (1920 x 1080 or higher)

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Technical specifications (continued)

Compatibility with other SIMATIC products

STEP 7 V15.1 can be installed on a PC in parallel with other versions of STEP 7 V11 to V15, STEP 7 V5.4 or higher, STEP 7 Micro/WIN, WinCC flexible (from 2008) and WinCC (V7.0 SP2 or higher).

Projects as from TIA Portal project version V13 SP1 can be directly upgraded to V15.1. Upgrading of projects from previous project versions (V11 to V13) is carried out on the basis of the TIA Portal products (e.g. STEP 7) used in the project in version V13 SP1 or V13 SP2 (latest update recommended).

Important note

TIA Portal project versions V13 SP1 to V15.1 are upgraded to project version V15.1 with TIA Portal V15.1. If you need to edit a TIA Portal project version V13 SP1 to V15, we recommend that you install that specific version of TIA Portal in addition to TIA Portal V15.1. The license purchased for V15.1 is also valid for all older TIA Portal versions.

Program code and hardware configuration from STEP 7 V5.4 SP5 can be migrated directly to a TIA Portal V15.1 project with STEP 7 V15.1.

Ordering data

	Article No.
STEP 7 Basic V15.1 Target system: SIMATIC S7-1200 Requirement: Windows 7 Home Premium SP1 (64-bit) Windows 7 Professional SP1 (64-bit) Windows 7 Enterprise SP1 (64-bit) Windows 7 Ultimate SP1 (64-bit) Windows 10 Home Version 1709, 1803 Windows 10 Professional Version 1709, 1803 Windows 10 Enterprise Version 1709, 1803 Windows 10 Enterprise 2016 LTSB Windows 10 IoT Enterprise 2015 LTSB Windows 10 IoT Enterprise 2016 LTSB Windows Server 2012 R2 StdE (full installation) Windows Server 2016 Standard (full installation) Type of delivery: en, de, fr, es, it, zh	
STEP 7 Basic V15.1, floating license	**6ES7822-0AA05-0YA5**
STEP 7 Basic V15.1, floating license, software download incl. license key[1] Email address required for delivery	**6ES7822-0AE05-0YA5**
STEP 7 Basic/Professional V15.1, trial license	**6ES7822-1AA05-0YA7**
Upgrade STEP 7 Basic V11...V14 to STEP 7 Basic V15.1, floating license	**6ES7822-0AA05-0YE5**
Upgrade STEP 7 Basic V11...V14 to STEP 7 Basic V15.1, floating license, software download incl. license key[1] Email address required for delivery	**6ES7822-0AE05-0YE5**
Powerpack STEP 7 Basic V15.1 to STEP 7 Professional V15.1, floating license	**6ES7822-1AA05-0YC5**
Powerpack STEP 7 Basic V15.1 to STEP 7 Professional V15.1, floating license, software download incl. license key[1] Email address required for delivery	**6ES7822-1AE05-0YC5**

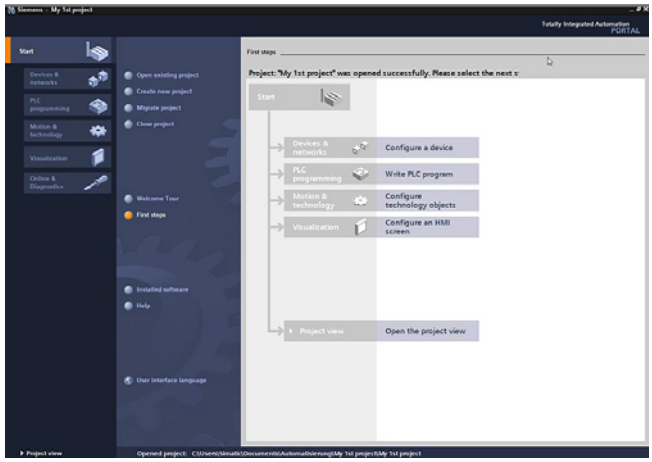
	Article No.
Software Update Service For a period of 12 months and for a fixed price, the customer is automatically provided with all upgrades and Service Packs for each installed software package. The contract is automatically extended by a further year unless canceled at least 12 weeks prior to expiration. Requires the current software version	
Software Update Service (Standard Edition)[2] The delivery is implemented according to the number of ordered SUS products (e.g. 10 upgrade packages with 10 DVDs, 10 USB flash drives, etc.) • STEP 7 Basic	**6ES7822-0AA00-0YL0**
Software Update Service (Compact Edition)[2] The delivery items are combined. For several contracts, only 1 package with 1 data storage medium set, 1 USB flash drive with the corresponding number of licenses and the corresponding number of CoLs will be supplied. Delivery items to be combined must be ordered as one item. • STEP 7 Basic	**6ES7822-0AA00-0YM0**
Software Update Service (download)[2]**:** Upgrades and Service Packs are available for downloading. Email address required for delivery • STEP 7 Basic	**6ES7822-0AE00-0YY0**

[1] For up-to-date information and download availability, see: http://www.siemens.com/tia-online-software-delivery

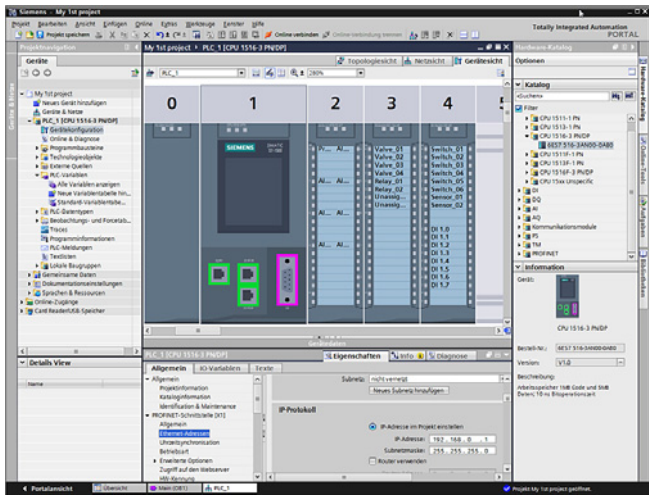
[2] For more information on the Software Update Service, see page 11/2.

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Overview



STEP 7 Professional V15.1 (TIA Portal), portal view



STEP 7 Professional V15.1 (TIA Portal), device view: configuring and parameterizing in realistic photo-quality representation

Intuitive, efficient and future-oriented - the engineering software for programming the SIMATIC controllers

SIMATIC STEP 7 Professional V15.1 is the engineering system for the S7-1200, S7-1500, S7-300, and S7-400 SIMATIC controllers, WinAC and software controllers.

STEP 7 V15.1 is based on the Totally Integrated Automation Portal (TIA Portal) central engineering framework which offers users a uniform, efficient and intuitive solution to all automation tasks.

New with V15.1

- Support of the high availability S7-1500R/H controllers
- Software units for program structuring
- Choice between tabular and textual interface when creating new SCL blocks
- Improvements in online monitoring of blocks
- Enhancement of the cross-reference display for interface parameters
- Simplified handling of the diagram configurations in the trace
- User-defined keyboard shortcuts
- Improved importing and exporting of project texts

Licenses

- STEP 7 Professional V15.1 is supplied with a STEP 7 Professional V15 floating license. The floating license allows the software to be used on any number of computers. This means one user per license can use the software independently of the computer used and without being tied to a specific workstation. The number of existing licenses determines the number of computers on which the software can be used simultaneously.
- STEP 7 Professional V15 and V15.1 are both enabled with the same STEP 7 Professional V15 license.
- Existing STEP 7 Professional licenses of versions V11 to V14 can be upgraded to V15.1. This requires an upgrade license.
- The user receives a combo license when upgrading from STEP 7 V5.x. The combo license enables engineering to be performed both on the STEP 7 V 5.x and the STEP 7 V15.1 platform.
- A STEP 7 Basic V15.1 license can be upgraded to a STEP 7 Professional V15.1 license with a Powerpack.

You can find more information on the Software Update Service, license types, online software delivery and handling your SW licenses with the Automation License Manager here:

http://www.siemens.com/simatic-licenses

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Technical specifications

	STEP 7 Professional V15.1 (TIA Portal)
License type	Floating license
Software class	A
Current version	V15.1
Target system	SIMATIC S7-1200, S7-1500, S7-300, S7-400, WinAC, software controllers
Operating systems	Windows 7 (64-bit) • Windows 7 Home Premium SP1 • Windows 7 Professional SP1 • Windows 7 Enterprise SP1 • Windows 7 Ultimate SP1 Windows 10 (64-bit) • Windows 10 Home Version 1709, 1803 • Windows 10 Professional Version 1709, 1803 • Windows 10 Enterprise Version 1709, 1803 • Windows 10 Enterprise 2016 LTSB • Windows 10 IoT Enterprise 2015 LTSB • Windows 10 IoT Enterprise 2016 LTSB Windows Server (64-bit) • Windows Server 2012 R2 StdE (full installation) • Windows Server 2016 Standard (full installation)
Recommended PC hardware	
Computer	SIMATIC Field PG M5 Advanced or higher (or comparable PC)
Processor	Intel Core i5-6440EQ (up to 3.4 GHz)
RAM	16 GB or more (min. 8 GB, 32 GB for large projects)
Hard disk	SSD with at least 50 GB storage space available
Network	1 Gbit (for multi-user)
Screen	15.6" full HD display (1920 x 1080 or higher)

Compatibility with other SIMATIC products

STEP 7 V15.1 can be installed on a PC in parallel with other versions of STEP 7 V11 to V15, STEP 7 V5.4 or higher, STEP 7 Micro/WIN, WinCC flexible (from 2008) and WinCC (V7.0 SP2 or higher).

Projects as from TIA Portal project version V13 SP1 can be directly upgraded to V15.1. Upgrading of projects from previous project versions (V11 to V13) is carried out on the basis of the TIA Portal products (e.g. STEP 7) used in the project in version V13 SP1 or V13 SP2 (latest update recommended).

Important note

TIA Portal project versions V13 SP1 to V15 are upgraded to project version V15.1 with TIA Portal V15.1. If you need to edit a TIA Portal project version V13 SP1 to V15, we recommend that you install that specific version of TIA Portal in addition to TIA Portal V15.1. The license purchased for V15.1 is also valid for all older TIA Portal versions.

Program code and hardware configuration from STEP 7 V5.4 SP5 can be migrated directly to a TIA Portal V15.1 project with STEP 7 V15.1.

Ordering data

	Article No.
STEP 7 Professional V15.1 Target system: SIMATIC S7-1200, S7-1500, S7-300, S7-400, WinAC Requirement: Windows 7 Home Premium SP1 (64-bit) Windows 7 Professional SP1 (64-bit) Windows 7 Enterprise SP1 (64-bit) Windows 7 Ultimate SP1 (64-bit) Windows 10 Home Version 1709, 1803 Windows 10 Professional Version 1709, 1803 Windows 10 Enterprise Version 1709, 1803 Windows 10 Enterprise 2016 LTSB Windows 10 IoT Enterprise 2015 LTSB Windows 10 IoT Enterprise 2016 LTSB Windows Server 2012 R2 StdE (full installation) Windows Server 2016 Standard (full installation) Type of delivery: en, de, fr, es, it, zh	
STEP 7 Professional V15.1, floating license	**6ES7822-1AA05-0YA5**
STEP 7 Professional V15.1, floating license, software download incl. license key [1] Email address required for delivery	**6ES7822-1AE05-0YA5**
STEP 7 Professional V15.1/2017 Combo, floating license	**6ES7810-5CC12-0YA5**
STEP 7 Professional V15.1/2017 Combo, floating license, software download incl. license key [1] Email address required for delivery	**6ES7810-5CE12-0YB5**
STEP 7 Professional V15.1, trial license	**6ES7822-1AA05-0YA7**
STEP 7 Professional V15.1 conversion package Only valid if ordered together with Software Update Service 6ES7 810-5CC04-0YE2 (STEP 7 Professional and STEP 7 Professional in TIA Portal).	
• Powerpack and upgrade STEP 7 V5.6 to STEP 7 Professional V15.1/2017 Combo, floating license. STEP 7 Software Update Service is a prerequisite.	**6ES7822-1AA05-0XC2**
• Powerpack and upgrade from STEP 7 V5.6 to STEP 7 Professional V15.1/2017 Combo, floating license. STEP 7 Software Update Service is a prerequisite. Software download including license key [1] Email address required for delivery	**6ES7822-1AE05-0XC2**

[1] For up-to-date information and download availability, see: http://www.siemens.com/tia-online-software-delivery

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Ordering data	Article No.
Upgrade **STEP 7 Professional V11...14 to STEP 7 Professional V15.1 or STEP 7 Professional V11...V14/ 201x Combo to V15.1/2017 Combo or** **STEP 7 Professional 2006...2010 to V15.1/2017 Combo, floating license**	**6ES7822-1AA05-0YE5**
Upgrade **STEP 7 Professional V11...14 to STEP 7 Professional V15.1 or STEP 7 Professional V11...V14/ 201x Combo to V15.1/2017 Combo or** **STEP 7 Professional 2006...2010 to V15.1/2017 Combo, floating license** **Software download incl. license key[1)]** Email address required for delivery	**6ES7822-1AE05-0YE5**
Powerpack STEP 7 Professional V15.1 Trial 365 to STEP 7 Prof. V15.1, floating license. Only valid if ordered together with Software Update Service 6ES7822-1AE00-0YY0 (STEP 7 Professional V1x) Prerequisite is a STEP 7 V15 Trial 365 license. License key download [1)] Email address required for delivery	**6ES7822-1BE05-0YC5**
50 hours of engineering with STEP 7 Professional Combo, WinCC Professional (incl. WinCC flexible 2008) and STEP 7 Safety Advanced (incl. Distributed Safety), floating license **Software download incl. license key [1)]** Email address required for delivery	**6ES7823-1GE05-0YA5**
Powerpack and upgrade from STEP 7 V5.4...V5.6 to STEP 7 Professional V15.1/2017 Combo, floating license	**6ES7822-1AA05-0XC5**
Powerpack and upgrade from STEP 7 V5.4...V5.6 to STEP 7 Professional V15.1/2017 Combo, floating license **Software download incl. license key [1)]** Email address required for delivery	**6ES7822-1AE05-0XC5**

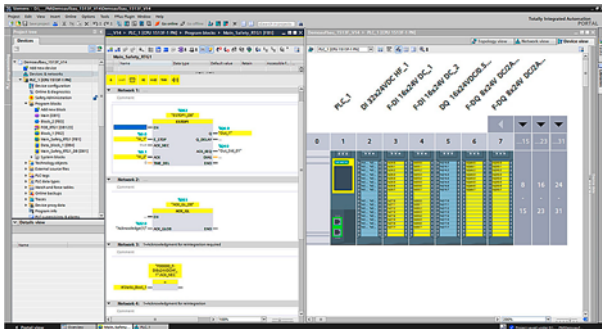
	Article No.
Software Update Service For a period of 12 months and for a fixed price, the customer is automatically provided with all upgrades and Service Packs for each installed software package. The contract is automatically extended by a further year unless canceled at least 12 weeks prior to expiration. Requires the current software version	
Software Update Service (Standard Edition)[2)] The delivery is implemented according to the number of ordered SUS products (e.g. 10 upgrade packages with 10 DVDs, 10 USB flash drives, etc.)	
• STEP 7 Professional in the TIA Portal	**6ES7822-1AA00-0YL5**
• STEP 7 Professional and STEP 7 Professional in the TIA Portal	**6ES7810-5CC04-0YE2**
Software Update Service (Compact Edition)[2)] The delivery items are combined. For several contracts, only 1 package with 1 data storage medium set, 1 USB flash drive with the corresponding number of licenses and the corresponding number of CoLs will be supplied. Delivery items to be combined must be ordered as one item.	
• STEP 7 Professional in the TIA Portal	**6ES7822-1AA00-0YM5**
• STEP 7 Professional and STEP 7 Professional in the TIA Portal	**6ES7810-5CC00-0YM2**
Software Update Service (download)[2)]: Upgrades and Service Packs are available for downloading. Email address required for delivery	
• STEP 7 Professional V1x	**6ES7822-1AE00-0YY0**
• STEP 7 Professional and STEP 7 Professional in the TIA Portal	**6ES7810-5CC04-0YY2**

1) For up-to-date information and download availability, see: http://www.siemens.com/tia-online-software-delivery

2) For more information on the Software Update Service, see page 11/2.

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Overview



STEP 7 Safety Advanced, configuration and programming

- For creating safety-related programs on the STEP 7 user interface
- For seamless and easy to use integration of safety-related functions into the standard automation
- All the required configuration and programming tools are integrated into the STEP 7 user interface and utilize a common project structure
- STEP 7 Safety Basic option package for parameter assignment and programming of the fail-safe S7-1200
- STEP 7 Safety Advanced option package for all fail-safe TIA SIMATIC controller classes (S7-1200, S7-1500, S7-1500 software controller, S7-300, S7-400, WinAC)

Licensing

- The engineering software can be installed on multiple computers. The number of existing licenses determines the number of computers on which the software can be used simultaneously (floating license).
- STEP 7 Safety Basic is a subset of STEP 7 Safety Advanced for programming the fail-safe S7-1200 F Basic Controller.
- Powerpacks can be used to upgrade an existing STEP 7 Safety Basic license.
- Combo licenses allow you to choose between programming with the predecessor product S7 Distributed Safety and STEP 7 Safety Advanced.
- An upgrade to a combo license is offered for the latest version of S7 Distributed Safety.
- Software Update Service (SUS) contracts can be concluded for both STEP 7 Safety Basic and STEP 7 Safety Advanced.

You can find more information on the Software Update Service, license types, online software delivery and handling your SW licenses with the Automation License Manager here:

http://www.siemens.com/simatic-licenses

Ordering data

	Article No.
STEP 7 Safety Advanced V15.1 Task: Engineering tool for configuring and programming fail-safe user programs for SIMATIC S7-1200 FC, S7-1500F, S7-1500F Software Controller, S7-300F, S7-400F, WinAC RTX F, ET 200SP F Controller and the fail-safe ET 200SP, ET 200MP, ET 200S, ET 200M, ET 200iSP, ET 200pro and ET 200eco I/O Requirement: STEP 7 Professional V15.1	
Floating license for 1 user, software and documentation on DVD; license key on USB flash drive	**6ES7833-1FA15-0YA5**
Floating license for 1 user, software, documentation and license key for download[2]; email address required for delivery	**6ES7833-1FA15-0YH5**
Software Update Service (Standard Edition)[1] The delivery is implemented according to the number of ordered SUS products (e.g. 10 upgrade packages with 10 DVDs, 10 USB flash drives, etc.). Requires the current software version.	**6ES7833-1FC00-0YX2**
Software Update Service (Compact Edition)[1] The delivery items are combined. For several contracts, only 1 package with 1 data storage medium set, 1 USB flash drive with the corresponding number of licenses and the corresponding number of CoLs will be supplied. The deliveries that are to be grouped together must be ordered as a single item. Requires the current software version. Minimum order quantity: 3 units	**6ES7833-1FC00-0YM2**
Software Update Service (Download)[1] Requires the current software version. Email address required for delivery.	**6ES7833-1FC00-0YY0**

1) For more information on the Software Update Service, see page 11/2.

2) For up-to-date information and download availability, see: http://www.siemens.com/tia-online-software-delivery

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Ordering data	Article No.
STEP 7 Safety Advanced Upgrade	
Upgrade from Distributed Safety V5.4 SP5 or STEP 7 Safety Advanced V11..V14 (Combo) to STEP 7 Safety Advanced V15.1 (Combo) for parallel use of versions; upgrade of combo license for 1 user; software and documentation on DVD, license key on USB flash drive	**6ES7833-1FA15-0YF5**
Upgrade from Distributed Safety V5.4 SP5 or STEP 7 Safety Advanced V11..V14 (Combo) to STEP 7 Safety Advanced V15.1 (Combo) for parallel use of versions; upgrade of combo license for 1 user; software, license key and documentation for download[2]; email address required for delivery	**6ES7833-1FA15-0YY5**
STEP 7 Safety Advanced Powerpack	
Powerpack STEP 7 Safety Basic V15.1 to STEP 7 Safety Advanced V15.1; floating license for 1 user; license key on USB flash drive	**6ES7833-1FA15-0YC5**
Powerpack STEP 7 Safety Basic V15.1 to STEP 7 Safety Advanced V15.1; floating license for 1 user; license key for download[2]; email address required for delivery	**6ES7833-1FA15-0YJ5**
STEP 7 Safety Advanced V15.1 Trial	**6ES7833-1FA15-0YA8**
Trial license, valid for 21 days; software and documentation on DVD; executable with TIA Portal V15.1 from STEP 7 Professional V15.1; for configuring S7-1200 FC, S7-1500F, S7-1500F Software Controllers, S7-300F, S7-400F, WinAC F; delivery also includes STEP 7 Safety Advanced V15 DVD	
STEP 7 Safety Basic V15.1	
Task: Engineering tool for configuring fail-safe user programs for SIMATIC S7-1200 FC Requirement: STEP 7 Basic V15.1 and higher	
Floating license for 1 user, software and documentation on DVD, license key on USB flash drive	**6ES7833-1FB15-0YA5**
Floating license for 1 user, software, documentation and license key for download[2]; email address required for delivery	**6ES7833-1FB15-0YH5**

	Article No.
STEP 7 Safety Basic Upgrade	
Upgrade from STEP 7 Safety Basic V13 SP1...V14 to STEP 7 Safety Basic V15.1 for parallel use of versions; upgrade license for 1 user; software and documentation on DVD, license key on USB flash drive	**6ES7833-1FB15-0YE5**
Upgrade from STEP 7 Safety Basic V13 SP1...V14 to STEP 7 Safety Basic V15.1 for parallel use of versions; upgrade license for 1 user; software, license key and documentation for download[2]; email address required for delivery	**6ES7833-1FB15-0YK5**
Software Update Service (Standard Edition)[1] The delivery is implemented according to the number of ordered SUS products (e.g. 10 upgrade packages with 10 DVDs, 10 USB flash drives, etc.). Requires the current software version.	**6ES7833-1FD00-0YX2**
Software Update Service (Compact Edition)[1] The delivery items are combined. For several contracts, only 1 package with 1 data storage medium set, 1 USB flash drive with the corresponding number of licenses and the corresponding number of CoLs will be supplied. The deliveries that are to be grouped together must be ordered as a single item. Requires the current software version. Minimum order quantity: 3 units	**6ES7833-1FD00-0YM2**
Software Update Service (Download)[1] Requires the current software version. Email address required for delivery.	**6ES7833-1FD00-0YN2**

[1] For more information on the Software Update Service, see page 11/2.

[2] For up-to-date information and download availability, see: http://www.siemens.com/tia-online-software-delivery

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Overview

With SIMATIC S7-PLCSIM Advanced, virtual controllers can be used for simulation of S7-1500 and ET 200SP controllers and for extensive function simulation.

The virtual controllers can also be tested and validated in conjunction with a plant/machine. An extensive API is available for interfacing plant/machine simulations.

New with V2.0 SP1

- The Control Panel can be used via a quick view or a freely movable Windows window. Advantages of the freely movable Windows window:
  - The Control Panel can always be displayed in the foreground (single click pin to desktop)
  - SIMATIC Memory Cards from previously created instances can easily be moved to the Control Panel via drag & drop. This facilitates the creation of new instances.
- Using the API, you can select whether the maximum cycle time is to be observed or ignored – depending on the target of the simulation

New with V2.0

- Synchronization of PLCSIM Advanced with co-simulation tools to process image partitions of cyclic OBs (e.g. cyclic interrupt OBs)
- Support of acyclic services (RDREC/WRREC) and interrupts (e.g. hardware interrupts)
- Hardware interrupts configured in the TIA Portal can be read over the API
- Easy backup and restoration of the software and hardware configuration from PLCSIM Advanced instances
- Parallel installation of PLCSIM from V15 and PLCSIM Advanced from V2.0 on one PC

Licensing

- The engineering software can be installed on multiple computers. The number of existing licenses determines the number of computers on which the software can be used simultaneously (floating license).
- An upgrade to version 2.0 is offered for users of the previous version 1.0.
- It is possible to conclude Software Update Service (SUS) contracts.

You can find more information on the Software Update Service, license types, online software delivery and handling your SW licenses with the Automation License Manager here:

http://www.siemens.com/simatic-licenses

Technical specifications

Minimum requirements for use

Hardware / software	Requirements
Processor	• One logical Intel Core™ i7-6820EQ for each started instance • At least one additional core for the operating system • At least one additional core for additional active applications
RAM	• 1 GB for each started instance • At least 4 GB for the Windows operating system • Additional RAM work memory according to the requirements of the remaining active applications
Free hard disk space	5 GB
Operating systems (64-bit version)	• Windows 7 Home Premium SP1 • Windows 7 Professional SP1 • Windows 7 Enterprise SP1 • Windows 7 Ultimate SP1 • Windows 10 Home Version 1709 & 1803 • Windows 10 Pro Version 1709 & 1803 • Windows 10 Enterprise Version 1709 & 1803 (for PG/PC) • Windows 10 Enterprise 2016 LTSB • Windows 10 IoT Enterprise 2016 LTSB • Windows Server 2012 R2 StdE (full installation) • Windows Server 2016 Standard (full installation)
Screen resolution	min. 1024 x 768

Compatibility with other products

PLCSIM Advanced V2.0 and PLCSIM from V15 can be installed and operated on the same PC or the same virtual machine. Communication between the two applications cannot be simulated.

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Ordering data

	Article No.
SIMATIC S7-PLCSIM Advanced V2.0 SP1	
Option for simulation of S7-1500 and ET 200SP	
Floating license, software and documentation on DVD; license key on USB flash drive	**6ES7823-1FA01-0YA5**
Floating license, software, documentation and license key for download[1]	**6ES7823-1FE01-0YA5**
Email address required for delivery	
Upgrade	
Upgrade SIMATIC S7-PLCSIM Advanced V1.0 to V2.0 SP1, floating license	**6ES7823-1FA01-0YE5**
Upgrade SIMATIC S7-PLCSIM Advanced V1.0 to V2.0 SP1, floating license for download [1]	**6ES7823-1FE01-0YE5**
Email address required for delivery	

	Article No.
Software Update Service[2]	
For a period of 12 months and for a fixed price, the customer is automatically provided with all upgrades and service packs for each installed software package. The contract is automatically extended by a further year unless canceled at least 12 weeks prior to expiration. Requires the current software version.	
Software Update Service: Upgrades and service packs are provided in the form of DVDs, USB flash drives etc.	**6ES7823-1FA00-0YL5**
Software Update Service (download)[1] Upgrades and service packs are available for downloading.	**6ES7823-1FE00-0YL5**
Email address required for delivery	

[1] For up-to-date information and download availability, see: http://www.siemens.com/tia-online-software-delivery

[2] For more information on the Software Update Service, see page 11/2.

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Overview

- For developing dynamically loadable function libraries for the S7-1500 Software Controllers and S7-1500 Advanced Controllers CPU 1518 MFP:
  - Implementation of function libraries that are executed under Windows with the high-level languages C/C++, C# and VB
  - Implementation of function libraries that are executed in real-time in the context of the user program of the CPU with the high-level language C++
  - Implementation of applications for the C++ runtime of the CPU 1518 MFP
- "Eclipse" development environment for real-time function libraries in the CPU user program and applications for the C++ runtime in the scope of supply.
- Development of library functions under Windows with MS Visual Studio (optional)
- Easy introduction to development by using basic projects via templates
- Automatic creation of function blocks for calling the library functions
- Simple integration of the function blocks into STEP 7 by importing.
- Simple use of the library functions in the controller without specific high-level language know-how.

Licensing

- ODK 1500S is supplied with a floating license. The floating license allows installation of the software on any number of computers. The number of licenses acquired determines the number of computers on which the software can be used simultaneously.
- An upgrade to version 2.5 is offered for users of the previous versions 1.0 and 2.0.
- The integrated development environment Eclipse, required for developing real-time libraries, is included in the scope of supply of ODK 1500S as well as templates for Visual Studio.
- SIMATIC ODK 1500S is available as a standalone product or in a bundle with SIMATIC Target 1500S™ for Simulink®.

You can find more information on the Software Update Service, license types, online software delivery and handling your SW licenses with the Automation License Manager here:

http://www.siemens.com/simatic-licenses

Technical specifications

System requirements

The SIMATIC ODK 1500S can be used on PC platforms with the following requirements:

- Operating systems Windows 7/8.1/10
- Min. 3 GB hard disk memory
- Min. 4 GB work memory
- Mouse, keyboard, monitor

Ordering data

	Article No.
SIMATIC ODK 1500S	
Open Development Kit for support in developing high-level language applications for SIMATIC S7-1500 Software Controllers V2.0 or V2.1; single license; supplied on DVD	**6ES7806-2CD02-0YA0**
Open Development Kit for support in developing high-level language applications for SIMATIC S7-1500 Software Controllers V2.0 or V2.1; single license; software download [1]	**6ES7806-2CD02-0YG0**
Email address required for delivery	
Open Development Kit for support in developing high-level language applications for SIMATIC S7-1500 Advanced Controllers; supplied on DVD, license key (floating license) on USB flash drive	**6ES7806-2CD03-0YA0**
Open Development Kit for support in developing high-level language applications for SIMATIC S7-1500 Advanced Controllers; single license; software download including license key (floating license) [1]	**6ES7806-2CD03-0YG0**
Email address required for delivery	
Open Development Kit for support in developing high-level language applications for SIMATIC S7-1500 Advanced Controllers; upgrade for existing installations as from V1.0; software download including license key (floating license) [1]	**6ES7806-2CD03-0YK0**
Email address required for delivery	

[1] For up-to-date information and download availability, see: http://www.siemens.com/tia-online-software-delivery

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Overview

The SIMATIC Target 1500S is an add-on for the Simulink® software from The MathWorks. This makes it possible to also use model-based design with MATLAB® and Simulink for SIMATIC S7-1500 controllers. For this purpose, executable code for all ODK-compatible S7-1500 controllers (S7-1500 Software Controllers, ET 200SP Open Controllers and CPU 1518 ODK/MFP) is generated directly from Simulink via the target 1500S.

New with V3.0

- Display of the Simulink model on the CPU web server (incl. monitoring and control of the current values of the model parameters)
- Once generated, the SO file is automatically transferred to the CPU
- Execution of the model and reading/writing of the model parameters in different OBs possible

Licensing

- The engineering software can be installed on multiple computers. The number of existing licenses determines the number of computers on which the software can be used simultaneously (floating license)
- SIMATIC Target 1500S™ for Simulink® V3.0 is available as a standalone product or in a bundle with the SIMATIC S7-1500 Software Controller Open Development Kit
- An upgrade to latest versions is available for previous versions

You can find more information on the Software Update Service, license types, online software delivery and handling your SW licenses with the Automation License Manager here:

http://www.siemens.com/simatic-licenses

Technical specifications

Requirements at the MATLAB end	
MATLAB 2017b (64-bit) or more recent version	• MATLAB 9.5 • MATLAB Coder 4.1 • Simulink 9.2 • Simulink Coder 9.0
Requirements at the SIMATIC end	
SIMATIC ODK 1500S V2.0/V2.5	Must be installed together with target 1500S, MATLAB and Simulink on the same PC
STEP 7 Professional from V15	For configuration of the S7-1500 CPUs, not essentially on the same PC as the target 1500S
Supported CPUs	• CPU 1507S(F) with firmware V2.0 or higher • CPU 1515SP PC (F) with firmware V2.0 or higher • CPU 1518 (F) ODK/MFP

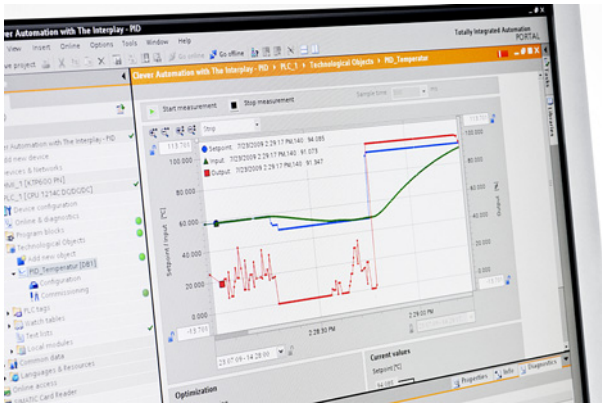
Ordering data

	Article No.
SIMATIC Target 1500S for Simulink V3.0 Download incl. license key [1] Email address required for delivery	**6ES7823-1BE02-0YA5**
Upgrade Upgrade of SIMATIC Target 1500S for Simulink V2.0 to V3.0, download incl. license key [1] Email address required for delivery	**6ES7823-1BE02-0YE5**
SIMATIC Target + ODK 1500S bundle Download incl. license key [1] Email address required for delivery	**6ES7823-1BE12-0YA0**

[1] For up-to-date information and download availability, see: http://www.siemens.com/tia-online-software-delivery

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Overview



- PID Professional combines the two option packages Modular PID Control and Standard PID Control in the TIA Portal.
- Permits the simple integration of continuous PID controllers, pulse controllers and step controllers in the application program
- Can be used for simple to complex closed-loop control tasks in SIMATIC S7-300 (CPU 313 or higher), S7-400, and WinAC.
- The engineering software for PID Professional is already included in the STEP 7 package in V13 or higher.
- Tuning functionality by means of PID Self-Tuner (part of STEP 7 as of V11 SP1).
- Reduces engineering costs thanks to time-saving parameterization and optimization of the controller

Licensing

- The engineering software can be installed on multiple computers. The number of existing licenses determines the number of computers on which the software can be used simultaneously (floating license).
- The Engineering Software requires STEP 7 Professional, the software is part of the STEP 7 Professional DVD and/or the program download. A license key is required for activation.
- During runtime, each CPU requires its own runtime license.
- Upgrades to PID Professional (engineering license or single runtime license) are offered for standard PID Control/Modular PID Control from V11 onwards.

You can find more information on the Software Update Service, license types, online software delivery and handling your SW licenses with the Automation License Manager here:

http://www.siemens.com/simatic-licenses

Ordering data

Ordering data	Article No.
PID Professional for TIA Portal Task: Function blocks and editors for PID controllers Requirement: STEP 7 V13 or higher Delivery package: Licenses on USB flash drive/ downloadable	
Floating license for the engineering and single license for runtime	**6ES7860-1XA02-0XA5**
Single license (Certificate of License) for runtime; per CPU (all versions)	**6ES7860-1XA01-0XB0**
Floating license for the engineering; download (email address required for delivery) [1]	**6ES7860-1XA01-0XH5**
Upgrade from Standard PID Control or Modular PID Control V5.1 to PID Professional for TIA Portal; floating license for the engineering, download (email address required for delivery) [1]	**6ES7860-1XA01-0XK5**
Upgrade from Standard PID Control or Modular PID Control V5.1 to PID Professional for TIA Portal; single license for runtime	**6ES7860-1XA02-0XE5**

[1] For up-to-date information and download availability, see: http://www.siemens.com/tia-online-software-delivery

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Overview



- Low-priced package for simple, controlled positioning and simple geared synchronous motion
- For use with any standard variable-speed drive, such as frequency converter or servo drive
- For incremental and absolute encoders

Licensing

- The engineering software can be installed on multiple computers. The number of existing licenses determines the number of computers on which the software can be used simultaneously (floating license).
- The Engineering Software requires STEP 7 Professional, the software is part of the STEP 7 Professional DVD and/or the program download. A license key is required for activation.
- During runtime, each CPU requires its own runtime license.

You can find more information on the Software Update Service, license types, online software delivery and handling your SW licenses with the Automation License Manager here:

http://www.siemens.com/simatic-licenses

Technical specifications

Supported hardware:

Easy Motion Control is runnable on the following CPUs:

- S7-300.
- S7-400.
- WinAC.
- ET 200S.
- ET 200pro.

Supported modules for the measuring of actual values:

- CPU 314C (FW version 2.0 of the CPU or higher).
- ET 200S 1 Count 5V/500 kHz.
- ET 200S 1 Count 24V/100kHz.
- ET 200S 1SSI.
- SM 338.
- FM 350-1, FM 450-1.
- SIMODRIVE sensor with PROFIBUS DP.
- IM 174.
- Other modules for measuring actual values (using free driver).

Supported modules for setpoint output:

- ET 200S 2AO U.
- SM 332.
- SM 432.
- IM 174.
- Other modules for setpoint output (using free driver).

Supported drives using PROFIBUS DP:

- Micromaster 4.
- SINAMICS G120.
- SINAMICS S120.

Storage space requirements

Required work memory in bytes		
Block	Required work memory per block	Additional work memory required per instance
MC_Init	1086	-
MC_MoveAbsolute	3924	112
MC_MoveRelative	2982	110
MC_MoveJog	3110	110
MC_Home	2886	104
MC_StopMotion	1114	70
MC_Control	1756	58
MC_Simulation	410	64
MC_GearIn	3476	128
Input driver	1416 ... 2654	76 ... 128
Output driver	384 ... 1242	52 ... 68
Axis data block	-	294

Ordering data

	Article No.
Easy Motion Control for TIA Portal Requirement: STEP 7 from V12 SP1; software included in STEP 7 V13	
Floating license and single license (Runtime) Type of delivery: CoL for the configuration software, USB flash drive with a license key for the configuration software, CoL for a runtime license; without software or documentation	**6ES7864-2XA02-0XA5**
Floating license download by email, valid for V11 or higher (email address required for delivery[1]); without software or documentation	**6ES7864-2XA01-0XH5**
Easy Motion Control Runtime License	
Type of delivery: CoL for one runtime single license (valid for Easy Motion Control V2.x and V11 or higher), without software or documentation	**6ES7864-0AF01-0YX0**

[1] For up-to-date information and download availability, see: http://www.siemens.com/tia-online-software-delivery

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Overview

The vendor- and platform-independent OPC Unified Architecture (UA) is the communication standard for Industrie 4.0 and is the standard mechanism for accessing S7-1500 data from non-Siemens devices.

Licensing

An OPC UA server or OPC UA client is available on the target systems (CPUs) and is activated using runtime licenses. Runtime licenses are offered in three levels for different target systems:

Target system	OPC UA S7-1500 Small	OPC UA S7-1500 Medium	OPC UA S7-1500 Large
ET 200SP CPU 1510SP/1512SP/ 1515SP (Open Controller) S7-1500 CPU 1511/1513	Yes	Yes	Yes
ET 200pro CPU 1516pro S7-1500 CPU 1515/1516 Software PLC 1507S	No	Yes	Yes
S7-1500 CPU 1517/1518/1508S	No	No	Yes

The runtime license includes the certificate for OPC UA (server and client) and can be run on the respective target systems including F, C and T/TF as from firmware V2.0 (client V2.6).

You can find more information on the Software Update Service, license types, online software delivery and handling your SW licenses with the Automation License Manager here:

http://www.siemens.com/simatic-licenses

Technical specifications

Can be used for	
SIMATIC OPC UA S7-1500	For all S7-1500 CPUs and ET200SP CPUs with FW V2.0 and higher (incl. S/F/T versions) and PLCSIM Advanced

Ordering data

	Article No.
SIMATIC OPC UA S7-1500 Small	
Single runtime license; can run on ET 200SP CPU 1510SP/1512SP/1515SP (Open Controller), S7-1500 CPU 1511/1513	
License certificate for OPC UA server (data access and OPC UA client)	**6ES7823-0BA00-1BA0**
Download incl. license certificate for OPC UA server (data access and OPC UA client) [1]	**6ES7823-0BE00-1BA0**
Email address required for delivery	
SIMATIC OPC UA S7-1500 Medium	
Single runtime license; can run on ET 200pro CPU 1516pro, ET 200SP CPU 1510SP/1512SP/ 1515SP (Open Controller), S7-1500 CPU 1511/1513/ 1515/1516, Software PLC 1507S	
License certificate for OPC UA server (data access and OPC UA client)	**6ES7823-0BA00-1CA0**
Download incl. license certificate for OPC UA server (data access and OPC UA client) [1]	**6ES7823-0BE00-1CA0**
Email address required for delivery	
SIMATIC OPC UA S7-1500 Large	
Single runtime license; can run on ET 200pro CPU 1516pro, ET 200SP CPU 1510SP/1512SP/ 1515SP (Open Controller), S7-1500 CPU 1511/1513/ 1515/1516/1517/1518, Software PLC 1507S	
License certificate for OPC UA server (data access and OPC UA client)	**6ES7823-0BA00-1DA0**
Download incl. license certificate for OPC UA server (data access and OPC UA client) [1]	**6ES7823-0BE00-1DA0**
Email address required for delivery	

[1] For up-to-date information and download availability, see: http://www.siemens.com/tia-online-software-delivery

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Overview

TIA Portal Multiuser Engineering allows several users to work on the same project simultaneously. This results in a significant reduction in configuration times, and projects can be commissioned faster.

The basic principle:
The project administration is handled by an autonomous server application. This can be installed independent of a TIA Portal.

New with V15

- Automatic selecting of multiuser objects
- Working offline is possible with Multiuser Engineering
- Extended check-in and comment functions
- Project server with extended change history and restoration functions

Licensing

- The software can be installed on multiple computers. The number of existing licenses determines the number of computers on which the software can be used simultaneously (floating license).
- The software is part of the STEP 7/WinCC (TIA Portal) DVD and/or of the program download, a license key is required for activation.
- An upgrade to version V15 is offered for users of the previous version V14.
- It is possible to conclude Software Update Service (SUS) contracts.

You can find more information on the Software Update Service, license types, online software delivery and handling your SW licenses with the Automation License Manager here:

http://www.siemens.com/simatic-licenses

Ordering data

	Article No.
TIA Portal Multiuser Engineering V15	
Software is component of STEP 7 / WinCC as of V15. Only the Certificates of License (CoL) are delivered with the license.	
Data storage medium package, floating license, license key on USB flash drive	**6ES7823-1AA05-0YA5**
Download incl. license key, floating license; license key for download [1]	**6ES7823-1AE05-0YA5**
Email address required for delivery	
Upgrade	
Software is component of STEP 7 / WinCC as of V15. Only the Certificates of License (CoL) are delivered with the license.	
Upgrade TIA Portal Multiuser Engineering V14 to V15, floating license; license key on USB flash drive	**6ES7823-1AA05-0YE5**
Upgrade TIA Portal Multiuser Engineering V14 to V15, floating license; license key for download [1]	**6ES7823-1AE05-0YE5**
Email address required for delivery	
Software Update Service [2]	
Data storage medium package	**6ES7823-1AA00-0YL5**
Download [1]	**6ES7823-1AE00-0YL5**
Email address required for delivery	

[1] For up-to-date information and download availability, see: http://www.siemens.com/tia-online-software-delivery

[2] For more information on the Software Update Service, see page 11/2.

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TIA Portal Cloud Connector

Overview

The TIA Portal Cloud Connector enables access to local PG/PC interfaces and connected SIMATIC hardware from the TIA Portal Engineering while the engineering is taking place via a remote desktop on a server of a private cloud.

Licensing

- The "Special Terms for the Use of Software with the TIA Portal Cloud Connector" apply for software for use with separately licensed TIA Portal products that have been released for use with the Cloud Connector
  https://support.industry.siemens.com/cs/ww/en/view/109739390
- The software is part of the STEP 7/WinCC (TIA Portal) DVD and/or the program download.

Ordering data

	Article No.
TIA Portal Cloud Connector	
Single license; software is component of STEP 7 / WinCC V14 and higher. Only the Certificates of License (CoL) are delivered with the license.	
• Data storage medium package	**6ES7823-1CA00-0YA0**
• Download including license key [1] Email address required for delivery	**6ES7823-1CE00-0YA0**

[1] For up-to-date information and download availability, see:
http://www.siemens.com/tia-online-software-delivery

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Overview

The Teamcenter Gateway permits storage and management of TIA Portal projects and global libraries in Teamcenter. Program handling is integrated into the TIA Portal.

Licensing

- Please note the compatibility of the installed program versions for the operation of the Teamcenter Gateway.
- The software can be installed on multiple computers. The number of existing licenses determines the number of computers on which the software can be used simultaneously (floating license).
- An upgrade to version V15 is offered for users of the previous version V14.
- It is possible to conclude Software Update Service (SUS) contracts.

You can find more information on the Software Update Service, license types, online software delivery and handling your SW licenses with the Automation License Manager here:

http://www.siemens.com/simatic-licenses

Technical specifications

Can be used with:

- TIA Portal with V14 or higher
- Teamcenter V11

Ordering data

	Article No.
TIA Portal Teamcenter Gateway	
Data storage medium package, floating license, license key on USB flash drive	**6ES7823-1EA05-0YA5**
Download incl. license certificate and license key for TIA Portal Teamcenter Gateway V15, floating license [1]	**6ES7823-1EE05-0YA5**
Email address required for delivery	
Upgrade	
Upgrade TIA Portal Teamcenter Gateway V14 to V15, floating license	**6ES7823-1EA05-0YE5**
Upgrade TIA Portal Teamcenter Gateway V14 to V15, floating license; license key for download[1];	**6ES7823-1EE05-0YE5**
Email address required for delivery	
Software Update Service[2]	
For a period of 12 months and for a fixed price, the customer is automatically provided with all upgrades and service packs for each installed software package. The contract is automatically extended by a further year unless canceled at least 12 weeks prior to expiration. Requires the current software version	
Data storage medium package	**6ES7823-1EA00-0YL5**
Download[1]	**6ES7823-1EE00-0YL5**
Email address required for delivery	

[1] For up-to-date information and download availability, see: http://www.siemens.com/tia-online-software-delivery

[2] For more information on the Software Update Service, see page 11/2.

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SIMATIC Visualization Architect

Overview

SIMATIC Visualization Architect

Challenge:

- To standardize the user interfaces of the visualizations throughout the plant
- Significant reduction of the engineering costs for generating the visualizations

Solution:

- Automatic generation and creation of the visualizations, based on the program code of the controller and corresponding visualization objects within the framework of system-wide library concepts.

Licensing

- The software can be installed on multiple computers. The number of existing licenses determines the number of computers on which the software can be used simultaneously (floating license).
- An upgrade to version V15.1 is offered to users of the previous version V14
- A rental license is available for temporary use
- A trial license is available for testing purposes
- It is possible to conclude Software Update Service (SUS) contracts

You can find more information on the Software Update Service, license types, online software delivery and handling your SW licenses with the Automation License Manager here:

http://www.siemens.com/simatic-licenses

Technical specifications

SIMATIC Visualization Architect	
Operating system requirements	In accordance with the requirements of the TIA Portal components: • SIMATIC STEP 7 (TIA Portal) • SIMATIC WinCC Professional, Advanced, Comfort, Basic
Supported STEP 7 version	SIMATIC STEP 7 V15.1
Supported WinCC versions	SIMATIC WinCC V15.1 Professional, Advanced, Comfort, Basic

Ordering data

	Article No.
SIMATIC Visualization Architect V15.1	
As package	
• SIMATIC Visualization Architect V15.1	**6AV2107-0PX05-0AA5**
• SIMATIC Visualization Architect V15.1 Rental	**6AV2107-0PX05-0AA6**
• SIMATIC Visualization Architect V15.1 Trial Download in Customer Support Portal	**6AV2107-0PX05-0AA7**
Download [1]	
• SIMATIC Visualization Architect V15.1	**6AV2107-0PX05-0AH5**
• SIMATIC Visualization Architect V15.1 Rental	**6AV2107-0PX05-0AH6**
Upgrade SIMATIC Visualization Architect V14 -> V15.1	
Engineering software in the TIA Portal; software and documentation on CD, License key on USB flash drive Class A; 6 languages: en, de, fr, es, it, zh	
• As package	**6AV2107-3PX05-0AA5**
• Download [1] Email address required for delivery	**6AV2107-3PX05-0AH5**

[1] For up-to-date information and download availability, see: http://www.siemens.com/tia-online-software-delivery

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Overview

The TIA Portal option ProDiag makes it possible to monitor a machine or plant and to intervene in the event of a fault. The monitoring messages which can be generated for the various faults provide specific information on the monitoring mode, location and cause of the fault. Information on troubleshooting can be provided in addition. Plant operators can then not only recognize faults, they can also identify any potential danger in advance and take appropriate countermeasures.

Licensing

- The runtime license for controllers includes 250 monitoring operations for multiple CPUs or an unlimited number of monitoring operations for a single CPU. From FW 2.0 onwards, the software can run on S7-1500/ET 200SP CPUs regardless of the TIA Portal version.
- For the visualization of the messages, the controls are licensed according to the HMI runtime platforms.

You can find more information on the Software Update Service, license types, online software delivery and handling your SW licenses with the Automation License Manager here:

http:www.siemens.com/simatic-licenses

Technical specifications

Can be used for	
SIMATIC ProDiag S7-1500	For all S7-1500 CPUs and ET 200SP CPUs with FW V2.0 and higher

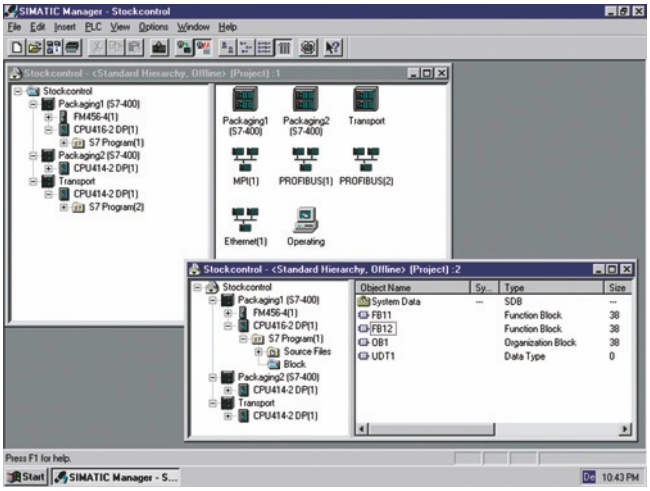
Ordering data

	Article No.
SIMATIC ProDiag S7-1500 for 250 monitoring functions	
For SIMATIC S7-1500 CPUs and ET 200SP CPUs with FW 2.0 and higher. Independent of the TIA Portal version.	
Package with data storage medium	**6ES7823-0AA00-1AA0**
Download incl. license key[1]	**6ES7823-0AE00-1AA0**
Email address required for delivery	
SIMATIC ProDiag for SIMATIC Comfort / Mobile Panels	
Controls for SIMATIC WinCC as of V14.	
Package with data storage medium	**6AV2107-0UP00-0BB0**
Download incl. license key[1] Email address required for delivery	**6AV2107-0UP00-0BH0**
SIMATIC ProDiag for WinCC Runtime Advanced	
Controls for SIMATIC WinCC as of V14.	
Package with data storage medium	**6AV2107-0UA00-0BB0**
Download incl. license key[1]	**6AV2107-0UA00-0BH0**
Email address required for delivery	
SIMATIC ProDiag for WinCC Runtime Professional	
Controls for SIMATIC WinCC as of V14	
Package with data storage medium	**6AV2107-0UB00-0BB0**
Download incl. license key[1]	**6AV2107-0UB00-0BH0**
Email address required for delivery	

[1] For up-to-date information and download availability, see: http://www.siemens.com/tia-online-software-delivery

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Overview



- Basic software STEP 7:
  The standard tool for the SIMATIC S7, SIMATIC C7 and SIMATIC WinAC automation systems.
- For fully utilizing the performance capability of the systems.
- With user-friendly functions for all phases of an automation project:
  - Configuration and parameter assignment of the hardware
  - Specifying the communication
  - Programming
  - Testing, commissioning and service
  - Documentation, archiving
  - Operating, diagnostic functions

Note

The STEP 7 (TIA Portal) engineering software is required to program the new S7-1200, S7-1500, ET 200SP CPU and S7-1500 Software Controller generation; it can also be used for programming the S7-300, S7-400 and SIMATIC WinAC.

Siemens offers a combo license for both platforms which enables you to work using both STEP 7 (TIA Portal) as well as traditional engineering software. See "STEP 7 Professional" for more information.

Licensing

- STEP 7 V5.6 can be installed on multiple computers. The number of existing licenses determines the number of computers on which the software can be used simultaneously (floating license).
- A 50 h rental license is available for limited use.
- An upgrade to version V5.6 is available for users of the previous V5.3...5.5 versions.
- A trial license is available for testing purposes.

You can find more information on the Software Update Service, license types, online software delivery and handling your SW licenses with the Automation License Manager here:

http://www.siemens.com/simatic-licenses

Technical specifications PC adapter USB A2

Article number	**6GK1571-0BA00-0AA0**
Product type designation	PC adapter USB A2
Transmission rate	
Transfer rate	
• at the 1st interface acc. to PROFIBUS	9.6 kbit/s ... 12 Mbit/s
Interfaces	
Number of electrical connections	
• at the 1st interface acc. to PROFIBUS	1
Number of interfaces acc. to USB	1
Type of electrical connection	
• at the 1st interface acc. to PROFIBUS	9-pin Sub-D socket (RS 485)
• of the USB interface	Standard-B socket
Standard for interfaces USB 2.0	Yes
Supply voltage, current consumption, power loss	
Type of voltage of the supply voltage	DC
Type of voltage supply optional external supply	No
Supply voltage	
• from USB	5 V
• Note	Supply direct from USB
Relative symmetrical tolerance at DC	
• at 5 V	5 %
Consumed current	
• from USB	0.2 A
Power loss [W]	1 W
Permitted ambient conditions	
Ambient temperature	
• during operation	0 ... 60 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
Relative humidity at 30 °C during operation maximum	95 %
Protection class IP	IP20
Design, dimensions and weight	
(unit format)	USB V2.0 adapter
Width	58 mm
(height)	26 mm
Depth	105 mm
(net weight)	365 g
Mounting type 35 mm DIN rail mounting	No
Number of plug-in cards of same design plug-in per PC station	1
Number of units Note	-
Performance data	
Product functions Diagnosis	
Product function	
• Port diagnostics	Yes
Standards, specifications, approvals	
Standard	
• for EMC	2004/108/EC
• for safety from CSA and UL	cULus, UL 60950-1, CSA22.2
• for emitted interference	EN 61000-6-3, EN 61000-6-4
• for interference immunity	EN 61000-6-1, EN 61000-6-2
Certificate of suitability	
• CE marking	Yes
• C-Tick	Yes

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Ordering data	Article No.
STEP 7 Version 5.6	
Target system: SIMATIC S7-300/400, SIMATIC C7 Requirement: Windows 7 SP1, Windows 10 Professional/Enterprise, Windows Server 2008 R2 SP1, Windows Server 2012 R2, Windows Server 2016 Type of delivery: German, English, French, Spanish, Italian; incl. license key on USB flash drive, with electronic documentation	
Floating license on DVD	**6ES7810-4CC11-0YA5**
Floating license, download[1]; Software, license key and documentation as download; email address required for delivery	**6ES7810-4CE11-0YB5**
Rental license for 50 hours; Software and documentation on DVD, license key on USB flash drive	**6ES7810-4CC11-0YA6**
Rental license for 50 hours, download[1]; Software, license key and documentation as download; email address required for delivery	**6ES7810-4CE11-0YB6**
Floating license upgrade V5.3...5.5 to V5.6; on DVD	**6ES7810-4CC11-0YE5**
STEP 7 V5.6 trial license On DVD, operational for 21 days	**6ES7810-4CC11-0YA7**
STEP 7 Version 5.6 Japanese	
Target system: SIMATIC S7-300/400, SIMATIC C7, SIMATIC WinAC Requirement: Windows 7 SP1, Windows 10 Professional/Enterprise, Windows Server 2008 R2 SP1, Windows Server 2012 R2, Windows Server 2016 Type of delivery: English, Japanese; incl. license key on USB flash drive, with electronic documentation	
Floating license Japanese on DVD	**6ES7810-4CC11-0JA5**
Upgrade floating license Japanese 3.x/4.x/5.x to V5.5; on DVD	**6ES7810-4CC11-0JE5**
STEP 7 Version 5.6, Chinese	
Target system: SIMATIC S7-300/400, SIMATIC C7 Requirement: Windows 7 SP1, Windows 10 Professional/Enterprise, Windows Server 2008 R2 SP1, Windows Server 2012 R2, Windows Server 2016 Type of delivery: English, Chinese; incl. license key on USB flash drive, with electronic documentation	
Floating license Chinese on DVD	**6ES7810-4CC11-0KA5**
Floating license upgrade Chinese 5.x to V5.6; on DVD	**6ES7810-4CC11-0KE5**

	Article No.
SIMATIC Manual Collection	**6ES7998-8XC01-8YE0**
Electronic manuals on DVD, multi-language: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC Distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	
SIMATIC Manual Collection update service for 1 year	**6ES7998-8XC01-8YE2**
Current "Manual Collection" DVD and the three subsequent updates	
EPROM programming device, USB prommer	**6ES7792-0AA00-0XA0**
For programming SIMATIC Memory Cards and EPROM modules	
MPI cable	**6ES7901-0BF00-0AA0**
For linking SIMATIC S7 and PG through MPI (5 m)	
Components for connecting a PC to MPI and PROFIBUS	
For PCs with a free PCI slot	
CP 5612	**6GK1561-2AA00**
For PCs without a free PCI slot	
USB A2 PC adapter	**6GK1571-0BA00-0AA0**
for connecting a PG/PC or Notebook to PROFIBUS or MPI; USB cable included in scope of supply	
Components for connecting the PC to Industrial Ethernet	
For PCs with a free PCI slot	
Layer 2 Ethernet cards	

[1] For up-to-date information and download availability, see: http://www.siemens.com/tia-online-software-delivery

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STEP 7 Professional

Overview



STEP 7 Professional supports all IEC languages.

In addition to the languages familiar from STEP 7:

- LAD
- FBD
- STL,

the following are also available:

- Sequential function chart
- Structured text

An offline simulation of user programs created with these languages is included. STEP 7 Professional thus replaces the combination of the individual packages STEP 7, S7-GRAPH, S7-SCL and S7-PLCSIM.

A Powerpack (conversion package) is available for customers who use STEP 7 already and wish to change. A valid STEP 7 license is required for purchasing the POWERPACK. A separate update service can be purchased for STEP 7 Professional.

Note

The STEP 7 (TIA Portal) engineering software is required to program the new generation of S7-1200, S7-1500 and ET 200SP CPU controllers as well as the S7-1500 Software Controller; it can also be used for programming the S7-300, S7-400 and SIMATIC WinAC.

Siemens offers a combo license for both platforms which enables you to work using both STEP 7 (TIA Portal) as well as traditional engineering software. See "Licensing" for more information.

Licensing

- New installations of STEP 7 Professional 2017 are only available as combo licenses together with STEP 7 Professional V15 (TIA Portal). The software can be installed on multiple computers. The number of existing licenses determines the number of computers on which the software can be used simultaneously (floating license).
- A 50 h rental license is available for limited use.
- An upgrade to V15/2017 Combo is available for users of the previous STEP 7 Professional 2006...2010 versions.
- Powerpack and upgrade enable migration from STEP 7 V5.6 to STEP 7 Professional V15/2017 Combo.
- A trial license is available for testing purposes.
- It is possible to conclude Software Update Service (SUS) contracts.

You can find more information on the Software Update Service, license types, online software delivery and handling your SW licenses with the Automation License Manager here:

http://www.siemens.com/simatic-licenses

Technical specifications PC adapter USB A2

Article number	**6GK1571-0BA00-0AA0**
Product type designation	PC adapter USB A2
Transmission rate	
Transfer rate	
• at the 1st interface acc. to PROFIBUS	9.6 kbit/s ... 12 Mbit/s
Interfaces	
Number of electrical connections	
• at the 1st interface acc. to PROFIBUS	1
Number of interfaces acc. to USB	1
Type of electrical connection	
• at the 1st interface acc. to PROFIBUS	9-pin Sub-D socket (RS 485)
• of the USB interface	Standard-B socket
Standard for interfaces USB 2.0	Yes

Article number	**6GK1571-0BA00-0AA0**
Product type designation	PC adapter USB A2
Supply voltage, current consumption, power loss	
Type of voltage of the supply voltage	DC
Type of voltage supply optional external supply	No
Supply voltage	
• from USB	5 V
• Note	Supply direct from USB
Relative symmetrical tolerance at DC	
• at 5 V	5 %
Consumed current	
• from USB	0.2 A
Power loss [W]	1 W
Permitted ambient conditions	
Ambient temperature	
• during operation	0 ... 60 °C
• during storage	-40 ... +70 °C
• during transport	-40 ... +70 °C
Relative humidity at 30 °C during operation maximum	95 %
Protection class IP	IP20

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Technical specifications (continued)

Article number	**6GK1571-0BA00-0AA0**
Product type designation	PC adapter USB A2
Design, dimensions and weight	
(unit format)	USB V2.0 adapter
Width	58 mm
(height)	26 mm
Depth	105 mm
(net weight)	365 g
Mounting type 35 mm DIN rail mounting	No
Number of plug-in cards of same design plug-in per PC station	1
Number of units Note	-
Performance data	
Product functions Diagnosis	
Product function	
• Port diagnostics	Yes

Article number	**6GK1571-0BA00-0AA0**
Product type designation	PC adapter USB A2
Standards, specifications, approvals	
Standard	
• for EMC	2004/108/EC
• for safety from CSA and UL	cULus, UL 60950-1, CSA22.2
• for emitted interference	EN 61000-6-3, EN 61000-6-4
• for interference immunity	EN 61000-6-1, EN 61000-6-2
Certificate of suitability	
• CE marking	Yes
• C-Tick	Yes

Ordering data

	Article No.
STEP 7 Professional 2017/V15 Target system: SIMATIC S7-300/400, SIMATIC C7, SIMATIC WinAC Requirement: Windows Server 2008 R2 SP1 Windows Server 2012 R2 Windows Server 2016 Windows 7 SP1 Windows 10 Professional Windows 10 Enterprise Type of delivery: English, German, French, Spanish, Italian; license key on USB flash drive, with electronic documentation	
Floating combo license on DVD	**6ES7810-5CC12-0YA5**
Floating license, license key download[2)] without software and documentation; email address required for delivery	**6ES7810-5CE12-0YB5**
Rental license for 50 hours, license key download[2)] without software and documentation; email address required for delivery	**6ES7823-1GE05-0YA5**

	Article No.
Conversion package STEP 7 Professional V15 Only valid if ordered together with Software Update Service 6ES7810-5CC04-0YE2 (STEP 7 Professional and STEP 7 Professional in TIA Portal).	
• Powerpack & upgrade from STEP 7 V5.6 to STEP 7 Professional V15/2017 Combo, floating license. STEP 7 Software Update Service must be available.	**6ES7822-1AA05-0XC2**
• Powerpack & upgrade from STEP 7 V5.6 to STEP 7 Professional V15/2017 Combo, floating license. STEP 7 Software Update Service must be available. Software download including license key [2)] Email address required for delivery	**6ES7822-1AE05-0XC2**
Upgrade STEP 7 Professional V11...14 to STEP 7 Professional V15 or STEP 7 Professional V11...V14/ 201x Combo to V15/2017 Combo or STEP 7 Professional 2006...2010 to V15/2017 Combo, floating license	**6ES7822-1AA05-0YE5**
Upgrade STEP 7 Professional V11...14 to STEP 7 Professional V15 or STEP 7 Professional V11...V14/ 201x Combo to V15/2017 Combo or STEP 7 Professional 2006...2010 to V15/2017 Combo, floating license Software download incl. license key[2)] Email address required for delivery	**6ES7822-1AE05-0YE5**

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STEP 7 Professional

Ordering data	Article No.
Powerpack & upgrade from STEP 7 V5.4...V5.6 to STEP 7 Professional V15/2017 Combo, floating license	**6ES7822-1AA05-0XC5**
STEP 7 Professional 2017 trial license; on DVD, runs for 21 days	**6ES7810-5CC12-0YA7**
Software Update Service For a period of 12 months and for a fixed price, the customer is automatically provided with all upgrades and service packs for each installed software package. The contract is automatically extended by a further year unless canceled at least 12 weeks prior to expiration. Requires the current software version	
Software Update Service (Standard Edition)[1] The delivery is implemented according to the number of ordered SUS products (e.g. 10 upgrade packages with 10 DVDs, 10 USB flash drives, etc.)	
• STEP 7 Professional and STEP 7 Professional in the TIA Portal	**6ES7810-5CC04-0YE2**
Software Update Service (Compact Edition)[1] The delivery items are combined. In future, only 1 package with 1 data storage medium set, 1 USB flash drive with the corresponding number of licenses and the corresponding number of COLs will be supplied for multiple contracts. Delivery items to be combined must be ordered as one item.	
• STEP 7 Professional and STEP 7 Professional in the TIA Portal	**6ES7810-5CC00-0YM2**
Software Update Service (download)[1][2] The upgrades and service packs are available for downloading. Email address required for delivery	
• STEP 7 Professional and STEP 7 Professional in the TIA Portal	**6ES7810-5CC04-0YY2**

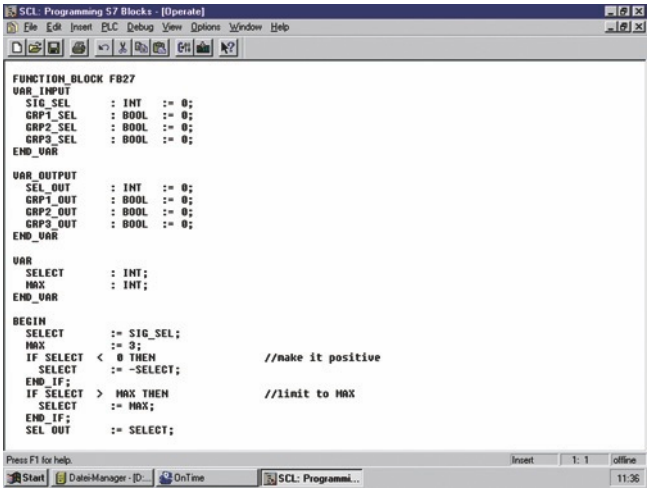
	Article No.
EPROM programming device, USB prommer For programming SIMATIC Memory Cards and EPROM modules	**6ES7792-0AA00-0XA0**
MPI cable For linking SIMATIC S7 and PG through MPI (5 m)	**6ES7901-0BF00-0AA0**
Components for connecting a PC to MPI and PROFIBUS	
For PCs with a free PCI slot	
CP 5612	**6GK1561-2AA00**
For PCs without a free PCI slot	
USB A2 PC adapter for connecting a PG/PC or Notebook to PROFIBUS or MPI; USB cable included in scope of supply	**6GK1571-0BA00-0AA0**
Components for connecting the PC to Industrial Ethernet	
For PCs with a free PCI slot	
Layer 2 Ethernet cards	

[1] For more information on the Software Update Service, see page 11/2.

[2] For up-to-date information and download availability, see: http://www.siemens.com/tia-online-software-delivery

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Overview



- PASCAL-type high-level language
- Optimized for programming programmable controllers
- With PLCopen Base Level certificate
- For use in SIMATIC S7-300 (recommended for CPU 314 and CPU 312C), S7-400, C7 and WinAC



Licensing

- S7-SCL is an integral part of the STEP 7 Professional software package or is available as a stand-alone software product.
- S7-SCL V5.6 is delivered with a floating license. The floating license allows installation of the software on any number of computers. This means one user per license can use the software independently of the computer used or from a specific workstation. The number of existing licenses determines the number of computers on which the software can be used simultaneously.
- An upgrade to version 5.6 is offered for users of the previous version 5.3.
- A separate update service can be purchased for S7-SCL.
- A trial license valid for 21 days is available for download from Industry Online Support: https://support.industry.siemens.com/cs/document/109748118

You can find more information on the Software Update Service, license types, online software delivery and handling your SW licenses with the Automation License Manager:

http://www.siemens.com/simatic-licenses

Technical specifications

Engineering Tool	**S7-SCL**
Current version	V5.3
Software class	A
Application areas	
Can be used for	Text-based high-level language programming of simple and complex calculations, CASE, loop, jump, and comparison functions
Marketing message	Programming of algorithms and calculations made easy!
Advantages	• Clear and easy-to-read programs • Functional, module-based programming • CASE instruction replaces a large number of jump and comparison functions • Easily understood by PLC programmers, as the programming philosophy of LAD/FBD/STL is retained • Easy switchover to PLC programming for PC programmers • Exchangeability (porting) of subroutines in accordance with IEC 61131-3 • Less time required for engineering compared to LAD/FBD/STL: Up to 20% for simple programs; at least 50% for demanding program structures
Sectors	• Labeling machines • Chemical plants (e.g. oxygen extraction, evaluation of measured values) • Rubber and plastics machines • Woodworking machines • Storage and logistics systems • Paper and printing machinery • Punching and cutting machines • Water industry • Coilers
Target systems	
Can be used in	S7-300 (CPU 313 or higher and CPU 312C or higher recommended) S7-400 C7 (C7-626 or higher recommended) WinAC
System prerequisites	
Operating system	Windows XP Professional Windows 7 Ultimate/Professional (S7-SCL V5.3 SP5 and higher)
Required hard drive memory in the PG/PC	50 MB
Required software	STEP 7 V5.4 or higher
Properties	
Monitoring tags	Yes
Controlling tags	Yes
Single-step processing	Yes
Integration in CFC	Yes

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Technical specifications (continued)

Program runtimes	
with S7-300 (typical)	Similar to LAD/FBD/STL
with S7-400 (typical)	Similar to LAD/FBD/STL
Diagnostics	
Integration of diagnostic data in ProAgent	-
Integration of diagnostic data in ProTool/Pro	-
Integration of diagnostic data in WinCC	-
Supported standards	
IEC 61131-3	PLCopen certification • Base Level ST available • Reusability Level ST available
Available versions/licenses	
Floating license	CD-ROM with • Tool • Electronic manual • Getting Started guide • Examples License on USB flash drive Certificate of License Product information
Upgrade (floating license)	CD-ROM with • Tool • Electronic manual • Getting Started guide • Examples License on USB flash drive Certificate of License Product information
Software Update Service (SUS)	
Also a component part of	
STEP 7 Professional	Yes
S7 Trainer Package	Yes
PCS 7	Yes
D7-SYS	-

Ordering data

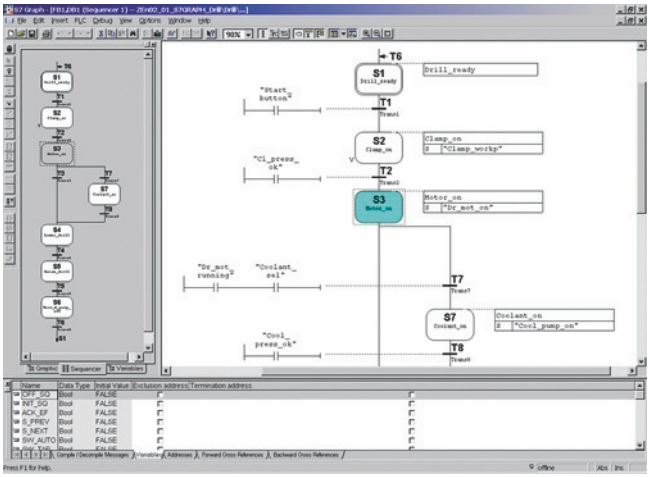
	Article No.
SIMATIC S7-SCL, Version 5.6 Task: High-level language programming Target system: SIMATIC S7-300 (CPU 314 or higher), SIMATIC S7-400, SIMATIC C7 Requirement: STEP 7 V5.6 or higher; Windows 7 SP1, Windows 10 Professional/ Enterprise, Windows Server 2008 R2 SP1, Windows Server 2012 R2, Windows Server 2016 Type of delivery: on CD; German, English, French, Spanish, Italian; incl. authorization diskette, with electronic documentation	
Floating License	**6ES7811-1CC06-0YA5**
Software Update Service (requires current software version)[1]	**6ES7811-1CA01-0YX2**
Upgrade floating to V5.6	**6ES7811-1CC06-0YE5**
SIMATIC Manual Collection Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC Distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	**6ES7998-8XC01-8YE0**
SIMATIC Manual Collection update service for 1 year Current "Manual Collection" DVD and the three subsequent updates	**6ES7998-8XC01-8YE2**

[1] For more information on the Software Update Service, see page 11/2.

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Overview



- For configuring and programming sequential processes using sequencers
- Standardized representation to EN 1131-3
- Clearly comprehensible program thanks to structuring of the process into separate steps
- With extensive diagnostic functions, integrated in the SIMATIC diagnostic concept
- With PLCopen Base Level certificate
- For use in SIMATIC S7-300 (recommended for CPU 315 and CPU 312C or higher), S7-400 C7 and WinAC



Licensing

- S7 GRAPH is an integral part of the STEP 7 Professional software package or is available as a stand-alone software product.
- S7-Graph V5.6 is delivered with a floating license. The floating license allows installation of the software on any number of computers. This means one user per license can use the software independently of the computer used or from a specific workstation. The number of existing licenses determines the number of computers on which the software can be used simultaneously.
- An upgrade to version 5.6 is offered for users of the previous version 5.3.
- A separate update service can be purchased for S7-GRAPH.
- A trial license valid for 21 days is available for download from Industry Online Support: https://support.industry.siemens.com/cs/document/109748125

You can find more information on the Software Update Service, license types, online software delivery and handling your SW licenses with the Automation License Manager:

http://www.siemens.com/simatic-licenses

Technical specifications

Engineering Tool	**S7-GRAPH**
Current version	V5.3
Software class	A
Application areas	
Can be used for	Graphical programming of sequential controllers and sequencers
Marketing message	Fast, elegant way to program sequential processes easily and transparently!
Advantages	• Can be used to optimum effect even during the design phase • Less configuration effort thanks to graphical structuring and programming • Quick and easy familiarization • Precise fault localization thanks to integrated diagnostics in combination with ProAgent for ProTool/Pro and WinCC • Less time required for engineering compared to LAD/FBD/STL: approx. 40 to 70%
Sectors	• Automotive industry (e.g. body-in-white, final assembly) • Electrical equipment manufacture • Rubber and plastics machines • Pick-and-place machines • Woodworking machines • Metalworking machines • Paper and printing machinery • Testing machines • Rolling mills • Coilers • Leisure and entertainment facilities

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Technical specifications (continued)

Target systems	
Can be used in	S7-300 (CPU 314 or higher and CPU 312C or higher recommended) S7-400 C7 (C7-626 or higher recommended) WinAC
System prerequisites	
Operating system	Windows XP Professional Windows 7 Professional Windows 7 Ultimate
Required hard drive memory in the PG/PC	50 MB
Required software	STEP 7 V5.4 with SP4 or SP5 or STEP 7 V5.5 with or without SP1
Properties	
Monitoring tags	Yes
Controlling tags	Yes
Single-step processing	Yes
Integration in CFC	-
Program runtimes	
with S7-300 (typical)	3 ms per block + 1 ms per active step
with S7-400 (typical)	0.4 ms per block + 0.06 ms per active step
Diagnostics	
Integration of diagnostic data in ProAgent	Yes
Integration of diagnostic data in ProTool/Pro	Via ProAgent
Integration of diagnostic data in WinCC	Via ProAgent
Supported standards	
IEC 61131-3	PLCopen certification • Base Level SFC available
Status of PLCopen activities	-
Available versions/licenses	
Floating license	CD-ROM with • Tool • Electronic manual • Getting Started guide • Examples License key on USB flash drive Certificate of License Product information
Upgrade (floating license)	CD-ROM with • Tool • Electronic manual • Getting Started guide • Examples License key on USB flash drive Certificate of License Product information
Software Update Service (SUS)	
Also a component part of	
STEP 7 Professional	Yes
S7 Trainer Package	Yes
PCS 7	-
D7-SYS	-

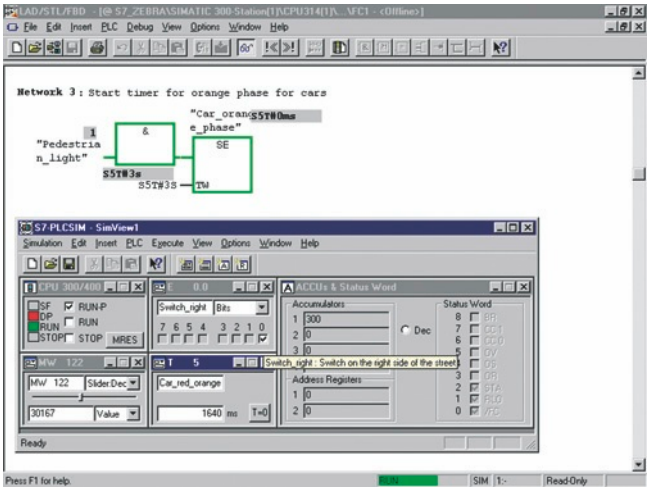
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	Article No.
SIMATIC S7-GRAPH, Version 5.6 Task: Configuring and programming of sequences Target system: SIMATIC S7-300, SIMATIC S7-400, SIMATIC C7 Requirement: STEP 7 V5.6; Windows 7 SP1, Windows 10 Professional/Enterprise, Windows Server 2008 R2 SP1, Windows Server 2012 R2, Windows Server 2016 Type of delivery: on CD; German, English, French, Spanish, Italian; including license key on USB flash drive, with electronic documentation	
Floating license	**6ES7811-0CC07-0YA5**
Software Update Service (requires current software version)[1]	**6ES7811-0CA01-0YX2**
Floating license upgrade to V5.6	**6ES7811-0CC07-0YE5**
SIMATIC Manual Collection Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC Distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	**6ES7998-8XC01-8YE0**
SIMATIC Manual Collection update service for 1 year Current "Manual Collection" DVD and the three subsequent updates	**6ES7998-8XC01-8YE2**

[1] For more information on the Software Update Service, see page 11/2.

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Overview



- For functional testing of the generated SIMATIC S7 user blocks on a programming device or PC, independent of the availability of the target hardware
- Shifts the detection and correction of programming errors to an early stage of development
- Enables an accelerated and cost-effective initial commissioning and enhances the program quality
- Can be used for LAD, FBD, STL, S7-GRAPH, S7-HiGraph, S7-SCL, CFC, S7-PDIAG, WinCC (local installation)

Licensing

- S7-PLCSIM is an integral part of the STEP 7 Professional software package or is available as a stand-alone software product
- S7-PLCSIM V5.4 is delivered with a floating license. The floating license allows installation of the software on any number of computers. This means one user per license can use the software independently of the computer used or from a specific workstation. The number of existing licenses determines the number of computers on which the software can be used simultaneously.
- An upgrade to version 5.4 is offered for users of the previous versions.
- A separate update service can be purchased for S7-PLCSIM.
- A trial license valid for 14 days is available for download from Industry Online Support:
  https://support.industry.siemens.com/cs/document/109750064

You can find more information on the Software Update Service, license types, online software delivery and handling your SW licenses with the Automation License Manager:

http://www.siemens.com/simatic-licenses

Technical specifications

Engineering Tool	S7-PLCSIM
License type	Floating license
Software class	A
Current version	V5.4
Target system (recommended)	SIMATIC S7-300 SIMATIC S7-400 SIMATIC C7
Operating system	Windows XP Professional Windows 7 Professional Windows 7 Ultimate
Required software packages	STEP 7 V5.4 with SP4 or SP5 or STEP 7 V5.5 with or without SP1
Disk space required in PG/PC	5 MB

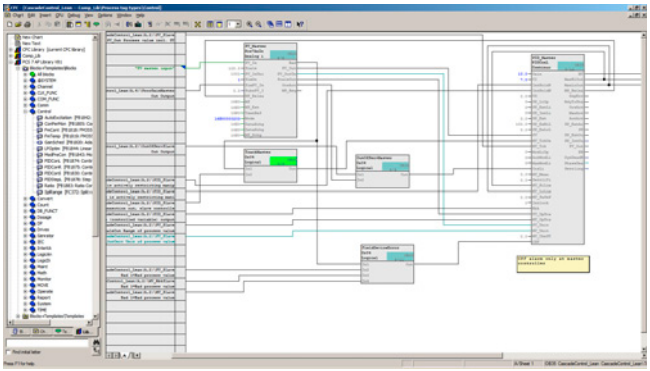
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	Article No.
S7-PLCSIM, Version 5.4 Task: Functional testing of SIMATIC S7 user blocks on PG/PC Target system: SIMATIC S7-300, SIMATIC S7-400, SIMATIC C7 Requirement: STEP 7 V5.4 or higher incl. SP4/SP5 or STEP 7 V5.5 with or without SP1 Type of delivery: on CD; English, German, French, Spanish, Italian; license key on USB flash drive, with electronic documentation	
Floating license	**6ES7841-0CC05-0YA5**
Software Update Service (requires current software version)[1]	**6ES7841-0CA01-0YX2**
Floating license upgrade to V5.4	**6ES7841-0CC05-0YE5**
SIMATIC Manual Collection Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC Distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	**6ES7998-8XC01-8YE0**
SIMATIC Manual Collection update service for 1 year Current "Manual Collection" DVD and the three subsequent updates	**6ES7998-8XC01-8YE2**

[1] For more information on the Software Update Service, see page 11/2.

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Overview



- For the generation of automation programs by drawing a technology chart
- With extensive libraries of ready-made software blocks to which user-created blocks can be added
- Minimized outlay and reduced error susceptibility due to the interconnection of ready-made blocks
- Optimized integration in the world of automation, for example, through guaranteed compatibility with all STEP 7 tools
- Can be used for SIMATIC S7-300 (recommended for CPU 316 or CPU 314C or higher), SIMATIC S7-400, SIMATIC WinAC and D7-SYS

Licensing

- SIMATIC CFC V9.0 is supplied with a floating license. The floating license allows installation of the software on any number of computers. This means one user per license can use the software independently of the computer used or from a specific workstation. The number of existing licenses determines the number of computers on which the software can be used simultaneously.
- An upgrade to version 9.0 is available for users of the previous 8.x versions.
- For SIMATIC CFC, the Software Update Service is available with the Standard, Compact and Download types of delivery.

You can find more information on the Software Update Service, license types, online software delivery and handling your SW licenses with the Automation License Manager:

http://www.siemens.com/simatic-licenses

Technical specifications

EngineringTool	**CFC**
Current version	V9.0
Software class	A
Application areas	
Can be used for	Graphical creation, interconnection and parameterization of (preconfigured) blocks and functions
Marketing message	Simply interconnect and configure instead of programming!
Advantages	• Can be used to optimum effect even during the design phase • Reduced configuration effort thanks to graphical interconnection • High degree of reusability of diagrams that have already been created • Quick and easy familiarization • Quick and transparent interconnection of ready-made functions • Technological creation of the program as a whole • Clear representation of control loop structures • Short commissioning time • High plant availability • Less time required for engineering compared to LAD/FBD/STL: up to 50%
Sectors	• Automotive industry (e.g. thermostats, tire production processes) • Chemicals • Power engineering and supply • Rubber and plastics machines • Metalworking machines • Food and beverage machines • Petrochemicals • Rolling mills • Water industry • Coilers
Target systems	
Can be used in	S7-300 S7-400 F/H systems WinAC
System prerequisites	
Operating system	MS Windows 7 Professional with SP1 (64-bit) MS Windows 7 Ultimate with SP1 (64-bit) MS Windows 7 Enterprise with SP1 (64-bit) MS Windows 10 Pro (64-bit) MS Windows 10 Enterprise 2015 LTSB (64-bit) MS Windows Server 2008 R2 Standard Edition with SP1 (64-bit) MS Windows Server 2012 R2 Update Standard Edition (64-bit)
Required hard drive memory in the PG/PC	approx. 80 MB
Required software	STEP 7 V5.6 or higher

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Technical specifications (continued)

Properties	
Monitoring tags	Yes
Controlling tags	Yes
Single-step processing	-
Integration in CFC	Yes
Program runtimes	
with S7-300 (typical)	Depending on the interconnected blocks
with S7-400 (typical)	Depending on the interconnected blocks
Diagnostics	
Integration of diagnostic data in ProAgent	-
Integration of diagnostic data in ProTool/Pro	-
Integration of diagnostic data in WinCC	-
Supported standards	
IEC 61131-3	based on the IEC standard
Status of PLCopen activities	-
Available versions/licenses	
Floating license	• 1 CD • 1 license key memory stick • 1 Certificate of License
Upgrade (floating license)	• 1 CD • 1 license key memory stick • 1 Certificate of License
Software Update Service (SUS)	
Also a component part of	
STEP 7 Professional	-
S7 Trainer Package	-
PCS 7	Yes
D7-SYS	Yes

Ordering data

	Article No.
SIMATIC CFC, Version 9.0 Task: Graphic configuring and programming of automation applications in the form of technology-oriented diagrams Target system: SIMATIC S7-300/400, SIMATIC WinAC, D7-SYS Requirements: STEP 7 V5.6 or higher Type of delivery: Engineering software and electronic documentation on CD-ROM, license key on USB flash drive, Certificate of License	
Floating license	**6ES7658-1EX58-0YA5**
Floating license upgrade from V8.x to V9.0	**6ES7658-1EX58-0YE5**
Software Update Service (requires current software version)[1]	**6ES7658-1EX00-2YL8**
Software Update Service for multiple orders (requires current software version); the delivery items are combined. For multiple contracts, only 1 package (1 data medium set and the corresponding number of licenses) will be supplied. Can be ordered with 5 or more contracts[1] The delivery items to be combined must be ordered as one item.	**6ES7658-1EX00-2YM8**
Software Update Service (requires current software version)[1]	**6ES7658-1EX00-2YV8**
Email address required for delivery	
SIMATIC Manual Collection Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC Distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	**6ES7998-8XC01-8YE0**
SIMATIC Manual Collection update service for 1 year Current "Manual Collection" DVD and the three subsequent updates	**6ES7998-8XC01-8YE2**

[1] For more information on the Software Update Service, see page 11/2.

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S7 Distributed Safety

Overview

- For creating safety-related automation applications with SIMATIC S7 in LAD or FBD (STEP 7 required)
- Implementation of safety functions by simply connecting function blocks
- With prefabricated block library
- Custom block creation possible
- Optimal embedding in the automation world thanks to total integration in the STEP 7 tools
- Scope of supply:
  - Distributed Safety Editor
  - Code generator
  - Debugger
  - Standard block libraries

Licensing

- SIMATIC S7 Distributed Safety is delivered with a floating license. The floating license allows installation of the software on any number of computers. This means one user per license can use the software independently of the computer used or from a specific workstation. The number of existing licenses determines the number of computers on which the software can be used simultaneously.
- An upgrade to version 5.4 is offered for users of the previous versions 5.x.
- A trial license valid for 14 days is available for download from Industry Online Support:
  https://support.industry.siemens.com/cs/document/109749360

You can find more information on the Software Update Service, license types, online software delivery and handling your SW licenses with the Automation License Manager:

http://www.siemens.com/simatic-licenses

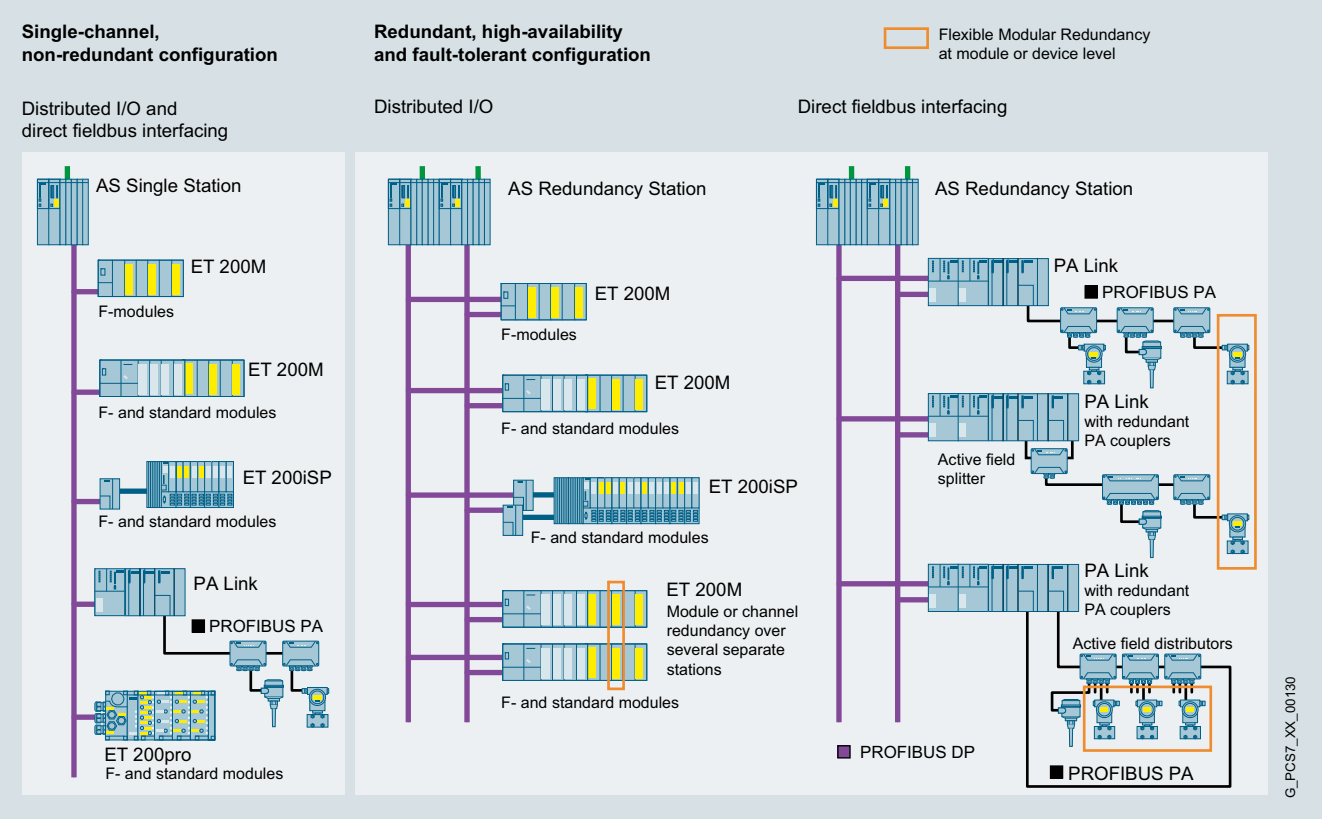
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	Article No.
S7 Distributed Safety V5.4 SP5 update 2 programming tool	
Task: Configuration software for configuring fail-safe user programs for SIMATIC S7-300F, S7-400F, WinAC RTX F, ET 200S, ET 200M, ET 200iSP, ET 200pro, ET 200eco, ET 200SP Requirement: Windows 7 SP1 (64-bit) Windows 10 Professional/Enterprise (64-bit) Windows Server 2008 R2 SP1 (64-bit) Windows Server 2012 R2 (64-bit), Windows Server 2016 (64-bit) STEP 7 from V5.5 SP1 Please also consider the operating systems that have been released for the STEP 7 version used	
Floating license for 1 user, software and documentation on DVD, license key on USB flash drive	**6ES7833-1FC02-0YA5**
Floating license for 1 user, software, documentation and license key for download[1] Email address required for delivery	**6ES7833-1FC02-0YH5**
S7 Distributed Safety upgrade	
From V5.x to V5.4; floating license for 1 user, software and documentation on DVD; license key on USB flash drive	**6ES7833-1FC02-0YE5**

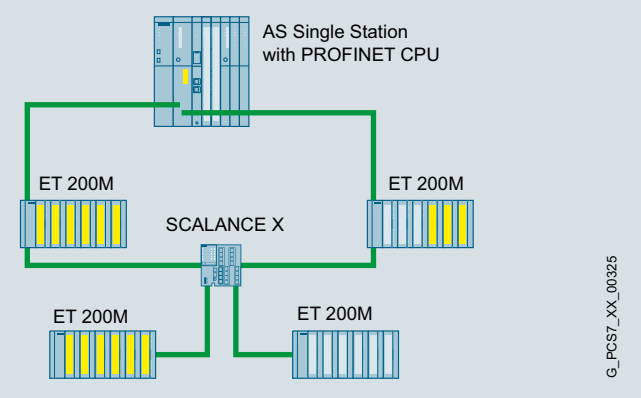
[1] For up-to-date information and download availability, see:
http://www.siemens.com/tia-online-software-delivery

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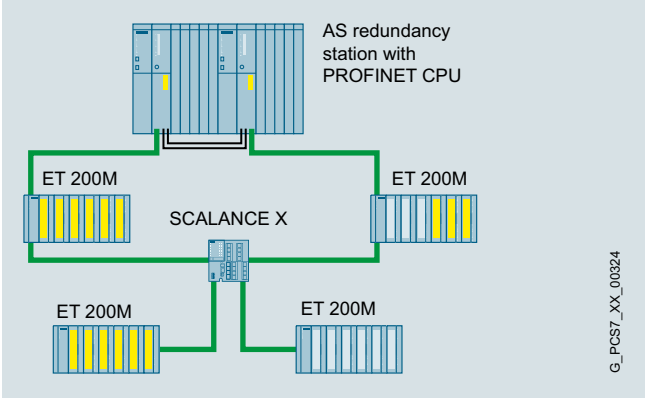
Overview



Common engineering system for basic process control system and safety instrumented system



PCS 7: Safety-related PROFINET IO communication with media redundancy



PCS 7: Safety-related PROFINET IO communication with system redundancy

The process industry frequently features complex technological sequences with high safety demands, and faults and failures in the process automation could have fatal consequences for personnel, machines, plants and the environment. Therefore, functional safety is of particular importance. The safety technology used must reliably detect errors in the process and also its own internal errors, and automatically set the plant/application to a safe state if an error is detected.

S7 F/FH Systems is the comprehensive product spectrum from Siemens for fail-safe, fault-tolerant, and high availability applications in the process industry. This is characterized by:

- Safe PROFIBUS and PROFINET communication
- Safe communication also via PROFIBUS PA with PROFIsafe
- ET 200 distributed I/O systems with safety-related I/O modules

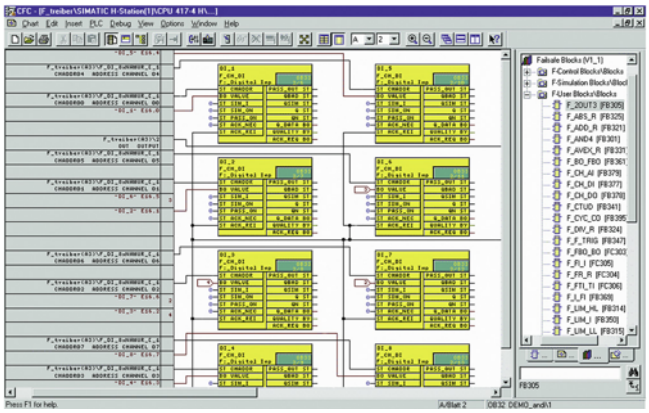
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Overview (continued)

- User-friendly process visualization, including safety-relevant fault messages, via optional operator stations
- Engineering system with SIMATIC S7 F Systems and SIMATIC S7 Safety Matrix software packages
- Safety-related F/FH automation systems of the S7-400 range: The safety-related automation systems of the S7 F/FH System are based on the hardware of CPU 400H, which is extended with the SIMATIC S7 F Systems software package to include safety functions. All F/FH Systems listed are TÜV-certified and comply with the safety requirements up to SIL 3 according to IEC 61508. Two design versions are available:
  - Single-channel (with one CPU, safety-related)
  - High-availability (with redundant CPUs, safety-related and fault-tolerant)

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Overview



The SIMATIC S7 F Systems engineering tool integrated in the SIMATIC Manager can be used to configure an S7 F/FH System. With this tool you can:

- Parameterize CPU and F-signal modules
- Create safety-related applications in the CFC.

Predefined, TÜV-approved blocks are available for this purpose. The safety-related blocks save the user having to perform redundant programming for detecting and reacting to errors.

Licensing

- The engineering software can be installed on multiple computers. The number of existing licenses determines the number of computers on which the software can be used simultaneously (floating license).
- During runtime, each CPU requires its own runtime license.
- An upgrade to version 6.2 is available for users of the previous 6.0/6.1 versions.

You can find more information on the Software Update Service, license types, online software delivery and handling your software licenses with the Automation License Manager here:

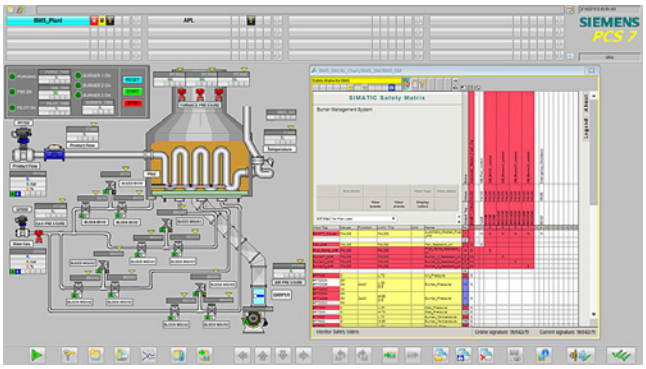
http://www.siemens.com/simatic-licenses

Ordering data

	Article No.
SIMATIC S7 F Systems RT license For processing safety-related application programs, for one AS 412F/FH, AS 414F/FH or AS 417F/FH	**6ES7833-1CC00-6YX0**
SIMATIC S7 F Systems V6.2 Programming and configuration environment for creating and using safety-related STEP 7 programs. 2 languages (English, German), software class A, runs on the engineering station under Windows 7 SP1 64-bit (Professional, Enterprise, Ultimate) or Windows Server 2008 R2 SP1 Standard 64-bit; on operator station additionally under Windows 7 SP1 32-bit (Enterprise, Ultimate), Windows 10 Enterprise 2015 LTSB 64-bit or Windows Server 2012 R2 Standard 64-bit, Floating license for 1 user No SIMATIC PCS 7 Software Media Package	
Type of delivery: Physical delivery License key on USB flash drive and Certificate of License, bundled with 1 × SIMATIC S7 F Systems Software Media Package per order item	**6ES7833-1CC26-0YA5**
Type of delivery: Online delivery License key download and online Certificate of License, combined with SIMATIC S7 F Systems Software Media Package (software download and online Certificate of License) Note: email address required	**6ES7833-1CC26-0YH5**
SIMATIC S7 F Systems V6.2 Upgrade Package For S7 F Systems upgrade from V6.0/V6.1 to V6.2 2 languages (English, German), software class A, runs on the engineering station under Windows 7 SP1 64-bit (Professional, Enterprise, Ultimate) or Windows Server 2008 R2 SP1 Standard 64-bit; on operator station additionally under Windows 7 SP1 32-bit (Enterprise, Ultimate), Windows 10 Enterprise 2015 LTSB 64-bit or Windows Server 2012 R2 Standard 64-bit, Floating license for 1 user No SIMATIC PCS 7 Software Media Package	
Type of delivery: Physical delivery License key on USB flash drive and Certificate of License, bundled with 1 × SIMATIC S7 F Systems Software Media Package per order item	**6ES7833-1CC26-0YE5**
Type of delivery: Online delivery License key download and online Certificate of License, combined with SIMATIC S7 F Systems Software Media Package (software download and online Certificate of License) Note: email address required	**6ES7833-1CC26-0YK5**

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Overview



SIMATIC S7 Safety Matrix, which can be used in addition to SIMATIC S7 F Systems, is an innovative safety lifecycle tool from Siemens that can be used not only for the convenient configuration of safety applications, but also for their operation and service. The tool, which is based on the proven principle of a cause-and-effect matrix, is ideally suited to processes where defined states require specific safety reactions.

SIMATIC S7 Safety Matrix means that programming of the safety logic is not only significantly simpler and more convenient, but also much faster than conventional processes. During the risk analysis of a plant, the configuration engineer can assign precisely defined reactions (effects) to events (causes) which may occur during a process.

Licensing

- The engineering software for the tool and viewer can be installed on multiple computers. The number of existing licenses determines the number of computers on which the software can be used simultaneously (floating license).
- An upgrade to version 6.3 is available for users of the previous 6.x versions.

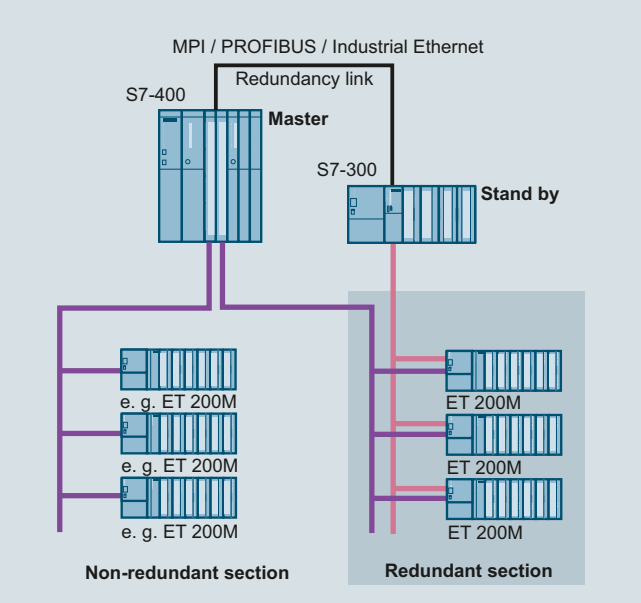
You can find more information on the Software Update Service, license types, online software delivery and handling your software licenses with the Automation License Manager under: www.siemens.com/simatic-licenses

Ordering data

	Article No.
SIMATIC Safety Matrix Tool V6.3 Creation, configuration, compilation, loading and online monitoring of the Safety Matrix in a SIMATIC PCS 7 environment Including SIMATIC Safety Matrix Viewer for SIMATIC PCS 7, for operation and monitoring of the Safety Matrix in a SIMATIC PCS 7 environment with multiple operator control levels Physical delivery License key on USB flash drive and Certificate of License, bundled with 1 × SIMATIC S7 Safety Matrix Software Media Package per order item	
Floating license for 1 installation	**6ES7833-1SM03-0YA5**
Floating license upgrade from V6.x to V6.3	**6ES7833-1SM03-0YE5**
SIMATIC Safety Matrix Viewer V6.3 for SIMATIC PCS 7 Operation and monitoring of the Safety Matrix in the SIMATIC PCS 7 environment with multiple operating levels Physical delivery License key on USB flash drive and Certificate of License, bundled with 1 × SIMATIC S7 Safety Matrix Software Media Package per order item	
Floating license for 1 installation	**6ES7833-1SM63-0YA5**
Floating license upgrade from V6.x to V6.3	**6ES7833-1SM63-0YE5**

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Overview



- Software package for assembling fault-tolerant control systems based on software
- Designed for control systems with single-channel distributed I/O
- For use in applications with low demands on changeover speed, such as the control of hydroelectric power plants, cooling circuits, traffic flows, level control, measured data acquisition
- Inexpensive thanks to the use of standard S7-300 and S7-400 components
- I/O linking with PROFIBUS DP in redundant configuration
- Optional control via WinCC operator station

Technical specifications

Technical specifications	
Hardware requirements	
CPU	S7-300: CPU 313C-2 DP, 314C-2 DP, 315-2 DP, 316-2 DP, 318-2 DP S7-400: all CPUs
Redundancy link of the CPUs	MPI, PROFIBUS, Industrial Ethernet; existing connections can also be used.
Suitable modules for ET 200M	IM 153-2; all DI/O, AI/O for ET 200M; FM 350-1 counter module CP 341
Software requirements	
Configuring/programming	STEP 7 V4.0
Communication configuration for redundant PROFIBUS DP	NCM S7 for PROFIBUS

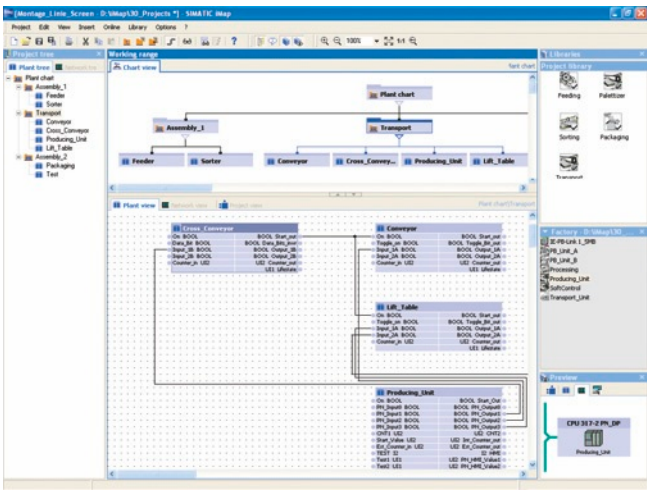
Ordering data

	Article No.
Program package software redundancy V1.2 Task: Configuring a redundant control. Target system: SIMATIC S7-300, S7-400 Requirement: STEP 7 V5.2, NCM S7 for PROFIBUS Delivery package: incl. electronic documentation (English, German, French, Spanish, Italian), 4 application examples and faceplate for WinCC on CD-ROM	
Single license (for 2 CPUs)	**6ES7862-0AC01-0YA0**
Single license, without software and documentation	**6ES7862-0AC01-0YA1**
SIMATIC Manual Collection Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC Distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	**6ES7998-8XC01-8YE0**
SIMATIC Manual Collection update service for 1 year Current "Manual Collection" DVD and the three subsequent updates	**6ES7998-8XC01-8YE2**

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SIMATIC iMap

Overview



- Component-based software tool for configuring the communication in distributed automation solutions
- For easy graphical configuration of the communication between subsystems and machine-to-machine communication in the production line
- Based on the PROFINET standard
- Open for PROFINET devices from various manufacturers on Industrial Ethernet
- Runs under Windows XP Professional and Windows 7 Ultimate/Professional

Licensing

- The engineering software can be installed on multiple computers. The number of existing licenses determines the number of computers on which the software can be used simultaneously (floating license).
- An upgrade to version 3.0 is available for users of previous versions.

You can find more information on the Software Update Service, license types, online software delivery and handling your SW licenses with the Automation License Manager here:

https://www.siemens.com/simatic-licenses

Technical specifications

Engineering Tool	**SIMATIC iMap**
Current version	V3.0
Software class	A
Application areas	
Keyword	SIMATIC iMap is an engineering tool for configuring communication between automation and field devices in distributed automation solutions.
Marketing message	"Time and cost savings in modular machine and plant construction with Component Based Automation." "Modularization and machine-to-machine communication along the production line."
Advantages	• Open component-based engineering tool to the PROFINET standard. • Simple communication between intelligent automation and field devices on PROFIBUS DP and on Ethernet. • Graphical configuration of communication on PROFIBUS DP and on Ethernet • Extremely high reusability of software components (technology modules) • Graphical structuring of the plant using "chart-in-chart" function • Convenient navigation through the project tree • Easy creation and structuring of technology libraries • PROFIBUS and Ethernet in the overview of the network view • Fast start-up thanks to downloading and testing directly on Ethernet (also of PROFIBUS slaves) • Online display of values of the technology modules on the interfaces and in the variable table • Diagnosis of communication in the diagnostics window
Sectors	• Automotive industry (especially in assembly, conveyor systems and in the paint shop) • Complex food and packaging machines • Conveyor systems based on PROFIBUS DP • Production lines with several interlinked machines

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Technical specifications (continued)

Target systems	• SIMATIC S7 CPU 31x-2 PN/DP and SIMATIC S7 CPU 319-3 PN/DP (with integrated PROFINET interface. This can be used as a proxy function for the devices of a complete PROFIBUS segment, one line only) • SIMATIC WinAC PN (can be used as a proxy function for the devices of a complete PROFIBUS segment, one line only) • SIMATIC NET IE/PB Link (can be used as a proxy function for the devices of a complete PROFIBUS segment) • SIMATIC NET CP 343-1 and CP 343-1 Advanced (for connecting SIMATIC S7-300 to Ethernet), CP443-1 Advanced (for connecting SIMATIC S7-400 to Ethernet) • Distributed I/O stations with separate CPU (all intelligent field devices on PROFIBUS such as SIMATIC CPU 313C-2DP, CPU 314C-2DP, CPU 315-2DP, CPU 316-2DP, ET 200 IM 151 CPU, ET 200S BM 147 CPU), • PROFINET CBA OPC Server (for access from PC applications to data in PROFINET devices) • Devices on Industrial Ethernet based on the PROFINET CBA standard • SIMATIC OPs (within the components) • SIMATIC ProTool/Pro, WinCC or any other visualization system with OPC client function
System prerequisites	
Operating system	Windows XP Prof. with Service Pack 2 or Windows 7 Ultimate/Professional; PC administration rights are required for installation
PG/PC hardware	Pentium processor, 1 GHz or higher
Recommended expansion of main memory in PG/PC	RAM: 512 MB or more
Hard disk space required in PG/PC	Approx. 200 MB
Software required	• STEP 7 V5.3 Service Pack 3 or higher • PN OPC Server V6.3 or higher The following software must be installed before iMap (included in the iMap package): • MS Internet Explorer V6.0 Service Pack 1 and higher • Adobe Acrobat Reader V5.0
Type of delivery	
Languages	English, German, French, Italian and Spanish
Single License (SL)	Yes
Upgrade License (UG)	Yes, from V2.0 to V3.0
Paper manuals	Electronically on CD
Authorization/licenses	
Authorization	Yes
Single License (SL)	Yes
Upgrade License (UG)	Yes
Software Update Service	Yes
Unlock Copy License	No

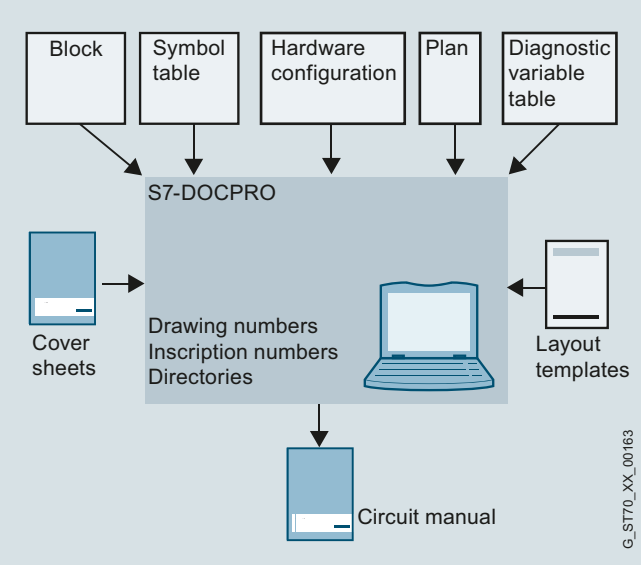
Ordering data

	Article No.
SIMATIC iMap V3.0 Target system: CPU 31x-2 PN/DP, CPU 319-3 PN/DP, SIMATIC WinAC PN, SIMATIC NET IE/PB Link, SIMATIC NET CP 343-1, SIMATIC NET CP 343-1 Advanced, SIMATIC NET CP 443-1 Advanced, distributed I/O devices with own CPU, PROFINET CBA OPC server, devices on Industrial Ethernet based on the PROFINET CBA standard, SIMATIC OPs, SIMATIC ProTool/Pro Requirements: Windows XP Prof. with Service Pack 2 or higher or Windows 7 Ultimate/Professional; on PG or PC with Pentium processor, min. 1 GHz; STEP 7 V5.3 Service Pack 3 or higher, PN OPC Server V6.3 or higher Type of delivery: German, English, with electronic documentation	
Floating license	**6ES7820-0CC04-0YA5**
Upgrade to V3.0, floating license	**6ES7820-0CC04-0YE5**

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DOCPRO

Overview



- For creating and managing plant documentation
- Permits structuring of project data, preparation in the form of wiring manuals, and uniform printouts
- For use in SIMATIC S7-300, S7-400 and C7

Licensing

- SIMATIC S7 DOCPRO is supplied with a floating license. The floating license allows the software to be installed on any number of computers. This means one user can use the software on any computer, or from one specific workstation per license. The number of licenses acquired determines the number of computers on which the software can be used simultaneously.
- A separate S7-DOCPRO update service is available for ordering.
- An upgrade to version 5.4 is available for users of previous versions.

You can find more information on the Software Update Service, license types, online software delivery and handling your SW licenses with the Automation License Manager here:
http://www.siemens.com/simatic-licenses

Technical specifications

Engineering Tool	DOCPRO
License type	Floating license
Software class	A
Current version	V5.4
Target system (recommended)	SIMATIC S7-300/400 SIMATIC C7
Operating system	Windows XP Professional Windows 7 Ultimate/Professional from DOCPRO V5.4 SP1
Required software packages	STEP 7, V5.4 and higher; for operation under Windows 7 STEP 7, V5.5 and higher
Disk space required in PG/PC	5 MB

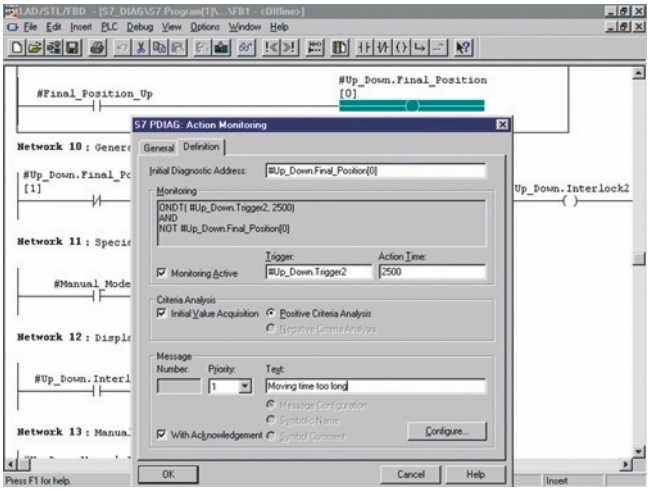
Ordering data

	Article No.
DOCPRO, Version 5.4 Task: Creation of circuit manuals for plant documentation management Target system: SIMATIC S7-300, SIMATIC S7-400, SIMATIC C7 Requirement: from STEP 7 V5.4 Delivery package: on CD; German, English, French, Spanish, Italian; incl. authorization diskette, with electronic documentation	
Floating license	**6ES7803-0CC03-0YA5**
Software Update Service (requires current software version)[1]	**6ES7803-0CA01-0YX2**
Floating license upgrade to V5.4	**6ES7803-0CC03-0YE5**
SIMATIC Manual Collection Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC Distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	**6ES7998-8XC01-8YE0**
SIMATIC Manual Collection update service for 1 year Current "Manual Collection" DVD and the three subsequent updates	**6ES7998-8XC01-8YE2**

[1] For more information on the Software Update Service, see page 11/2.

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Overview



- For configuration of process diagnostics with SIMATIC S7
- Increases the availability of machines and production plants and provides supports with fault analysis and elimination on-site
- For use on the SIMATIC S7-300, S7-400

Licensing

- S7-PDIAG V5.6 is supplied with a floating license. The floating license allows installation of the software on any number of computers. This means one user per license can use the software independently of the computer used and without being tied to a certain workplace. The number of licenses acquired determines the number of computers on which the software can be used simultaneously.
- An upgrade to version 5.6 is offered for users of the previous version 5.3.

You can find more information on the Software Update Service, license types, online software delivery and handling your SW licenses with the Automation License Manager here:

http://www.siemens.com/simatic-licenses

Technical specifications

Engineering Tool	S7-PDIAG
License type	Floating license
Software class	A
Current version	V5.6
Target system (recommended)	SIMATIC S7-300 (CPU 314 or higher) SIMATIC S7-400
Operating system	Windows Server R2 SP1, Windows Server 2012 R2, Windows Server 2016, Windows 7 SP1, Windows 10 Professional, Windows 10 Enterprise
Required software packages	STEP 7 V5.6 or higher
Disk space required in PG/PC	26 MB

Ordering data

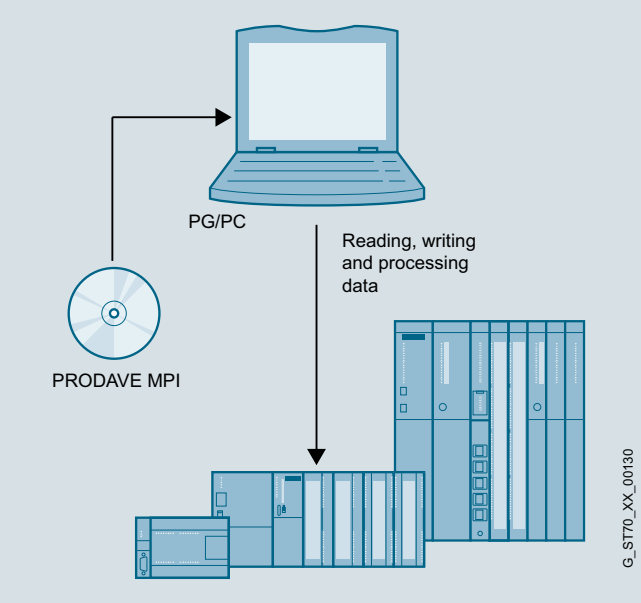
	Article No.
S7-PDIAG, Version 5.6 Task: Configuring of process diagnostics for LAD/FBD/STL Target system: SIMATIC S7-300 (CPU 314 and higher); SIMATIC S7-400 Requirement: From STEP 7 V5.6; under Windows Server R2 SP1, Windows Server 2012 R2, Windows Server 2016, Windows 7 SP1, Windows 10 Professional, Windows 10 Enterprise Form of delivery: on CD; German, English, French, Spanish, Italian; incl. authorization diskette, with electronic documentation	
Floating license	**6ES7840-0CC05-0YA5**
Software Update Service (requires current software version)[1]	**6ES7840-0CA01-0YX2**
Upgrade to V5.6	**6ES7840-0CC05-0YE5**
SIMATIC Manual Collection Electronic manuals on DVD, multi-language: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC Distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	**6ES7998-8XC01-8YE0**
SIMATIC Manual Collection update service for 1 year Current "Manual Collection" DVD and the three subsequent updates	**6ES7998-8XC01-8YE2**

[1] For more information on the Software Update Service, see page 11/2.

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PRODAVE

Overview



- The toolbox for exchange of process data between SIMATIC S7, SIMATIC C7 and a PG/PC
- For autonomous handling of data traffic over MPI/PPI, PROFIBUS and Industrial Ethernet

Licensing

- PRODAVE is supplied with a single license. The single license permits the software to be installed on just one computer.
- It is possible to acquire a single license without software and documentation for installation on more than one computer.

You can find more information on the Software Update Service, license types, online software delivery and handling your SW licenses with the Automation License Manager here:

http://www.siemens.com/simatic-licenses

Technical specifications

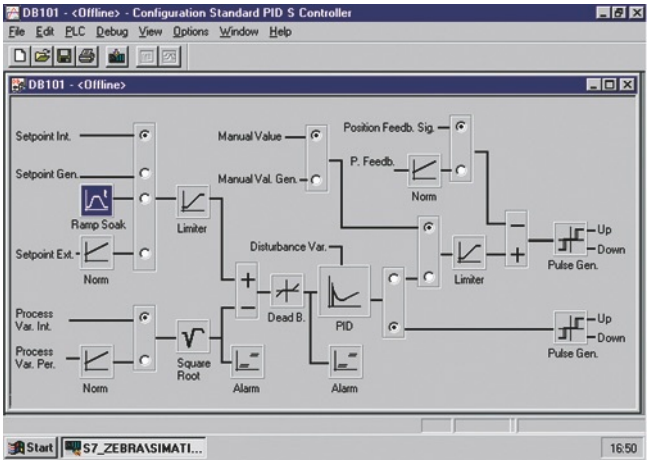
Parameterization software	PRODAVE
License type	Simple license, copy license
Software class	A
Current version	V6.2
Target system	SIMATIC S7-200 SIMATIC S7-300 SIMATIC S7-400 SIMATIC C7
Operating system	Windows XP Professional, Windows 7 Professional and Ultimate (32 and 64-bit in each case)
Required software packages	-
Main memory configuration in target system	8 MB on PG/PC
Disk space required in PG/PC	2 MB
Standard FBs	
Required libraries	-

Ordering data

	Article No.
PRODAVE MPI/IE V6.2 for Windows XP Professional, Windows 7 Professional and Ultimate (32 and 64-bit in each case) Task: Data link between PG/PC and SIMATIC S7/C7 via MPI (S7-200 via PPI) or Industrial Ethernet Requirements: Windows XP Professional, Windows 7 Professional and Ultimate (32 and 64-bit in each case); CP 5611, integrated MPI or PC adapter Delivery package: CD incl. electr. documentation (German, English)	
Single license	**6ES7807-4BA03-0YA0**
Copy license, without software and documentation	**6ES7807-4BA03-0YA1**
PRODAVE MPI Mini V6.0 for Windows 95/98/ME/NT 4.0/ 2000 Prof./XP Prof. Task: Data link between PG/PC and SIMATIC S7/C7 over MPI (S7-200 over PPI); with reduced functional scope Requirement: Windows 95/98/ME/NT 4.0/ 2000 Prof./XP Prof.; CP 5611, integrated MPI or PC adapter Delivery package: CD incl. electr. documentation (German, English)	
Single license	**6ES7807-3BA01-0YA0**
Copy license, without software and documentation	**6ES7807-3BA01-0YA1**
SIMATIC Manual Collection Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC Distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	**6ES7998-8XC01-8YE0**
SIMATIC Manual Collection update service for 1 year Current "Manual Collection" DVD and the three subsequent updates	**6ES7998-8XC01-8YE2**

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Overview



- For integrating continuous PID controllers, pulse controllers and step controllers in the application program
- Reduces engineering costs thanks to time-saving parameterization and optimization of the controller
- For use in SIMATIC S7-300 (CPU 313 or higher), S7-400 and WinAC

Licensing

- The Standard PID Control consists of a parameterization tool (engineering software) and function blocks (runtime software).
- The engineering software can be installed on multiple computers. The number of existing licenses determines the number of computers on which the software can be used simultaneously (floating license).
- Function blocks may be copied as often as required onto any programming devices/PCs. However, one license is always required per CPU on which they are used.

You can find more information on the Software Update Service, license types, online software delivery and handling your SW licenses with the Automation License Manager here:

http://www.siemens.com/simatic-licenses

Technical specifications

Parameterization software	**Standard PID Control**					
License type	Single license					
Software class	A					
Current version	V5.2 SP4					
Target system	SIMATIC S7-300 (CPU 313 or higher) SIMATIC S7-400 SIMATIC C7					
Required software packages	STEP 7 V5.6 or higher					
Main memory configuration in PG/PC	16 MB					
Disk space required in PG/PC	1.85 MB					
Standard function blocks	**PID_CP (FB 1)**		**PID_ES (FB 2)**		**LP_SCHED (FC 1)**	
Storage space requirements • FB length in the memory • DB length in the memory	Load memory 8956 bytes 1168 bytes	Work memory 7796 bytes 510 bytes	Load memory 9104 bytes 1124 bytes	Work memory 7982 bytes 484 bytes	Load memory 1064 bytes 184 bytes[2]	Work memory 976 bytes 100 bytes[2]
Runtimes • In S7-300[1] • In S7-400[1]	 0.18 - 4.4 ms 0.13 - 0.35 ms		 0.2 - 5.1 ms 0.16 - 0.35 ms		 0.03 - 0.3 ms 0.03 - 0.08 ms	
Required libraries	Standard PID Control FBs					
License types	Simple license and 1 runtime license; 1 runtime license					
Software class	A					
Current version	V5.2 SP3					
Target system	SIMATIC S7-300 (CPU 313 or higher) SIMATIC S7-400 SIMATIC C7					
Required software packages	STEP 7 V5.6 or higher					
Main memory configuration in PG/PC	16 MB					
Disk space required in PG/PC	1.85 MB					

1) Depending on the CPU

2) With 5 control loops

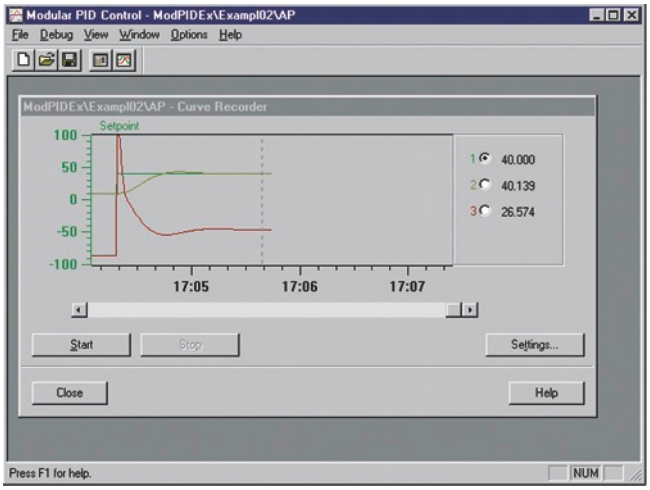
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Ordering data	Article No.
Standard PID Control parameterization tool, V5.2 Task: Parameter assignment tool for standard controllers Requirement: STEP 7 V5.6 or higher Type of delivery: With electronic manual/Getting Started English, German; incl. authorization diskette	
Floating license	**6ES7830-2AA22-0YX0**
Standard function blocks for Standard PID Control, V5.2 Task: Standard FBs for standard controllers Target system: SIMATIC S7-300 (CPU 313 or higher), S7-400 Type of delivery: With electronic manual/Getting Started English, German	
Single license	**6ES7860-2AA21-0YX0**
Single license without software and documentation	**6ES7860-2AA21-0YX1**

	Article No.
SIMATIC Manual Collection Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC Distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	**6ES7998-8XC01-8YE0**
SIMATIC Manual Collection update service for 1 year Current "Manual Collection" DVD and the three subsequent updates	**6ES7998-8XC01-8YE2**

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Overview



- For creating complex closed-loop control structures
- Preferred for implementation in closed-loop control equipment in mid-range and high-end applications and in process engineering
- For use in SIMATIC S7-300 (CPU 313 or higher), S7-400 and WinAC

Licensing

- The Modular PID Control consists of a parameterization tool (engineering software) and function blocks (runtime software).
- The engineering software can be installed on multiple computers. The number of existing licenses determines the number of computers on which the software can be used simultaneously (floating license).
- Function blocks may be copied as often as required onto any programming devices/PCs. However, one license is always required per CPU on which they are used.

You can find more information on the Software Update Service, license types, online software delivery and handling your SW licenses with the Automation License Manager here:

http://www.siemens.com/simatic-licenses

Technical specifications

Parameterization software	Modular PID Control
License type	Single license
Software class	A
Current version	V5.1 SP4
Target system	SIMATIC S7-300 (CPU 313 or higher) SIMATIC S7-400 SIMATIC C7
Required software packages	STEP 7 V5.6 or higher

Parameterization software	Modular PID Control
Main memory configuration in PG/PC	16 MB
Disk space required in PG/PC	1.85 MB
Processor, at least	486
Windows swap area, approx.	20 MB (max. possible)

Standard function blocks	A_DEAD_B		CRP_IN		CPR_OUT	
Storage space requirements	Load memory	Work memory	Load memory	Work memory	Load memory	Work memory
• FB length in the memory	898 bytes	692 bytes	182 bytes	70 bytes	206 bytes	96 bytes
• DB length in the memory	186 bytes	44 bytes	122 bytes	20 bytes	114 bytes	14 bytes
Runtimes in S7-300	0.13 to 0.17 ms		0.06 ms		0.18 to 0.22 ms	
Runtimes in S7-400	0.01 to 0.03 ms		0.01 to 0.02 m		0.01 to 0.04 ms	
Target system	SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC		SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC		SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC	

Standard function blocks	DEAD_T		DEAD_BAND		DIF	
Storage space requirements	Load memory	Work memory	Load memory	Work memory	Load memory	Work memory
• FB length in the memory	532 bytes	394 bytes	232 bytes	120 bytes	410 bytes	268 bytes
• DB length in the memory	142 bytes	22 bytes	114 bytes	16 bytes	158 bytes	30 bytes
Runtimes in S7-300	0.26 to 0.33 ms		0.16 to 0.21 ms		0.55 to 0.71 ms	
Runtimes in S7-400	0.02 to 0.06 m		0.01 to 0.03 ms		0.03 to 0.09 ms	
Target system	SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC		SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC		SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC	

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Technical specifications (continued)

Standard function blocks	**ERR_MON**		**INTEG**		**LAG1ST**	
Storage space requirements	Load memory	Work memory	Load memory	Work memory	Load memory	Work memory
• FB length in the memory	558 bytes	360 bytes	488 bytes	314 bytes	534 bytes	368 bytes
• DB length in the memory	206 bytes	52 bytes	168 bytes	36 bytes	156 bytes	30 bytes
Runtimes in S7-300	0.27 to 0.35 ms		0.40 to 0.51 ms		0.52 to 0.67 ms	
Runtimes in S7-400	0.01 to 0.05 ms		0.02 to 0.07 ms		0.03 to 0.09 ms	
Target system	SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC		SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC		SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC	

Standard function blocks	**LAG2ND**		**LIMALARM**		**LIMITER**	
Storage space requirements	Load memory	Work memory	Load memory	Work memory	Load memory	Work memory
• FB length in the memory	690 bytes	516 bytes	390 bytes	240 bytes	262 bytes	140 bytes
• DB length in the memory	190 bytes	46 bytes	152 bytes	28 bytes	124 bytes	20 bytes
Runtimes in S7-300	0.88 to 1.14 ms		0.47 to 0.61 ms		0.14 to 0.17 ms	
Runtimes in S7-400	0.04 to 0.16 ms		0.02 to 0.07 ms		0.03 to 0.01 ms	
Target system	SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC		SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC		SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC	

Standard function blocks	**LMNGEN_C**		**LMNGEN_S**		**NONLIN**	
Storage space requirements	Load memory	Work memory	Load memory	Work memory	Load memory	Work memory
• FB length in the memory	1576 bytes	1280 bytes	2578 bytes	2152 bytes	826 bytes	672 bytes
• DB length in the memory	276 bytes	80 bytes	360 bytes	110 bytes	138 bytes	18 bytes
Runtimes in S7-300	0.32 to 0.41 ms		1.16 to 1.47 ms		0.32 to 0.41 ms	
Runtimes in S7-400	0.02 to 0.06 ms		0.06 to 0.18 ms		0.02 to 0.07 ms	
Target system	SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC		SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC		SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC	

Standard function blocks	**NORM**		**OVERRIDE**		**PARA_CTL**	
Storage space requirements	Load memory	Work memory	Load memory	Work memory	Load memory	Work memory
• FB length in the memory	234 bytes	122 bytes	362 bytes	214 bytes	406 bytes	232 bytes
• DB length in the memory	130 bytes	24 bytes	146 bytes	28 bytes	234 bytes	82 bytes
Runtimes in S7-300	0.33 to 0.43 ms		0.15 to 0.18 ms		0.12 to 0.15 ms	
Runtimes in S7-400	0.02 to 0.07 ms		0.01 to 0.04 ms		0.01 to 0.03 ms	
Target system	SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC		SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC		SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC	

Standard function blocks	**PID**		**PULSEGEN**		**RMP_SOAK**	
Storage space requirements	Load memory	Work memory	Load memory	Work memory	Load memory	Work memory
• FB length in the memory	1560 bytes	1242 bytes	1110 bytes	872 bytes	1706 bytes	1500 bytes
• DB length in the memory	340 bytes	98 bytes	190 bytes	34 bytes	212 bytes	62 bytes
Runtimes in S7-300	1.15 to 1.46 ms		0.17 to 0.20 ms		0.16 to 0.20 ms	
Runtimes in S7-400	0.06 to 0.18 ms		0.01 to 0.05 ms		0.01 to 0.04 ms	
Target system	SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC		SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC		SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC	

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Technical specifications (continued)

Standard function blocks	ROC_LIM		SCALE		SP_GEN	
Storage space requirements	Load memory	Work memory	Load memory	Work memory	Load memory	Work memory
• FB length in the memory	1242 bytes	980 bytes	136 bytes	32 bytes	658 bytes	484 bytes
• DB length in the memory	222 bytes	50 bytes	114 bytes	16 bytes	164 bytes	40 bytes
Runtimes in S7-300	0.53 to 0.68 ms		0.10 to 0.13 ms		0.27 to 0.35 ms	
Runtimes in S7-400	0.02 to 0.09 ms		0.01 to 0.02 ms		0.02 to 0.06 ms	
Target system	SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC		SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC		SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC	

Standard function blocks	SPLT_RAN		SWITCH		LP_SCHED	
Storage space requirements	Load memory	Work memory	Load memory	Work memory	Load memory	Work memory
• FB length in the memory	304 bytes	180 bytes	238 bytes	116 bytes	1104 bytes	972 bytes[1)]
• DB length in the memory	138 bytes	28 bytes	118 bytes	18 bytes	234 bytes	64 bytes[1)]
Runtimes in S7-300	0.09 to 0.11 ms		0.07 to 0.09 ms		0.28 to 0.34 ms	
Runtimes in S7-400	0.01 to 0.02 ms		0.01 to 0.03 ms		0.03 to 0.08 ms	
Target system	SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC		SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC		SIMATIC S7-300 (CPU 313 and higher), S7-400, WinAC	

[1)] With 5 control loops

Standard FBs in general	
Required libraries	Modular PID Control FBs
License types	Simple license and 1 runtime license; 1 runtime license
Software class	A
Current version	V5.1 SP3
Required software packages	STEP 7 V5.6 or higher
Main memory configuration in PG/PC	16 MB
Disk space required in PG/PC	1.85 MB

Ordering data

	Article No.
Modular PID Control commissioning tool, V5.1 for SIMATIC S7 and WinAC Task: Commissioning tool for modular PID controllers Requirement: STEP 7 V5.6 or higher Type of delivery: With electronic manual, English, German; incl. authorization diskette	
Floating license	**6ES7830-1AA11-0YX0**
Standard function blocks for Modular PID Control, V5.1 Task: Standard FBs for modular PID controllers Target system: SIMATIC S7-300 (CPU 313 or higher), S7-400, WinAC Type of delivery: English, German; with electronic manual	
Single license	**6ES7860-1AA10-0YX0**
Single license, without software and documentation	**6ES7860-1AA10-0YX1**

	Article No.
SIMATIC Manual Collection Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC Distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	**6ES7998-8XC01-8YE0**
SIMATIC Manual Collection update service for 1 year Current "Manual Collection" DVD and the three subsequent updates	**6ES7998-8XC01-8YE2**

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Overview

- PID Self-Tuner: For expanding existing PID controllers to create self-tuning PI or PID controllers.
- Optimization of PI or PID controllers with 3-step action (HEATING – OFF – COOLING)
- Convenient online initial setting and online adaptation during operation
- Ideally applicable to temperature controllers, but also suitable for level and flow controllers
- Can be used with SIMATIC S7-300 (CPU 313 or higher), SIMATIC S7-400 and WinAC; in combination with PID control (integrated in STEP 7), Standard PID Control, Modular PID Control, FM 355, FM 455 as well as with any PID algorithm

Licensing

- The PID Self-Tuner complements the Standard PID Control or Modular PID Control software packages.
- Function blocks may be copied as often as required onto any programming devices/PCs. However, one license is always required for each CPU on which they are used.

You can find more information on the Software Update Service, license types, online software delivery and handling your SW licenses with the Automation License Manager here:

http://www.siemens.com/simatic-licenses

Technical specifications

Parameterization software	**PID Self-Tuner**			
License type	-			
Software class	-			
Current version	-			
Target system	-			
Operating system	-			
Required software packages	-			
Main memory configuration in PG/PC	-			
Disk space required in PG/PC	-			
Standard FBs	**-**			
PID Self-Tuner	**TUN_EC**		**TUN_ES**	
Storage space requirements • FB length in the memory • DB length in the memory	Load memory approx. 6542 bytes 644 bytes	Work memory approx. 5956 bytes 294 bytes	Load memory 6332 bytes 638 bytes	Work memory 5714 bytes 288 bytes
Runtimes • In S7-300 • In S7-400	 1.0 ms to 1.5 ms [1] 0.06 ms to 0.19 ms [1]		 1.0 ms to 1.5 ms [1] 0.06 ms to 0.19 ms [1]	
Required libraries	PID Self-Tuner FBs V5.1			
License types	-			
Software class	A			
Current version	V5.1 SP3			
Target system	SIMATIC S7-300 (CPU 313 or higher) SIMATIC S7-400 SIMATIC C7-620			
Required software packages	STEP 7 V5.6 or higher			
Main memory configuration in PG/PC	-			
Disk space required in PG/PC	-			

[1] Depending on the CPU selected

Ordering data

	Article No.
PID Self-Tuner V5.1 Task: Online tuning for PID controller Target system: SIMATIC S7-300 (CPU 313 or higher), S7-400, WinAC Type of delivery: Standard function blocks, electronic manual and Getting Started English/German	
Single license	**6ES7860-4AA01-0YX0**
Single license, without software and documentation	**6ES7860-4AA01-0YX1**

	Article No.
SIMATIC Manual Collection Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC Distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	**6ES7998-8XC01-8YE0**
SIMATIC Manual Collection update service for 1 year Current "Manual Collection" DVD and the three subsequent updates	**6ES7998-8XC01-8YE2**

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Overview

- Option package for creating motion control applications for CPU 31xT and CPU 317TF
- Optimal embedding in the automation world thanks to total integration in the STEP 7 tools
- Programming in the standard SIMATIC programming languages LAD, FBD and STL
- Additional Engineering Tools such as S7-SCL or S7-GRAPH can be used

Licensing

- The engineering software can be installed on multiple computers. The number of existing licenses determines the number of computers on which the software can be used simultaneously (floating license).

You can find more information on the Software Update Service, license types, online software delivery and handling your SW licenses with the Automation License Manager here:

http://www.siemens.com/simatic-licenses

Ordering data

	Article No.
S7 Technology V4.2	
Task: Option package for configuring and programming technology tasks with SIMATIC S7 CPU 31xT and SIMATIC S7 CPU 317TF Requirement: STEP 7 V5.6 and higher Type of delivery: on DVD Incl. documentation for CPU 31xT, CPU 317TF (included on DVD)	
Floating license	**6ES7864-1CC42-0YA5**
Floating license for 1 user, license key download without software or documentation[1]; email address required for delivery	**6ES7864-1CC42-0XH5**

[1] For up-to-date information and download availability, see: http://www.siemens.com/tia-online-software-delivery

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Easy Motion Control

Overview



- Low-priced package for simple, controlled positioning and simple geared synchronous motion
- For use with any standard variable-speed drive, such as frequency converter or servo drive
- For incremental and absolute encoders

Licensing

- The engineering interface for STEP 7 up to V5.5 is included in Easy Motion Control V2.1 and can be installed without license.
- The function blocks of Easy Motion Control require one runtime license for each CPU onto which they are loaded. Easy Motion Control V2.1 includes a runtime single license; other licenses can be ordered separately.

You can find more information on the Software Update Service, license types, online software delivery and handling your SW licenses with the Automation License Manager here:

http://www.siemens.com/simatic-licenses

Note of product versions

Easy Motion Control is an option for STEP 7 V5.x or STEP 7 Professional 2010/17 for controllers of the SIMATIC S7-300/S7-400 series and WinAC. When you use STEP 7 (TIA Portal) to program these controllers, you require the optional package Easy Motion Control (TIA Portal)

Technical specifications

Supported hardware:

Easy Motion Control is runnable on the following CPUs:

- S7-300.
- S7-400.
- WinAC.
- ET 200S.
- ET 200pro.

Supported modules for the measuring of actual values:

- CPU 314C (FW version 2.0 of the CPU or higher).
- ET 200S 1 Count 5V/500 kHz.
- ET 200S 1 Count 24V/100kHz.
- ET 200S 1SSI.
- SM 338.
- FM 350-1, FM 450-1.
- SIMODRIVE sensor with PROFIBUS DP.
- IM 174.
- Other modules for measuring actual values (using free driver).

Supported modules for setpoint output:

- ET 200S 2AO U
- SM 332
- SM 432
- IM 174
- Other modules for setpoint output (using free driver).

Supported drives using PROFIBUS DP:

- Micromaster 4
- SINAMICS G120
- SINAMICS S120

Storage space requirements

Required main storage in byte		
Block	Required main storage per block	Additional main storage required per instance
MC_Init	1086	-
MC_MoveAbsolute	3924	112
MC_MoveRelative	2982	110
MC_MoveJog	3110	110
MC_Home	2886	104
MC_StopMotion	1114	70
MC_Control	1756	58
MC_Simulation	410	64
MC_GearIn	3476	128
Input driver	1416 ... 2654	76 ... 128
Output driver	384 ... 1242	52 ... 68
Axis data block	-	294

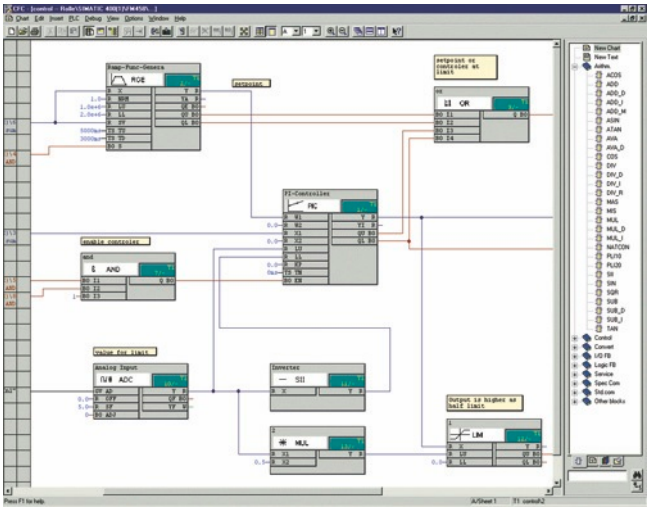
Ordering data

	Article No.
Easy Motion Control V2.1 Requirement: STEP 7 V5.3 SP2 up to V5.5 Type of delivery: Software and documentation in 2 languages (English, German) on CD and CoL for one runtime single license	**6ES7864-0AC01-0YX0**
Easy Motion Control Runtime License Type of delivery: CoL for one runtime single license (valid for Easy Motion Control V2.x and V11 or higher), without software or documentation	**6ES7864-0AF01-0YX0**

[1] For up-to-date information and download availability, see: http://www.siemens.com/tia-online-software-delivery

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Overview



- Optional package for STEP 7 V5.6 for configuring closed-loop control and automation tasks with SIMATIC TDC, FM 458-1 DP and T400
- Extensive block library
- Generation of user libraries in ANSI C with D7-FB-GEN function block generator

Licensing

- D7-SYS is delivered with a floating license. The floating license allows installation of the software on any number of computers. This means one user per license can use the software independently of the computer used or from a specific workstation. The number of existing licenses determines the number of computers on which the software can be used simultaneously.
- An upgrade to version 9.0 is available for users of the previous 8.x version.
- A separate update service can be purchased for D7-SYS.
- As of version 8.1, the D7-FB-GEN block generator that was previously sold separately is included in the D7-SYS scope of supply.

You can find more information on the Software Update Service, license types, online software delivery and handling your SW licenses with the Automation License Manager:

http://www.siemens.com/simatic-licenses

Ordering data

	Article No.
SIMATIC D7-SYS V9.0 Reference hardware: SIMATIC TDC, FM 458-1 DP, T400 Requirement: MS Windows 7 Professional with SP1 (64-bit) (English language version only) MS Windows 7 Ultimate and Enterprise with SP1 (64-bit) MS Windows 10 Pro and Enterprise (64-bit) MS Windows Server 2008 R2 Standard Edition with SP1 (64-bit) MS Windows Server 2012 R2 Standard Edition (64-bit) MS Windows Server 2016 Standard Edition (64-bit) STEP 7 V5.6 Type of delivery: On DVD, en, de, with electronic documentation	
Floating license	**6ES7852-0CC06-0YA5**
Upgrade license from V8.x to V9.0	**6ES7852-0CC06-0YE5**
Software Update Service[1)]	**6ES7852-0CC01-0YL5**
SIMATIC Manual Collection Electronic manuals on DVD, multi-language: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC Distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	**6ES7998-8XC01-8YE0**
SIMATIC Manual Collection update service for 1 year Current "Manual Collection" DVD and the three subsequent updates	**6ES7998-8XC01-8YE2**

[1)] For more information on the Software Update Service, see page 11/2.

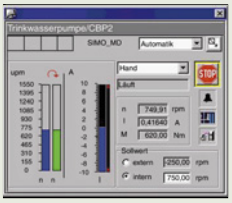
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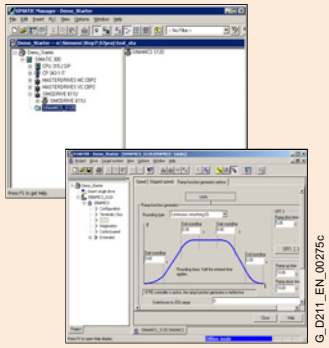
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Drive ES engineering software

Overview

SIMATIC Programs	Configuration / Commissioning
Drive ES PCS 7	Drive ES Basic Maintenance





G_D211_EN_00275c

Drive ES is the engineering system used to integrate the communication, configuration and data management functions of Siemens drive technology into the SIMATIC automation world easily, efficiently and cost-effectively.

The following software packages are available for selection:

- Drive ES Basic Maintenance
- Drive ES PCS 7

Drive ES (**D**rive **E**ngineering **S**oftware) fully integrates drives from Siemens into the world of Totally Integrated Automation.

Ordering data

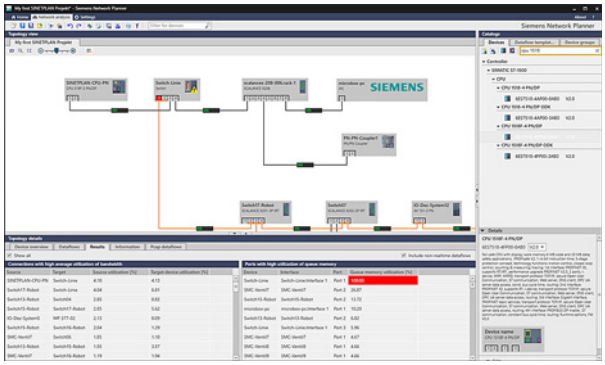
	Article No.
Drive ES Basic Maintenance V5.6 SPx *)	
Configuration software for the integration of drives into TIA (Totally Integrated Automation)	
Requirement: STEP 7 V5.4 SP4 or higher	
Type of delivery: DVD-ROM	
Languages: en, de, fr, it, es	
With electronic documentation	
• Floating license, 1 user	**6SW1700-5JA00-6AA0**
Drive ES PCS 7 V8.2 SPx *)	
Block library for PCS 7 for the integration of drives in Classic Style (as predecessor)	
Requirement: PCS 7 V8.2 and higher	
Type of delivery: CD-ROM	
Languages: en, de, fr, it, es	
With electronic documentation	
• Single-user license incl. 1 runtime license	**6SW1700-8JD00-2AA0**
• Runtime license (without data storage medium)	**6SW1700-5JD00-1AC0**
• Update service for single-user license	**6SW1700-0JD00-0AB2**
• Upgrade from V6.x/V7.x/V8.x to V8.2 SPx *)	**6SW1700-8JD00-2AA4**
Drive ES PCS 7 APL V8.2 SPx *)	
Block library for PCS 7 for the integration of drives in APL Style (Advanced Process Library)	
Requirement: PCS 7 V8.2 and higher	
Type of delivery: CD-ROM	
Languages: en, de, fr, it, es	
With electronic documentation	
• Single-user license incl. 1 runtime license	**6SW1700-8JD01-2AA0**
• Runtime license (without data storage medium)	**6SW1700-5JD00-1AC0**
• Update service for single-user license	**6SW1700-0JD01-0AB2**
• Upgrade of APL V8.x to V8.2 SPx *) or Drive ES PCS 7 V6.x, V7.x, V8.x classic to Drive ES PCS 7 APL V8.2 SPx *)	**6SW1700-8JD01-2AA4**

	Article No.
Drive ES PCS 7 V9.0 SPx *)	
Block library for PCS 7 for the integration of drives in Classic Style (as predecessor)	
Requirement: PCS 7 V9.0 or higher	
Type of delivery: CD-ROM	
Languages: en, de, fr, it, es	
With electronic documentation	
• Single-user license incl. 1 runtime license	**6SW1700-1JD00-0AA0**
• Runtime license (without data storage medium)	**6SW1700-5JD00-1AC0**
• Update service for single-user license	**6SW1700-0JD00-0AB2**
• Upgrade from V6.x/V7.x/V8.x/V9.x to V9.0 SPx *)	**6SW1700-1JD00-0AA4**
Drive ES PCS 7 APL V9.0 SPx *)	
Block library for PCS 7 for the integration of drives in APL Style (Advanced Process Library)	
Requirement: PCS 7 V9.0 or higher	
Type of delivery: CD-ROM	
Languages: en, de, fr, it, es	
With electronic documentation	
• Single-user license incl. 1 runtime license	**6SW1700-1JD01-0AA0**
• Runtime license (without data storage medium)	**6SW1700-5JD00-1AC0**
• Update service for single-user license	**6SW1700-0JD01-0AB2**
• Upgrade of APL V8.x, V9.x to V9.0 SPx *) or Drive ES PCS 7 V6.x, V7.x, V8.x, V9.x classic to Drive ES PCS 7 APL V9.0 SPx *)	**6SW1700-1JD01-0AA4**

*) Orders are automatically supplied with the latest Service Pack (SP).

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Overview



SINETPLAN topology view

The SINETPLAN Siemens Network Planner

- supports planners of automation systems based on PROFINET and
- facilitates the professional and proactive simulation of a plant/system network.

Licenses

- The engineering software can be installed on multiple computers. The number of existing licenses determines the number of computers on which the software can be used simultaneously (floating license).

You can find more information on the Software Update Service, license types, online software delivery and handling your SW licenses with the Automation License Manager:

http://www.siemens.com/simatic-licenses

Technical specifications

SINETPLAN V2.0 can be used on the following operating systems (64-bit each):

- Microsoft Windows 7 Professional SP1
- Microsoft Windows 7 Enterprise SP1
- Microsoft Windows 7 Ultimate SP1
- Microsoft Windows 10 Home Version 1809
- Microsoft Windows 10 Pro Version 1809
- Microsoft Windows 10 Enterprise Version 1809

Ordering data

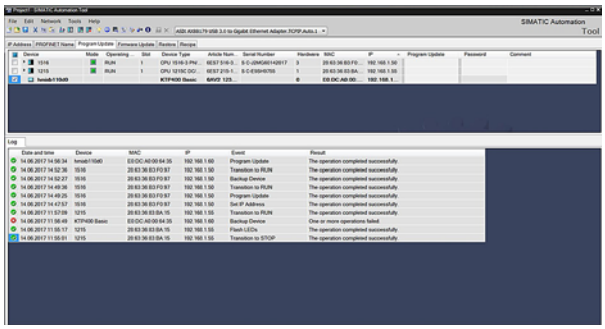
	Article No.
Siemens Network Planner SINETPLAN V2.0	
Software for simulating PROFINET networks; 3 languages de/en/zh, executable under Windows 7 and Windows 10 (64-bit each)	
• Floating license; software and documentation on DVD, license key on USB flash drive	**6ES7853-0AA01-0YA5**
• Floating license; software download incl. license key[1] Email address required for the delivery	**6ES7853-0AE01-0YA5**
Siemens Network Planner SINETPLAN Upgrade V2.0	
Software for simulating PROFINET networks; upgrade from V1.x to V2.0; 3 languages de/en/zh, executable under Windows 7 and Windows 10 (64-bit each)	
• Floating license; software and documentation on DVD, license key on USB flash drive	**6ES7853-0AA01-0YE5**
• Floating license; software download incl. license key[1] Email address required for the delivery	**6ES7853-0AE01-0YE5**

[1] For up-to-date information and download availability, see: https://support.industry.siemens.com/cs/ww/en/view/109763136

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SIMATIC Automation Tool

Overview



- To support commissioning and service activities independent of the engineering framework
- For configuration, operation, maintenance and documentation of automation networks
- Rapid overview of the status of the SIMATIC automation system
- Time savings thanks to parallel operations (license required)
- Optimum upgrade support for the devices used and their versions through the display of article numbers, firmware versions and HW versions
- Simple traceability of performed operations and resulting changes in the system through the optional, automatic storage of event log entries in a file
- Automated processes for optimum API-based workflows (license required)

Supported products:

- SIMATIC ET 200
  - ET 200AL IM
  - ET 200AL SM and IO-Link
  - ET 200eco
  - ET 200M IM
  - ET 200MP IM
  - ET 200S IM
  - ET 200pro IM
  - ET 200pro IO-Link and RFID
  - ET 200SP CPU
  - ET 200SP IM and server modules
  - ET 200SP SM, ASi, CM, CP, TM, IO-Link, motor starters
- SIMATIC S7-1200
  - S7-1200 CPU
  - S7-1200 SM and CM
- SIMATIC S7-1500
  - S7-1500 CPU
  - S7-1500 SM and other modules
- SIMATIC HMI
  - HMI Basic 2nd Generation
  - HMI Comfort
  - HMI Mobile
- SITOP power supplies
- RFID and MOBY
- SCALANCE

Licenses

- The software can be installed on multiple computers. The number of existing licenses determines the number of computers on which the software can be used simultaneously (floating license).

You can find more information on the Software Update Service, license types, online software delivery and handling your SW licenses with the Automation License Manager here:

http://www.siemens.com/simatic-licenses

Technical specifications

The SIMATIC Automation Tool V3.1 can be used on the following operating systems (64-bit only):

- Windows 7 Home Premium SP1
- Windows 7 Professional SP1
- Windows 7 Enterprise SP1
- Windows 7 Ultimate SP1
- Windows 10 Home
- Windows 10 Pro
- Windows 10 Enterprise
- Windows 10 IoT Enterprise

Ordering data

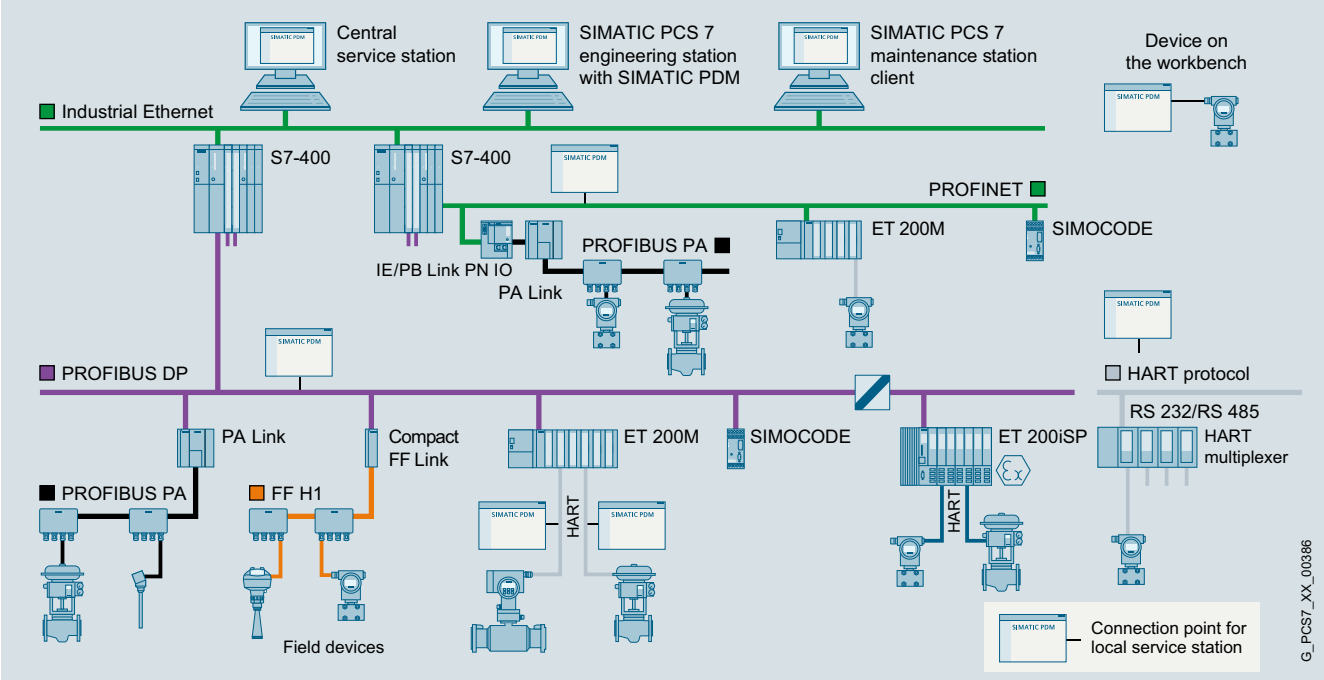
	Article No.
SIMATIC Automation Tool V3.1 Commissioning and service software for machines and plants; 6 languages: en, de, fr, es, it, zh; runs under Windows 7 and Windows 10 (64-bit) Floating license; software download incl. license key[1]; Email address required for delivery	**6ES7853-1AE03-0YA5**
SIMATIC Automation Tool SDK V3.1 API software and documentation for creating customer applications for commissioning and servicing machines and plants; 6 languages: en, de, fr, es, it, zh; runs under Windows 7 and Windows 10 (64-bit) Software download incl. license key[1] Email address required for delivery	**6ES7853-1AE03-0AG8**

[1] For up-to-date information and download availability, see: https://support.industry.siemens.com/cs/ww/en/view/98161300

11

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Overview



Configuration options with SIMATIC PDM

SIMATIC PDM (Process Device Manager) is a universal, vendor-independent tool for the configuration, parameter assignment, commissioning, diagnostics and servicing of intelligent field devices (sensors and actuators) and field components (remote I/Os, multiplexers, control-room devices, compact controllers), which in the following sections will be referred to simply as devices.

With *one* software product, SIMATIC PDM enables users to work with over 4 000 devices and device variants of Siemens and over 200 other manufacturers worldwide on a *single* homogeneous user interface.

The user interface satisfies the requirements of the VDI/VDE GMA 2187 and IEC 65/349/CD directives. Parameters and functions for all supported devices are displayed in a consistent and uniform fashion independent of their communications interface. Even complex devices with several hundred parameters can be represented clearly and processed quickly. Using SIMATIC PDM it is very easy to navigate in highly complex stations such as remote I/Os and even connected field devices.

From the viewpoint of device integration, SIMATIC PDM is the most powerful open process device manager on the global market. Devices not previously supported can be integrated in SIMATIC PDM by importing their device description packages (either EDD or FDI). This provides security for your investment and saves you investment costs, training expenses and follow-up costs.

SIMATIC PDM supports the operative system management in particular through:

- Uniform presentation and operation of devices
- Uniform representation of diagnostics information
- Indicators for preventive maintenance and servicing
- Detection of changes in the project and device
- Increasing the operational reliability
- Reducing the investment, operating and maintenance costs
- Quantity options for
  - Transfer of parameters between devices
  - Transfer of parameter sets to the devices
  - Export and import functions
  - Diagnostics update

SIMATIC PDM can be used extremely flexibly and tailored to a specific task for field device service:

- Single-point station for point-to-point connection to field devices
- Local service and parameter assignment station with connection to fieldbus segments
- Central service and parameter assignment station with connection to plant bus
- Central HART service and parameter assignment station for HART multiplexers and WirelessHART field devices
- Integrated into the stand-alone SIMATIC PDM Maintenance Station
- Integrated into the SIMATIC PCS 7 process control system

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Overview (continued)

Maintenance personnel can assign field device parameters at mobile and stationary workstations with SIMATIC PDM. Practically every workstation integrated in the production plant can be used for configuration. Service personnel are thus able to work directly at the location of the field device, while data is stored centrally in the engineering station or maintenance station. This leads to a significant shortening of maintenance and travel times. Additional device-independent system functions support higher-level maintenance stations for creating progress lists for work and servicing.

When a maintenance station is configured in the SIMATIC PCS 7 process control system, SIMATIC PDM is integrated into it and transmits parameter data, diagnostic information and processing information. You can switch directly to the SIMATIC PDM views from the diagnostics faceplates in the maintenance station to perform diagnostics and work on the device in more detail.

A SIMATIC PDM user administration system based on SIMATIC Logon is used to assign various roles with defined function privileges to users. These function privileges refer to SIMATIC PDM system functions, e.g. writing to the device.

For all devices integrated with device description packages, SIMATIC PDM provides a range of information for display and further processing on the maintenance station, for example:

- Device type information (electronic rating plate)
- Detailed diagnostics information (manufacturer information, information on error diagnostics and troubleshooting, further documentation)
- Results of internal condition monitoring functions
- Status information (for example local configuration changes), device test completed
- Information on changes (audit trail report)
- Parameter information

Technical specifications

SIMATIC PDM V9.1	
Hardware	• PG/PC/notebook with processor corresponding to operating system requirements
Operating system (alternatives)	• Windows 7 Professional/Ultimate/ Enterprise SP1, 32-bit/64-bit • Windows 10 Enterprise 2015 LTSB 64-bit • Windows Server 2012 R2 SP1 Standard Edition, 64-bit
Integration in STEP 7/PCS 7	• SIMATIC PCS 7 V8.0+SP2/V8.1/V8.2 (without Communication FOUNDATION Fieldbus) • SIMATIC PCS 7 V9.0 • STEP 7 V5.5+SP4/V5.6
SIMATIC PDM Client	• Microsoft Internet Explorer 10 or 11 • Google Chrome

Ordering data

	Article No.
SIMATIC PDM Stand alone product packages	
Minimum configuration	
SIMATIC PDM Single Point V9.1 including 1 TAG; product package for operation and configuration of one field device; communication via PROFIBUS DP/PA, HART (modem, RS 232, PROFIBUS/PROFINET), Modbus, Ethernet or PROFINET	
Additional functions or SIMATIC PDM TAGs are not possible	
6 languages (English, German, French, Italian, Spanish, Chinese), software class A, runs with Windows 7 Ultimate 64-bit, Windows 10 Enterprise 2015 LTSB 64-bit or Windows Server 2012 R2 Standard 64-bit (see SIMATIC PDM V9.1 Readme for latest information), floating license for 1 user	
Without SIMATIC PCS 7 Software Media Package	
• Physical delivery License key on USB flash drive and certificate of license, bundled with 1 × SIMATIC PDM Software Media Package per order item	**6ES7658-3HA68-0YA5**
• Online delivery License key download and online certificate of license combined with SIMATIC PDM Software Media Package (SIMATIC PDM and device library software download) Note: Email address required!	**6ES7658-3HA68-0YH5**
Basic configuration for individual product package as well as local service and parameter assignment stations	
SIMATIC PDM Basic V9.1 including 4 TAGs; product package for operation and configuration of field devices and components; communication via PROFIBUS DP/PA, HART (modem, RS 232, PROFIBUS/PROFINET), Modbus, Ethernet or PROFINET	
6 languages (English, German, French, Italian, Spanish, Chinese), software class A, runs with Windows 7 Ultimate 64-bit, Windows 10 Enterprise 2015 LTSB 64-bit or Windows Server 2012 R2 Standard 64-bit (see SIMATIC PDM V9.1 Readme for latest information), floating license for 1 user	
Without SIMATIC PCS 7 Software Media Package	
• Physical delivery License key on USB flash drive and certificate of license, bundled with 1 × SIMATIC PDM Software Media Package per order item	**6ES7658-3AB68-0YA5**
• Online delivery License key download and online certificate of license combined with SIMATIC PDM Software Media Package (SIMATIC PDM and device library software download) Note: Email address required!	**6ES7658-3AB68-0YH5**

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Ordering data	Article No.
Configuration for local service and parameter assignment station	
SIMATIC PDM Service V9.1 Product package for service and measuring circuit tests on a local service station, with • SIMATIC PDM Basic incl. 4 TAGs • 50 TAGs 6 languages (English, German, French, Italian, Spanish, Chinese), software class A, runs with Windows 7 Ultimate 64-bit, Windows 10 Enterprise 2015 LTSB 64-bit or Windows Server 2012 R2 Standard 64-bit (see SIMATIC PDM V9.1 Readme for latest information), floating license for 1 user Without SIMATIC PCS 7 Software Media Package	
• Physical delivery License key on USB flash drive and certificate of license, bundled with 1 × SIMATIC PDM Software Media Package per order item	**6ES7658-3JD68-0YA5**
• Online delivery License key download and online certificate of license combined with SIMATIC PDM Software Media Package (SIMATIC PDM and device library software download) Note: Email address required!	**6ES7658-3JD68-0YH5**
Configuration for central service and parameter assignment station	
SIMATIC PDM stand-alone server V9.1 Product package for service and device management in plant units, with • SIMATIC PDM Basic incl. 4 TAGs • SIMATIC PDM Extended • SIMATIC PDM Server • 2 × SIMATIC PDM 1 Client • 100 TAGs 6 languages (English, German, French, Italian, Spanish, Chinese), software class A, runs with Windows 7 Ultimate 64-bit, Windows 10 Enterprise 2015 LTSB 64-bit or Windows Server 2012 R2 Standard 64-bit (see SIMATIC PDM V9.1 Readme for latest information), single license for 1 installation Without SIMATIC PCS 7 Software Media Package	
• Physical delivery License key on USB flash drive and certificate of license, bundled with 1 × SIMATIC PDM Software Media Package per order item	**6ES7658-3TX68-0YA5**
• Online delivery License key download and online certificate of license combined with SIMATIC PDM Software Media Package (SIMATIC PDM and device library software download) Note: Email address required!	**6ES7658-3TX68-0YH5**

	Article No.
SIMATIC PDM system-integrated product packages	
Configuration for local SIMATIC S7 engineering and service station	
SIMATIC PDM S7 V9.1 Product package for use in a SIMATIC S7 configuration environment, with • SIMATIC PDM Basic incl. 4 TAGs • SIMATIC PDM Extended • SIMATIC PDM Integration in STEP 7/PCS 7 • 100 TAGs 6 languages (English, German, French, Italian, Spanish, Chinese), software class A, runs with Windows 7 Ultimate 64-bit, Windows 10 Enterprise 2015 LTSB 64-bit or Windows Server 2012 R2 Standard 64-bit (see SIMATIC PDM V9.1 Readme for latest information), floating license for 1 user Without SIMATIC PCS 7 Software Media Package	
• Physical delivery License key on USB flash drive and certificate of license, bundled with 1 × SIMATIC PDM Software Media Package per order item	**6ES7658-3KD68-0YA5**
• Online delivery License key download and online certificate of license combined with SIMATIC PDM Software Media Package (SIMATIC PDM and device library software download) Note: Email address required!	**6ES7658-3KD68-0YH5**
Configuration for central SIMATIC PCS 7 engineering and service stations	
SIMATIC PDM PCS 7 V9.1 Product package for use in a SIMATIC PCS 7 configuration environment 6 languages (English, German, French, Italian, Spanish, Chinese), software class A, runs with Windows 7 Ultimate 64-bit, Windows 10 Enterprise 2015 LTSB 64-bit or Windows Server 2012 R2 Standard 64-bit (see SIMATIC PDM V9.1 Readme for latest information) Floating license for 1 user, with • SIMATIC PDM Basic incl. 4 TAGs • SIMATIC PDM Extended • SIMATIC PDM Integration in STEP 7/PCS 7 • SIMATIC PDM Routing • 100 TAGs Without SIMATIC PCS 7 Software Media Package	
• Physical delivery License key on USB flash drive and certificate of license, bundled with 1 × SIMATIC PDM Software Media Package per order item	**6ES7658-3LD68-0YA5**
• Online delivery License key download and online certificate of license combined with SIMATIC PDM Software Media Package (SIMATIC PDM and device library software download) Note: Email address required!	**6ES7658-3LD68-0YH5**

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SIMATIC PDM

Ordering data	Article No.
SIMATIC PDM PCS 7-FF V9.1 Product package for use in a SIMATIC PCS 7 configuration environment, including FOUNDATION Fieldbus H1 communication	
6 languages (English, German, French, Italian, Spanish, Chinese), software class A, runs with Windows 7 Ultimate 64-bit, Windows 10 Enterprise 2015 LTSB 64-bit or Windows Server 2012 R2 Standard 64-bit (see SIMATIC PDM V9.1 Readme for latest information)	
Floating license for 1 user, with • SIMATIC PDM Basic incl. 4 TAGs • SIMATIC PDM Extended • SIMATIC PDM Integration in STEP 7/PCS 7 • SIMATIC PDM Routing • SIMATIC PDM Communication FOUNDATION Fieldbus • 100 TAGs	
Without SIMATIC PCS 7 Software Media Package	
• Physical delivery License key on USB flash drive and certificate of license, bundled with 1 × SIMATIC PDM Software Media Package per order item	**6ES7658-3MD68-0YA5**
• Online delivery License key download and online certificate of license combined with SIMATIC PDM Software Media Package (SIMATIC PDM and device library software download) Note: Email address required!	**6ES7658-3MD68-0YH5**
SIMATIC PDM PCS 7 Server V9.1 Product package for use in a SIMATIC PCS 7 configuration environment, including server functionality	
6 languages (English, German, French, Italian, Spanish, Chinese), software class A, runs with Windows 7 Ultimate 64-bit, Windows 10 Enterprise 2015 LTSB 64-bit or Windows Server 2012 R2 Standard 64-bit (see SIMATIC PDM V9.1 Readme for latest information)	
Single license for 1 installation, with • SIMATIC PDM Basic incl. 4 TAGs • SIMATIC PDM Extended • SIMATIC PDM Integration in STEP 7/PCS 7 • SIMATIC PDM Routing • SIMATIC PDM Server • 100 TAGs	
Without SIMATIC PCS 7 Software Media Package	
• Physical delivery License key on USB flash drive and certificate of license, bundled with 1 × SIMATIC PDM Software Media Package per order item	**6ES7658-3TD68-0YA5**
• Online delivery License key download and online certificate of license combined with SIMATIC PDM Software Media Package (SIMATIC PDM and device library software download) Note: Email address required!	**6ES7658-3TD68-0YH5**

Optional product components for SIMATIC PDM	Article No.
SIMATIC PDM Extended V9.1 For enabling additional system functions	
6 languages (English, German, French, Italian, Spanish, Chinese), software class A, runs with Windows 7 Ultimate 64-bit, Windows 10 Enterprise 2015 LTSB 64-bit or Windows Server 2012 R2 Standard 64-bit (see SIMATIC PDM V9.1 Readme for latest information), floating license for 1 user	
Without SIMATIC PCS 7/SIMATIC PDM Software Media Package	
• Physical delivery License key on USB flash drive and certificate of license	**6ES7658-3NX68-2YB5**
• Online delivery (without SIMATIC PCS 7/SIMATIC PDM Software Media Package) License key download and online certificate of license Note: Email address required!	**6ES7658-3NX68-2YH5**
SIMATIC PDM Integration in STEP 7/SIMATIC PCS 7 V9.1 For integration in a SIMATIC S7/ SIMATIC PCS 7 configuration environment	
6 languages (English, German, French, Italian, Spanish, Chinese), software class A, runs with Windows 7 Ultimate 64-bit, Windows 10 Enterprise 2015 LTSB 64-bit or Windows Server 2012 R2 Standard 64-bit (see SIMATIC PDM V9.1 Readme for latest information), floating license for 1 user	
Without SIMATIC PCS 7/SIMATIC PDM Software Media Package	
• Physical delivery License key on USB flash drive and certificate of license	**6ES7658-3BX68-2YB5**
• Online delivery License key download and online certificate of license Note: Email address required!	**6ES7658-3BX68-2YH5**
SIMATIC PDM Routing V9.1 For plant-wide navigation to field devices	
6 languages (English, German, French, Italian, Spanish, Chinese), software class A, runs with Windows 7 Ultimate 64-bit, Windows 10 Enterprise 2015 LTSB 64-bit or Windows Server 2012 R2 Standard 64-bit (see SIMATIC PDM V9.1 Readme for latest information), floating license for 1 user	
Without SIMATIC PCS 7/SIMATIC PDM Software Media Package	
• Physical delivery License key on USB flash drive and certificate of license	**6ES7658-3CX68-2YB5**
• Online delivery License key download, online certificate of license Note: Email address required!	**6ES7658-3CX68-2YH5**

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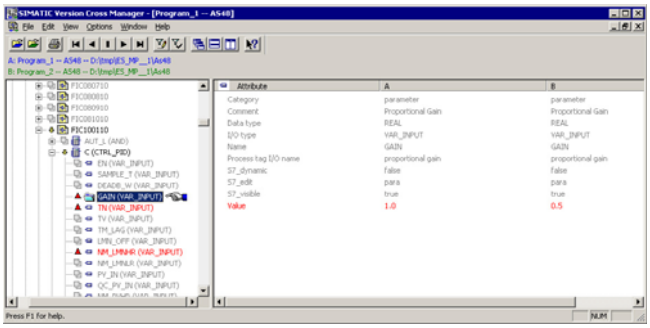
Ordering data	Article No.
SIMATIC PDM Server V9.1 For activating the server functionality	
6 languages (English, German, French, Italian, Spanish, Chinese), software class A, runs with Windows 7 Ultimate 64-bit, Windows 10 Enterprise 2015 LTSB 64-bit or Windows Server 2012 R2 Standard 64-bit (see SIMATIC PDM V9.1 Readme for latest information), single license for 1 installation	
Without SIMATIC PCS 7/SIMATIC PDM Software Media Package	
• Physical delivery License key on USB flash drive, certificate of license	**6ES7658-3TX68-2YB5**
• Online delivery License key download and online certificate of license Note: Email address required!	**6ES7658-3TX68-2YH5**
SIMATIC PDM Communication FOUNDATION Fieldbus V9.1 For communication with field devices on FOUNDATION Fieldbus H1	
6 languages (English, German, French, Italian, Spanish, Chinese), software class A, runs with Windows 7 Ultimate 64-bit, Windows 10 Enterprise 2015 LTSB 64-bit or Windows Server 2012 R2 Standard 64-bit (see SIMATIC PDM V9.1 Readme for latest information), floating license for 1 user	
Without SIMATIC PCS 7/SIMATIC PDM Software Media Package	
• Physical delivery License key on USB flash drive and certificate of license	**6ES7658-3QX68-2YB5**
• Online delivery License key download and online certificate of license Note: Email address required!	**6ES7658-3QX68-2YH5**
SIMATIC PDM HART Server V9.1 For using HART multiplexers as well as for configuration of wireless HART field devices	
6 languages (English, German, French, Italian, Spanish, Chinese), software class A, runs with Windows 7 Ultimate 64-bit, Windows 10 Enterprise 2015 LTSB 64-bit or Windows Server 2012 R2 Standard 64-bit (see SIMATIC PDM V9.1 Readme for latest information), floating license for 1 user	
Without SIMATIC PCS 7/SIMATIC PDM Software Media Package	
• Physical delivery License key on USB flash drive and certificate of license	**6ES7658-3EX68-2YB5**
• Online delivery License key download and online certificate of license Note: Email address required!	**6ES7658-3EX68-2YH5**

	Article No.
SIMATIC PDM 1 Client Cumulative client license for SIMATIC PDM configurations with SIMATIC PDM Server, software class A, single license for 1 installation	
• Physical delivery License key on USB flash drive and certificate of license	**6ES7658-3UA00-2YB5**
• Online delivery License key download and online certificate of license Note: Email address required!	**6ES7658-3UA00-2YH5**
SIMATIC PDM TAGs TAG licenses for expanding the available TAG volume, cumulative, software class A, floating license for 1 user	
• Physical delivery License key on USB flash drive and certificate of license	
- 10 TAGs	**6ES7658-3XC00-2YB5**
- 100 TAGs	**6ES7658-3XD00-2YB5**
- 1 000 TAGs	**6ES7658-3XE00-2YB5**
• Online delivery License key download and online certificate of license Note: Email address required!	
- 10 TAGs	**6ES7658-3XC00-2YH5**
- 100 TAGs	**6ES7658-3XD00-2YH5**
- 1 000 TAGs	**6ES7658-3XE00-2YH5**
SIMATIC PDM Software Media Package	
SIMATIC PDM Software Media Package V9.1 Installation software without license, 6 languages (English, German, French, Italian, Spanish, Chinese), software class A, runs with Windows 7 Ultimate 64-bit, Windows 10 Enterprise 2015 LTSB 64-bit or Windows Server 2012 R2 Standard 64-bit (see SIMATIC PDM V9.1 Readme for latest information)	
Without SIMATIC PCS 7 Software Media Package	
Note: Can only be used in conjunction with a valid license or in demo mode!	
• Physical delivery SIMATIC PDM and device library software on DVD	**6ES7658-3GX68-0YT8**
• Online delivery SIMATIC PDM and device library software download Note: Email address required!	**6ES7658-3GX68-0YG8**

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SIMATIC Version Cross Manager

Overview



The SIMATIC Version Cross Manager is a user-friendly tool for determining the differences between various versions of individual projects or multi-projects by:

- Tracing missing, additional or differing objects by comparing hardware configuration, communication, plant hierarchy, CFC/SFC plans, SFC details, block types, messages, global tags, signals and run sequences
- Graphic display of comparison results in a combination of tree and tabular formats
- Clear hierarchical structuring according to the technological hierarchy of the plant
- Color-coded identification of the differences

Note:

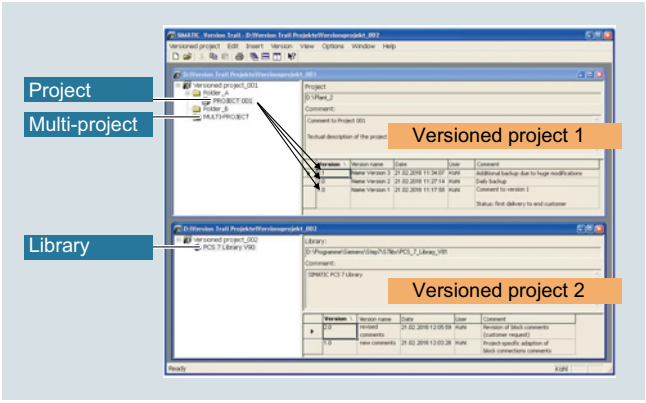
As the function "Control module adjustment" is based on a basic functionality of the Version Cross Manager (VXM), you need a VXM license to use this function. In the absence of a license, a message appears telling you to install Version Cross Manager. This is not actually necessary, all you need to install is a valid VXM license that will enable the relevant functionality on the engineering station.

Ordering data

	Article No.
SIMATIC Version Cross Manager V9.0 6 languages (English, German, French, Italian, Spanish, Chinese), software class A Runs with the following operating systems (see VXM Readme in the Siemens Industry Online Support for latest information) • Windows 7 Ultimate 64-bit • Windows 10 Enterprise 2015 LTSB 64-bit • Windows Server 2012 R2 Standard edition 64-bit • Windows Server 2016 Standard edition 64-bit Floating license for 1 user, without SIMATIC PCS 7 Software Media Package	
• Physical delivery License key on USB flash drive and certificate of license and TIA Engineering Toolset CD	**6ES7658-1CX58-2YA5**
• Online delivery License key download, online certificate of license and TIA Engineering Toolset (software download) Note: Email address required!	**6ES7658-1CX58-2YH5**
Upgrade package (only for TIA applications)	
SIMATIC Version Cross Manager upgrade from V7.1/V8.2 to V9.0 6 languages (English, German, French, Italian, Spanish, Chinese), software class A, for operating systems see above Floating license for 1 user, without SIMATIC PCS 7 Software Media Package	
• Physical delivery License key on USB flash drive, certificate of license and TIA Engineering Toolset CD	**6ES7658-1CX58-2YE5**
• Online delivery License key download, online certificate of license and TIA Engineering Toolset (software download) Note: Email address required!	**6ES7658-1CX58-2YK5**

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Overview



SIMATIC Version Trail is a software option for engineering which, together with the SIMATIC Logon central user administration, can assign a version history to libraries, projects and multi-projects.

Ordering data

	Article No.
SIMATIC Version Trail V9.0 6 languages (English, German, French, Italian, Spanish, Chinese), software class A	
Runs with the following operating systems (see VT Readme in the Siemens Industry Online Support for latest information) • Windows 7 Ultimate 64-bit • Windows 10 Enterprise 2015 LTSB 64-bit • Windows Server 2012 R2 Standard Edition 64-bit • Windows Server 2016 Standard Edition 64-bit	
Floating license for 1 user, without SIMATIC PCS 7 Software Media Package	
• Physical delivery License key on USB flash drive, certificate of license and TIA Engineering Toolset CD	**6ES7658-1FX58-2YA5**
• Online delivery License key download, online certificate of license and TIA Engineering Toolset (software download) Note: Email address required!	**6ES7658-1FX58-2YH5**
Upgrade package (only for TIA applications)	
SIMATIC Version Trail upgrade from V8.x to V9.0 6 languages (English, German, French, Italian, Spanish, Chinese), software class A, for operating systems see above	
Floating license for 1 user, without SIMATIC PCS 7 Software Media Package	
• Physical delivery License key on USB flash drive, certificate of license	**6ES7658-1FX58-2YE5**
• Online delivery License key download, online certificate of license and TIA Engineering Toolset (software download) Note: Email address required!	**6ES7658-1FX58-2YK5**

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Notes

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12/2 **Programming devices**
12/2 Field PG M6
12/7 Accessories
12/7 External prommer
12/8 Communications software
12/8 SOFTNET for PROFIBUS
12/10 SOFTNET for Industrial Ethernet

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Overview



- The mobile, industry-standard programming device for automation engineers with a powerful, eighth-generation Intel® Core™ i processor (Coffee Lake) and high-speed RAM (DDR4 RAM)
- Elegant, robust enclosure made of light-weight stable injection-molded magnesium with rubber-protected corners and retractable carry-handle
- Can optimally be used both for engineering in the office and for the commissioning, service or maintenance of automation systems
- Industrial notebook with all commonly used interfaces for industrial applications
- Can be used immediately thanks to pre-installed SIMATIC engineering software

Technical specifications

Article number	**6ES7718-.....-0...** SIMATIC Field PG M6
General information	
Design of the programming device	Notebook
Display	
Design of display	15.6" full HD display in 16:9 format
Resolution (pixels)	
• Horizontal image resolution	1 920 Pixel
• Vertical image resolution	1 080 Pixel
General features	
• Non-reflecting	Yes
• Luminance	300 cd/m²
Backlighting	
• Type of backlighting	LED
Control elements	
Keyboard fonts	
• Design	QWERTZ/QWERTY or AZERTY (French); 87 keys
Touch operation	
• Integrated touch pad	Yes; Clickpad
Supply voltage	
Design of the power supply	External wide-range power supply; 3-pole
permissible range, lower limit (AC)	100 V; ±10 %, sinusoidal
permissible range, upper limit (AC)	240 V; ±10 %, sinusoidal
Line frequency	
• permissible range, lower limit	47 Hz
• permissible range, upper limit	63 Hz
Processor	
Processor type	Intel Core i5-8400H (2.5 to 4.2 GHz, 4 cores and hyper-threading, 8 MB Smart Cache) or i7-8850H (2.6 to 4.3 GHz 6 cores and hyper-threading, 9 MB Smart Cache)
Chipset	Intel CM246
Hyper-threading	Yes
Turbo Boost Technology 2.0	Yes
Graphic	
Graphics controller	Intel® UHD Graphics 630
Drives	
SSD	Yes; Easy to replace
• Memory capacity	256 Gbyte; Up to 2 TB SSD
TPM Security Chip	Yes; 2.0 (version for China without TPM)
Memory	
Type of memory	DDR4-SDRAM SO-DIMM
Work memory	
• Number of slots	2; Can be equipped with 1x 8 GB, 1x 16 GB or 2x 16 GB
Accumulator	
Replaceable	Yes; Lithium-ion battery
Capacity	8.25 A·h

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Technical specifications (continued)

Article number	**6ES7718-.....-0...** SIMATIC Field PG M6
Interfaces	
PROFIBUS/MPI	1x PROFIBUS DP / MPI; 9-pin Sub-D socket; 9.6 kBaud to 12 MBaud
Number of RS 232 interfaces	1; 25-pin socket
Number of USB interfaces	4
• Type A	3; 1x USB port incl. integrated charging function for USB devices (e.g. smartphone) – also with device switched off
• Type C	1; USB 3.1 Gen. 2
Number of chip-card readers	1; Smart Card Reader (ISO/IEC 7816)
Bluetooth radio standard	Yes; V5.0
Multimedia card/SD card slot	2 in 1 (SDHC UHS-II, MMC)
Card reader for SIMATIC memory cards	SIMATIC memory cards (for S7-300/400), SMC (for S7-1x00), SIMATIC micro memory card (for S7-300/C7/ET 200) - including programming interfaces
Universal Audio Jack	Yes; Audio socket for 3.5 mm jack
Video interfaces	
• analog video signal (VGA)	Yes; via adapter from DVI to VGA
• DVI-I	Yes; 1x
• DisplayPort	Yes; 1x
Industrial Ethernet	
• Industrial Ethernet interface	2x Ethernet (RJ45)
- 100 Mbps	Yes
- 1000 Mbps	Yes; Gigabit Ethernet; 2x RJ45 with 2 independent MAC/IP addresses
• Wake on LAN	Yes
• IAMT (Intel Active Management Technology)	Yes
WLAN	
• Type	802.11ac
Integrated Functions	
Monitoring functions	
• Status LEDs	Battery status, device status, access to HDD/DVD, access to SD/MMC, MPI/DP, S5 and S7 modules / Card Reader (except Smart Card Reader), Num Lock, Caps Lock, WLAN active
EMC	
Interference immunity against discharge of static electricity	
• Interference immunity against discharge of static electricity acc. to IEC 61000-4-2	Yes; ±4 kV contact discharge acc. to IEC 61000-4-2, ESD; ±8 kV air discharge acc. to IEC 61000-4-2, ESD
Interference immunity to cable-borne interference	
• Interference immunity on supply cables	±2 kV (according to IEC 61000-4-4, burst); ±1 kV (according to IEC 61000-4-5, surge pulse/line to line); ±2 kV (according to IEC 61000-4-5, surge pulse/line to ground)
• Interference immunity on signal cables	±1 kV (according to IEC 61000-4-4, burst, length < 30 m); ±2 kV (according to IEC 61000-4-4, burst, length > 30 m); ±2 kV (according to IEC 61000-4-5, surge sym./line to ground, length > 30 m)
Standards, approvals, certificates	
CE mark	Yes
CSA approval	Yes
UL approval	Yes
DIN/ISO 9001	Yes

Article number	**6ES7718-.....-0...** SIMATIC Field PG M6
Ambient conditions	
Ambient temperature during operation	
• min.	5 °C; Max. 10 °C/h (no condensation)
• max.	40 °C; Max. 10 °C/h (no condensation)
Ambient temperature during storage/transportation	
• min.	-20 °C; Max. 20 °C/h (no condensation)
• max.	60 °C; Max. 20 °C/h (no condensation)
Relative humidity	
• Operation, min.	5 %; At 30 °C/h (no condensation); Tested according to IEC 60068-2-78, IEC 60068-2-30, IEC 60068-2-14
• Operation, max.	85 %; At 30 °C/h (no condensation); Tested according to IEC 60068-2-78, IEC 60068-2-30, IEC 60068-2-14
Vibrations	
• Operation, tested according to IEC 60068-2-6	Yes
Shock testing	
• tested according to IEC 60068-2-27	Yes
Operating systems	
Additional info on operating system	Multi-Language User Interface (MUI): 6 languages (English, German, French, Spanish, Italian, Chinese)
pre-installed operating system	
• Windows 10	Yes; Windows 10 Enterprise 64-bit
Software	
Preinstalled	
• STEP 7 Professional (TIA Portal)	Yes; Software version: V15.1
• STEP 7	Yes; Professional 2017 SR1
• WinCC flexible Advanced 2008	Yes; Software version: SP5
• WinCC Advanced (TIA Portal)	Yes; Software version: V15.1
• STEP 5	Yes; Optional; software version: STEP 5 V7.23 HF2 (incl. GRAPH 5/II V7.15)
Mechanics/material	
Material of housing	metal
Handle	Yes; retractable
Socket for Kensington lock	Yes
rubber corner guards	Yes
Dimensions	
Width	385 mm
Height	53 mm
Depth	275 mm
Weights	
Weight, approx.	3.4 kg; incl. rechargeable battery
Scope of supply	
Accumulator	Yes
Power supply	Yes
Backpack	Yes
SIMATIC Software	Yes
Recovery media	Yes; Restore & Recovery

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Ordering data

	Article No.
Field PG M6 Comfort programming device	**6ES7718- 0 ■ ■ 0 ■ - 0 ■ ■ 0**
Intel i5-8400H processor (8 MB Smart Cache, 2.5 to 4.2 GHz, 4 cores + Hyper-Threading), 15.6" display, full HD (1920x1080), DVD+-RW drive, UHD graphics 630, WLAN 802.11ac, Bluetooth v5.0; without SIMATIC S5 interface, without SIMATIC S5 EPROMMER	
RAM	
• 1 x 8 GB DDR4 SDRAM SO-DIMM	**A**
• 1 x 16 GB DDR4 SDRAM SO-DIMM	**B**
• 2 x 16 GB DDR4 SDRAM SO-DIMM	**C**
Hard disk	
• 256 GB SSD SATA	**A**
• 512 GB SSD SATA	**B**
• 2 TB SSD SATA	**C**
Keyboard and power cable (essential)	
• Keyboard: QWERTY (& German); power supply cable: Germany, France, the Netherlands, Spain, Belgium, Austria, Sweden, Finland	**0**
• Keyboard: AZERTY (France); power supply cable: Germany, France, the Netherlands, Spain, Belgium, Austria, Sweden, Finland	**1**
• Keyboard: QWERTY (& German); power supply cable: Italy	**2**
• Keyboard: QWERTY (& German); power supply cable: Switzerland	**3**
• Keyboard: QWERTY (& German); power supply cable: USA	**4**
• Keyboard: QWERTY (& German); power supply cable: United Kingdom	**5**
• Keyboard: QWERTY (& German); power supply cable: China; approval for China (CCC)	**6**
• Keyboard: QWERTY (& German); without power supply cable	**7**

	Article No.
Field PG M6 Comfort programming device (cont.)	**6ES7718- 0 ■ ■ 0 ■ - 0 ■ ■ 0**
Operating system	
• Windows 10 Enterprise, 64-bit	**A**
SIMATIC software licenses	
• Trial license: STEP 7 Professional Combo (STEP 7 Prof. V15.1 and STEP 7 Prof. 2017 SR1), WinCC Advanced Combo (WinCC V15.1 and WinCC flexible 2008 SP8), Safety Advanced Combo (Safety Adv. V15.1 and Distributed Safety V5.4 SP5)	**A**
• License: STEP 7 & WinCC & Safety in the TIA Portal: STEP 7 Prof. V15.1, WinCC Adv. V15.1, Safety Advanced V15.1	**B**
• License: STEP 7 & WinCC & Safety Combo: STEP 7 Professional Combo (STEP 7 Prof. V15.1 and STEP 7 Prof. 2017 SR1), WinCC Advanced Combo (WinCC V15.1 and WinCC flexible 2008 SP8), Safety Advanced Combo (Safety Adv. V15.1 and Distributed Safety V5.4 SP5)	**C**

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Ordering data

	Article No.
Field PG M6 Advanced programming device	**6ES7718- 1 ■ ■ ■ ■ - 0 ■ ■ 0**
Intel i7-8850H processor (9 MB Smart Cache, 2.6 to 4.3 GHz, 6 cores + Hyper-Threading), 15.6" display, full HD (1920x1080), DVD+-RW drive, UHD graphics 630, WLAN 802.11ac, Bluetooth v5.0;	
RAM	
• 1 x 8 GB DDR4 SDRAM SO-DIMM	**A**
• 1 x 16 GB DDR4 SDRAM SO-DIMM	**B**
• 2 x 16 GB DDR4 SDRAM SO-DIMM	**C**
Hard disk	
• 256 GB HDD SATA	**A**
• 512 GB SSD SATA	**B**
• 2 TB SSD SATA	**C**
SIMATIC S5 interface	
• Without S5 interface, without S5 EPROMMER	**0**
• With S5 interface, with S5 EPROMMER; incl. STEP 5 license, S5 PLC cable and EPROM adapter	**1**
Keyboard and power cable (essential)	
• Keyboard: QWERTY (& German); power supply cable: Germany, France, the Netherlands, Spain, Belgium, Austria, Sweden, Finland	**0**
• Keyboard: AZERTY (France); power supply cable: Germany, France, the Netherlands, Spain, Belgium, Austria, Sweden, Finland	**1**
• Keyboard: QWERTY (& German); power supply cable: Italy	**2**
• Keyboard: QWERTY (& German); power supply cable: Switzerland	**3**
• Keyboard: QWERTY (& German); power supply cable: USA	**4**
• Keyboard: QWERTY (& German); power supply cable: United Kingdom	**5**
• Keyboard: QWERTY (& German); power supply cable: China; approval for China (CCC)	**6**
• Keyboard: QWERTY (& German); without power supply cable	**7**

	Article No.
Field PG M6 Advanced programming device (cont.)	**6ES7718- 1 ■ ■ ■ ■ - 0 ■ ■ 0**
Operating system	
• Windows 10 Enterprise, 64-bit	**A**
SIMATIC Software licenses	
• Trial license: STEP 7 Professional Combo (STEP 7 Prof. V15.1 and STEP 7 Prof. 2017 SR1), WinCC Advanced Combo (WinCC V15.1 and WinCC flexible 2008 SP8), Safety Advanced Combo (Safety Adv. V15.1 and Distributed Safety V5.4 SP5)	**A**
• License: STEP 7 & WinCC & Safety in the TIA Portal: STEP 7 Prof. V15.1, WinCC Adv. V15.1, Safety Advanced V15.1	**B**
• License: STEP 7 & WinCC & Safety Combo: STEP 7 Professional Combo (STEP 7 Prof. V15.1 and STEP 7 Prof. 2017 SR1), WinCC Advanced Combo (WinCC V15.1 and WinCC flexible 2008 SP8), Safety Advanced Combo (Safety Adv. V15.1 and Distributed Safety V5.4 SP5)	**C**

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Ordering data	Article No.
Accessories	
Memory expansion	
8 GB RAM	**6ES7648-3AK00-0PA0**
16 GB RAM	**6ES7648-3AK10-0PA0**
AC/DC external power supply unit For Field PG M6 only; spare part, included in the scope of supply of the Field PG M6	**6ES7798-0GA05-0XA0**
Power cord (length 3 m) For Field PG M2/M4/M5/M6 only	
For Germany, France, the Netherlands, Spain, Belgium, Austria, Sweden, Finland	**6ES7900-5AA00-0XA0**
For Great Britain	**6ES7900-5BA00-0XA0**
For Switzerland	**6ES7900-5CA00-0XA0**
For USA	**6ES7900-5DA00-0XA0**
For Italy	**6ES7900-5EA00-0XA0**
For China	**6ES7900-5FA00-0XA0**
Spare battery (lithium ion, 8.25 Ah)[1] For Field PG M6 only; spare part, included in the scope of supply of the Field PG M6	**6ES7798-0AA10-0XA0**
MPI cable For connecting a PG and SIMATIC S7 via MPI; 5 m	**6ES7901-0BF00-0AA0**
S5 EPROM programming adapter For SIMATIC S5 EPROM programming using the Field PG	**6ES7798-0CA00-0XA0**
S5 connection cable For connecting programming devices to SIMATIC S5 PLCs, 5 m	**6ES5734-2BF00**
Replaceable SSD kit	
Replaceable SSD 512 GB serial ATA; with protective pocket and torx screwdriver; for Field PG M5/M6	**6ES7791-2BA22-0AA0**
Replaceable SSD 2 TB serial ATA; with protective pocket and torx screwdriver; for Field PG M6	**6ES7791-2BA25-0AA0**

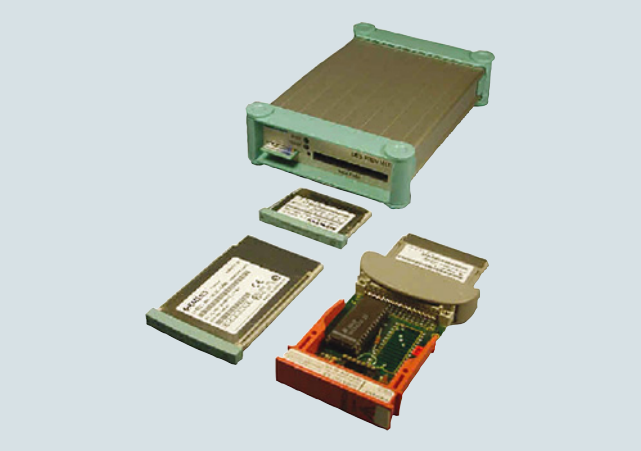
	Article No.
Adapter serial ATA to USB 3.0 For using the removable hard disk in the hard disk kit as an external hard disk (only for Field PG M4/M5/M6)	**6ES7790-1AA01-0AA0**
Backpack for Field PG M4/M5/M6	**6ES7798-0DA02-0XA0**
SIMATIC IPC Image & Partition Creator V3.5 Software tool for very easy preventive data backup and efficient partition management on SIMATIC IPCs	**6ES7648-6AA03-5YA0**
SIMATIC IPC Remote Manager V1.3 Software tool for efficient remote maintenance and management of a SIMATIC IPC	**6ES7648-6EA01-3YA0**
Software Update Service (Standard Edition)[2] The delivery is implemented according to the number of ordered SUS products (e.g. 10 upgrade packages with 10 DVDs, 10 USB flash drives, etc.)	
• STEP 7 Professional V1x	**6ES7822-1AA00-0YL5**
• STEP 7 Professional Combo (STEP 7 Prof. V1x (TIA Portal) and STEP 7 Prof.)	**6ES7810-5CC04-0YE2**
• SIMATIC WinCC Advanced	**6AV6613-0AA00-0AL0**
• SIMATIC STEP 7 Safety Advanced	**6ES7833-1FC00-0YX2**
Software Update Service (download)[2] The upgrades and service packs are available for downloading. Email address required for delivery	
• STEP 7 Professional V1x	**6ES7822-1AE00-0YY0**
• STEP 7 Professional Combo (STEP 7 Prof. V1x (TIA Portal) and STEP 7 Prof.)	**6ES7810-5CC04-0YY2**
• SIMATIC WinCC Advanced	**6AV6613-0AA00-0AY0**
• SIMATIC STEP 7 Safety Advanced	**6ES7833-1FC00-0YY0**

[1] The capacity of the battery decreases for technological reasons with each charging/discharging cycle and also as the result of being stored at excessively high or low temperatures. The running time per charge decreases therefore over the course of time. With normal use, the battery can be charged and discharged over a period of six months from when the Field PG is purchased. Loss of capacity is not covered by the warranty. For the battery's operation we grant a warranty of six months.
We recommend replacing the battery with an original Siemens battery at the end of these six months if there is a significant drop in performance.

[2] For more information on the Software Update Service, see page 11/2.

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Overview



- External EPROM programming device
- For programming SIMATIC Memory Cards, SIMATIC Micro Memory Cards as well as SIMATIC EPROM and EEPROM modules
- For connection to the PC via the USB interface

Technical specifications

Article number	**6ES7792-0AA00-0XA0** USB Prommer, 115/220V
General information	
Design of the programming device	Desktop device
Display	
Design of display	without
Supply voltage	
Design of the power supply	90 to 264 V; 47 to 63 Hz; wide range power supply unit
Ambient conditions	
Ambient temperature during operation	
• min.	5 °C
• max.	40 °C
Ambient temperature during storage/transportation	
• min.	-20 °C
• max.	60 °C
Dimensions	
Width	172 mm
Height	40 mm
Depth	121 mm
Weights	
Weight, approx.	400 g

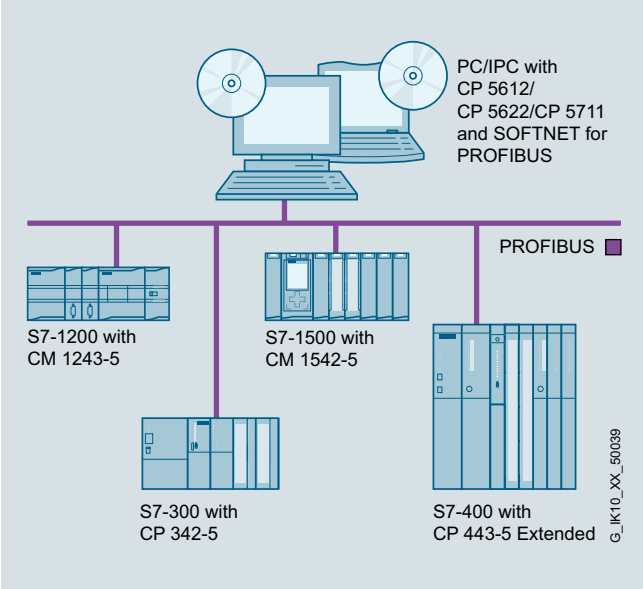
Ordering data

	Article No.
EPROM programming device, USB Prommer For programming SIMATIC Memory Cards and EPROM modules	**6ES7792-0AA00-0XA0**

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SOFTNET for PROFIBUS

Overview



DP-M	DP-S	FMS	OPC	PG/OP	S7/S5
●	●		●	●	●

- Software for connecting PCs/programming devices and notebooks to automation systems
- Communication services:
  - PROFIBUS DP master Class 1 and 2 with acyclic expansions
  - PROFIBUS DP slave
  - PG/OP communication
  - S7 communication
  - Open communication (SEND/RECEIVE) based on the FDL interface
- The appropriate OPC servers and configuration tools are included in the scope of supply of the respective communications software

Technical specifications

Performance data	CP 5612/CP 5622/CP 5711
Mono protocol mode	
Number of connectable DP slaves	max. 60
Number of FDL tasks waiting	max. 50
Number of PG/OP and S7 connections	max. 8
• DP master	DP-V0, DP-V1 with SOFTNET-PB DP
• DP slave	DP-V0, DP-V1 with SOFTNET-PB DP slave

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Ordering data

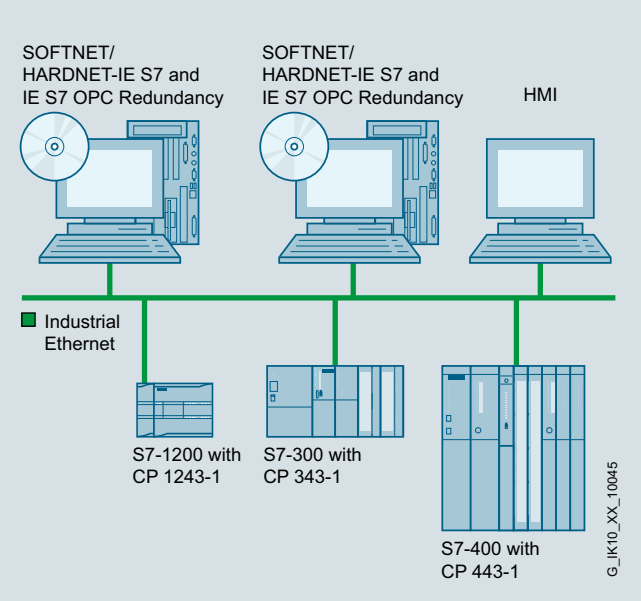
	Article No.
SOFTNET-PB S7	
Software for S7 communication, incl. FDL protocol with OPC server and configuration tool, runtime software, software and electronic manual on DVD-ROM, license key on USB flash drive, Class A; for CP 5612 (Win 7 and higher), CP 5622 (Win 7 and higher), CP 5711	
SOFTNET-PB S7 V15	
For 32/64-bit: Windows 7 SP1 for Windows 7 SP1 (Professional, Enterprise, Ultimate), 64-bit For Windows Server 2008 R2 SP1 (Standard or Enterprise Edition) For Windows Server 2012 R2 Update (Standard Edition) For Windows 10 Pro, 64-bit, Version 1607 or higher For Windows 10 Enterprise, 64-bit, Version 1607 or higher English/German	
• Single license for one installation	**6GK1704-5CW15-0AA0**
Software Update Service For 1 year, with automatic extension Requirement: current software version	**6GK1704-5CW00-3AL0**
Upgrade	
• From Edition 2006 to SOFTNET-S7 Edition 2008 or V15	**6GK1704-5CW00-3AE0**
SOFTNET-PB DP	
Software for DP protocol (master Class 1 and 2), incl. FDL protocol with OPC server and configuration tool; runtime software, software and electronic manual on DVD-ROM, license key on USB flash drive; for CP 5612 (Win 7 and higher), CP 5622 (Win 7 and higher), CP 5711	
SOFTNET-PB DP V15	
For Windows 7 SP1 (Professional, Enterprise, Ultimate), 64-bit For Windows Server 2008 R2 SP1 (Standard or Enterprise Edition) For Windows Server 2012 R2 Update (Standard Edition) For Windows 10 Pro, 64-bit, Version 1607 or higher For Windows 10 Enterprise, 64-bit, Version 1607 or higher English/German	
• Single license for one installation	**6GK1704-5DW15-0AA0**
Software Update Service For 1 year, with automatic extension Requirement: current software version	**6GK1704-5DW00-3AL0**
Upgrade	
• From Edition 2006 to SOFTNET-DP Edition 2008 or V15	**6GK1704-5DW00-3AE0**

	Article No.
SOFTNET-PB DP Slave	
Software for DP slave, with OPC server and configuration tool, single license for one installation, runtime software, software and electronic manual on DVD-ROM, license key on USB flash drive, Class A; for CP 5612 (Win 7 and higher), CP 5622 (Win 7 and higher), CP 5711	
SOFTNET-PB DP Slave V15	
For Windows 7 SP1 (Professional, Enterprise, Ultimate), 64-bit For Windows Server 2008 R2 SP1 (Standard or Enterprise Edition) For Windows Server 2012 R2 Update (Standard Edition) For Windows 10 Pro, 64-bit, Version 1607 or higher For Windows 10 Enterprise, 64-bit, Version 1607 or higher English/German	
• Single license for one installation	**6GK1704-5SW15-0AA0**
Software Update Service For 1 year, with automatic extension Requirement: current software version	**6GK1704-5SW00-3AL0**
Upgrade	
• From Edition 2006 to SOFTNET-DP Slave Edition 2008 or V15	**6GK1704-5SW00-3AE0**

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SOFTNET for Industrial Ethernet

Overview



System configuration SOFTNET for Industrial Ethernet

ISO	TCP/ UDP	PN	MRP	OPC	PG/OP	S7/S5	IT
●	●			●	●	●	

G_IK10_XX_10185

- Software for coupling programming devices/PCs/workstations to automation systems
- Communication services:
  - PG/OP communication
  - S7 communication
  - Open communication (SEND/RECEIVE)
- Can be used with
  - Layer 2 Ethernet card (PCI/PCIe), e.g. CP 1612 A2
  - Integrated Industrial Ethernet interface
  - Modem/ISDN (Remote Access Service RAS)
- Complete protocol stack as a software package
- Increased availability thanks to additional option packages such as OPC server redundancy

Technical specifications

Technical specifications	
Performance data	
S7 and PG/OP communication (number of operable connections)	
• SOFTNET-IE S7 Extended	Max. 255 (S7-300 / S7-400) Max. 512 (S7-1200 / S7-1500)
• SOFTNET-IE S7	Max. 64
• SOFTNET-IE S7 Lean	Max. 8

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Ordering data	Article No.
SOFTNET S7 for Industrial Ethernet	
Software for S7 and open communication, incl. OPC server, PG/OP communication, and NCM PC/STEP 7 Professional V12, runtime software, software and electronic manual on CD-ROM, license key on USB flash drive, Class A	
SOFTNET-IE S7 V15	
For Windows 7 SP1 Prof./Ult. (64-bit); Windows Server 2008 R2 SP1, Windows Server 2012 R2; Windows 10 PRO/Enterprise (64-bit), Version 1607 or higher; Windows Server 2016; English/German	
Up to 64 connections; single license for one installation	
• On DVD	**6GK1704-1CW15-0AA0**
• Download [1]	**6GK1704-1CW15-0AK0**
Software Update Service	**6GK1704-1CW00-3AL0**
For 1 year with automatic extension Requirement: current software version	
Upgrade	
• From Edition 2006 to Edition 2008 or V13	**6GK1704-1CW00-3AE0**
• From V6.0, V6.1, V6.2 or V6.3 to Edition 2008 or V13	**6GK1704-1CW00-3AE1**
SOFTNET-IE S7 REDCONNECT VM V15	
Software for fail-safe S7 communication via redundant networks, incl. S7 OPC server, runtime software, software and electronic manual on CD-ROM, license key on USB flash drive, Class A For Windows 7 SP1 Prof./Ult. (64-bit); Windows Server 2008 R2 SP1, Windows Server 2012 R2; Windows 10 PRO/Enterprise (64-bit), Version 1607 or higher; Windows Server 2016; English/German	
• Single license for one installation	**6GK1704-0HB15-0AA0**

	Article No.
SOFTNET-IE S7 Lean Edition V15	
For Windows 7 SP1 Prof./Ult. (64-bit); Windows Server 2008 R2 SP1, Windows Server 2012 R2; Windows 10 PRO/Enterprise (64-bit), Version 1607 or higher; Windows Server 2016; Up to eight connections; English/German; single license for one installation	
• On DVD	**6GK1704-1LW15-0AA0**
• Download [1]	**6GK1704-1LW15-0AK0**
Software Update Service	**6GK1704-1LW00-3AL0**
For 1 year with automatic extension Requirement: current software version	
Upgrade	
• From Edition 2006 to Edition 2008 or V13	**6GK1704-1LW00-3AE0**
• From V6.0, V6.1, V6.2 or V6.3 to Edition 2008 or V13	**6GK1704-1LW00-3AE1**
IE S7 OPC Redundancy	
Software for redundant OPC servers in the environment of Industrial Ethernet software, S7 products, runtime software, software and electronic manual on CD-ROM, license key on USB flash drive, Class A	
IE S7 OPC Redundancy V13	
For 64-bit: Windows 2008 Server R2 SP1; English/German	
• Single license for one installation	**6GK1706-1CW13-0AA0**

[1] For more details of online software delivery, visit: http://www.siemens.com/tia-online-software-delivery

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Notes

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Introduction

Overview

Telecontrol systems for controlling and monitoring widely distributed plants usually consist of a supervisory control system (telecontrol center) and one or more outstations connected over large distances for the automation of distributed plant sections.

SIPLUS RIC is a versatile telecontrol system that uses the internationally standardized telecontrol protocols:

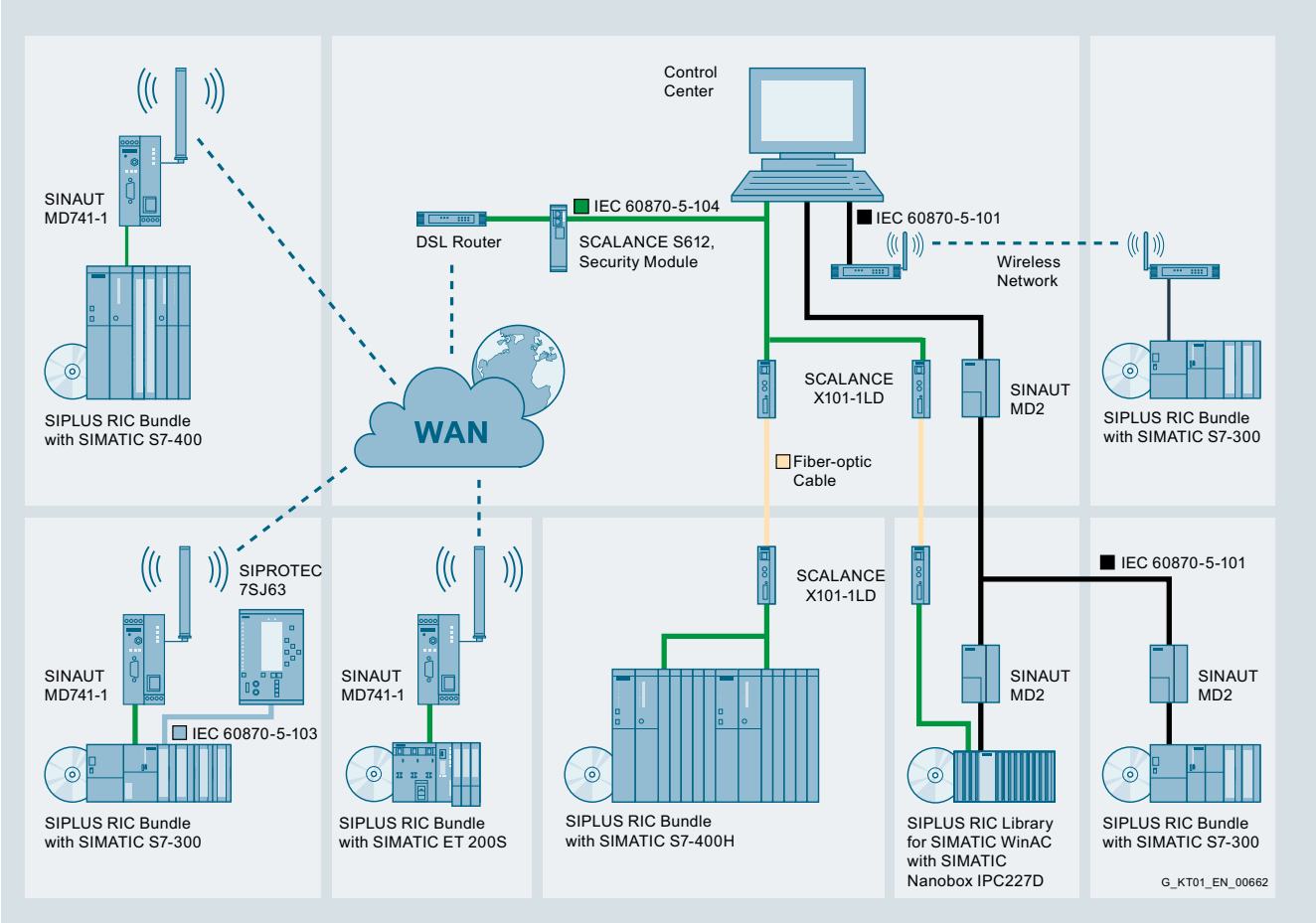
- Serial transmission IEC 60870-5-101
- Ethernet (TCP/IP) IEC 60870-51-104
- Connection of protection devices IEC 60870-5-103

It provides secure communication with reduced data volume for reliable operation in the Wide Area Network (WAN) thanks to event-driven, time-stamped transmission and monitored output of commands.

Application

SIPLUS RIC offers maximum functionality and modularity to meet the requirements made upon the monitoring and control of spatially distributed systems, even under extreme environmental conditions.

It is therefore suitable for sectors such as Oil, Gas, Water, Wastewater, Power Generation/Distribution, and Transportation.



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Overview

IEC 60870-5-101, IEC 60870-5-103 and IEC 60870-5-104 are standardized vendor-independent protocols. With SIPLUS RIC, they can be parameterized with the SIMATIC Manager or TIA Portal V13 SP1 without the need for additional installations.

The protocol IEC 60870-5-101 supports standard WLAN connections via dedicated lines; in the automation system the modems are coupled via RS 232 to the communication modules 1SI, CP 340, CP 341, CP 441, CP 1540 or CP 1541.

The protocol IEC 60870-5-103 permits serial communication with protection devices, e.g. SIPROTEC. Coupling takes place via the 1SI, CP 340, CP 341, CP 441, CM PTP, CP1540 or CP1541 communication modules and RS485 interface with fiber-optic cables.

The IEC 60870-5-104 protocol supports TCP/IP-based WAN connections such as Internet/DSL or GPRS/UMTS/LTE. Either the PN interfaces of the CPUs or the CP 343-1CX10/ -1EX30/-1GX30 and CP 1543 communication modules are used as interfaces. Redundancy groups and substitute routes (combinations of serial and Ethernet transmission paths) are both possible and enabled via the interfaces.

The libraries for the IEC 60870-5-101 and -104 protocols are supplied as master and slave including activation for PN-CPU and CP interface. The IEC 60870-5-103 is only provided as master.

SIMATIC controllers can also communicate with third-party products by means of the IEC protocols.

Information can be forwarded both from lower-level stations and protection devices to the control centers. Automatic updating of the information objects can take place which can then be forwarded with the information object and ASDU address unchanged. These addresses can however also be changed by means of parameter assignment.

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SIPLUS RIC libraries for S7-1500 and ET 200SP

Overview



If a SIMATIC S7-1500/ET 200SP-based system is to communicate with a Siemens control center, e.g. SIMATIC PCS 7 TeleControl, WinCC TeleControl, WinCC OA, or a control center of a third-party supplier using the IEC 60870-5 telecontrol standard, the IEC 60870-5-101 (serial), -103 (protection) or -104 (TCP/IP) telecontrol protocols can be used in the SIMATIC automation systems.

SIPLUS RIC libraries offer an integrated, scalable system based on SIMATIC S7-1500/ET 200SP functions for the following data volumes:

- 200 data points, for use with CPU 1510SP-1 PN[1)], CPU 1511-1 PN and CPU 1511C-1 PN
- 800 data points, for use with CPU 1512SP-1 PN and CPU 1512C-1 PN
- 1000 data points, for use with CPU 1513-1 PN
- 2000 data points, for use with CPU 1515-2 PN
- 4000 data points, for use with CPU 1516-3 PN/DP
- 5000 data points, for use with CPU 1517-3 PN/DP and with CPU 1518-4 PN/DP

The work memory for data is used for buffering the message frames. Longer communication failure times can thus be bridged. The SIPLUS RIC software libraries are based on the standard TIA Portal and can be used on various, mutually compatible types of SIMATIC S7 devices, thus saving hardware costs and programming overhead.

The libraries on CD are supplied together with a SIMATIC memory card, which can be used on all CPUs. Four versions with different memory sizes are available for selection.

With SIPLUS extreme hardware, telecontrol devices for an extended ambient temperature range (-40 ... +70 °C) and exceptional exposure to media (conformal coating) can be implemented using the telecontrol protocols.

A license certificate with the activation of all telecontrol protocols IEC 60870-5-101 (serial), -103 (protection) or -104 (TCP/IP) is supplied for the SIMATIC memory card included in the scope of supply.

1) The CPU 1510SP-1 PN is only suitable for the IEC protocol since memory space is too low for additional functions.

Ordering data

	Article No.
SIPLUS RIC libraries for SIMATIC S7-1500/ET 200SP	
Runtime license; CD with software and documentation	
• with SIMATIC Memory Card; 12 MB	**6AG6003-8CF00-0LE0**
• with SIMATIC Memory Card; 24 MB	**6AG6003-7CF00-0LF0**
• with SIMATIC Memory Card, 256 MB	**6AG6003-7CF00-0LL0**
• with SIMATIC Memory Card, 2 GB	**6AG6003-7CF00-0LP0**

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Overview



If a SIMATIC ET 200S-based system is to communicate with a Siemens control center, e.g. SIMATIC PCS 7 TeleControl, WinCC TeleControl, WinCC OA, or a control center of a third-party supplier using the IEC 60870-5 telecontrol standard, the IEC 60870-5-101 (serial), -103 (protection) or -104 (TCP/IP) telecontrol protocols can be used in the SIMATIC automation systems.

SIPLUS RIC libraries offer an integrated, scalable system based on SIMATIC ET 200S functions, for up to 200 information points.

The non-retain memory can also be used for buffering message frames. Longer communication failure times can thus be bridged. The SIPLUS RIC software libraries are based on the standard SIMATIC Manager or TIA Portal and can be used on various, mutually compatible types of SIMATIC S7 devices – this saves hardware costs and programming overhead.

The libraries on CD are supplied together with a SIMATIC memory card, which can be used on all CPUs. Two versions with different memory sizes are available for selection.

With SIPLUS extreme hardware, telecontrol devices for an extended ambient temperature range (-40 ... +70 °C) and exceptional exposure to media (conformal coating) can be implemented using the telecontrol protocols.

A license certificate with the activation of all telecontrol protocols IEC 60870-5-101 (serial), -103 (protection) or -104 (TCP/IP) is supplied for the SIMATIC memory card included in the scope of supply.

Note:

The SIPLUS RIC libraries for ET 200S completely replace the previous SIPLUS RIC ET 200S bundles and SIPLUS RIC ET 200S extreme bundles.

Ordering data

	Article No.
SIPLUS RIC libraries for SIMATIC ET 200S	
Runtime license; CD with software and documentation	
• with SIMATIC Memory Card, 512 KB	**6AG6003-5CF00-0CA0**
• with SIMATIC Memory Card, 2 MB	**6AG6003-5CF00-0DA0**

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SIPLUS RIC libraries for SIMATIC S7-300

Overview



If a SIMATIC S7-300-based system is to communicate with a Siemens control center, e.g. SIMATIC PCS 7 TeleControl, WinCC TeleControl, WinCC OA, or a control center of a third-party supplier using the IEC 60870-5 telecontrol standard, the IEC 60870-5-101 (serial), -103 (protection) or -104 (TCP/IP) telecontrol protocols can be used in the SIMATIC automation systems.

SIPLUS RIC libraries offer an integrated, scalable system based on SIMATIC S7-300 functions, for the following data quantities:

- 200 information points, for use with CPU 314
- 1 000 information points, for use with CPU 315
- 2 000 information points, for use with CPU 317
- 5 000 information points, for use with CPU 319

The non-retain memory can also be used for buffering message frames. Longer communication failure times can thus be bridged. The SIPLUS RIC software libraries are based on the standard SIMATIC Manager or TIA Portal and can be used on various, mutually compatible types of SIMATIC S7 devices – this saves hardware costs and programming overhead.

The libraries on CD are supplied together with a SIMATIC memory card, which can be used on all CPUs. Two versions with different memory sizes are available for selection.

With SIPLUS extreme hardware, telecontrol devices for an extended ambient temperature range (-40 ... +70 °C) and exceptional exposure to media (conformal coating) can be implemented using the telecontrol protocols.

A license certificate with the activation of all telecontrol protocols IEC 60870-5-101 (serial), -103 (protection) or -104 (TCP/IP) is supplied for the SIMATIC memory card included in the scope of supply.

Note:

The SIPLUS RIC libraries for S7-300 completely replace the previous SIPLUS RIC S7-300 bundles and SIPLUS RIC S7-300 extreme bundles.

Ordering data

	Article No.
SIPLUS RIC libraries for SIMATIC S7-300	
Runtime license; CD with software and documentation	
• with SIMATIC Memory Card, 512 KB	**6AG6003-1CF00-0CA0**
• with SIMATIC Memory Card, 2 MB	**6AG6003-1CF00-0DA0**

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Overview



If a SIMATIC S7-400/S7-400H-based system is to communicate with a Siemens control center, e.g. SIMATIC PCS 7 TeleControl, WinCC TeleControl, WinCC OA, or a control center of a third-party supplier using the IEC 60870-5 telecontrol standard, the IEC 60870-5-101 (serial), -103 (protection) or -104 (TCP/IP) telecontrol protocols can be used in the SIMATIC automation systems.

SIPLUS RIC libraries offer an integrated, scalable system based on SIMATIC S7-400/S7-400H functions for the following data quantities:

- 1 000 information points, for use with CPU 412 or CPU 412H
- 2 000 information points, for use with CPU 414 or CPU 414H
- 5 000 information points, for use with CPU 410H, CPU 416/CPU 416H or CPU 417/CPU 417H

The work memory for data which is limited to 256 MB in the CPU 410H for data blocks generated online is used for buffering the frames. Longer communication failure times can thus be bridged. The SIPLUS RIC software libraries are based on the standard SIMATIC Manager or TIA Portal and can be used on various, mutually compatible types of SIMATIC S7 devices – this saves hardware costs and programming overhead.

The libraries are supplied on a CD and can be used on all CPUs.

With SIPLUS extreme hardware, telecontrol devices for an extended ambient temperature range (-40 ... +70 °C) and exceptional exposure to media (conformal coating) can be implemented using the telecontrol protocols.

A memory card (CPU V5.0 or higher) or a CPU (CPU V4.x or higher and CPU 410H) are licensed. All IEC 60870-5-101 (serial), -103 (protection) or -104 (TCP/IP) telecontrol protocols are activated via the email address siplus-ric.automation@siemens.com.

Note:

The SIPLUS RIC libraries for S7-400 completely replace the previous SIPLUS RIC S7-400 bundles, SIPLUS RIC S7-400 extreme bundles, and IEC 60870 libraries for SIMATIC PCS 7.

Ordering data

	Article No.
SIPLUS RIC libraries for SIMATIC S7-400	
Runtime license for SIMATIC S7-400 firmware version 4.x or higher; CD with software and documentation; Note: If used in S7-400H systems, a license will be required for each CPU.	**6AG6003-3CF00-0AA0**

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SIPLUS RIC libraries for software controllers

Overview



If a SIMATIC WinAC RTX-/S7-1500 Software Controller-/Open Controller-based system is to communicate with a Siemens control center, e.g. SIMATIC PCS 7 TeleControl, WinCC TeleControl, WinCC OA, or a control center of a third-party supplier using the IEC 60870-5 telecontrol standard, the IEC 60870-5-101 (serial), -103 (protection) or -104 (TCP/IP) telecontrol protocols can be used in the SIMATIC automation systems.

The SIPLUS RIC software libraries are based on the standard SIMATIC Manager (WinAC) or TIA Portal (S7-1500 Software Controller / Open Controller) and can be used on various, mutually compatible types of SIMATIC S7 devices – thus saving on hardware costs and programming overhead.

The libraries are supplied on a CD and can be used for all WinAC-RTX-/S7-1500 Software Controller/Open Controller systems.

With SIPLUS extreme hardware, telecontrol devices for an extended ambient temperature range (-40 ... +70 °C) and exceptional exposure to media (conformal coating) can be implemented using the telecontrol protocols.

All IEC 60870-5-101 (serial), -103 (protection) or -104 (TCP/IP) telecontrol protocols are activated via the email address siplus-ric.automation@siemens.com.

Note:

The SIPLUS RIC libraries for PC-based Automation include SIPLUS RIC libraries for:

- SIMATIC ET 200SP Open Controller, CPU 1515SP PC
- SIMATIC S7-1500 Software Controller
- SIMATIC WinAC

Ordering data

	Article No.
SIPLUS RIC libraries for software controllers	
Runtime license; CD with software and documentation	**6AG6003-0CF00-0AA0**

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Overview



SIDOOR automatic door control systems

Door control system is the general term for a controller of an access system.

The SIDOOR product family is primarily intended for the operation of sliding doors, whereby these doors can be operated both horizontally and vertically.

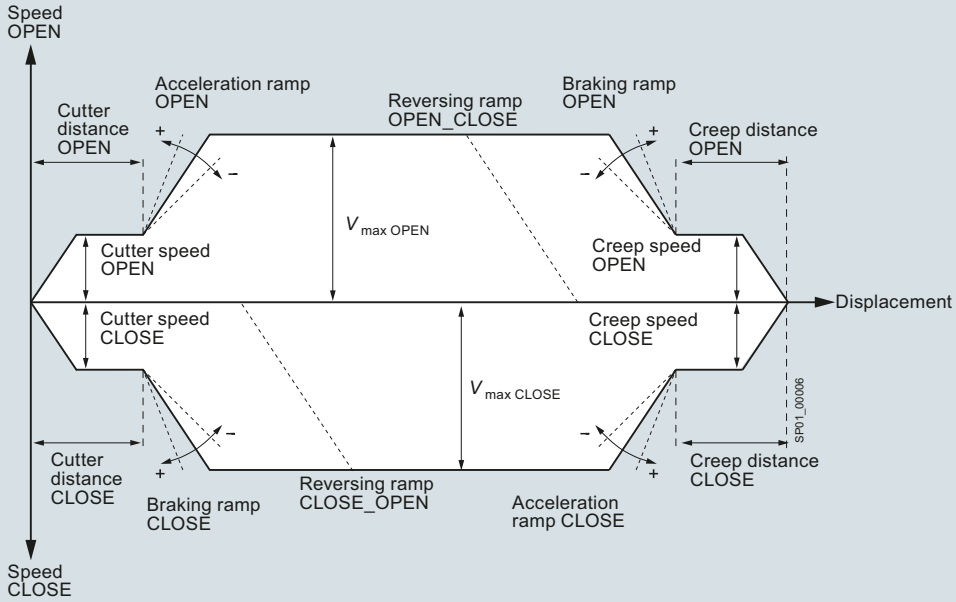
Door control systems are characterized by the fact that there are always two defined states for the open and closed position of the door.

The door is always controlled, regulated and moved between these two positions in accordance with the guidelines of the respective application.

In a defined learn run via "single-button operation", the door system independently determines the values for the door width, the dynamic door weight and the drive direction of the geared motor and stores these data in a non-volatile memory.

The optimum drive characteristics at the door are automatically calculated and are consistently adhered to.

The travel curve transitions are rounded off so that the door movement is smooth and jerk-free.



Creep speed	Reduced speed in the vicinity of the OPEN position of the elevator door (creep distance)
Cutter speed	Reduced speed in the vicinity of the CLOSED position of the elevator door (cutter distance)
Creep distance	Range of door travel in the vicinity of the OPEN position
Cutter distance	Range of door travel in the vicinity of the CLOSED position
V_{max}	Maximum permissible door speed

Reversing ramp OPEN_CLOSE	Travel reverses from the OPEN to the CLOSE direction
Reversing ramp CLOSE_OPEN	Travel reverses from the CLOSE to the OPEN direction

Note:
When reversing from the open to the close direction, the door is braked with the reversing ramp OPEN_CLOSE, and starts the closing movement with the acceleration ramp CLOSE.

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Overview

The elevator door drive is comprised of a controller and the maintenance-free drive unit, geared motor or gearless EC technology direct drive motor.

Controllers are electronic controllers connected to the power supply via an external power supply unit (SIDOOR NT40 or SIDOOR Transformer). They are generally connected to the higher-level controller via digital or fieldbus interfaces, and can be configured via a user interface.

The SIDOOR AT40 and SIDOOR ATE500E control units can be used to control horizontally operated cabin and shaft doors as well as vertically operated rising doors and rolling shutters at adjustable speeds and accelerations.

Geared motors form the maintenance-free drive unit in the door drive. The geared motors feature DC motors with non-self-locking gearing, and are speed-controlled. The set force and speed limits are not exceeded. The gearless motor (direct drive) is the maintenance-free drive unit of the door drive.

Operation of the named door drives does not require limit switches. The door width and the "OPEN"/"CLOSE" positions are determined automatically.

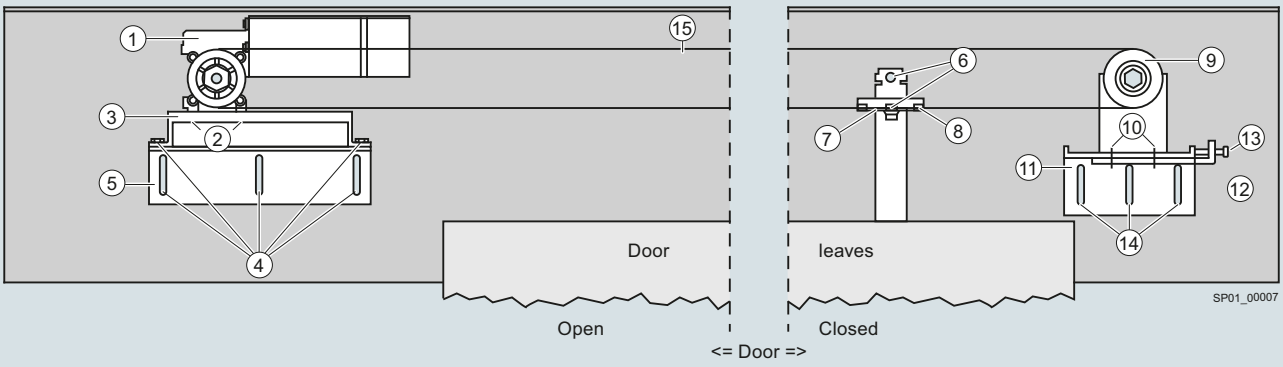
The power is transmitted by a toothed belt. The toothed belt passes over a deflector pulley and can be fitted with 2 door clutch holders. This enables it to drive both one-sided and centrally-opening doors. The accessories are not included in the scope of supply, see "Accessories".

Design

The product-specific property of the elevator door controllers is based on the fact that the closing weights/closing springs integrated in the shaft doors are also taken into account.

These weights/springs are integrated in the shaft doors so that open doors close automatically if the cabin is not at the relevant floor.

They must also be moved by the elevator door drive in their opening direction and support it in the closing movement.



Complete motor mounting

(1) Geared motor
(2) 4 x locking hexagonal safety bolts M5 x 10
(3) Rubber-metal anti-vibration mount
(4) 10 x locking hexagonal safety bolts M6 x 16
(5) Mounting bracket for the motor mounting

Mounting material for door clutch holder

(6) 2 x locking hexagonal safety bolts M6 x 12
(7) Door clutch holder
(8) Clamping plate

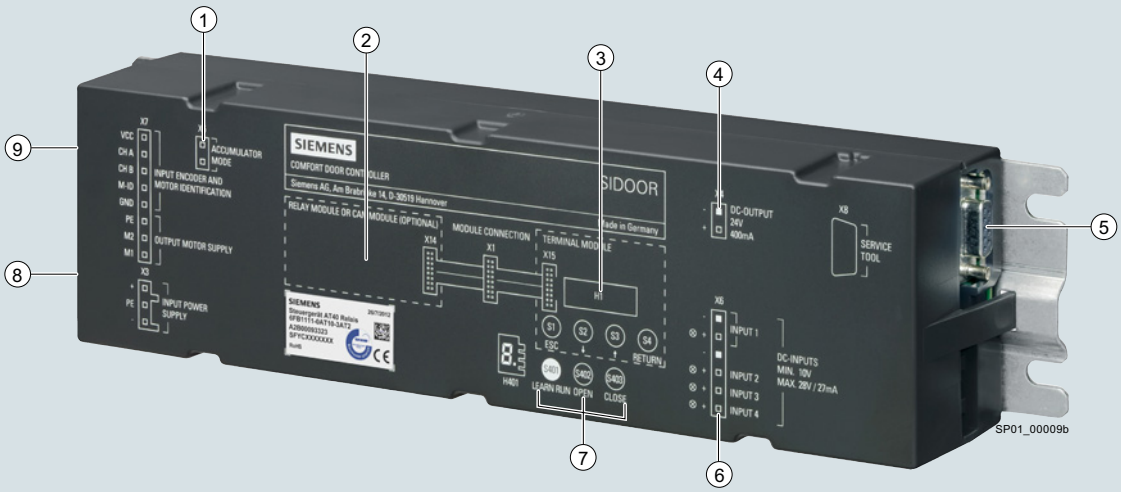
Deflector unit and clamping device

(9) Deflector unit
(10) 2 x locking hexagonal safety bolts M6 x 12
(11) Mounting bracket for the deflector unit and tensioning device
(12) Tensioning lug for the deflector unit and tensioning device
(13) Tensioning screw M6 x 30
(14) 10 x locking hexagonal safety bolts M6 x 16
(15) Toothed belt (length 4 m)

Mounting suggestion for door control systems

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Overview



1. Optional: additional input signal
2. BASIC CAN module or relay module
3. Terminal module
4. Connection for 24 V DC/400 mA output voltage
5. Connection
   - Software Kit or
   - Service Tool
6. Input signal connection
7. Control panel
8. Connector
   - NT40 switch-mode power supply or
   - Mains transformer
9. Motor connection

SIDOOR AT40 elevator door drive (relay module version)

SIDOOR AT40 – SIDOOR enables the quick, easy and versatile installation, configuration and operation of a wide range of elevator door systems.

Version:

- BASIC (without module)
- Relay module (including relay and terminal module)
- CAN module (including CAN and terminal module)
  The SIDOOR AT40 CAN controller has CiA 301 certification and also offers support for CiA 417.
  - The door system can be visualized and parameterized by the elevator controller using the "Virtual Terminal" function.
  - Parameters for evaluating mechanical wear can be collected and evaluated at the door via the CANopen bus. These parameters can include energy or counter values as well as door travel times.
- For dynamic door weights up to 600 kg
- Automatic door weight detection
- 4 to 8 kg maximum counterweight (depending on motor version)
- Operating temperature -20 to +50 °C
- Flexible motor management (four different motor types), automatic detection
- Opening width 0.3 to 5 m
- Auxiliary power output 24 V DC ± 15 %; 0.4 A (short-circuit-proof)
- Output stage short-circuit-proof
- Supports power-optimized operation in the elevator cabin
- Vandal-proof
- IP54 degree of protection for 180 to 600 kg motor versions, gear unit IP40 (SIDOOR M5: entirely IP54)
- The current operating states are indicated via a 7-segment display directly in the elevator door drive or externally using the Software Kit or Service Tool, see "Additional units".

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Technical specifications

Article number	**6FB1111-0AT11-3AT0** SIDOOR AT40 BASIC	**6FB1111-0AT10-3AT2** SIDOOR AT40 RELAY	**6FB1111-1AT10-3AT3** SIDOOR AT40 CAN
General information			
Product brand name	SIDOOR		
Product version		With relay outputs	With CAN interface
Manufacturer's article no. of the usable motor	6FB1103-0AT10-5MA0, 6FB1103-0AT11-5MA0, 6FB1103-0AT10-4MB0, 6FB1103-0AT11-4MB0, 6FB1103-0AT10-3MC0, 6FB1103-0AT11-3MC0, 6FB1103-0AT10-3MD0, 6FB1103-0AT11-3MD0		
Manufacturer's article no. of the usable power supply unit	6FB1112-0AT20-2TR0, 6FB1112-0AT20-3PS0		
Supply voltage			
Design of the power supply	via SIDOOR TRANSFORMER / NT40		
Input current			
Current consumption, max.	10 A		
I^2t, min.	30 $A^2 \cdot s$		
Encoder supply			
Output voltage (DC)	24 V		
short-circuit proof	Yes		
Remark	Ensure correct polarity! CAUTION: Do not supply with external voltage!		
Output current			
• For output (24 V DC), max.	400 mA		
Power			
Active power input	80 W		
Active power input, max.	540 W		
Active power input (standby mode)	5 W		6 W
Digital inputs			
Control inputs isolated	Yes		
Control inputs p-switching	Yes		
Input voltage			
• per DC input, min.	10 V; Observe polarity !		
• per DC input, max.	28 V; Observe polarity !		
Input current			
• per DC input, min.	9 mA		
• per DC input, max.	27 mA		
Digital outputs			
Relay outputs			
Switching capacity of contacts			
- at 30 V DC, min.		0.01 A	
- at 30 V DC, max.		1 A	0.5 A
- at 50 V DC, min.		0.01 A; 50 V DC switching voltage not released for NFPA-relevant countries	
- at 50 V DC, max.		1 A; 50 V DC switching voltage not released for NFPA-relevant countries	
- at 230 V AC, min.		0.01 A	
- at 230 V AC, max.		1 A	
Mechanical data			
Opening width of door, min.	0.3 m		
Opening width of door, max.	5 m		
Weight of door, max.	600 kg		
Operating cycle frequency of door, max.	180 1/h		
Counterforce, max.	80 N		
Kinetic energy, max.	100 J		
Counterweight			
• with SIDOOR M2 geared motor, max.	4 kg		
• with SIDOOR M3 geared motor, max.	6 kg		
• with SIDOOR M4 geared motor, max.	8 kg		
• with SIDOOR M5 geared motor, max.	8 kg		

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Technical specifications (continued)

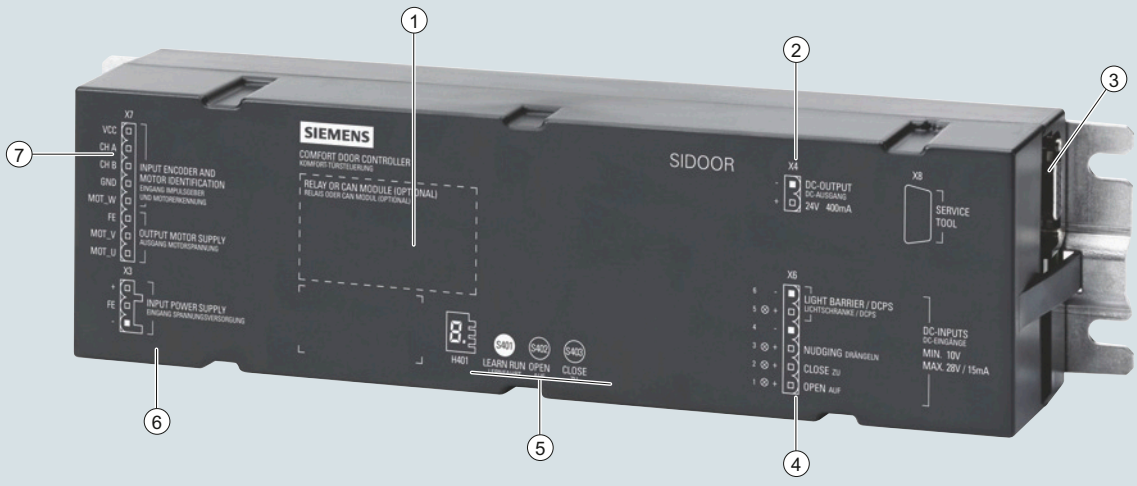
Article number	**6FB1111-0AT11-3AT0**	**6FB1111-0AT10-3AT2**	**6FB1111-1AT10-3AT3**
	SIDOOR AT40 BASIC	SIDOOR AT40 RELAY	SIDOOR AT40 CAN
Interfaces			
Interfaces/bus type	without		CANopen, CiA standard 301, profile 417
Number of bus nodes			32
Isolation			
Overvoltage category	2		
Degree and class of protection			
IP degree of protection	IP20		
Standards, approvals, certificates			
Certificate of suitability according to EN 81	Yes		
CE mark	Yes		
UL approval	No		
EAC (formerly Gost-R)	Yes		
TÜV Inspectorate approval	Yes		
TÜV prototype tested	Yes		
Standard for EMC	EN 12015 / EN 12016		
Standard for safety	EN 60950-1 / EN 81-20		
Ambient conditions			
Ambient temperature during operation			
• min.	-20 °C		
• max.	50 °C		
Ambient temperature during storage/transportation			
• Storage, min.	-40 °C		
• Storage, max.	50 °C		
Relative humidity			
• No condensation, min.	10 %		
• No condensation, max.	93 %		
Dimensions			
Width	320 mm		
Height	60 mm		
Depth	80 mm		

Ordering data

	Article No.
SIDOOR AT40 elevator door drive	
horizontal, up to 600 kg door weight	
• BASIC controller (without module)	**6FB1111-0AT11-3AT0**
• Controller with relay module	**6FB1111-0AT10-3AT2**
• Controller with CAN module	**6FB1111-1AT10-3AT3**

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Overview



1. CAN module or RELAY module
2. Output voltage 24 V DC/400 mA connection
3. Connection
   - Service Tool or
   - Software Kit
4. Input signal connection
5. Control panel
6. Connection
   - NT40 switch mode power supply
   - Transformer
7. Motor connection (direct drive)

SIDOOR ATE500E elevator door drive

The SIDOOR ATE500E elevator door drive enables the quick, easy and versatile installation, configuration and operation of EC technology gearless elevator door systems.

- Design:
  - Relay module
  - CAN module
- For dynamic door weights up to 280 kg
- High control performance and optimized drive characteristic transitions
- Automatic door weight detection (single-button commissioning)
- 6 kg maximum counterweight of the coupled floor door
- Operating temperature -25 to +50 °C without restrictions
- Automatic identification of the connected motor
- Opening width 0.3 to 5 m
- Auxiliary voltage output 24 V DC ± 15 %; 0.4 A (short-circuit-proof)
- Output stage short-circuit-proof
- Optimized energy consumption during cabin operation (DCPS)
- Vandal-proof
- IP20 degree of protection
- The current operating states are indicated via a 7-segment display directly in the elevator door drive or externally using the Software Kit or Service Tool, see "Additional units"

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Technical specifications

Article number	**6FB1211-5AT10-7AT2**	**6FB1211-1AT10-7AT3**
	SIDOOR ATE500E RELAY	SIDOOR ATE500E CAN
General information		
Product brand name	SIDOOR	
Product version	With relay outputs	With CAN interface
Optional product expansion	SIDOOR TRANSFORMER (6FB1112-0AT20-2TR0), SIDOOR TRANSFORMER UL (6FB1112-0AT21-2TR0), SIDOOR NT40 (6FB1112-0AT20-3PS0)	
Manufacturer's article no. of the usable motor	6FB1203-0AT12-7DA0	
Manufacturer's article no. of the usable power supply unit	6FB1112-0AT20-2TR0, 6FB1112-0AT21-2TR0, 6FB1112-0AT20-3PS0	
Installation type/mounting		
Installation and mounting instructions	No direct sunlight, requirements specific to the end application must be observed. NFPA industry environment: Installation outside a control cabinet only horizontal. NFPA elevator environment: Must be installed in a fire protection enclosure	
Supply voltage		
Rated value (DC)	36 V; with MED280: At 24 V DC max. door speed of 500 mm/s; at 28.8 V DC max. door speed of 800 mm/s	
Input current		
I^2t, min.	30 $A^2 \cdot s$	
Power		
Active power input (standby mode)	5 W	6 W
Digital inputs		
Control inputs isolated	Yes	
Control inputs p-switching	Yes	
Protection in case of DC supply	Use of a circuit breaker in the supply path according to 60898-1, 8A, C-characteristic type SIEMENS: 5SY4108-7 or 5SY4108-7KK11	
Input voltage		
• per DC input, min.	10 V; Observe polarity !	
• per DC input, max.	28 V; Observe polarity !	
Input current		
• per DC input, min.	3 mA	
• per DC input, max.	15 mA	
Digital outputs		
short-circuit proof	Yes	
Overload-proof	Yes	
Remark	Ensure correct polarity! CAUTION: Do not supply with external voltage!	
Output voltage		
• Output voltage (DC)	24 V	
Output current		
• For output (24 V DC), max.	400 mA	
Relay outputs		
Switching capacity of contacts		
- at 30 V DC, min.	0.01 A	
- at 30 V DC, max.	1 A	0.5 A
- at 50 V DC, min.	0.01 A; 50 V DC switching voltage not released for NFPA-relevant countries	
- at 50 V DC, max.	1 A; 50 V DC switching voltage not released for NFPA-relevant countries	
- at 230 V AC, min.	0.01 A	
- at 230 V AC, max.	1 A	
Mechanical data		
Opening width of door, min.	0.3 m	
Opening width of door, max.	5 m	
Weight of door, max.	280 kg	
Operating cycle frequency of door, max.	180 1/h	
Kinetic energy, max.	75 J	
Counterweight		
• with SIDOOR MED280 direct drive, max.	6 kg	

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Technical specifications (continued)

Article number	**6FB1211-5AT10-7AT2** SIDOOR ATE500E RELAY	**6FB1211-1AT10-7AT3** SIDOOR ATE500E CAN
Interfaces		
Interfaces/bus type	without	CANopen, CiA standard 301, profile 417
Number of bus nodes		32
Isolation		
Overvoltage category	2	
Degree and class of protection		
IP degree of protection	IP20	
Standards, approvals, certificates		
Certificate of suitability according to EN 81	Yes	
CE mark	Yes	
UL approval	Yes	
EAC (formerly Gost-R)	Yes	
TÜV Inspectorate approval	Yes	
TÜV prototype tested	Yes	
Standard for EMC	EN 12015 / EN 12016 / EN 61000-6-2 / EN 61000-6-4 / EN 61326-3-1	
Standard for safety	EN 60335-1 / EN 60950-1 / EN 81-20 / UL 61010-1 / UL 61010-2-201 / EN ISO 13849-1 Cat. 2 PL d / IEC 62061: SIL 2	
Ambient conditions		
Ambient temperature during operation		
• min.	-25 °C	
• max.	50 °C	
• Remark	Bolt the controller onto a metal mounting surface so that thermal conductivity is ensured	
Ambient temperature during storage/transportation		
• Storage, min.	-40 °C	
• Storage, max.	85 °C	
Air pressure acc. to IEC 60068-2-13		
• Installation altitude above sea level, max.	2 000 m	
Relative humidity		
• No condensation, min.	10 %	
• No condensation, max.	93 %	
Mechanics/material		
Service life		
• Mean time between failures (MTBF)	19 y	
Dimensions		
Width	320 mm	
Height	60 mm	
Depth	80 mm	

Ordering data

	Article No.
SIDOOR ATE500E elevator door drive	
• Controller with relay module	**6FB1211-5AT10-7AT2**
• Controller with CAN module	**6FB1211-1AT10-7AT3**

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Overview



SIDOOR Transformer

The SIDOOR TRANSFORMER and SIDOOR TRANSFORMER UL are standard power supply units operated with 220-240 V AC, 50/60 Hz, from the SIDOOR product range. They can be used for controllers capable of controlling masses of up to 400 kg.

Technical specifications

Article number	**6FB1112-0AT20-2TR0**	**6FB1112-0AT21-2TR0**
	SIDOOR TRANSFORMER	SIDOOR TRANSFORMER UL
General information		
Product type designation	TRANSFORMER	TRANSFORMER UL
Product version	Power supply unit for SIDOOR controllers	
Installation type/mounting		
Mounting type	Hexagon head bolt M6, L > 70 mm	
Supply voltage		
permissible range, lower limit (AC)	220 V	
permissible range, upper limit (AC)	240 V	
relative symmetrical tolerance of the supply voltage	10 %	
Line frequency		
• permissible range, lower limit	50 Hz	
• permissible range, upper limit	60 Hz	
Mains filter		
• integrated	Yes	
Input current		
Current consumption, max.	1.6 A	
Operational current of fuse protection at input, min.	6 A	
Operational current of fuse protection at input, max.	10 A	
Tripping characteristic class of fuse protection at input	D6, C10	
Output voltage		
RMS value (pulsating DC voltage at full load)	17.3 V; At 230 V AC	
RMS value (pulsating DC voltage at 0.7 mA peak current), max.	27 V; At 264 V AC	
RMS value (pulsating DC voltage at full load), min.	16.5 V	
RMS value (pulsating DC voltage at full load), max.	18 V	
Output current		
Current output (rated value)	14.3 A; t on 2 s / t off 8 s	
Power		
Emitted active power, max.	115 W; Average value above 10 s	
Isolation		
Overvoltage category	2	
Degree of pollution	2	
Degree and class of protection		
IP degree of protection	IP54	
Standards, approvals, certificates		
CE mark	Yes	
EAC (formerly Gost-R)	Yes	
RoHS conformity	Yes	
China RoHS compliance	Yes	
Standard for EMC	EN 12015 / EN 12016 / EN 61000-6-2 / EN 61000-6-3 / EN 61000-3-2 / EN 61000-3-3	
Standard for safety	Low Voltage Directive (LVD) 2014/35/EU	UL 61010-1, CSA C22.2 No. 61010-1-12, Low Voltage Directive (LVD) 2014/35/EU

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Technical specifications (continued)

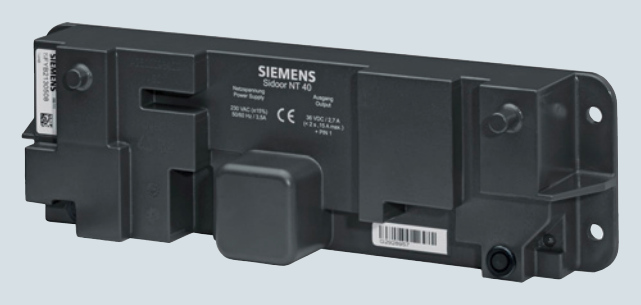
Article number	**6FB1112-0AT20-2TR0** SIDOOR TRANSFORMER	**6FB1112-0AT21-2TR0** SIDOOR TRANSFORMER UL
Ambient conditions		
Ambient temperature during operation		
• min.	-20 °C	
• max.	55 °C	
• Remark	No direct exposure to the sun	
Ambient temperature during storage/transportation		
• Storage, min.	-20 °C	
• Storage, max.	70 °C	
• Transportation, min.	-40 °C	
• Transportation, max.	70 °C	
Altitude during operation relating to sea level		
• Installation altitude above sea level, max.	2 000 m	
Relative humidity		
• No condensation, min.	10 %	
• No condensation, max.	93 %	
Cables		
Cable length		
• Input side	2 m	
• Output side	1.5 m	
Connection method		
Design of electrical connection at input	SCHUKO connector DIN 49.441, CEE7/VII	Equipped with ferrules
Design of electrical connection at output	WAGO 721-103/026	
Dimensions		
Width	145 mm	
Height	65 mm	
Depth	126 mm	

Ordering data

	Article No.
SIDOOR Transformer power supply	**6FB1112-0AT20-2TR0**
SIDOOR Transformer power supply with UL approval	**6FB1112-0AT21-2TR0**

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Overview



The SIDOOR NT40 switched mode power supply unit is operated with 230 V AC (± 15 %), 50/60 Hz, to power the elevator door controllers.

It is especially suitable for door systems with high door weights.

On the output side, the power supply unit delivers a voltage of 36 V DC (± 3 %) SELV at a rated output power of < 100 W.

In order to enable fast acceleration/deceleration of the doors by the controller, the device can briefly (< 2 s) deliver a current of 15 A (corresponds to a short-time power output of 540 W).

Technical specifications

Article number	**6FB1112-0AT20-3PS0** SIDOOR NT40
General information	
Product brand name	SIDOOR
Product type designation	NT40
Installation type/mounting	
Mounting type	Four 5 mm screws
Supply voltage	
Rated value (AC)	230 V
relative symmetrical tolerance of the supply voltage	15 %
Line frequency	
• permissible range, lower limit	47 Hz
• permissible range, upper limit	63 Hz
Input current	
Current consumption for 2 s, max.	3.5 A
Rated value at 230 V AC	0.7 A
Operational current of fuse protection at input, min.	6 A
Operational current of fuse protection at input, max.	10 A
Tripping characteristic class of fuse protection at input	B
Output voltage	
Rated value (DC)	36 V; SELV
Relative symmetrical tolerance of the output voltage	3 %
Output current	
Rated value, min.	0 A
Rated value, max.	2.5 A
Temporary overload current (for 2 s maximum)	15 A
Power	
Active power input, max.	100 W
Emitted active power, max.	100 W
Emitted active power (restricted to 2 s)	540 W
Efficiency at 230 V AC (with 100 W emitted active power)	90 %
Active apparent power, max.	650 V·A

Article number	**6FB1112-0AT20-3PS0** SIDOOR NT40
Isolation	
Overvoltage category	2
Degree and class of protection	
IP degree of protection	IP54
Equipment protection class	I
Standards, approvals, certificates	
Standard for EMC	EMC Directive 2004/108/EC, EN 12015, EN 12016
Standard for safety	EN 60950-1:2006
Ambient conditions	
Ambient temperature during operation	
• min.	-20 °C
• max.	55 °C
• Remark	No direct exposure to the sun
Ambient temperature during storage/transportation	
• Storage, min.	-20 °C
• Storage, max.	70 °C
• Transportation, min.	-40 °C
• Transportation, max.	70 °C
Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	2 000 m
Relative humidity	
• No condensation, min.	10 %
• No condensation, max.	93 %
Cables	
Cable length	
• Input side	2 m
• Output side	1.5 m
Connection method	
Design of electrical connection at input	SCHUKO connector DIN 49.441, CEE7/VII
Design of electrical connection at output	WAGO 721-103/026
Dimensions	
Width	270 mm
Height	55 mm
Depth	80 mm

Ordering data

	Article No.
SIDOOR NT40 switched mode power supply	**6FB1112-0AT20-3PS0**

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Overview SIDOOR Software Kit



SIDOOR Software Kit

The scope of supply of the SIDOOR Software Kit includes an installation CD, which includes the following functionalities:

SIDOOR User Software	The component that enables the door control system to be configured, parameters to be assigned, and analyzed.
Siemens HCS12 Firmware Loader	This component is used to update the operating software of the door controller.
SIDOOR USB to UART Bridge Driver	This driver is essential for operation of the USB adapter.

Note:

Some firmware updates are offered as free downloads in the Siemens Industry Online Support. For information on the availability and acquisition of more firmware, please contact Technical Support.

Ordering data	Article No.
SIDOOR Software Kit	**6FB1105-0AT01-6SW0**

Overview Service Tool



The Service Tool can be used to input run commands, change run parameters and read out learned parameters, door states, input/output signals and service data.

You do not need to open the cover of the controller to do this.

Note:

If the Service Tool is in the "Quick adjustment" or "Total adjustment" menu, the run commands of the controller are blocked via the command inputs.

Ordering data	Article No.
SIDOOR Service Tool Hand-held terminal for parameter assignment of controllers	**6FB1105-0AT01-6ST0**

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Overview

SIDOOR geared motors are a combination of gear unit, motor and sensor. They are easy to connect to the controller via the interface provided and are automatically detected during commissioning.

The maintenance-free, variable speed drive unit comprises a DC motor with non-self-locking gearing.

The geared motors must be selected according to the mass to be moved. Two different versions are available for each of the SIDOOR M2 to SIDOOR M5 geared motors, with gear output on the left or on the right:

- SIDOOR M2 geared motors (max. door weight 120 kg)
- SIDOOR M3 geared motors (max. door weight 180 kg)
- SIDOOR M4 geared motors (max. door weight 400 kg)
- SIDOOR M5 geared motors (max. door weight 600 kg)



Geared motors:
SIDOOR M2 L 6FB1103-0AT10-5MA0 (version with pinion left),
SIDOOR M3 L 6FB1103-0AT10-4MB0 (version with pinion left),
SIDOOR M4 L 6FB1103-0AT10-3MC0 (version with pinion left),
SIDOOR M5 L 6FB1103-0AT10-3MD0 (version with pinion left)
(Images are shown in the order from bottom to top)

Technical specifications

Article number	**6FB1103-0AT10-5MA0**	**6FB1103-0AT11-5MA0**	**6FB1103-0AT10-4MB0**	**6FB1103-0AT11-4MB0**	**6FB1103-0AT10-3MC0**	**6FB1103-0AT11-3MC0**	**6FB1103-0AT10-3MD0**	**6FB1103-0AT11-3MD0**
	SIDOOR M2 L	SIDOOR M2 R	SIDOOR M3 L	SIDOOR M3 R	SIDOOR M4 L	SIDOOR M4 R	SIDOOR M5 L	SIDOOR M5 R
General information								
Product brand name	SIDOOR							
Product version	With driven gear on the left	With driven gear on the right	With driven gear on the left	With driven gear on the right	With driven gear on the left	With driven gear on the right	With driven gear on the left	With driven gear on the right
Input current								
Operational current (rated value)	1.8 A		4 A				7.5 A	
Mechanical data								
Torque of the rotary operating mechanism (rated value)	1.05 N·m		3 N·m				6.8 N·m	
Speed, max.	0.5 m/s		0.65 m/s		0.75 m/s		0.5 m/s	
Gear ratio	15							
Number of pulses per revolution, max.	100							
Weight of door, max.	120 kg		180 kg		400 kg		600 kg	
Degree and class of protection								
IP degree of protection								
• of the motor	IP20		IP54					
• of the gear unit	IP20		IP40				IP54	
Ambient conditions								
Ambient temperature during operation								
• min.	-20 °C							
• max.	50 °C							
Ambient temperature during storage/transportation								
• Storage, min.	-40 °C							
• Storage, max.	85 °C							
Dimensions								
Height of motor	90 mm		98 mm		115 mm		124 mm	
Length of motor	207 mm		236 mm		275 mm		344 mm	
Diameter of motor	48 mm		63 mm				80 mm	
Width of gear unit, including drive pinion	90 mm		85 mm		105 mm		111 mm	

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Geared motors

Ordering data	Article No.		Article No.
SIDOOR M2 geared motors		**SIDOOR M4 geared motors**	
M2 L	**6FB1103-0AT10-5MA0**	M4 L	**6FB1103-0AT10-3MC0**
M2 R	**6FB1103-0AT11-5MA0**	M4 R	**6FB1103-0AT11-3MC0**
SIDOOR M3 geared motors		**SIDOOR M5 geared motors**	
M3 L	**6FB1103-0AT10-4MB0**	M5 L	**6FB1103-0AT10-3MD0**
M3 R	**6FB1103-0AT11-4MB0**	M5 R	**6FB1103-0AT11-3MD0**

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Overview



SIDOOR MED280 direct drive

SIDOOR direct drives are a combination of motor and sensor. They are easy to connect to the controller via the interface provided and are automatically detected during commissioning.

The maintenance-free drive unit consists of a gearless, speed-controlled, electronically commutated motor with non-self-locking gearing.

Direct drives are designed for certain masses and can control both drive directions.

- SIDOOR MED280 direct drive for max. 280 kg (6FB1203-0AT12-7DA0)

Technical specifications

Article number	**6FB1203-0AT12-7DA0** SIDOOR MED280
General information	
Product type designation	MED280
Product version	With driven gear
Supply voltage	
Rated value (DC)	24 V
Input current	
Operational current (rated value)	9.7 A
Power	
Active power input	233 W
Mechanical data	
Torque of the rotary operating mechanism (rated value)	4.7 N·m
Speed, max.	0.8 m/s
Number of pulses per revolution, max.	1 024
Weight of door, max.	280 kg
Degree and class of protection	
IP degree of protection	
• of the motor	IP54
Standards, approvals, certificates	
CE mark	Yes
UL approval	Yes
EAC (formerly Gost-R)	Yes
TÜV Inspectorate approval	Yes
China RoHS compliance	Yes
Ambient conditions	
Ambient temperature during operation	
• min.	-25 °C
• max.	70 °C
Ambient temperature during storage/transportation	
• Storage, min.	-40 °C
• Storage, max.	85 °C
Dimensions	
Width of motor	160 mm
Height of motor	140 mm
Length of motor	56 mm
• including drive pinion	91 mm

Ordering data

	Article No.
SIDOOR MED280 direct drive Motor for door control, for max. dynamic door dimensions of 280 kg	**6FB1203-0AT12-7DA0**

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Overview

A range of accessories is available for SIDOOR elevator door drive systems with geared motors:

This is necessary to ensure low-noise operation of the door leaves by the controller. The geared motors can be optimally integrated into the respective door drive system.

Rubber-metal anti-vibration mounts for geared motors

To ensure low-noise door operation, SIDOOR geared motors are integrated in the door system using rubber-metal anti-vibration mounts.

- Rubber-metal anti-vibration mount 6FB1104-0AT02-0AD0 for M2 and M3 geared motors.
- Rubber-metal anti-vibration mount 6FB1104-0AT01-0AD0 for M4 and M5 geared motors.



Rubber-metal anti-vibration mount 6FB1104-0AT02-0AD0



Rubber-metal anti-vibration mount 6FB1104-0AT01-0AD0

Mounting brackets

Two different mounting brackets are available with elongated holes:

- Mounting bracket 6FB1104-0AT01-0AS0 for the geared motors for flexible accommodation of the rubber-bonded metal
- Mounting bracket 6FB1104-0AT02-0AS0 for the deflector unit. For setting the toothed belt to the required belt tension.



Mounting bracket 6FB1104-0AT01-0AS0 for mounting the geared motor



Mounting bracket 6FB1104-0AT02-0AS0 for the deflector unit

Door clutch holder

The door clutch holder serves to connect the respective door leaf by means of a toothed belt while also functioning as a toothed-belt lock. One door clutch holder per door leaf is required. The toothed-belt lock can accommodate both open ends of the toothed belt.

A door clutch holder is available for each toothed belt width:

- Width 12 mm: 6FB1104-0AT01-0CP0
- Width 14 mm: 6FB1104-0AT02-0CP0



Door clutch holder 6FB1104-0AT01-0CP0 (packaging size = 1 unit)

Deflector unit

The deflector unit 6FB1104-0AT03-0AS0 contains an embedded belt pulley which can be mounted on the door system.

The STS toothed belt is redirected via this deflector unit (toothed belt width 12 mm or 14 mm).



Deflector unit 6FB1104-0AT03-0AS0

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Overview (continued)

STS toothed belt

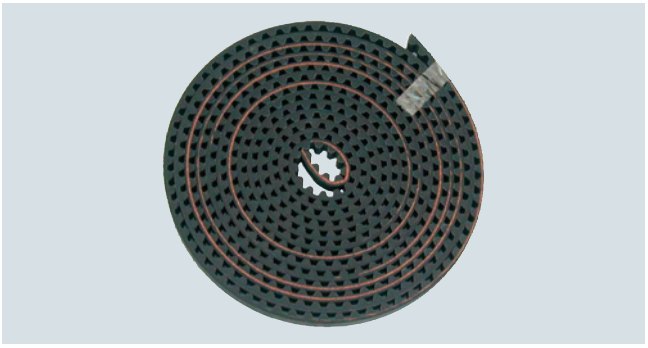
The door system is moved between the end positions of the door using the STS toothed belts. Two different toothed belt lengths can be ordered for each toothed belt width.

Toothed belt width 12 mm:

- Length 4 m: 6FB1104-0AT01-0AB0
- Length 45 m: 6FB1104-0AT02-0AB0

Toothed belt width 14 mm:

- Length 4 m: 6FB1104-0AT03-0AB0
- Length 55 m: 6FB1104-0AT04-0AB0



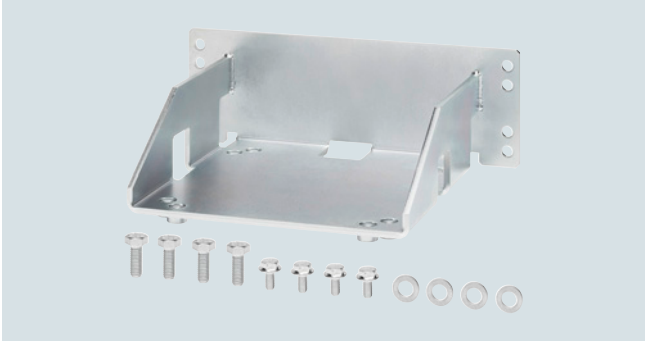
Toothed belt 6FB1104-0AT01-0AB0, length 4 m



Toothed belt 6FB1104-0AT02-0AB0, length 45 m

A range of accessories is available for SIDOOR elevator door systems with EC technology:

Motor holder 6FB1104-0AT03-0AD0 for accommodation of the SIDOOR MED280 direct drive.



Mounting bracket:

- For mounting the SIDOOR motor holder 6FB1104-0AT01-0AS0

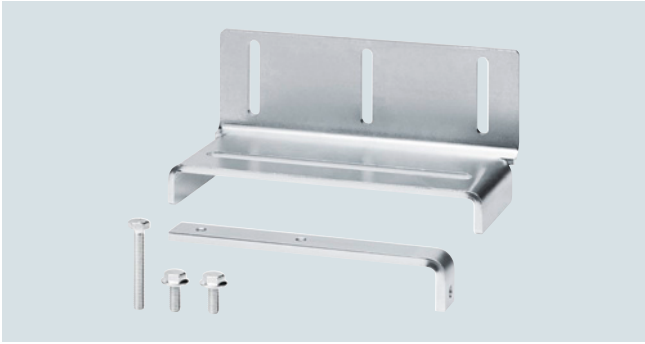


- With tensioning device for mounting the deflector unit and setting the toothed belt to the required tension (large) 6FB1104-0AT05-0AS4



SIDOOR mounting bracket, large

- With tensioning device for mounting the deflector unit and setting the toothed belt to the required tension (small) 6FB1104-0AT05-0AS5



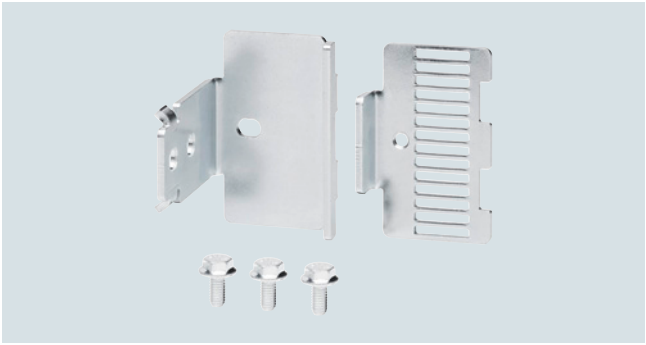
SIDOOR mounting bracket, small

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Overview (continued)

Door clutch holder

- For attaching both ends of the toothed belt and connecting the respective door leaf to the toothed belt, width 20 mm 6FB1104-0AT05-0AS1



SIDOOR door clutch holder

Deflector unit:

For attaching the SIDOOR toothed belt and fixing to the door 6FB1104-0AT07-0AS0



SIDOOR deflector unit

STD toothed belt

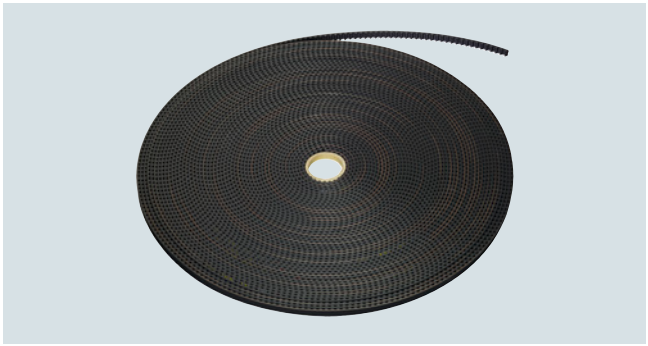
As a connection between the door system and the end positions of the door

Toothed belt width 20 mm. Length 4 m 6FB1104-0AT05-0AB0



SIDOOR toothed belt, small

Toothed belt width 20 mm. Length 45 m 6FB1104-0AT06-0AB1



SIDOOR toothed belt, large

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Ordering data

	Article No.
Elevator door systems with geared motors	
Rubber-metal anti-vibration mounts for geared motors	
• SIDOOR rubber-metal anti-vibration mount for M2 and M3 geared motors	**6FB1104-0AT02-0AD0**
• SIDOOR rubber-metal anti-vibration mount for M4 and M5 geared motors	**6FB1104-0AT01-0AD0**
Mounting bracket	
• SIDOOR mounting bracket for geared motor	**6FB1104-0AT01-0AS0**
• SIDOOR mounting bracket with tensioning device for deflector pulley	**6FB1104-0AT02-0AS0**
SIDOOR door clutch holder	
• For toothed belt, width 12 mm	**6FB1104-0AT01-0CP0**
• For toothed belt, width 14 mm	**6FB1104-0AT02-0CP0**
SIDOOR deflector unit	**6FB1104-0AT03-0AS0**
SIDOOR deflector roller for the STS toothed belt	**6FB1104-0AT04-0AS2**
SIDOOR STS toothed belt	
Width 12 mm	
• 4 m	**6FB1104-0AT01-0AB0**
• 45 m	**6FB1104-0AT02-0AB0**
SIDOOR STS toothed belt	
Width 14 mm	
• 4 m	**6FB1104-0AT03-0AB0**
• 55 m	**6FB1104-0AT04-0AB0**

	Article No.
Elevator door systems with EC technology	
Motor holder for SIDOOR MED280 direct drive	**6FB1104-0AT03-0AD0**
Mounting bracket for mounting the motor holder	**6FB1104-0AT01-0AS0**
Mounting bracket with tensioning device for mounting the deflector unit	
• Large	**6FB1104-0AT05-0AS4**
• Small	**6FB1104-0AT05-0AS5**
SIDOOR door clutch holder	**6FB1104-0AT05-0AS1**
For toothed belt, width 20 mm	
SIDOOR deflector unit	**6FB1104-0AT07-0AS0**
SIDOOR toothed belt STD	
Width 20 mm	
• 4 m	**6FB1104-0AT05-0AB0**
• 55 m	**6FB1104-0AT06-0AB1**

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Overview

The door drive system consists of a controller and a maintenance-free drive unit, the geared motors.

Controllers are electronic controllers connected to the power supply via an external power supply unit. They are generally connected to the higher-level controller via digital or fieldbus interfaces, and can be configured via a user interface.

These controllers are available for selection for industrial applications:

- SIDOOR ATD401W, connected to the higher-level controller via PROFIBUS interface (PROFIBUS module), masses of up to 700 kg
- SIDOOR ATD420W, connected to the higher-level controller via PROFIBUS interface (PROFIBUS module), masses of up to 700 kg
- SIDOOR ATD430W, connected to the higher-level controller via PROFINET interface, masses of up to 700 kg

The safe functions – force limitation, energy limitation and end position detection – fulfill the requirements according to EN ISO 13849-1 for Category 2 and Performance Level d. The drives are suitable for power-operated guards according to EN ISO 14120

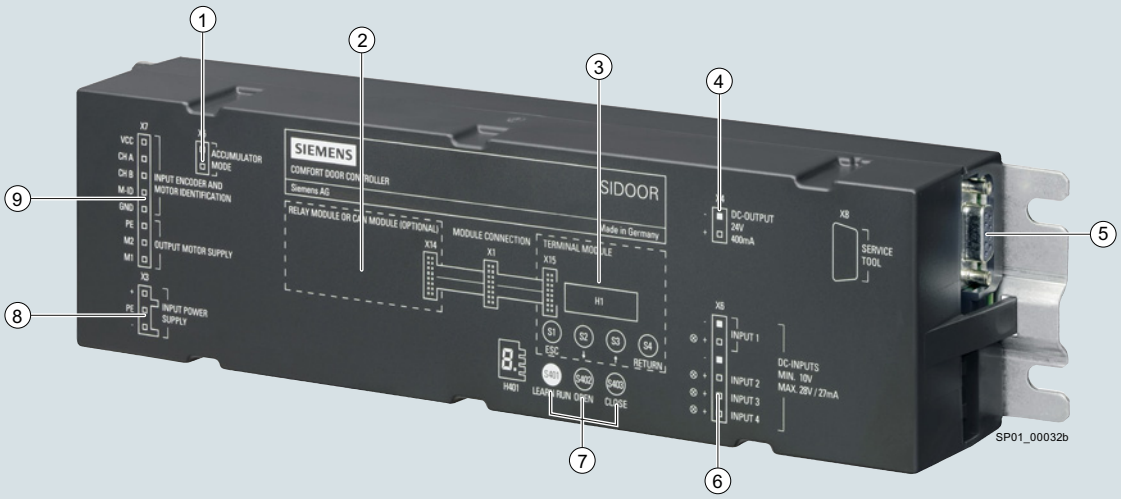
Geared motors form the maintenance-free drive unit in the door drive. The geared motors are DC motors with non-self-locking gearing, and are speed-controlled. The set force and speed limits are not exceeded.

Operation of the named door drives does not require limit switches. The door width and the "OPEN"/"CLOSE" positions are determined automatically.

The power is transmitted by a toothed belt. The toothed belt passes over a deflector pulley and can be fitted with 2 door clutch holders. This enables it to drive both one-sided and centrally-opening doors. The accessories are not included in the scope of supply, see "Accessories".

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Overview



1. Digital input
2. Fieldbus interface
3. Terminal module
4. Output voltage 24 V DC/400 mA connection
5. Connection
   - Software Kit or
   - Service Tool
6. Input signal connection
7. Control panel
8. Input voltage connection
   16.8 to 36 V DC
   for connection of power supply
9. Motor connection

SIDOOR ATD401W

The SIDOOR ATD401W enables the quick, easy and versatile installation, configuration and operation of a wide range of industrial door drive systems.

- Relay module design
- Masses of up to 700 kg
- Automatic determination of the door weight and friction during the learn run
- Digital inputs, for example for direct connection of a light barrier as type 2 ESPE (electro-sensitive protective equipment) according to EN 61496-1
- 3 relay outputs for position feedback and reversing feedback
- Operating temperature -20 to +50 °C
- Flexible motor management, automatic recognition of the geared motor
- Opening width 0.3 to 5 m
- Auxiliary voltage output 24 V DC ±15%; 0.4 A (short-circuit-proof)
- Output stage for the motor control is short-circuit-proof
- Indicates the current operating states on a 7-segment display directly on the controller or using the Software Kit or Service Tool

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Technical specifications

Article number	**6FB1141-1AT11-3WE2** SIDOOR ATD401W
General information	
Product brand name	SIDOOR
Product version	With relay outputs
Optional product expansion	TRANSFORMER (6FB1112-0AT20-2TR0), TRANSFORMER UL (6FB1112-0AT21-2TR0), NT40 (6FB1112-0AT20-3PS0), DIN rail holder (6FB1144-0AT00-3AS0)
Manufacturer's article no. of the usable motor	6FB1103-0AT10-4MB0, 6FB1103-0AT10-3MC0, 6FB1103-0AT10-3MD0, 6FB1103-0AT11-4MB0, 6FB1103-0AT11-3MC0, 6FB1103-0AT11-3MD0, 6FB1103-0AT14-4MB1, 6FB1103-0AT13-4MB1, 6FB1103-0AT14-3MC2, 6FB1103-0AT13-3MC2, 6FB1103-0AT14-3MG2, 6FB1103-0AT13-3MG2
Manufacturer's article no. of the usable power supply unit	6FB1112-0AT20-2TR0, 6FB1112-0AT21-2TR0, 6FB1112-0AT20-3PS0, 6EP3446-8SB10-0AY0
Installation type/mounting	
Installation and mounting instructions	No direct solar radiation, final application-specific requirements must be observed. Installation outside a control cabinet only in horizontal mounting position
Supply voltage	
Rated value (DC)	36 V
Input current	
I^2t, min.	30 $A^2 \cdot s$
Power	
Active power input (standby mode)	5 W
Digital inputs	
Control inputs isolated	Yes
Control inputs p-switching	Yes
Protection in case of DC supply	Use of a circuit breaker in the supply path according to 60898-1, 8A, C-characteristic type SIEMENS: 5SY4108-7 or 5SY4108-7KK11
Input voltage	
• per DC input, min.	10 V; Observe polarity !
• per DC input, max.	28 V; Observe polarity !
Input current	
• per DC input, min.	9 mA
• per DC input, max.	27 mA
Digital outputs	
short-circuit proof	Yes
Overload-proof	Yes
Remark	Ensure correct polarity! CAUTION: Do not supply with external voltage!
Output voltage	
• Output voltage (DC)	24 V
Output current	
• For output (24 V DC), max.	400 mA

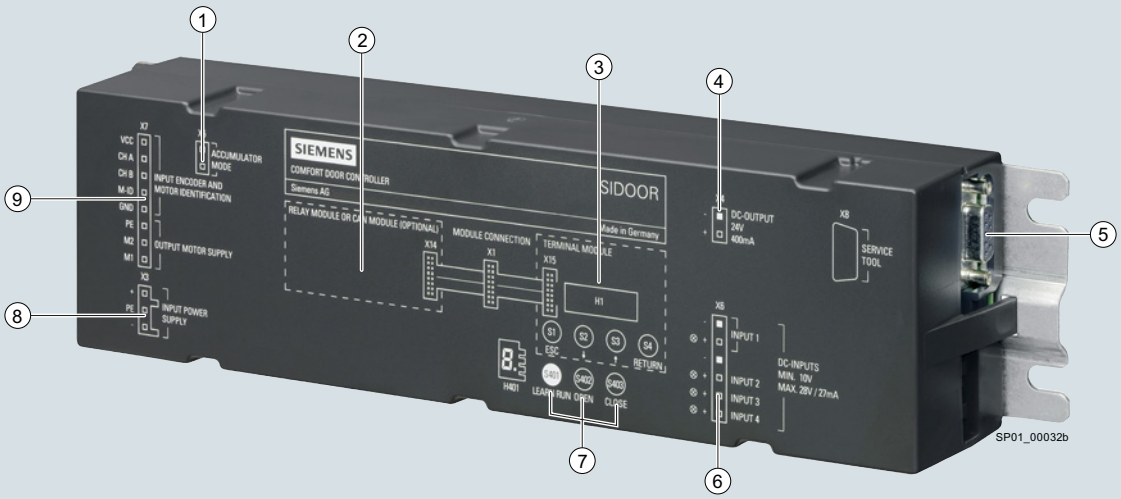
Article number	**6FB1141-1AT11-3WE2** SIDOOR ATD401W
Relay outputs	
Switching capacity of contacts	
- at 30 V DC, min.	0.01 A
- at 30 V DC, max.	1 A
Mechanical data	
Opening width of door, min.	0.3 m
Opening width of door, max.	5 m
Weight of door, max.	600 kg
Operating cycle frequency of door, max.	180 1/h
Counterforce, max.	75 N
Kinetic energy, max.	100 J
Interfaces	
Interfaces/bus type	without
Isolation	
Overvoltage category	2
Degree and class of protection	
IP degree of protection	IP20
Standards, approvals, certificates	
Certificate of suitability according to EN 81	No
CE mark	Yes
UL approval	Yes
EAC (formerly Gost-R)	Yes
TÜV Inspectorate approval	Yes
Standard for EMC	EN 61000-6-2 / EN 61000-6-4
Standard for safety	EN 60950-1 / UL 61010-1 / UL 61010-2-201 / EN ISO 13849-1 Cat. 2 PL d
Ambient conditions	
Ambient temperature during operation	
• min.	-20 °C
• max.	50 °C
Ambient temperature during storage/transportation	
• Storage, min.	-40 °C
• Storage, max.	70 °C
Air pressure acc. to IEC 60068-2-13	
• Installation altitude above sea level, max.	2 000 m
Relative humidity	
• No condensation, min.	10 %
• No condensation, max.	93 %
Dimensions	
Width	320 mm
Height	60 mm
Depth	80 mm

Ordering data

	Article No.
SIDOOR ATD401W Controller, relay module design	**6FB1141-1AT11-3WE2**

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Overview



1. Digital input
2. Fieldbus interface
3. Terminal module
4. Output voltage 24 V DC/400 mA connection
5. Connection
   - Software Kit or
   - Service Tool
6. Input signal connection
7. Control panel
8. Input voltage connection
   16.8 to 36 V DC
   for connection of power supply
9. Motor connection

SIDOOR ATD420W

The SIDOOR ATD420W can be used to operate horizontal sliding doors. The drive system has been specially designed for use in a very wide range of machine tools. The communication-capable ATD420W controller offers complete flexibility for integration with a machine tool via PROFIBUS

- Masses of up to 700 kg
- Integrated PROFIBUS interface
- 5 freely parameterizable digital inputs for signal acquisition, of which one input is optionally parameterizable for:
  - Connection of a light barrier as type 2 ESPE (electro-sensitive protective equipment) according to EN 61496-1
  - Connection of a pressure-sensitive edge according to ISO 13856-2
- 2 relay contacts for additional position signals
- Automatic determination of the door weight and friction during the learn run
- Parameter assignment and analysis of the door parameters via PROFIdrive
- Operating temperature -20 to +50 °C
- Flexible motor management, i.e. automatic recognition of the geared motor
- Assisted drive (motor-assisted movement of the door)
- Impulse stop (door stopped automatically by applying light force)
- Impulse drive (automatic door movement after applying light force)
- Opening width 0.3 to 5 m
- Auxiliary power output 24 V DC ±15 % and 0.4 A (short-circuit-proof)
- Output stage for the motor control is short-circuit proof
- Indicates the current operating states on a 7-segment display directly on the controller or using the Software Kit or Service Tool

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Technical specifications

Article number	**6FB1141-2AT10-3WE2** SIDOOR ATD420W
General information	
Product brand name	SIDOOR
Product version	With PROFIBUS interface
Optional product expansion	TRANSFORMER (6FB1112-0AT20-2TR0), TRANSFORMER UL (6FB1112-0AT21-2TR0), NT40 (6FB1112-0AT20-3PS0), DIN rail holder (6FB1144-0AT00-3AS0)
Manufacturer's article no. of the usable motor	6FB1103-0AT10-4MB0, 6FB1103-0AT10-3MC0, 6FB1103-0AT10-3MD0, 6FB1103-0AT11-4MB0, 6FB1103-0AT11-3MC0, 6FB1103-0AT11-3MD0, 6FB1103-0AT14-4MB1, 6FB1103-0AT13-4MB1, 6FB1103-0AT14-3MC2, 6FB1103-0AT13-3MC2, 6FB1103-0AT14-3MG2, 6FB1103-0AT13-3MG2
Manufacturer's article no. of the usable power supply unit	6FB1112-0AT20-2TR0, 6FB1112-0AT21-2TR0, 6FB1112-0AT20-3PS0, 6EP3446-8SB10-0AY0
Installation type/mounting	
Installation and mounting instructions	No direct solar radiation, final application-specific requirements must be observed. Installation outside a control cabinet only in horizontal mounting position
Supply voltage	
Rated value (DC)	36 V
Input current	
I^2t, min.	30 $A^2 \cdot s$
Power	
Active power input (standby mode)	5 W
Digital inputs	
Control inputs isolated	Yes
Control inputs p-switching	Yes
Protection in case of DC supply	Use of a circuit breaker in the supply path according to 60898-1, 8A, C-characteristic type SIEMENS: 5SY4108-7 or 5SY4108-7KK11
Input voltage	
• per DC input, min.	10 V; Observe polarity !
• per DC input, max.	28 V; Observe polarity !
Input current	
• per DC input, min.	9 mA
• per DC input, max.	27 mA
Digital outputs	
short-circuit proof	Yes
Overload-proof	Yes
Remark	Ensure correct polarity! CAUTION: Do not supply with external voltage!
Output voltage	
• Output voltage (DC)	24 V

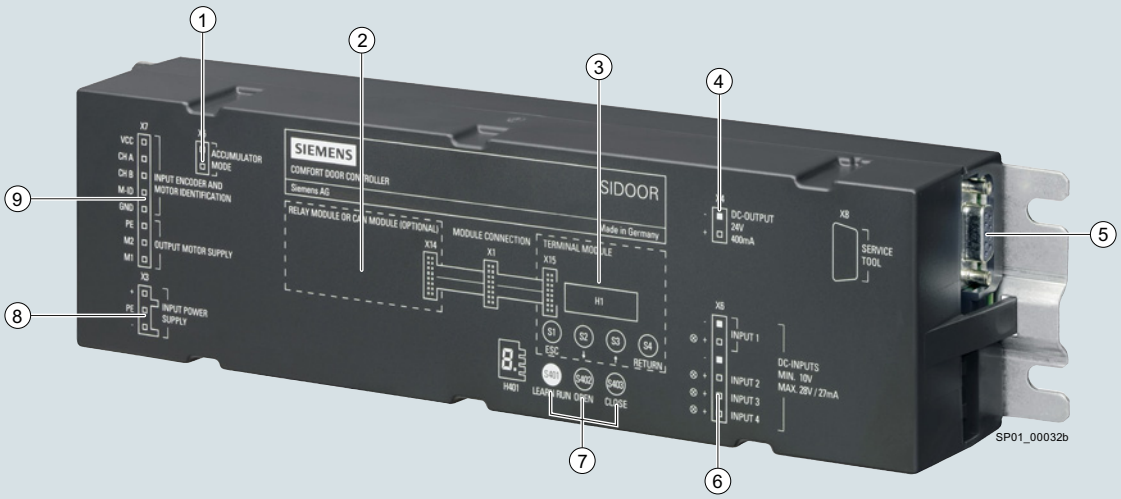
Article number	**6FB1141-2AT10-3WE2** SIDOOR ATD420W
Output current	
• For output (24 V DC), max.	400 mA
Relay outputs	
Switching capacity of contacts	
- at 30 V DC, min.	0.01 A
- at 30 V DC, max.	0.5 A
Mechanical data	
Opening width of door, min.	0.3 m
Opening width of door, max.	5 m
Weight of door, max.	600 kg
Operating cycle frequency of door, max.	180 1/h
Counterforce, max.	75 N
Kinetic energy, max.	100 J
Interfaces	
Interfaces/bus type	PROFIBUS according to IEC 61784-3
Number of bus nodes	32
Isolation	
Overvoltage category	2
Degree and class of protection	
IP degree of protection	IP20
Standards, approvals, certificates	
Certificate of suitability according to EN 81	No
CE mark	Yes
UL approval	Yes
EAC (formerly Gost-R)	Yes
TÜV Inspectorate approval	Yes
PNO certificate	Yes
Standard for EMC	EN 61000-6-2 / EN 61000-6-4
Standard for safety	EN 60950-1 / UL 61010-1 / UL 61010-2-201 / EN ISO 13849-1 Cat. 2 PL d
Ambient conditions	
Ambient temperature during operation	
• min.	-20 °C
• max.	50 °C
Ambient temperature during storage/transportation	
• Storage, min.	-40 °C
• Storage, max.	70 °C
Air pressure acc. to IEC 60068-2-13	
• Installation altitude above sea level, max.	2 000 m
Relative humidity	
• No condensation, min.	10 %
• No condensation, max.	93 %
Dimensions	
Width	320 mm
Height	60 mm
Depth	80 mm

Ordering data

	Article No.
SIDOOR ATD420W Controller, integrated PROFIBUS interface	**6FB1141-2AT10-3WE2**

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Overview



1. Digital input
2. Fieldbus interface
3. Terminal module
4. Output voltage 24 V DC/400 mA connection
5. Connection
   - Software Kit or
   - Service Tool
6. Input signal connection
7. Control panel
8. Input voltage connection
   16.8 to 36 V DC
   for connection of power supply
9. Motor connection

SIDOOR ATD430W

The SIDOOR ATD430W can be used to operate horizontal sliding doors. The drive system has been specially designed for use in a very wide range of machine tools. The communication-capable ATD430W controller offers complete flexibility for integration into a machine tool via PROFINET.

- Masses of up to 700 kg
- Integrated PROFINET interface (2 RJ45 ports)
- 5 freely parameterizable digital inputs for signal acquisition, of which one input is optionally parameterizable for:
  - Connection of a light barrier as type 2 ESPE (electro-sensitive protective equipment) according to EN 61496-1
  - Connecting a pressure-sensitive edge according to ISO 13856-22, relay contacts for additional position signals
- 2 relay contacts for additional position signals
- Automatic determination of the door weight and friction during the learn run
- Parameter assignment and analysis of the door parameters
- Operating temperature -20 to +50 °C
- Flexible motor management, i.e. automatic recognition of the geared motor
- Assisted drive (motor-assisted movement of the door)
- Impulse stop (door stopped automatically by applying light force)
- Impulse drive (automatic door movement after applying light force)
- Opening width 0.3 to 5 m
- Auxiliary power output 24 V DC ±15 % and 0.4 A (short-circuit-proof)
- Output stage for the motor control is short-circuit-proof
- Indicates the current operating states on a 7-segment display directly on the controller or using the Software Kit or Service Tool

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Technical specifications

Article number	**6FB1141-3AT10-3WE2** SIDOOR ATD430W
General information	
Product brand name	SIDOOR
Product version	With PROFINET interface
Optional product expansion	TRANSFORMER (6FB1112-0AT20-2TR0), TRANSFORMER UL (6FB1112-0AT21-2TR0), NT40 (6FB1112-0AT20-3PS0), DIN rail holder (6FB1144-0AT00-3AS0)
Manufacturer's article no. of the usable motor	6FB1103-0AT10-4MB0, 6FB1103-0AT10-3MC0, 6FB1103-0AT10-3MD0, 6FB1103-0AT11-4MB0, 6FB1103-0AT11-3MC0, 6FB1103-0AT11-3MD0, 6FB1103-0AT14-4MB1, 6FB1103-0AT13-4MB1, 6FB1103-0AT14-3MC2, 6FB1103-0AT13-3MC2, 6FB1103-0AT14-3MG2, 6FB1103-0AT13-3MG2
Manufacturer's article no. of the usable power supply unit	6FB1112-0AT20-2TR0, 6FB1112-0AT21-2TR0, 6FB1112-0AT20-3PS0, 6EP3446-8SB10-0AY0
Installation type/mounting	
Installation and mounting instructions	No direct solar radiation, final application-specific requirements must be observed. Installation outside a control cabinet only in horizontal mounting position
Supply voltage	
Rated value (DC)	36 V
Input current	
I^2t, min.	30 $A^2 \cdot s$
Power	
Active power input (standby mode)	5 W
Digital inputs	
Control inputs isolated	Yes
Control inputs p-switching	Yes
Protection in case of DC supply	Use of a circuit breaker in the supply path according to 60898-1, 8A, C-characteristic type SIEMENS: 5SY4108-7 or 5SY4108-7KK11
Input voltage	
• per DC input, min.	10 V; Observe polarity !
• per DC input, max.	28 V; Observe polarity !
Input current	
• per DC input, min.	9 mA
• per DC input, max.	27 mA
Digital outputs	
short-circuit proof	Yes
Overload-proof	Yes
Remark	Ensure correct polarity! CAUTION: Do not supply with external voltage!
Output voltage	
• Output voltage (DC)	24 V
Output current	
• For output (24 V DC), max.	400 mA

Article number	**6FB1141-3AT10-3WE2** SIDOOR ATD430W
Relay outputs	
Switching capacity of contacts	
- at 30 V DC, min.	0.01 A
- at 30 V DC, max.	0.5 A
Mechanical data	
Opening width of door, min.	0.3 m
Opening width of door, max.	5 m
Weight of door, max.	600 kg
Operating cycle frequency of door, max.	180 1/h
Counterforce, max.	75 N
Kinetic energy, max.	100 J
Interfaces	
Interfaces/bus type	PROFINET IO according to Conformance Class C
Isolation	
Overvoltage category	2
Degree and class of protection	
IP degree of protection	IP20
Standards, approvals, certificates	
Certificate of suitability according to EN 81	No
CE mark	Yes
UL approval	Yes
EAC (formerly Gost-R)	Yes
TÜV Inspectorate approval	Yes
PNO certificate	Yes
Standard for EMC	EN 61000-6-2 / EN 61000-6-4
Standard for safety	EN 60950-1 / UL 61010-1 / UL 61010-2-201 / EN ISO 13849-1 Cat. 2 PL d
Ambient conditions	
Ambient temperature during operation	
• min.	-20 °C
• max.	50 °C
• Remark	Screw control device thermally conductive onto a metallic mounting surface or standard rail mounting, otherwise the maximum operating temperature is only 40 °C
Ambient temperature during storage/transportation	
• Storage, min.	-40 °C
• Storage, max.	70 °C
Air pressure acc. to IEC 60068-2-13	
• Installation altitude above sea level, max.	2 000 m
Relative humidity	
• No condensation, min.	10 %
• No condensation, max.	93 %
Dimensions	
Width	320 mm
Height	60 mm
Depth	80 mm

Ordering data

	Article No.
SIDOOR ATD430W Controller, integrated PROFINET interface (2 RJ45 ports)	**6FB1141-3AT10-3WE2**

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Overview

The power supplies can be used for the various SIDOOR controllers:

SIDOOR TRANSFORMER and TRANSFORMER UL power supply units:
For masses of up to 400 kg and moderate performance.

SIDOOR NT40 switched mode power supply:
For masses of up to 700 kg and maximum performance.

SITOP PSU8200 3-phase stabilized power supply, 36 V DC/13 A:
For masses of up to 700 kg and maximum performance.

Overview Power supply unit

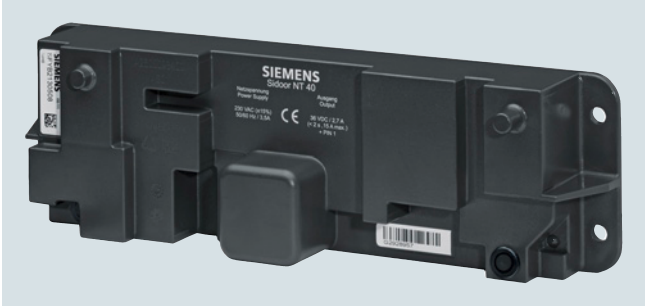


SIDOOR Transformer

The SIDOOR TRANSFORMER and SIDOOR TRANSFORMER UL are standard power supply units operated with 220-240 V AC, 50/60 Hz, from the SIDOOR product range. They can be used for all controllers without integrated power supplies.

For more information, see page 13/17.

Overview Switched mode power supply



The SIDOOR NT40 switched mode power supply unit is operated with 230 V AC (± 15%), 50/60 Hz, to power the elevator door controllers.

It is especially suitable for door systems with high door weights.

On the output side, the power supply unit delivers a voltage of 36 V DC (± 3%) SELV at a rated output power of < 100 W.

In order to enable fast acceleration/deceleration of the doors by the controller, the device can briefly (< 2 s) deliver a current of 15 A (corresponds to a short-time power output of 540 W).

For more information, see page 13/19.

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Overview



The 3-phase SITOP modular are technology power supplies for sophisticated solutions and offer maximum functionality for use in complex plants and machines. The wide-range input allows connection to almost any electrical power system worldwide and ensures a high degree of safety, even if there are large voltage fluctuations. The power boost provides up to three times the rated current for brief periods. In case of overload, you can choose between constant current with automatic restart or latching shutdown. The high degree of efficiency keeps energy consumption and heating in the control cabinet low, and the compact metal housing also saves space.

Main product highlights

- 36 V DC/13 A
- 3-phase AC input 400 to 500 volts
- Extremely slim design – no lateral installation clearances required
- Power boost with 3 times the rated current (for 25 ms) for tripping protective devices
- Extra power with 1.5 times the rated current (5 s/min) for brief functional overload
- Choice of constant current or latching shutdown short-circuit response
- Optional symmetrical load distribution for parallel operation
- Operating state on 3 LEDs
- Extremely high efficiency up to 94%
- Wide temperature range from -25 to +70 °C
- Comprehensive certifications, such as cULus, ATEX

Technical specifications

Article number	**6EP3446-8SB10-0AY0**
Product	SITOP PSU8200
Power supply, type	36 V/13 A
Input	
Input	3-phase AC
Rated voltage value $V_{in\ rated}$	400 ... 500 V
Voltage range AC	320 ... 575 V
Wide-range input	Yes
Mains buffering at $I_{out\ rated}$, min.	15 ms; at V_{in} = 400 V
Rated line frequency 1	50 Hz
Rated line frequency 2	60 Hz
Rated line range	47 ... 63 Hz
Input current	
• at rated input voltage 400 V	1.2 A
• at rated input voltage 500 V	1 A
Switch-on current limiting (+25 °C), max.	16 A
I^2t, max.	0.8 $A^2 \cdot s$
Built-in incoming fuse	none
Protection in the mains power input (IEC 898)	Required: 3-pole connected miniature circuit breaker 6 ... 16 A characteristic C or circuit breaker 3RV2011-1DA10 (setting 3 A) or 3RV2711-1DD10 (UL 489)
Output	
Output	Controlled, isolated DC voltage
Rated voltage V_{out} DC	36 V
Total tolerance, static ±	3 %
Static mains compensation, approx.	0.1 %
Static load balancing, approx.	0.2 %
Residual ripple peak-peak, max.	100 mV
Spikes peak-peak, max. (bandwidth: 20 MHz)	200 mV
Adjustment range	36 ... 42 V
Product function Output voltage adjustable	Yes
Output voltage setting	via potentiometer; max. 480 W
Status display	Green LED for 36 V OK
Signaling	Relay contact (NO contact, rating 60 V DC/ 0.3 A) for 36 V OK
On/off behavior	No overshoot of V_{out} (soft start)
Startup delay, max.	2.5 s
Voltage increase time of the output voltage maximum	500 ms
Rated current value $I_{out\ rated}$	13 A
Current range	0 ... 13 A
• Note	+60 ... +70 °C: Derating 2%/K
Supplied active power typical	468 W
Short-term overload current	
• at short-circuit during operation typical	39 A
Duration of overloading capability for excess current	
• at short-circuit during operation	25 ms
Constant overload current	
• on short-circuiting during the start-up typical	14 A
Parallel switching for enhanced performance	Yes; switchable characteristic
Numbers of parallel switchable units for enhanced performance	2

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Technical specifications (continued)

Article number	6EP3446-8SB10-0AY0
Product	SITOP PSU8200
Power supply, type	36 V/13 A
Efficiency	
Efficiency at $V_{out\ rated}$, $I_{out\ rated}$, approx.	94 %
Power loss at $V_{out\ rated}$, $I_{out\ rated}$, approx.	30 W
Closed-loop control	
Dynamic mains compensation ($V_{in\ rated}$ ±15 %), max.	0.1 %
Dynamic load smoothing (I_{out}: 50/100/50 %), U_{out} ± typ.	1 %
Load step setting time 50 to 100%, typ.	0.2 ms
Load step setting time 100 to 50%, typ.	0.2 ms
Dynamic load smoothing (I_{out}: 10/90/10 %), U_{out} ± typ.	2 %
Load step setting time 10 to 90%, typ.	0.2 ms
Load step setting time 90 to 10%, typ.	0.2 ms
Setting time maximum	10 ms
Protection and monitoring	
Output overvoltage protection	< 48 V
Current limitation, typ.	14 A
Property of the output Short-circuit proof	Yes
Short-circuit protection	Alternatively, constant current characteristic approx. 14 A or latching shutdown
Enduring short circuit current RMS value	
• typical	14 A
Overcurrent overload capability in normal operation	overload capability 150 % $I_{out\ rated}$ up to 5 s/min
Overload/short-circuit indicator	LED yellow for "overload", LED red for "latching shutdown"
Safety	
Primary/secondary isolation	Yes
(galvanic isolation)	Safety extra low output voltage V_{out} according to EN 60950-1
Protection class	Class I
Leakage current	
• maximum	3.5 mA
• typical	0.9 mA
CE mark	Yes
UL/cUL (CSA) approval	cULus-Listed (UL 508, CSA C22.2 No. 107.1), File E197259; cCSAus (CSA C22.2 No. 60950-1, UL 60950-1)
Explosion protection	IECEx Ex nA nC IIC T4 Gc; ATEX (EX) II 3G Ex nA nC IIC T4 Gc; cCSAus (CSA C22.2 No. 213, ANSI/ISA-12.12.01) Class I, Div. 2, Group ABCD, T4
FM approval	-
CB approval	Yes
Marine approval	-
Degree of protection (EN 60529)	IP20

Article number	6EP3446-8SB10-0AY0
Product	SITOP PSU8200
Power supply, type	36 V/13 A
EMC	
Emitted interference	EN 55022 Class B
Supply harmonics limitation	EN 61000-3-2
Noise immunity	EN 61000-6-2
Operating data	
Ambient temperature	
• during operation	-25 ... +70 °C
- Note	with natural convection
• during transport	-40 ... +85 °C
• during storage	-40 ... +85 °C
Humidity class according to EN 60721	Climate class 3K3, no condensation
Mechanics	
Connection technology	screw-type terminals
Connections	
• Supply input	L1, L2, L3, PE: 1 screw terminal each for 0.2 ... 4 mm² single-core/finely stranded
• Output	+, -: 2 screw terminals each for 0.2 ... 4 mm²
• Auxiliary	13, 14 (alarm signal): 1 screw terminal each for 0.14 ... 1.5 mm²; 15, 16 (Remote): 1 screw terminal each for 0.14 ... 1.5 mm²
Width of the enclosure	70 mm
Height of the enclosure	125 mm
Depth of the enclosure	125 mm
Required spacing	
• top	50 mm
• bottom	50 mm
• left	0 mm
• right	0 mm
Weight, approx.	1.2 kg
Product feature of the enclosure housing for side-by-side mounting	Yes
Installation	Snaps onto DIN rail EN 60715 35x7.5/15
Electrical accessories	Buffer module
Mechanical accessories	Device identification label 20 mm × 7 mm, TI-grey 3RT2900-1SB20
Other information	Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)

Ordering data

	Article No.
SITOP PSU8200 3-phase, 36 V DC/13 A Stabilized power supply Input: 3 AC 400 … 500 V Output: 36 V DC/13 A	**6EP3446-8SB10-0AY0**

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Overview SIDOOR Software Kit



SIDOOR Software Kit

The scope of supply of the SIDOOR Software Kit includes an installation CD, which includes the following functionalities:

SIDOOR User Software	The component that enables the door control system to be configured, parameters to be assigned, and analyzed.
Siemens HCS12 Firmware Loader	This component is used to update the operating software of the door controller.
SIDOOR USB to UART Bridge Driver	This driver is essential for operation of the USB adapter.

Note:

Some firmware updates are offered as free downloads in the Siemens Industry Online Support. For information on the availability and acquisition of more firmware, please contact Technical Support.

For more information, see page 13/20.

Overview SIDOOR Service Tool



The Service Tool can be used to input run commands, change run parameters and read out learned parameters, door states, input/output signals and service data.

The Service Tool is connected to the various controllers by the respective cable.

You do not need to open the cover of the controller to do this.

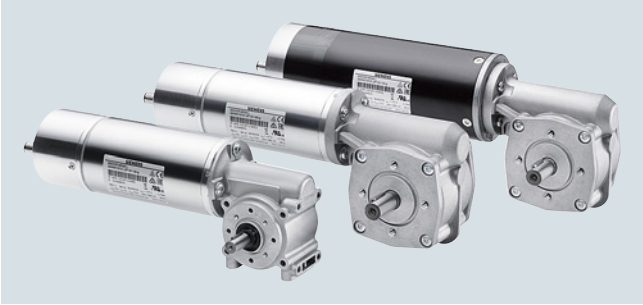
Note:

If the Service Tool is in the "Quick adjustment" or "Total adjustment" menu, the run commands of the controller are blocked via the command inputs.

For more information, see page 13/20.

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Overview



SIDOOR MDG3 L, MDG4 L and MDG5 L

The SIDOOR geared motor is a combination of a gear unit, motor and incremental encoder matched to the complete system. It is easy to connect to the controller via the interface provided, and is automatically detected during commissioning.

The maintenance-free, variable speed drive unit comprises a DC motor with non-self-locking gearing. All geared motors are available with the output shaft on the left or right. The view is toward the front of the gear unit.

The "mass to be moved" has to be taken into account when selecting the geared motor:

The weight to be moved is calculated from the sum of the mass equivalent of the moment of inertia of the motor rotor, the moved door weight and the moved door mechanism weight. The weight of the door to be moved and the moved weight of the door mechanism depend on the application. You can find additional information in the System Manual.

The **output shaft** is appropriately prepared for the mechanical coupling of the door.

- Output gear with 56 mm effective diameter for the use of a S8M toothed belt (see Accessories).
- Output shaft with groove and feather key A 5x5 according to DIN 6885, the output gear design and effective diameter can be freely configured between 28 mm and 122 mm. This version of the geared motors is recommended, among other things, with a mechanical coupling via gear rack or chain.

Technical specifications

Article number	**6FB1103-0AT10-4MB0**	**6FB1103-0AT11-4MB0**	**6FB1103-0AT10-3MC0**	**6FB1103-0AT11-3MC0**	**6FB1103-0AT10-3MD0**	**6FB1103-0AT11-3MD0**
	SIDOOR M3 L	SIDOOR M3 R	SIDOOR M4 L	SIDOOR M4 R	SIDOOR M5 L	SIDOOR M5 R
General information						
Product type designation	M3 L	M3 R	M4 L	M4 R	M5 L	M5 R
Product version	With driven gear on the left	With driven gear on the right	With driven gear on the left	With driven gear on the right	With driven gear on the left	With driven gear on the right
Supply voltage						
Rated value (DC)	30 V					
Input current						
Operational current (rated value)	4 A				7.5 A	
Power						
Active power input	120 W				225 W	
Mechanical data						
Torque of the rotary operating mechanism (rated value)	3 N·m				6.8 N·m	
Speed, max.	0.65 m/s		0.75 m/s		0.5 m/s	
Gear ratio	15					
Number of pulses per revolution, max.	100					
Weight of door, max.	180 kg		400 kg		600 kg	
Degree and class of protection						
IP degree of protection						
• of the motor	IP54					
• of the gear unit	IP40				IP54	
Standards, approvals, certificates						
CE mark	Yes					
UL approval	Yes					
EAC (formerly Gost-R)	Yes					
TÜV Inspectorate approval	Yes					
China RoHS compliance	Yes					
Ambient conditions						
Ambient temperature during operation						
• min.	-20 °C					
• max.	50 °C					
Ambient temperature during storage/transportation						
• Storage, min.	-40 °C					
• Storage, max.	85 °C					

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Technical specifications (continued)

Article number	6FB1103-0AT10-4MB0 SIDOOR M3 L	6FB1103-0AT11-4MB0 SIDOOR M3 R	6FB1103-0AT10-3MC0 SIDOOR M4 L	6FB1103-0AT11-3MC0 SIDOOR M4 R	6FB1103-0AT10-3MD0 SIDOOR M5 L	6FB1103-0AT11-3MD0 SIDOOR M5 R
Dimensions						
Height of motor	98 mm		115 mm		124 mm	
Length of motor	236 mm		275 mm		344 mm	
Diameter of motor	63 mm				80 mm	
Width of gear unit, including drive pinion	85 mm		105 mm		111 mm	
General information						
Product type designation	**MDG3 L**	**MDG3 R**	**MDG4 L**	**MDG4 R**	**MDG5 L**	**MDG5 R**
Product version	Left gearbox output with groove and feather key	Right gearbox output with groove and feather key	Left gearbox output with groove and feather key	Right gearbox output with groove and feather key	Left gearbox output with groove and feather key	Right gearbox output with groove and feather key
Supply voltage						
Rated value (DC)	30 V					
Input current						
Operational current (rated value)	4 A				7.5 A	
Power						
Active power input	120 W				225 W	
Mechanical data						
Torque of the rotary operating mechanism (rated value)	3 N·m				6 N·m	
Speed, max.	0.65 m/s		0.75 m/s		0.5 m/s	
Mass to be moved, max.	180 kg		400 kg		700 kg	
Gear unit	Yes					
Gear ratio	15					
Number of pulses per revolution, max.	100					
Fixed output gear	No					
Degree and class of protection						
IP degree of protection						
• of the motor	IP56					
• of the gear unit	IP56					
Standards, approvals, certificates						
CE mark	Yes					
UL approval	Yes					
EAC (formerly Gost-R)	Yes					
China RoHS compliance	Yes					
Ambient conditions						
Ambient temperature during operation						
• min.	-20 °C					
• max.	50 °C					
Ambient temperature during storage/transportation						
• Storage, min.	-40 °C					
• Storage, max.	85 °C					
Cables						
Fixed connecting cable	No					
Dimensions						
Diameter of output gear, min.	28 mm					
Diameter of output gear, max.	122 mm					
Height of motor	98 mm		115 mm		124 mm	
Length of motor	264 mm		303 mm		348 mm	
Diameter of motor	63 mm				80 mm	
Width of gearbox	85 mm		106 mm		109 mm	

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Ordering data

	Article No.
SIDOOR M3 geared motors	
M3 L	**6FB1103-0AT10-4MB0**
M3 R	**6FB1103-0AT11-4MB0**
SIDOOR M4 geared motors	
M4 L	**6FB1103-0AT10-3MC0**
M4 R	**6FB1103-0AT11-3MC0**
SIDOOR M5 geared motors	
M5 L	**6FB1103-0AT10-3MD0**
M5 R	**6FB1103-0AT11-3MD0**

	Article No.
SIDOOR MDG3 geared motors	
MDG3 L	**6FB1103-0AT14-4MB1**
MDG3 R	**6FB1103-0AT13-4MB1**
SIDOOR MDG4 geared motor	
MDG4 L	**6FB1103-0AT14-3MC2**
MDG4 R	**6FB1103-0AT13-3MC2**
SIDOOR MDG5 geared motor	
MDG5 L	**6FB1103-0AT14-3MG2**
MDG5 R	**6FB1103-0AT13-3MG2**

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Overview

An extensive range of accessories is available for the door control drives.

This is necessary to ensure low-noise operation of the door leaves by the motor. The geared motors can be optimally integrated into the respective door drive system.

Accessories for all controllers for industrial applications

Rubber-metal anti-vibration mounts for geared motors

To ensure low-noise door operation, SIDOOR geared motors are integrated in the door system using rubber-metal anti-vibration mounts.

- Rubber-metal anti-vibration mount 6FB1104-0AT02-0AD0 for M3 and MDG3 geared motors
- Rubber-metal anti-vibration mount 6FB1104-0AT01-0AD0 for M4 and MDG4 as well as M5 and MDG5 geared motors



Rubber-metal anti-vibration mount 6FB1104-0AT02-0AD0 for geared motors with masses to be moved of up to 180 kg



Rubber-metal anti-vibration mount 6FB1104-0AT01-0AD0 for geared motors with masses to be moved of up to 700 kg

Mounting bracket

Two different mounting brackets are available with elongated holes:

- Mounting bracket 6FB1104-0AT01-0AS0 for mounting SIDOOR geared motors, for flexible accommodation of the rubber-bonded metal
- Mounting bracket 6FB1104-0AT02-0AS0 for the deflector unit. For setting the toothed belt to the required belt tension.



Mounting bracket 6FB1104-0AT01-0AS0 for mounting the geared motor



Mounting bracket 6FB1104-0AT02-0AS0 for the deflector unit

DIN rail holder

The standard DIN rail holder 6FB1144-0AT00-3SA0 is available for mounting controllers on the TH 35 standard DIN rail according to IEC 60715.

Door clutch holder

The door clutch holder serves to connect the respective door leaf by means of a toothed belt while also functioning as a toothed-belt lock. One door clutch holder per door leaf is required. The toothed-belt lock can accommodate both open ends of the toothed belt.

A door clutch holder is available for each toothed belt width:

- Width 12 mm: 6FB1104-0AT01-0CP0
- Width 14 mm: 6FB1104-0AT02-0CP0



Door clutch holder 6FB1104-0AT01-0CP0 (packaging size = 1 unit)

Deflector unit

The deflector unit 6FB1104-0AT03-0AS0 contains an embedded belt pulley which can be mounted on the door system. The STS toothed belt is redirected via this deflector unit.



Deflector unit 6FB1104-0AT03-0AS0

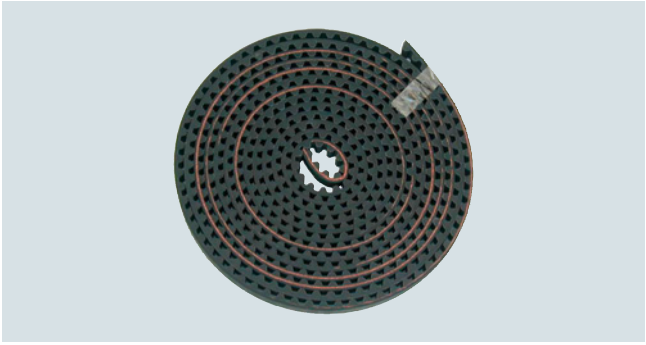
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Overview (continued)

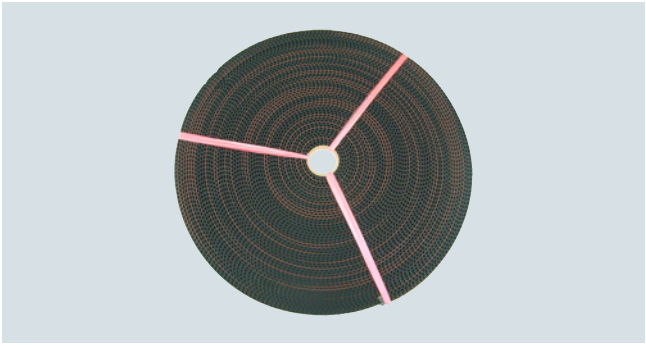
STS toothed belt

The door system is moved between the end positions of the door using the STS toothed belts. Two different toothed belt lengths can be ordered for each toothed belt width.

- Toothed belt width 12 mm:
  - Length 4 m: 6FB1104-0AT01-0AB0
  - Length 45 m: 6FB1104-0AT02-0AB0
- Toothed belt width 14 mm:
  - Length 4 m: 6FB1104-0AT03-0AB0
  - Length 55 m: 6FB1104-0AT04-0AB0



Toothed belt 6FB1104-0AT01-0AB0 (width 12 mm, length 4 m)



Toothed belt 6FB1104-0AT02-0AB0 (width 12 mm, length 45 m)

MDG-PULLEY belt pulley

This belt pulley is used for DC geared motors with the S8M toothed belt with an effective diameter of 56 mm.

- for SIDOOR MDG4, MDG5 DC geared motors: 6FB1104-0AT14-0AS1
- for SIDOOR MDG3 DC geared motors: 6FB1104-0AT10-0AS1

SIDOOR MDG-CABLE cable set

This cable set connects the ATD4xxW door controller to the SIDOOR MDG3, MDG 4 and MDG 5 geared motors. Various lengths are available.

- Length 5 m: 6FB1104-0AT05-0CB2
- Length 10 m: 6FB1104-0AT10-0CB2
- Length 15 m: 6FB1104-0AT15-0CB2
- Length 20 m: 6FB1104-0AT20-0CB2

Ordering data

	Article No.
Rubber-metal anti-vibration mounts for geared motors	
• SIDOOR rubber-metal anti-vibration mount for geared motors with masses of up to 180 kg	**6FB1104-0AT02-0AD0**
• SIDOOR rubber-metal anti-vibration mount for geared motors with masses of up to 700 kg	**6FB1104-0AT01-0AD0**
Mounting bracket	
• SIDOOR mounting bracket for geared motor	**6FB1104-0AT01-0AS0**
• SIDOOR mounting bracket with tensioning device for deflector pulley	**6FB1104-0AT02-0AS0**
DIN rail holder	
For mounting controllers on the standard DIN rail TH 35	**6FB1144-0AT00-3AS0**
SIDOOR door clutch holder	
• For toothed belt width of 12 mm	**6FB1104-0AT01-0CP0**
SIDOOR deflector unit	**6FB1104-0AT03-0AS0**
SIDOOR STS toothed belt	
Width 12 mm	
• 4 m	**6FB1104-0AT01-0AB0**
• 45 m	**6FB1104-0AT02-0AB0**
SIDOOR STS toothed belt	
Width 14 mm	
• 4 m	**6FB1104-0AT03-0AB0**
• 55 m	**6FB1104-0AT04-0AB0**
For industrial applications only	
SIDOOR MDG-CABLE cable set	
• 5 m	**6FB1104-0AT05-0CB2**
• 10 m	**6FB1104-0AT10-0CB2**
• 15 m	**6FB1104-0AT15-0CB2**
• 20 m	**6FB1104-0AT20-0CB2**
CM 1241 communication module	**6ES7241-1CH32-0XB0**
SIDOOR door clutch holder	
• For toothed belt, width 14 mm	**6FB1104-0AT02-0CP0**
SIDOOR MDG-PULLEY	
• SIDOOR MDG-PULLEY 14-S8M-56 belt pulley for MDG4 and MDG5 DC geared motors and S8M toothed belt, effective diameter 56 mm	**6FB1104-0AT14-0AS1**
• SIDOOR MDG-PULLEY 10-S8M-56, belt pulley for MDG3 DC geared motor and S8M toothed belt, effective diameter 56 mm	**6FB1104-0AT10-0AS1**

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Overview

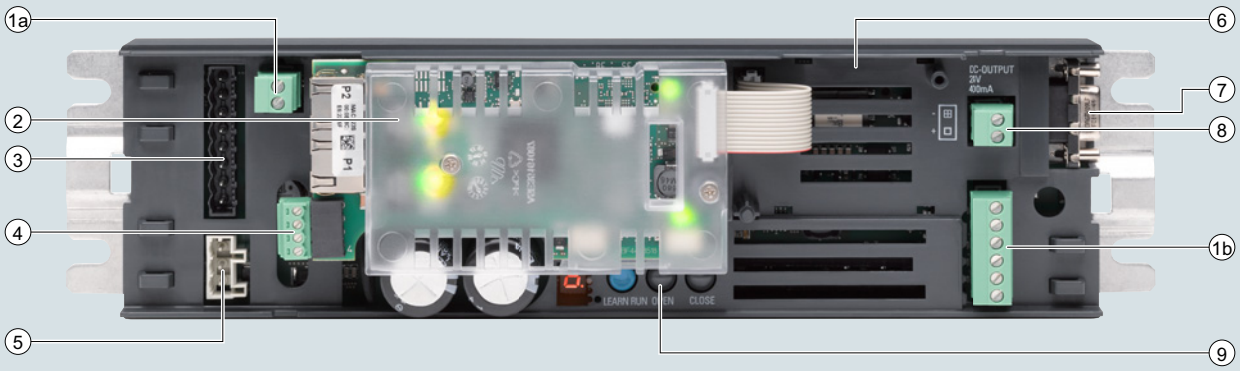
The product-specific application/requirement lies in complying with the special railway requirements concerning functional safety.

Interior railway doors have a closing spring which must always bring the door into the "CLOSED" position. This applies to either side, even when a train car is inclined at 10°.

These specific operating states are handled by the door controller.

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Overview



(1a) (1b) Input signal connection
(2) PROFINET module (2PN incl. status LEDs)
(3) SIDOOR EC direct drive connection
(4) Power supply connection (SIDOOR TRANSFORMER or SITOP)
(5) Output signal connection
(6) Fan (only for SIDOOR ATE531S)
(7) Connection
- Software Kit or
- Service Tool
(8) 24 V DC / 400 mA output
(9) Display status and push button service

SIDOOR ATE530S/531S wiring diagram

The SIDOOR ATE53xS door controller is an “intelligent” door drive which can be used for safety-oriented operation of platform screen doors (PSD) according to individual requirements. Siemens has once again shown just how easy integration can be with the innovative SIDOOR ATE53xS platform screen door drive in conjunction with SIDOOR MED280 or MEG251 motors. The PROFINET module integrated in the SIDOOR ATE53xS enables standardized, certified connection to PROFINET IO systems.

- Use of standard automation components
- Full integration into TIA Portal and STEP 7 thanks to PROFINET connection
- Parameter assignment and monitoring of door control parameters via the PROFINET interface (function blocks available as example applications in SIOS).
- Application example:
  Synchronization of two-panel and independent platform screen doors with SIDOOR ATE530S PROFINET EC door drive and S7-1500 CPU via TIA Portal
  https://support.industry.siemens.com/cs/ww/en/view/109480495
- Application example:
  Safety-oriented automation of platform screen doors with SIDOOR ATE530S PROFINET EC door drive and S7-1500 CPU via TIA Portal
  https://support.industry.siemens.com/cs/ww/en/view/109477186
- Read-in of two safe signals (two-channel, antivalent)
- High level of system safety thanks to safe torque off (e.g. self-release in the event of a fault)
- Firmware update for all SIDOOR controllers on an entire platform possible centrally via TCP/IP
- SIL 2 according to IEC 62061

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Technical specifications

Article number	**6FB1231-3BM12-7AT0** SIDOOR ATE530S COATED	**6FB1231-3BM11-7AT0** SIDOOR ATE531S
General information		
Product type designation	ATE530S	ATE531S
Product version	With PROFINET interface and protective coating	With PROFINET interface, protective coating, and temperature extension
Optional product expansion	Standard mounting rail holder 6FB1144-0AT00-3AS0	
Manufacturer's article no. of the usable motor	6FB1203-0AT12-7DA0	
Manufacturer's article no. of the usable power supply unit	6FB1112-0AT20-2TR0	
Mean time between failures (MTBF)	13 y	
Installation type/mounting		
Installation and mounting instructions	No direct exposure to the sun	
Supply voltage		
Design of the power supply	Via SIDOOR TRANSFORMER or via DC	
Rated value (DC)	36 V; With MED280: At 24 V DC max. door speed of 500 mm/s, at 28.8 V DC max. door speed of 800 mm/s. With MEG251: At 24 V DC max. door speed of 500 mm/s, at 28.8 V DC max. door speed of 750 mm/s	
permissible range, lower limit (DC)	19.2 V	
permissible range, upper limit (DC)	37.1 V	
Protection in case of DC supply	Use of a circuit breaker in the supply path according to 60898-1, 8A, C-characteristic type SIEMENS: 5SY4108-7 or 5SY4108-7KK11	
Encoder supply		
Output voltage (DC)	24 V	
short-circuit proof	Yes	
Overload-proof	Yes	
Remark	Ensure correct polarity! CAUTION: Do not supply with external voltage!	
Output current		
• For output (24 V DC), max.	400 mA	
Power		
Active power input	80 W	
Active power input, max.	540 W	
Active power input (standby mode)	7 W	
Digital inputs		
Control inputs isolated	Yes	
Control inputs p-switching	Yes	
Input voltage		
• per DC input, min.	10 V; Observe polarity !	
• per DC input, max.	28 V; Observe polarity !	
Input current		
• per DC input, min.	3 mA	
• per DC input, max.	15 mA	
Digital outputs		
Relay outputs		
Switching capacity of contacts		
- at 30 V DC, min.	0.01 A	
- at 30 V DC, max.	0.5 A	
Mechanical data		
Opening width of door, min.	0.35 m	
Opening width of door, max.	5 m	
Weight of door, max.	280 kg	
Operating cycle frequency of door, max.	180 1/h	
Kinetic energy, max.	75 J	

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Technical specifications (continued)

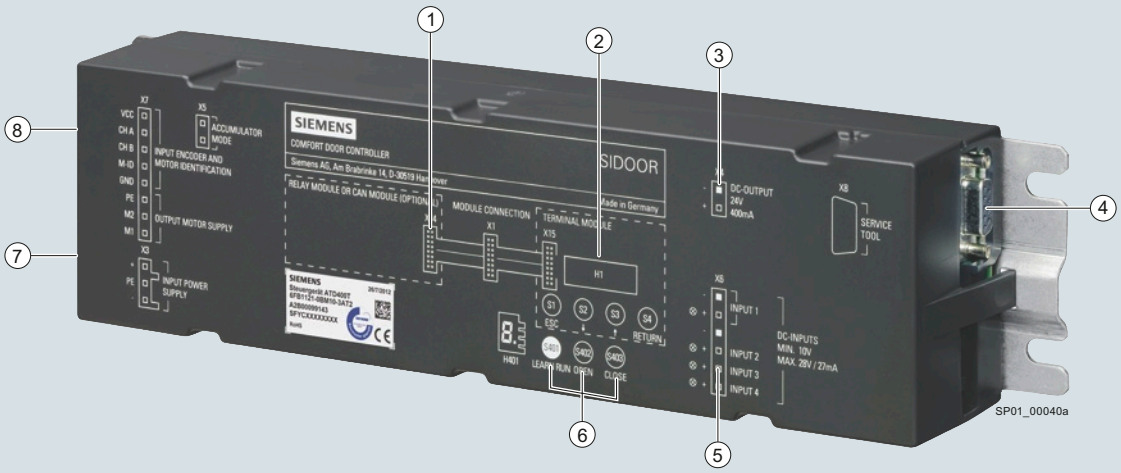
Article number	**6FB1231-3BM12-7AT0** SIDOOR ATE530S COATED	**6FB1231-3BM11-7AT0** SIDOOR ATE531S
Interfaces		
Interfaces/bus type	PROFINET according to Conformance Class A, B, C; integrated switch for linear and ring structure	
Isolation		
Overvoltage category	2	
Degree and class of protection		
IP degree of protection	IP20	
Standards, approvals, certificates		
CE mark	Yes	No
UL approval	No	
China RoHS compliance	Yes	
Standard for EMC	EN 61000-6-2 / EN 61000-6-4 / EN 61326-3-1 / EN 50121-3-2 / EN50121-4 / EN50121-5	
Standard for safety	EN 60950-1 / EN 60335-1 / EN 14752 / EN ISO 13849-1 Cat. 2 PL d / IEC 62061: SIL 2	
Ambient conditions		
Ambient temperature during operation		
• min.	-25 °C	
• max.	50 °C	70 °C
• Remark	Screw control device thermally conductive onto a metallic mounting surface or standard rail mounting, otherwise the maximum operating temperature is only 40 °C	To ensure compliance with MTBF value, ensure that the ambient temperature is less than 50 °C for 90 % of operating time and screw the control unit onto a metallic mounting surface in a manner that ensures thermal conductivity or use standard rail mounting. At operating temperatures above 50 °C, the maximum output current of the 24 V DC output is a maximum of 0.1 A and the maximum number of cycles is 60/h.
Ambient temperature during storage/transportation		
• Storage, min.	-40 °C	
• Storage, max.	85 °C	
Altitude during operation relating to sea level		
• Installation altitude above sea level, max.	2 000 m	
Relative humidity		
• No condensation, min.	10 %	
• No condensation, max.	93 %	
Dimensions		
Width	320 mm	
Height	60 mm	
Depth	80 mm	

Ordering data

	Article No.		Article No.
SIDOOR ATE530S Platform Screen Door Drive SIDOOR ATE530S coated, version with protective coating	**6FB1231-3BM12-7AT0**	**SIDOOR ATE531S Platform Screen Door Drive** SIDOOR ATE531S, version with protective coating and extended temperature range	**6FB1231-3BM11-7AT0**

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Overview



1 RELAY module connection
2 Terminal module
3 Output voltage 24 V DC/400 mA connection
4 Connection
- Service Tool or
- Software Kit
5 Input signal connection
6 Control panel
7 16.8 to 36 V DC input voltage connection
8 Motor connection

SIDOOR ATD400T interior railway door drive

The SIDOOR ATD400T interior railway door drive is an "intelligent" door drive which enables interior and gangway doors to be opened and closed at adjustable speeds and accelerations.

- Relay module design
- For dynamic door weights up to 180 kg
- Automatic door weight detection
- Operating temperature -20 to +70 °C [1)]
- Flexible motor management (two different motor types), automatic detection
- Opening width 0.25 to 4 m
- Door can be operated with and without closing springs (60 to 80 N)
- With two identical door leaves, can be used up to a train inclination of 0 to 10%
- Forces and energies are limited in accordance with EN 14752
- EMC according to EN 50121-3-2
- Fulfills HL3 according to fire protection standard EN 45545-2 (Railway applications – Fire protection on rail vehicles)
- Vandal-proof

[1)] Note:

- Maximum output current at 24 V DC:
  - 0.4 A at ≤ 55 °C ambient temperature during operation
  - 0.1 A from 55 °C to 70 °C ambient temperature during operation, with restrictions at operating temperatures > 55 °C
- Maximum ambient temperature during operation:
  - 55 °C
  - 70 °C with restrictions at operating temperatures > 55 °C
- Restrictions at operating temperatures > 55 °C:
  - Use the 24 V output voltage only for operating the control inputs (max. 0.1 A)
  - Use a sufficiently large (at least 350 x 350 mm), unpainted metal mounting plate
  - The maximum drive parameters are restricted to the default values
  - If temperature class T3 according to EN 50155 is used, the maximum air temperature of 85 °C must not be exceeded near the printed-circuit board

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Technical specifications

Article number	**6FB1121-0BM13-3AT2** SIDOOR ATD400T RELAY
General information	
Product brand name	SIDOOR
Product version	With relay outputs
Manufacturer's article no. of the usable motor	6FB1103-0AT10-4MB0, 6FB1103-0AT11-4MB0, 6FB1103-0AT15-4MB0, 6FB1103-0AT16-4MB0
Installation type/mounting	
Installation and mounting instructions	At operating temperatures > 55 °C a sufficiently large (at least 350 mm x 350 mm), unpainted, metal mounting plate must be used
Supply voltage	
Rated value (DC)	24 V
Input current	
Current consumption, max.	15 A
Digital inputs	
Control inputs isolated	Yes
Control inputs p-switching	Yes
Input voltage	
• per DC input, min.	10 V; Observe polarity !
• per DC input, max.	28 V; Observe polarity !
Input current	
• per DC input, min.	9 mA
• per DC input, max.	27 mA
Digital outputs	
short-circuit proof	Yes
Overload-proof	Yes
Remark	Ensure correct polarity! CAUTION: Do not supply with external voltage!
Output voltage	
• Output voltage (DC)	24 V
Output current	
• For output (24 V DC), max.	400 mA
• For output (24 V DC) at 55 to 70 °C, max.	100 mA
Relay outputs	
Switching capacity of contacts	
- at 50 V DC, min.	0.01 A; 50 V DC switching voltage not released for NFPA-relevant countries
- at 50 V DC, max.	1 A; 50 V DC switching voltage not released for NFPA-relevant countries
- at 230 V AC, min.	0.01 A
- at 230 V AC, max.	1 A

Article number	**6FB1121-0BM13-3AT2** SIDOOR ATD400T RELAY
Mechanical data	
Opening width of door, min.	0.25 m
Opening width of door, max.	4 m
Weight of door, max.	400 kg
Operating cycle frequency of door, max.	180 1/h
Counterforce, max.	80 N
Counterweight	
• with SIDOOR M3 geared motor, max.	6 kg
Interfaces	
Interfaces/bus type	without
Isolation	
Overvoltage category	2
Degree and class of protection	
IP degree of protection	IP20
Standards, approvals, certificates	
CE mark	Yes
UL approval	No
Standard for EMC	EN 50121-3-2
Ambient conditions	
Ambient temperature class according to EN 50155	T3
Ambient temperature during operation	
• min.	-25 °C
• max.	70 °C; At operating temperatures > 55 °C the operating parameters are limited to default values
• Remark	At operating temperatures > 55 °C, the maximum air temperature of 85 °C must not be exceeded near the printed-circuit board if temperature class T3 according to EN 50155 is used
Ambient temperature during storage/transportation	
• Storage, min.	-40 °C
• Storage, max.	50 °C
Air pressure acc. to IEC 60068-2-13	
• Installation altitude above sea level, max.	2 000 m
Relative humidity	
• No condensation, min.	10 %
• No condensation, max.	93 %
Fire resistance	
• Behavior in fire	complies with EN 45545-2 Hazard Level HL3
Dimensions	
Width	320 mm
Height	60 mm
Depth	80 mm

Ordering data

	Article No.
SIDOOR ATD400T Controller for interior railway doors, relay module design	**6FB1121-0BM13-3AT2**

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Overview SIDOOR Software Kit



SIDOOR Software Kit

The scope of supply of the SIDOOR Software Kit includes an installation CD, which includes the following functionalities:

SIDOOR User Software	The component that enables the door control system to be configured, parameters to be assigned, and analyzed.
Siemens HCS12 Firmware Loader	This component is used to update the operating software of the door controller.
SIDOOR USB to UART Bridge Driver	This driver is essential for operation of the USB adapter.

Note:

Some firmware updates are offered as free downloads in the Siemens Industry Online Support. For information on the availability and acquisition of more firmware, please contact Technical Support.

For more information, see page 13/20.

Overview SIDOOR Service Tool



The Service Tool can be used to input run commands, change run parameters and read out learned parameters, door states, input/output signals and service data.

You do not need to open the cover of the controller to do this.

Note:

If the Service Tool is in the "Quick adjustment" or "Total adjustment" menu, the run commands of the controller are blocked via the command inputs.

For more information, see page 13/20.

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Overview

SIDOOR motors are speed controlled, taking set force and speed limits into account. The gear outlet direction is defined as left or right when viewing the gear unit from the front. Force transmission is via a toothed belt. The toothed belt passes over a deflector pulley and can be fitted with two door clutch holders. This enables it to drive both single-side and centrally opening doors.

SIDOOR geared motors are available in two technological versions.

- 1. DC technology in version
  (area of application: interior railway doors)
  - DC geared motor
    SIDOOR geared motors are a combination of gear unit, motor, and encoder. They are easy to connect to the controller via the interface provided and are automatically detected during commissioning. The variable speed drive unit comprises a speed-controlled DC motor with non-self-locking gearing.
- 2. EC technology in version
  (area of application: platform screen doors)
  - EC direct drive
    SIDOOR direct drives are a combination of motor and sensor. They are easy to connect to the controller via the interface provided and are automatically detected during commissioning. The maintenance-free drive unit consists of a gearless, speed-controlled, electronically commutated motor. The EC direct drive can be fitted in various mounting orientations, facilitating reduced inventory management and minimizing assets.
  - EC geared motors
    EC geared motors are electronically commutated DC motors with non-self-locking gearing and are speed-controlled. They are easy to connect to the controller via the interface provided and are automatically detected during commissioning. Due to the brushless drive technology, EC geared motors are subject to less abrasion compared with DC geared motors and thus have a longer service life. On account of the brushless drive technology, no commutation noises come from this motor, so it generates less noise than the DC geared motors.

Motors for interior railway door drives

The following **DC geared motors** are available for interior railway door drives. They should be selected according to the dynamic door weight.

- SIDOOR MDG180 geared motors, compliance with fire protection standard EN 45545-2 (max. door weight 180 kg)
  - SIDOOR MDG180 L EN 45545-2 (pinion left)
    6FB1103-0AT16-4MB0
  - SIDOOR MDG180 R EN 45545-2 (pinion right)
    6FB1103-0AT15-4MB0
- SIDOOR M3 geared motors (max. door weight 180 kg)
  - SIDOOR M3 L (pinion left) 6FB1103-0AT10-4MB0
  - SIDOOR M3 R (pinion right) 6FB1103-0AT11-4MB0

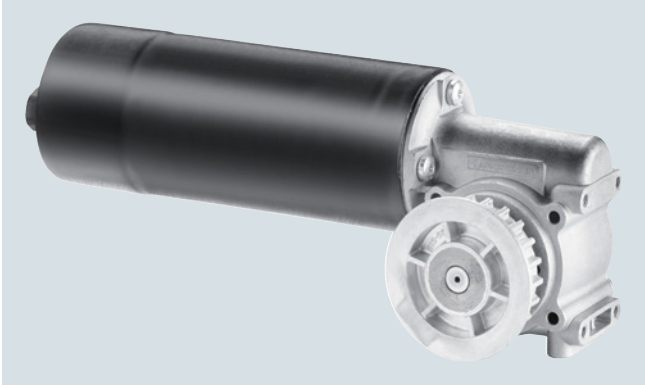
Motors for platform screen door drives

EC technology:

- SIDOOR MEG251 geared motors (max. door weight 250 kg)
  - SIDOOR MEG251 L (pinion left), 6FB1203-5AT00-7MP0
  - SIDOOR MEG251 R (pinion right), 6FB1203-5AT01-7MP0



DC geared motor SIDOOR M3 L, 6FB1103-0AT10-4MB0 or SIDOOR MDG180 L, 6FB1103-0AT16-4MB0.
(version with pinion left)



EC geared motor SIDOOR MEG251 L, 6FB1203-5AT00-7MP0.
(version with pinion left)

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Technical specifications

Article number	6FB1103-0AT16-4MB0 SIDOOR MDG180 L DIN EN 45545-2	6FB1103-0AT15-4MB0 SIDOOR MDG180 R DIN EN 45545-2	6FB1103-0AT10-4MB0 SIDOOR M3 L	6FB1103-0AT11-4MB0 SIDOOR M3 R	6FB1203-5AT00-7MP0 SIDOOR MEG251 L	6FB1203-5AT01-7MP0 SIDOOR MEG251 R
General information						
Product brand name	SIDOOR					
Product type designation	MDG180 L DIN EN 45545-2	MDG180 R DIN EN 45545-2	M3 L	M3 R	MEG251 L	MEG251 R
Product version	With driven gear on the left	With driven gear on the right	With driven gear on the left	With driven gear on the right	With driven gear on the left	With driven gear on the right
Supply voltage						
Rated value (DC)	30 V				24 V	
Input current						
Operational current (rated value)	4 A				6.8 A	
Power						
Active power input	120 W				163 W	
Mechanical data						
Torque of the rotary operating mechanism (rated value)	3 N·m				4.1 N·m	
Speed, max.	0.65 m/s				0.75 m/s	
Gear ratio	15					
Number of pulses per revolution, max.	100					
Weight of door, max.	180 kg				250 kg	
Breakaway force, max.					50 N	
Degree and class of protection						
IP degree of protection						
• of the motor	IP54				IP40	
• of the gear unit	IP40					
Ambient conditions						
Ambient temperature during operation						
• min.	-20 °C					
• max.	50 °C				70 °C	
Ambient temperature during storage/transportation						
• Storage, min.	-40 °C					
• Storage, max.	85 °C					
Fire resistance						
• Behavior in fire	complies with EN 45545-2 Hazard Level HL3					
Dimensions						
Height of motor	98 mm				100 mm	
Length of motor	236 mm				249 mm	
Diameter of motor	63 mm				62 mm	
Width of gear unit, including drive pinion	85 mm				86 mm	

Ordering data

	Article No.
Motors for interior railway door drives	
SIDOOR MDG180 geared motors	
• MDG180 L, EN 45545-2	**6FB1103-0AT16-4MB0**
• MDG180 R, EN 45545-2	**6FB1103-0AT15-4MB0**
SIDOOR M3 geared motors	
• M3 L	**6FB1103-0AT10-4MB0**
• M3 R	**6FB1103-0AT11-4MB0**

	Article No.
Motors for platform screen doors	
SIDOOR MEG251 EC technology geared motor	
• MEG251 L	**6FB1203-5AT00-7MP0**
• MEG251 R	**6FB1203-5AT01-7MP0**

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Overview



SIDOOR MED280 direct drive

SIDOOR direct drives are a combination of motor and sensor. They are easy to connect to the controller via the interface provided and are automatically detected during commissioning.

The maintenance-free drive unit consists of a gearless, speed-controlled, electronically commutated motor.

Direct drives are designed for specified max. dynamic door masses and can control both drive directions.

- SIDOOR MED280 direct drive for max. 280 kg (6FB1203-0AT12-7DA0)

Technical specifications

Article number	**6FB1203-0AT12-7DA0** SIDOOR MED280
General information	
Product type designation	MED280
Product version	With driven gear
Supply voltage	
Rated value (DC)	24 V
Input current	
Operational current (rated value)	9.7 A
Power	
Active power input	233 W
Mechanical data	
Torque of the rotary operating mechanism (rated value)	4.7 N·m
Speed, max.	0.8 m/s
Number of pulses per revolution, max.	1 024
Weight of door, max.	280 kg
Degree and class of protection	
IP degree of protection	
• of the motor	IP54
Standards, approvals, certificates	
CE mark	Yes
UL approval	Yes
EAC (formerly Gost-R)	Yes
TÜV Inspectorate approval	Yes
China RoHS compliance	Yes
Ambient conditions	
Ambient temperature during operation	
• min.	-25 °C
• max.	70 °C
Ambient temperature during storage/transportation	
• Storage, min.	-40 °C
• Storage, max.	85 °C
Dimensions	
Width of motor	160 mm
Height of motor	140 mm
Length of motor	56 mm
• including drive pinion	91 mm

Ordering data

	Article No.
SIDOOR MED280 direct drive Motor for door control, for max. dynamic door masses up to 280 kg	**6FB1203-0AT12-7DA0**

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Overview

A comprehensive range of accessories is available for the SIDOOR systems. This is necessary to ensure low-noise operation of the door leaves by the controller.

Accessories for SIDOOR DC and EC geared motors

Rubber-metal anti-vibration mount

To ensure low-noise door operation, the SIDOOR geared motors are integrated in the door system using rubber-metal anti-vibration mounts.

- Rubber-metal anti-vibration mount 6FB1104-0AT02-0AD0 for SIDOOR M3 and SIDOOR MDG180 DC geared motors (also for EN 45545-2) and SIDOOR MEG251 EC geared motors (door weights up to 250 kg)
- Rubber-metal anti-vibration mount 6FB1104-0AT01-0AD0 for SIDOOR M4 DC geared motors (door weights up to 400 kg)



Rubber-metal anti-vibration mount 6FB1104-0AT02-0AD0



Rubber-metal anti-vibration mount 6FB1104-0AT01-0AD0

Mounting bracket

Two different mounting brackets are available with elongated holes:

- Mounting bracket 6FB1104-0AT01-0AS0 for SIDOOR M3 and SIDOOR MDG180 DC geared motors (also for EN 45545-2) and SIDOOR MEG251 EC geared motors for flexible accommodation of the rubber-bonded metal.
- Mounting bracket 6FB1104-0AT02-0AS0 for the deflector unit, this enables the toothed belt to be set to the required belt tension.



Mounting bracket 6FB1104-0AT01-0AS0 for mounting the geared motor



Mounting bracket 6FB1104-0AT02-0AS0 for the deflector unit

Door clutch holder

The door clutch holder 6FB1104-0AT01-0CP0 serves to connect the respective door leaf by means of a toothed belt while also functioning as a toothed-belt lock. One door clutch holder per door leaf is required. The toothed-belt lock can accommodate both open ends of the toothed belt.



Door clutch holder 6FB1104-0AT01-0CP0 (packaging size = 1 unit)

Deflector unit

The deflector unit 6FB1104-0AT03-0AS0 contains an embedded belt pulley which can be mounted on the door system.

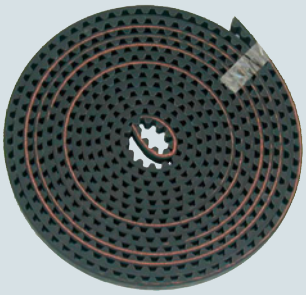
The STS toothed belt is redirected via this deflector unit.



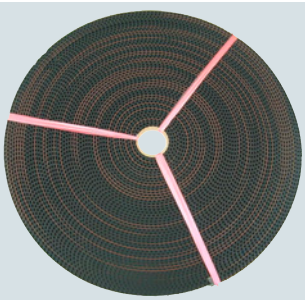
Deflector unit 6FB1104-0AT03-0AS0

STS toothed belt

The door system is moved between the end positions of the door using the STS toothed belt 6FB1104-0AT0.-0AB0. Two different toothed belt lengths are available.



Toothed belt 6FB1104-0AT01-0AB0, length 4 m



Toothed belt 6FB1104-0AT02-0AB0, length 45 m

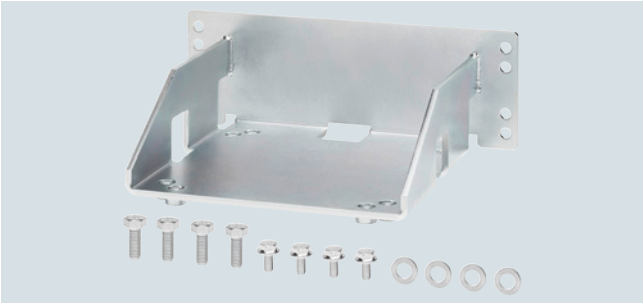
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Overview (continued)

Accessories for the SIDOOR MED280 EC direct drive, for the controller for the SIDOOR ATE530S/ATE531S platform screen door drive

Motor holder

- Motor holder 6FB1104-0AT03-0AD0 for accommodation of the SIDOOR MED280 direct drive.



SIDOOR motor holder

Mounting bracket

- For mounting the SIDOOR motor holder 6FB1104-0AT01-0AS0 Identical to the mounting bracket 6FB1104-0AT01-0AS0 for DC geared motors.



Mounting bracket for geared motor

- With tensioning device for mounting the deflector unit and setting the toothed belt to the required tension (large) 6FB1104-0AT05-0AS4



SIDOOR mounting bracket, large

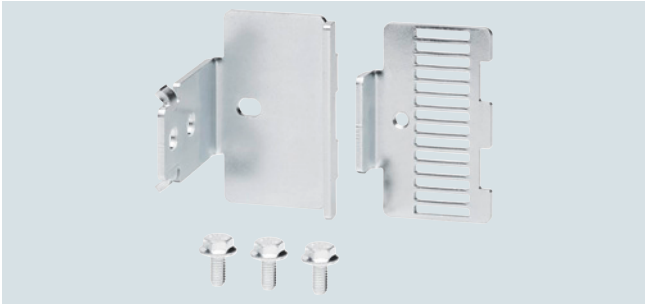
- With tensioning device for mounting the deflector unit and setting the toothed belt to the required tension (small) 6FB1104-0AT05-0AS5



SIDOOR mounting bracket, small

Door clutch holder

- For attaching both ends of the toothed belt and connecting the respective door panel to the toothed belt, width 20 mm, 6FB1104-0AT05-0AS1



SIDOOR door clutch holder

Deflector unit

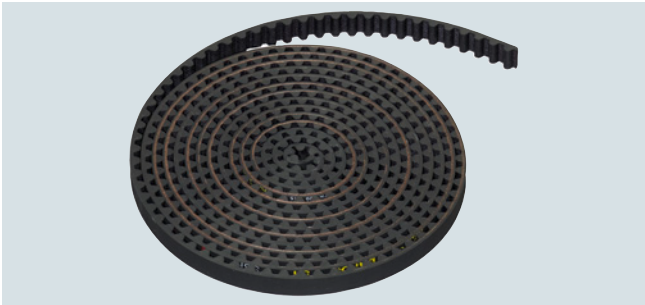
- For attaching the SIDOOR toothed belt and fixing to the door 6FB1104-0AT07-0AS0



SIDOOR deflector unit

STD toothed belt

- As a connection between the door system and the end positions of the door, toothed belt width 20 mm. Length 4 m, 6FB1104-0AT05-0AB0



SIDOOR toothed belt, small

- Toothed belt width 20 mm. Length 45 m 6FB1104-0AT06-0AB1



SIDOOR toothed belt, large

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Accessories

Ordering data	Article No.
Accessories for the SIDOOR MED280 EC direct drive, for the controller for the SIDOOR ATE530S/ATE531S platform screen door drive	
Motor holder for SIDOOR MED280 direct drive	**6FB1104-0AT03-0AD0**
Mounting bracket for mounting the motor holder	**6FB1104-0AT01-0AS0**
Mounting bracket with tensioning device for mounting the deflector unit	
• Large	**6FB1104-0AT05-0AS4**
• Small	**6FB1104-0AT05-0AS5**
SIDOOR door clutch holder	
• For toothed belt, width 20 mm	**6FB1104-0AT05-0AS1**
SIDOOR deflector unit	**6FB1104-0AT07-0AS0**
SIDOOR toothed belt STD	
Width 20 mm	
• 4 m	**6FB1104-0AT05-0AB0**
• 45 m	**6FB1104-0AT06-0AB1**

	Article No.
Accessories for SIDOOR DC and EC geared motors	
Rubber-metal anti-vibration mounts for geared motors	
• SIDOOR rubber-metal anti-vibration mount for geared motors for door weights up to 300 kg	**6FB1104-0AT02-0AD0**
• SIDOOR rubber-metal anti-vibration mount for geared motors for door weights from 300 kg	**6FB1104-0AT01-0AD0**
Mounting bracket	
• SIDOOR mounting bracket for geared motor	**6FB1104-0AT01-0AS0**
• SIDOOR mounting bracket with tensioning device for deflector pulley	**6FB1104-0AT02-0AS0**
SIDOOR door clutch holder	
• For toothed belt, width 12 mm	**6FB1104-0AT01-0CP0**
SIDOOR deflector unit	**6FB1104-0AT03-0AS0**
SIDOOR STS toothed belt	
Width 12 mm	
• 4 m	**6FB1104-0AT01-0AB0**
• 45 m	**6FB1104-0AT02-0AB0**

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Overview



SIPLUS CMS family

With the Condition Monitoring System from Siemens you can constantly monitor your machines and plants. Maintenance procedures can be planned better and only performed when they are actually necessary – predictive maintenance.

Overview SIPLUS CMS1200



The SIPLUS CMS1200 Condition Monitoring System is part of SIMATIC S7-1200 and is designed for the early detection of mechanical damage.

It provides the following benefits:

- vRMS machine monitoring in acc. with ISO 10816-3
- aRMS machine monitoring
- Detailed identification of damage with frequency-selective diagnostics
- Raw data recording and export for SIPLUS CMS X-Tools
- Trend recording and analysis
- Signaling of limit violations
- Permanent monitoring to protect the machines
- Effective monitoring of important processes and systems
- Early detection of damage
- Scheduled maintenance instead of spontaneous repair
- Reduction in maintenance costs
- Increase in system availability
- Optimum utilization of the service life of the units

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SIPLUS CMS1200 SM 1281 Condition Monitoring

Overview



SIPLUS CMS1200 SM 1281 Condition Monitoring forms part of SIMATIC S7-1200 and is used for the:

- Monitoring of motors, generators, pumps, fans, or other mechanical components
- Recording and analysis of vibrations
- Expansion capability of up to 7 modules

Technical specifications

Article number	**6AT8007-1AA10-0AA0** SM1281_Condition_Monitoring
General information	
Product brand name	SIPLUS
Product category	Condition Monitoring
Product description	S7-1200 module for the monitoring of vibrations on mechanical components based on parameters and frequency-selective analysis functions
Installation type/mounting	
Mounting type	Rail or wall mounting
Mounting position	Horizontal, vertical
Recommended mounting position	Horizontal
Supply voltage	
Type of supply voltage	DC
Rated value (DC)	
• 24 V DC	Yes
permissible range, lower limit (DC)	20.4 V
permissible range, upper limit (DC)	28.8 V
Input current	
Current consumption, typ.	200 mA
Current consumption, max.	250 mA
from backplane bus 5 V DC, typ.	80 mA
from backplane bus 5 V DC, max.	85 mA
Power loss	
Power loss, typ.	4.8 W
Memory	
Total memory capacity	1 Gbyte
Hardware configuration	
Design of hardware configuration	Modular, up to 7 modules per CPU
Speed input	
Number of speed inputs	1
Input voltage	
• 24 V DC digital	Yes
Sensor input	
Number of IEPE sensor inputs	4
Sampling frequency, max.	46 875 Hz

Article number	**6AT8007-1AA10-0AA0** SM1281_Condition_Monitoring
Interfaces	
Type of data transmission	Export of raw data as WAV file for further analysis (e.g. using CMS X-Tools) can be downloaded via browser/FTP, online data transfer to CMS X-Tools
Ethernet interface	Yes
Protocols	
Bus communication	Yes
Web server	
• HTTP	Yes
Interrupts/diagnostics/ status information	
Alarms	
• Diagnostic alarm	Yes
Diagnostics indication LED	
• for status of the inputs	Yes
• for maintenance	Yes
• Status indicator digital input (green)	No
Integrated Functions	
Monitoring functions	
• Monitoring of the sensor inputs	Yes; Cable break and short-circuit
• Vibration characteristic monitoring via RMS value of the vibration speed	Yes
• Vibration characteristic monitoring via RMS value of the vibration acceleration	Yes
• Vibration characteristic monitoring via diagnostic characteristic value	Yes
• Frequency-selective monitoring via vibration speed spectrum	Yes
• Frequency-selective monitoring via vibration acceleration spectrum	Yes
• Frequency-selective monitoring via envelope curve analysis	Yes

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Technical specifications (continued)

Article number	**6AT8007-1AA10-0AA0** SM1281_Condition_Monitoring
Measuring functions	
• Physical measuring principle	Vibration acceleration
Measuring range	
- Measurement range vibration frequency, min.	0.1 Hz
- Measurement range vibration frequency, max.	10 000 Hz
Degree and class of protection	
Degree of protection acc. to EN 60529	
• IP20	Yes
Standards, approvals, certificates	
Certificate of suitability	CE
Reference designation according to DIN EN 81346-2	P
Ambient conditions	
Free fall	
• Fall height, max.	0.3 m; five times, in product package
Ambient temperature during operation	
• horizontal installation, min.	-20 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	-20 °C
• vertical installation, max.	45 °C
Ambient temperature during storage/transportation	
• min.	-40 °C
• max.	70 °C
Air pressure acc. to IEC 60068-2-13	
• Operation, min.	795 hPa
• Operation, max.	1 080 hPa
• Storage/transport, min.	660 hPa
• Storage/transport, max.	1 080 hPa
Relative humidity	
• Operation without condensation, min.	5 %
• Operation without condensation, max.	95 %
Software	
Browser software required	Web browser Mozilla Firefox (ESR31) or Microsoft Internet Explorer (10/11)
Connection method	
required front connector	Yes
Design of electrical connection	Screw connection
Mechanics/material	
Material of housing	Plastic: polycarbonate, abbreviation: PC- GF 10 FR
Enclosure material (front)	
• Plastic	Yes
Dimensions	
Width	70 mm
Height	112 mm
Depth	75 mm
Weights	
Weight, approx.	260 g

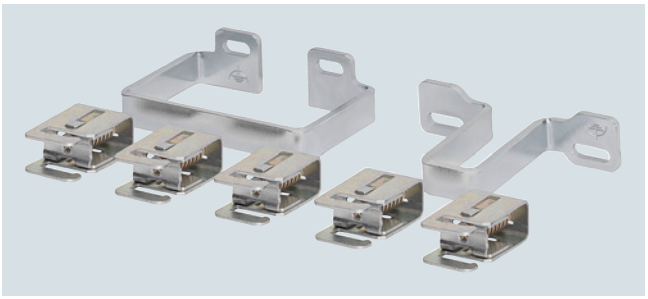
Ordering data

	Article No.
SIPLUS CMS1200 SM 1281 Condition Monitoring Module for SIMATIC S7-1200 for monitoring vibrations in mechanical components based on characteristic values and frequency-selective analysis functions.	**6AT8007-1AA10-0AA0**

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Overview

SIPLUS CMS1200 SM 1281 shield clamp set



CMS1200 accessories

SIPLUS CMS1200 SM 1281 shield clamp set, 6AT8007-1AA20-0AA0

An additional shield clamp set must be ordered for the EMC-compliant connection of cables to the SIPLUS CMS1200 SM 1281 Condition Monitoring.

The shield clamp set comprises two shield clamps and five terminal clamps. One shield clamp is screwed on above and one below the module. The sensor cable shields are connected to the shield clamps by means of the terminal clamps.

VIB-SENSOR S01 vibration sensor



VIB-SENSOR S01 vibration sensor

VIB-SENSOR S01 6AT8002-4AB00 vibration sensor

The VIB-SENSOR S01 vibration sensor with IEPE (integrated electronics piezo-electric) interface can be directly connected to the CMS1200 SM1281 Condition Monitoring module.

The sensor detects vibration accelerations in the frequency range from 0.5 Hz to 15 kHz with a resolution of 100 mV/g.

A threaded screw with an M8 thread for mounting to the measuring point is included in the scope of supply. The connecting cable is connected to the vibration sensor via the MIL connector.

SIPLUS CABLE-MIL connecting cables



SIPLUS CABLE-MIL connecting cables

SIPLUS CABLE-MIL connecting cables 6AT8002-4AC03, 6AT8002-4AC10

The VIB-SENSOR S01 vibration sensor is connected to the SIPLUS CMS1200 SM1281 Condition Monitoring module by means of the SIPLUS CABLE-MIL connecting cable.

This high-quality industrial cable is made of black polyurethane and is pre-assembled on one end with a MIL connector (MIL-C5015). The open cable end of the shielded two-wire cable is connected directly to the screw terminals of the basic unit.

The connecting cable is available in lengths of 3 m and 10 m.

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Technical specifications

Article number	**6AT8007-1AA20-0AA0** SM 1281 shield clamp set
General information	
Product brand name	SIPLUS
Product description	For the EMC-compliant connection of cables to the SIPLUS CMS1200 SM 1281 Condition Monitoring Module
Installation type/mounting	
Mounting type	Wall mount
Connection method	
Number of signal cables connectable to the shield support	5

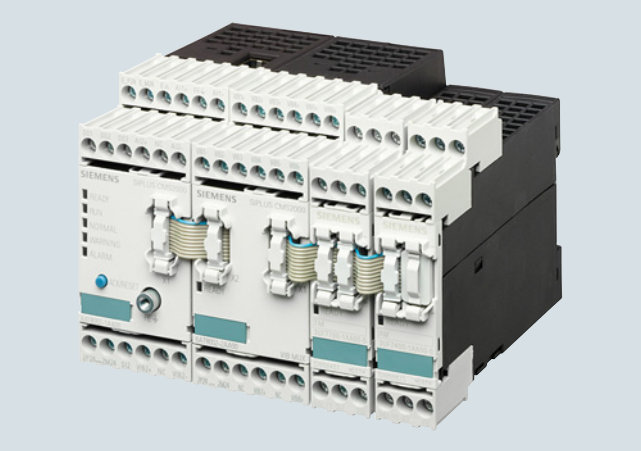
Article number	**6AT8002-4AB00** SIPLUS CMS2000 VIB-SENSOR S01
General information	
Product brand name	SIPLUS
Product description	Piezoelectric sensor for connection to the SIPLUS CMS2000 Basic Unit VIB or the SIPLUS CMS2000 VIB-MUX expansion module
Physical measuring principle	Piezo-quartz recorder with integrated evaluation electronics
Operating range of sensor at +/- 3 dB, min.	0.5 Hz
Operating range of sensor at +/- 3 dB, max.	15 000 Hz
Measurement range vibration acceleration, max.	50 gn
Sensitivity, typ.	100 mV/gn
Resolution of measured value of vibration acceleration, min.	0.002 gn
Resonance frequency	23 kHz
Installation type/mounting	
other mounting	incl. mounting bolts UNF1/4-28 on M8
Input current	
Type of power supply	IEPE 2 to 10 mA
Sensor input	
Encoder signals, IEPE	
• Signal voltage (DC), min.	10 V
• Signal voltage (DC), max.	14 V
Degree and class of protection	
IP degree of protection	IP65
Cables	
Cable length, max.	80 m
Connection method	
Type of connection	MIL-C5015
Mechanics/material	
Material of housing	Stainless steel

Ordering data

	Article No.
SIPLUS CMS1200, SM 1281 shield clamp set For EMC-compliant connection of signal and encoder cables to SIPLUS CMS1200 SM 1281 Condition Monitoring.	**6AT8007-1AA20-0AA0**
VIB-SENSOR S01 vibration sensor Piezoelectric sensor for connection to SIPLUS CMS1200 SM 1281 Condition Monitoring.	**6AT8002-4AB00**
SIPLUS CABLE-MIL For connection of VIB-SENSOR S01 vibration sensor to SIPLUS CMS1200 SM 1281 Condition Monitoring.	
SIPLUS CABLE-MIL-300; length 3 m	**6AT8002-4AC03**
SIPLUS CABLE-MIL-1000; length 10 m	**6AT8002-4AC10**

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Overview



The modular and parameterizable SIPLUS CMS2000 Condition Monitoring System is an easy-to-parameterize, web-based system.

It provides the following benefits:

- Analysis of the status of rolling-contact bearings in accordance with VDI 3832 (DKW)
- RMS machine monitoring in accordance with DIN ISO 10816-3
- Detailed identification of damage with frequency-selective diagnostics
- Raw data recording and export to CMS X-Tools
- Trend recording and analysis
- Monitoring of process variables
- Signaling of limit violations
- Permanent monitoring to protect the machines
- Effective monitoring of important processes and systems
- Energy efficiency support
- Early detection of damage
- Scheduled maintenance instead of spontaneous repair
- Reduction in maintenance costs
- Increased system availability
- Optimum utilization of the service life of the units

The SIPLUS CMS2000 Condition Monitoring System is modularly expandable, e.g. with the

- SIPLUS CMS2000 VIB-MUX expansion module for expanding the IEPE vibration channels
- Temperature module for direct connection of temperature sensors (Pt100, Pt1000, etc.)

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Overview



The SIPLUS CMS2000 Basic Unit VIB is used for:

- Monitoring of motors, generators, pumps, fans, or other mechanical components
- Recording and analysis of vibrations, speed, and temperature

It is modularly expandable via the system interface, e.g. using SIPLUS CMS2000 VIB-MUX expansion modules and temperature modules.

Technical specifications

Article number	**6AT8002-1AA00** SIPLUS CMS2000 Basic Unit VIB
General information	
Product brand name	SIPLUS
Product description	Basic unit for the monitoring of vibrations on mechanical components based on parameters and frequency-selective analysis functions for measuring category 0 acc. to EN 61010
Physical measuring principle	Vibration acceleration
Measurement range vibration frequency, min.	2 Hz
Measurement range vibration frequency, max.	10 000 Hz
Installation type/mounting	
Mounting type	standard rail
Mounting position	vertical
Recommended mounting position	vertical
Supply voltage	
Type of supply voltage	DC
Rated value (DC)	24 V
permissible range, lower limit (DC)	19.2 V
permissible range, upper limit (DC)	28.8 V
Power loss	
Power loss, typ.	2.6 W
Memory	
Total memory capacity	1 Gbyte
Hardware configuration	
Design of hardware configuration	modular construction, basic unit can be expanded by means of expansion modules
Digital inputs	
Number of disable inputs	1
Number of trigger inputs	1
Input voltage	
• At the 24 V DC disable input	Yes
• At the disable input (DC), max.	28.8 V
• At the trigger input 24 V DC	Yes
• At the trigger input (DC), max.	28.8 V
Digital outputs	
Number of signaling outputs	3
Design of signaling outputs	Electronic
Output current	
• For signaling output, max.	0.1 A

Article number	**6AT8002-1AA00** SIPLUS CMS2000 Basic Unit VIB
Analog inputs	
Number of analog inputs	2
Input ranges (rated values), voltages	
• At DC, min.	-10 V
• At DC, max.	10 V
Input ranges (rated values), currents	
• 0 to 20 mA	No
• +/- 4 mA to +/- 20 mA	Yes
Speed input	
Number of speed inputs	1
Input voltage	
• 24 V DC digital	Yes
• At DC, max.	28.8 V
• -10 V to +10 V	No
Input current	
• 0 to 20 mA	No
• 4 mA to 20 mA	No
• permissible range, upper limit	0.1 A
• Short-circuit current	0.7 A
Sensor input	
Number of IEPE sensor inputs	2
Number of MEMS sensor inputs	0
Sampling frequency, max.	46 875 Hz
Interfaces	
Type of data transmission	Export of raw data as WAV file for further analysis (e.g. using CMS X-Tools) can be downloaded via browser/FTP, online data transfer to CMS X-Tools
Ethernet interface	Yes
SIMOCODE interface	Yes
Protocols	
Bus communication	Yes
Open IE communication	
• TCP/IP	Yes
Web server	
• HTTP	Yes
Interrupts/diagnostics/ status information	
Diagnostics via e-mail	Yes

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Technical specifications (continued)

Article number	6AT8002-1AA00 SIPLUS CMS2000 Basic Unit VIB
Integrated Functions	
Monitoring functions	
• Monitoring of the sensor inputs	Yes
• Vibration characteristic monitoring via RMS value of the vibration speed	Yes
• Vibration characteristic monitoring via diagnostic characteristic value	Yes
• Frequency-selective monitoring via vibration speed spectrum	Yes
• Frequency-selective monitoring via vibration acceleration spectrum	Yes
• Frequency-selective monitoring via envelope curve analysis	Yes
Isolation	
Overvoltage category	II
Degree and class of protection	
IP degree of protection	IP20
Standards, approvals, certificates	
Certificate of suitability	CE, UL 508, CSA C22.2 Nr.142, C-TICK (RCM)
Degree of pollution	2
Reference designation according to DIN EN 61346-2	P
Reference designation according to DIN 40719 extended according to IEC 204-2, according to IEC 750	P
Ambient conditions	
Ambient temperature during operation	
• min.	-20 °C
• max.	65 °C
Ambient temperature during storage/transportation	
• Storage, min.	-25 °C
• Storage, max.	85 °C
• Transportation, min.	-25 °C
• Transportation, max.	85 °C
Air pressure acc. to IEC 60068-2-13	
• Installation altitude above sea level, max.	1 500 m
Relative humidity	
• Operation without condensation, min.	5 %
• Operation without condensation, max.	95 %

Article number	6AT8002-1AA00 SIPLUS CMS2000 Basic Unit VIB
Software	
Browser software required	Webbrowser Mozilla Firefox, Google Chrome or Microsoft Internet Explorer
Connection method	
Design of electrical connection for the inputs and outputs	Screw connection
Design of electrical connection for auxiliary and control circuit	Screw connection
• Connectable conductor cross-section, solid or stranded, min.	0.5 mm^2
• Connectable conductor cross-section, solid or stranded, max.	4 mm^2
• Connectable conductor cross-section, finely stranded with end sleeve, min.	0.5 mm^2
• Connectable conductor cross-section, finely stranded with end sleeve, max.	2.5 mm^2
• Connectable cable cross-section finely stranded without end sleeve, min.	0.5 mm^2
• Connectable cable cross-section finely stranded without end sleeve, max.	2.5 mm^2
Terminals	
• Removable terminal for main circuit	Yes
• Removable terminal for auxiliary and control circuit	Yes
Mechanics/material	
Material of housing	plastic
Dimensions	
Width	45 mm
Height	106 mm
Depth	124 mm
Weights	
Weight, approx.	300 g

13

Ordering data

	Article No.
SIPLUS CMS2000 Basic Unit VIB Basic unit for monitoring vibrations in mechanical components based on characteristic values and frequency-selective analysis functions for measurement category 0 according to EN 61010	**6AT8002-1AA00**

	Article No.
Shield connection For the EMC-compliant connection of signal and encoder cables to the basic unit VIB (packaging unit = 2 pieces)	**6AT8002-4AA00**

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Overview

SIPLUS CMS2000 VIB-MUX expansion modules and temperature modules can be connected to the SIPLUS CMS2000 Basic Unit VIB via the SIMOCODE system interface.

SIPLUS CMS2000 VIB-MUX expansion modules

Up to two SIPLUS CMS2000 VIB-MUX expansion modules can be connected to the SIPLUS CMS2000 Basic Unit VIB to expand the vibration channels. In this way, the number of vibration channels can be expanded modularly from 2 to a maximum of 16 channels.

The following configuration options are possible:

- Basic unit without expansion:
  2 time-synchronous, continuously sampled vibration channels
- Basic unit with one SIPLUS CMS2000 VIB-MUX:
  8 + 1: 8 channels via the SIPLUS CMS2000 VIB-MUX in multiplex mode, 1 channel continuous and independent of the channels connected on the SIPLUS CMS2000 VIB-MUX
- Basic unit with two SIPLUS CMS2000 VIB-MUX:
  16 vibration channels in multiplex mode

SIMOCODE connecting cable for connecting the SIPLUS CMS2000 Basic Unit VIB to the SIPLUS CMS2000 VIB-MUX see "Accessories".



SIPLUS CMS2000 VIB-MUX expansion module 6AT8002-2AA00

Temperature modules

Up to two temperature modules can be connected to the SIPLUS CMS2000 Basic Unit VIB.

Each temperature module has three inputs for the connection of up to three analog temperature sensors (sensor types: Pt100/ Pt1000, KTY83/KTY84 or NTC) available.

SIMOCODE connecting cable for connecting the SIPLUS CMS2000 Basic Unit VIB to the temperature modules, see "Accessories".



Temperature module 3UF7700-1AA00-0

Technical specifications

Article number	**6AT8002-2AA00** SIPLUS CMS2000 VIB-MUX
General information	
Product brand name	SIPLUS
Product description	Up to two SIPLUS CMS2000 VIB-MUX expansion modules can be connected to the SIPLUS CMS2000 Basic Unit VIB. Up to 8 IEPE vibration channels can be connected for each expansion module.
Functional principle	Multiplexing of analog IEPE signals
Physical measuring principle	Vibration acceleration
Measurement range vibration frequency, min.	2 Hz
Measurement range vibration frequency, max.	10 000 Hz
Installation type/mounting	
Mounting type	standard rail
Mounting position	vertical
Recommended mounting position	vertical

Article number	**6AT8002-2AA00** SIPLUS CMS2000 VIB-MUX
Supply voltage	
Type of supply voltage	DC
Rated value (DC)	24 V
Power	
Active power input, max.	2.4 W
Power loss	
Power loss, typ.	0.05 W
Digital outputs	
Number of digital outputs	1
Sensor input	
Number of IEPE sensor inputs	8
Number of MEMS sensor inputs	0
Interfaces	
SIMOCODE interface	Yes
Degree and class of protection	
IP degree of protection	IP20

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Technical specifications (continued)

Article number	6AT8002-2AA00 SIPLUS CMS2000 VIB-MUX
Standards, approvals, certificates	
Certificate of suitability	CE, UL 508, CSA C22.2 Nr.142, C-TICK (RCM)
Reference designation according to DIN EN 61346-2	P
Reference designation according to DIN 40719 extended according to IEC 204-2, according to IEC 750	P
Ambient conditions	
Ambient temperature during operation	
• min.	-20 °C
• max.	65 °C
Ambient temperature during storage/transportation	
• Storage, min.	-25 °C
• Storage, max.	85 °C
• Transportation, min.	-25 °C
• Transportation, max.	85 °C
Relative humidity	
• Operation without condensation, min.	5 %
• Operation without condensation, max.	95 %
Connection method	
Design of electrical connection for the inputs and outputs	Screw connection
Design of electrical connection for auxiliary and control circuit	Screw connection
• Connectable conductor cross-section, solid or stranded, min.	0.5 mm^2
• Connectable conductor cross-section, solid or stranded, max.	4 mm^2
• Connectable conductor cross-section, finely stranded with end sleeve, min.	0.5 mm^2
• Connectable conductor cross-section, finely stranded with end sleeve, max.	2.5 mm^2
• Connectable cable cross-section finely stranded without end sleeve, min.	0.5 mm^2
• Connectable cable cross-section finely stranded without end sleeve, max.	2.5 mm^2
Terminals	
• Removable terminal for main circuit	Yes
• Removable terminal for auxiliary and control circuit	Yes

Article number	6AT8002-2AA00 SIPLUS CMS2000 VIB-MUX
Mechanics/material	
Material of housing	plastic
Dimensions	
Width	45 mm
Height	106 mm
Depth	124 mm
Weights	
Weight, approx.	0.27 kg

Article number	3UF7700-1AA00-0
Product designation	temperature module
General technical data:	
Protection class IP	IP20
Ambient temperature	
• during storage	-40 ... +80 °C
• during operation	-25 ... +60 °C
• during transport	-40 ... +80 °C
Reference code	
• acc. to DIN EN 61346-2	B
Installation/ mounting/ dimensions:	
Mounting type	screw and snap-on mounting
Width	22.5 mm
Height	92 mm
Depth	124 mm
Inputs/ Outputs:	
Number of analog inputs	3
Connections:	
Type of electrical connection for auxiliary and control current circuit	screw-type terminals

Ordering data

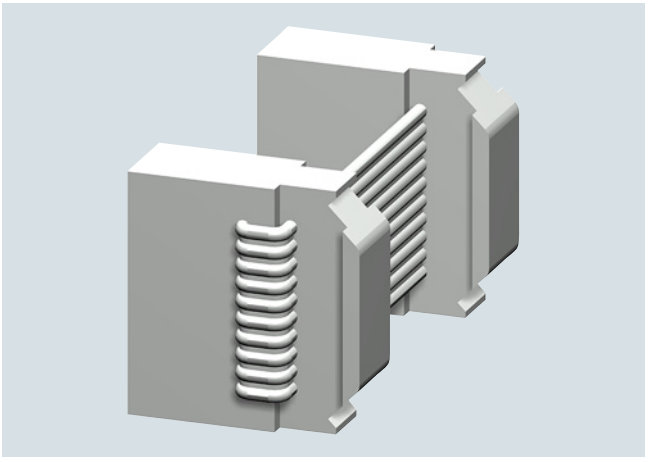
	Article No.
SIPLUS CMS2000 VIB-MUX expansion modules Up to two expansion modules can be connected to the SIPLUS CMS2000 Basic Unit VIB. Up to 8 IEPE vibration channels can be connected for each expansion module.	**6AT8002-2AA00**

	Article No.
Temperature modules Up to two temperature modules can be connected to the SIPLUS CMS2000 Basic Unit VIB.	**3UF7700-1AA00-0**

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Overview

SIMOCODE connecting cables

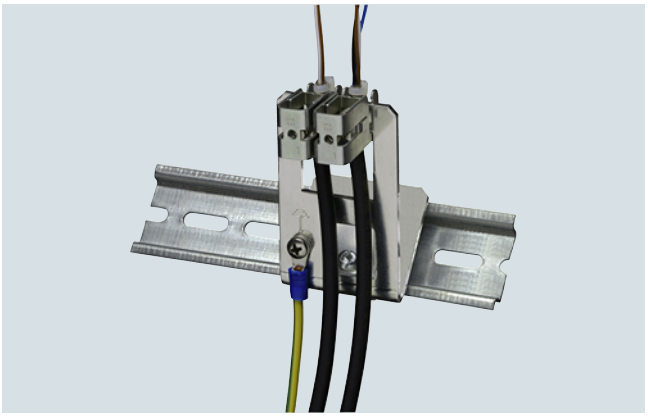


SIMOCODE connecting cable 3UF7930-0AA00-0

The connecting cable is used for connecting the SIPLUS CMS2000 Basic Unit VIB to the SIPLUS CMS2000 VIB-MUX expansion modules and the temperature modules via the SIMOCODE system bus interface.

The connecting cable with a length of 0.025 m must be used for side-by-side mounting of the basic unit and SIPLUS CMS2000 VIB-MUX expansion modules or temperature modules on a TH 35-15 standard DIN rail in accordance with IEC 60715.

Shield connection



6AT8002-4AA00 shield connection

A separate shield connection must be ordered for the EMC-compliant connection of signal and encoder cables to the SIPLUS CMS2000 Basic Unit VIB and the SIPLUS CMS2000 VIB-MUX expansion module.

The shield connection comprises two shield clamps and five terminal clamps. One shield clamp each is attached to the DIN rail above and below the basic unit. The sensor cable shields are connected to the shield clamps by means of the terminal clamps.

VIB-SENSOR S01 vibration sensor



VIB-SENSOR S01 vibration sensor 6AT8002-4AB00

The VIB-SENSOR S01 vibration sensor with IEPE (integrated electronics piezo-electric) interface can be directly connected to the SIPLUS CMS2000 Basic Unit VIB and the SIPLUS CMS2000 VIB-MUX expansion module.

The sensor detects vibration accelerations in the frequency range from 0.5 Hz to 15 kHz with a resolution of 100 mV/*g*.

A threaded screw with an M8 male thread for mounting to the measuring point is included in the scope of supply. The connecting cable is connected to the vibration sensor via the MIL connector.

SIPLUS CABLE-MIL connecting cables



SIPLUS CABLE-MIL connecting cables 6AT8002-4AC03, 6AT8002-4AC10

The VIB-SENSOR S01 vibration sensor is connected to the SIPLUS CMS2000 Basic Unit VIB or the SIPLUS CMS2000 VIB-MUX expansion module by means of the SIPLUS CABLE-MIL connecting cable.

This high-quality industrial cable is made of black polyurethane and is pre-assembled on one end with a MIL connector (MIL-C5015). The open cable end of the shielded two-wire cable is connected directly to the screw terminals of the basic unit.

The connecting cable is available in lengths of 3 m and 10 m.

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Technical specifications

Article number	6AT8002-4AA00
	CMS2000 SHIELD CONNECTION ACCESSORY
General information	
Product brand name	SIPLUS
Product description	For the EMC-compliant connection of signal and encoder cables to the SIPLUS CMS2000 Basic Unit VIB or the SIPLUS CMS2000 VIB-MUX expansion module
Installation type/mounting	
Mounting type	standard rail
Connection method	
Number of signal cables connectable to the shield support	3

Article number	6AT8002-4AC03	6AT8002-4AC10
	SIPLUS CMS2000 CABLE 3m	SIPLUS CMS2000 CABLE 10m
General information		
Product brand name	SIPLUS	
Product category	Connection cable	
Product description	For connection of the VIB-SENSOR S01 vibration sensor to the SIPLUS CMS2000 Basic Unit VIB or the SIPLUS CMS2000 VIB-MUX expansion module	
Cables		
Type of insulation	black polyurethane	
Design of shield	Braided shielding with stranded drain wire	
Cable length	3 m	10 m
Connection method		
Type of connection	MIL-C5015 / open cable end	

Article number	6AT8002-4AB00
	SIPLUS CMS2000 VIB-SENSOR S01
General information	
Product brand name	SIPLUS
Product description	Piezoelectric sensor for connection to the SIPLUS CMS2000 Basic Unit VIB or the SIPLUS CMS2000 VIB-MUX expansion module
Physical measuring principle	Piezo-quartz recorder with integrated evaluation electronics
Operating range of sensor at +/- 3 dB, min.	0.5 Hz
Operating range of sensor at +/- 3 dB, max.	15 000 Hz
Measurement range vibration acceleration, max.	50 gn
Sensitivity, typ.	100 mV/gn
Resolution of measured value of vibration acceleration, min.	0.002 gn
Resonance frequency	23 kHz
Installation type/mounting	
other mounting	incl. mounting bolts UNF1/4-28 on M8
Input current	
Type of power supply	IEPE 2 to 10 mA
Sensor input	
Encoder signals, IEPE	
• Signal voltage (DC), min.	10 V
• Signal voltage (DC), max.	14 V
Degree and class of protection	
IP degree of protection	IP65
Cables	
Cable length, max.	80 m
Connection method	
Type of connection	MIL-C5015
Mechanics/material	
Material of housing	Stainless steel

Ordering data

	Article No.
SIMOCODE connecting cable For side-by-side mounting of the SIPLUS CMS2000 Basic Unit VIB and SIPLUS CMS2000 VIB-MUX expansion modules or 3UF7700-1AA00-0 temperature modules	**3UF7930-0AA00-0**
SIPLUS CMS2000 shield support For the EMC-compliant connection of signal and encoder cables to the SIPLUS CMS2000 Basic Unit VIB or the SIPLUS CMS2000 VIB-MUX expansion module	**6AT8002-4AA00**

	Article No.
Vibration sensor VIB-SENSOR S01 Piezoelectric sensor for connection to the SIPLUS CMS2000 Basic Unit VIB or the SIPLUS CMS2000 VIB-MUX expansion module	**6AT8002-4AB00**
CABLE-MIL connecting cable For connection of the VIB-SENSOR S01 vibration sensor to the SIPLUS CMS2000 Basic Unit VIB or to the SIPLUS CMS2000 VIB-MUX expansion module	
• CABLE-MIL-300 connecting cable length 3 m	**6AT8002-4AC03**
• CABLE-MIL-1000 connecting cable length 10 m	**6AT8002-4AC10**

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Overviews



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Overview



SIMATIC HMI operator control and monitoring systems – efficient machine-level operator control and monitoring

Equipment for monitoring and operator control is needed wherever people have to work with or on machinery and plants performing diverse tasks from cylinder driers to waste compactors. It is not difficult to find the right device for your specific task. The challenge is to find a solution that is future-proof and flexible, that can be integrated into higher-level networks, and that can also meet the ever-increasing demands for transparency and data provision. SIMATIC HMI Panels have proven their value in a variety of different applications in all industrial sectors over many years. The range of the systems in use is just as wide as that of the applications and technologies in the respective plants.

SIMATIC HMI stands for highly efficient machine-level operator control and monitoring and has some unique advantages:

- Efficient engineering
  Visualization can be created more quickly and easily than ever before.
- Innovative design and operation
  Visualization becomes the outstanding feature of the machine.
- Brilliant HMI operator panels
  The right operator panel for every application.
- Backup – with security
  Protection for investments and know-how, secure operation.
- Commissioning in the fast lane
  Lose no time with testing and servicing.
- Openness with PC-based
  For flexible, independent applications

www.siemens.com/hmi

SIMATIC HMI software – a lot more than just visualization software

With the SIMATIC WinCC (TIA Portal), SIMATIC WinCC and SIMATIC WinCC Open Architecture product families, SIMATIC HMI covers the entire engineering and visualization software spectrum for the human machine interface.

- Almost the entire range of SIMATIC operator panels can be configured with SIMATIC WinCC (TIA Portal), the successor to SIMATIC WinCC flexible.
  The functionality covers both visualization tasks at machine level and SCADA applications on PC-based multi-user systems.
- The current version 7.5 of SIMATIC WinCC is available for extremely complex process visualization tasks and SCADA applications, e.g. taking account of redundant solutions and vertical integration all the way to plant intelligence solutions.
- Ultimately, SIMATIC WinCC Open Architecture addresses applications that require extensive customer-specific adaptations or manage large and/or complex applications, as well as projects that demand special system requirements and functions.

www.siemens.com/hmi-software

SIMATIC HMI – brilliant and rugged operator panel

Basic HMI – for the entry level

- Key Panels
  Pre-assembled and ready for installation, for conventional operator panels. No configuration required with WinCC!
  www.siemens.com/key-panels
- Basic Panels
  The entry level series for simple HMI applications.
  www.siemens.com/basic-panels

Panel-based HMI Advanced - for more sophistication

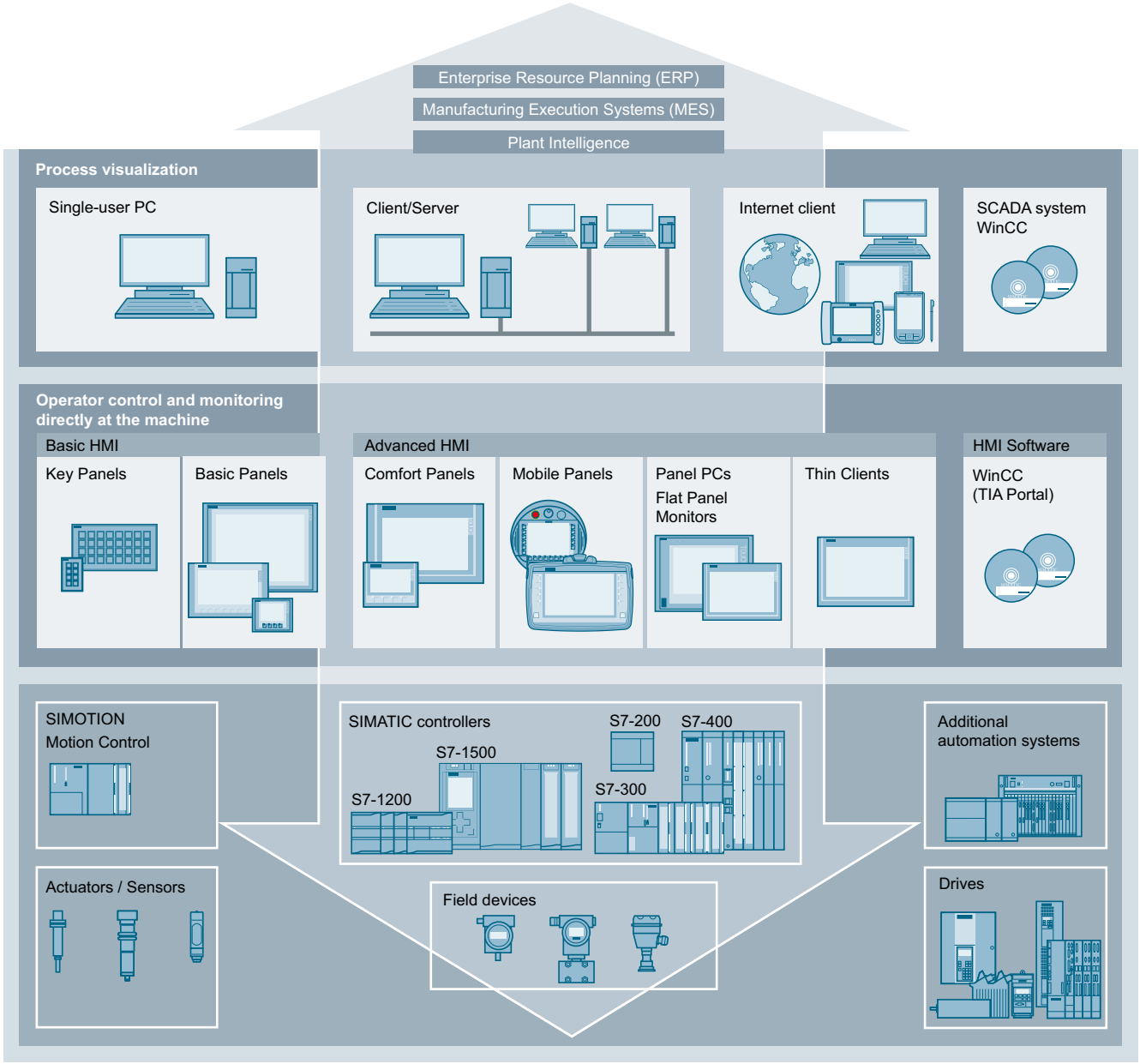
- Comfort Panels
  High-end functionality for demanding indoor and outdoor HMI applications.
  www.siemens.com/comfort-panels
- Mobile Panels
  Portable HMI operator panels for mobile deployment on site.
  www.siemens.com/mobile-panels

Individual HMI devices in customized versions

www.siemens.com/customized-automation

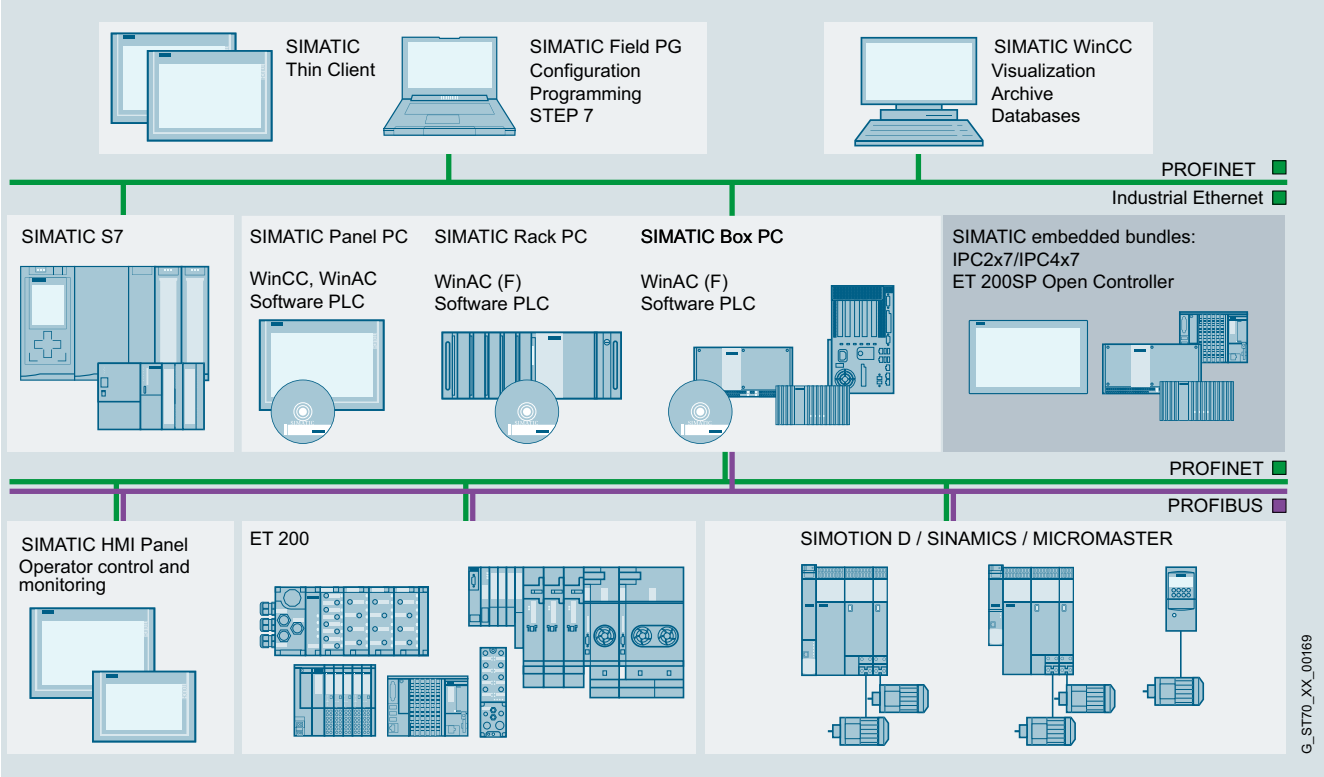
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Overview (continued)



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Overview



SIMATIC PC-based Automation

www.siemens.com/pc-based

Industrial IoT Gateway - SIMATIC IOT2000

An intelligent gateway which harmonizes communication between the various sources of data before analyzing it and forwarding it to the corresponding recipients. An easy-to-implement solution.

www.siemens.com/iot2000

Industrial PCs

Our reliable and innovative industrial PCs are the optimal PC hardware platform for PC-based Automation from Siemens.

- Rack PC
- Box PC
- Panel PC
- Tablet PC
- Industrial monitors and thin clients
- Devices for special requirements
  - Fully-enclosed IP65 devices
  - Devices with stainless steel fronts
  - Devices for hazardous areas
- IPC software
- Embedded bundles/software packages

www.siemens.com/simatic-ipc

Software controller

The SIMATIC S7-1500 Software Controller implements a SIMATIC S7-1500 controller on SIMATIC IPC. It is particularly suitable for control solutions in special-purpose machine manufacturing which involve a high-performance implementation of complex control tasks, the integration of PC applications, or the realization of multiple tasks on a single device.

www.siemens.com/software-controller

PC-based controllers

PC-based controllers combine the functions of a PC-based software controller with visualization, PC applications and central I/Os (inputs/outputs) in a single, compact device. The SIMATIC ET 200SP Open Controller is an industrial PC with the design of the ET 200SP I/O system and a pre-installed S7-1500 Software Controller.

www.siemens.com/open-controller

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Overview



SIMATIC PCS 7 system architecture

Performance you trust

In process engineering plants, the process control system is the starting point for optimal value added: All procedures and processes can be operated, monitored and influenced with the process control system.

The more powerful the process control system, the more effectively this potential can be used. For this reason, performance is in the foreground with SIMATIC PCS 7, alongside scalability, flexibility, and integration. Starting with planning and engineering, the process control system offers powerful tools, functions and features for cost-effective and efficient plant operation through all phases of the plant life cycle.

Performance through integration

Integration is one of the special strengths of SIMATIC PCS 7. This has many aspects:

- Horizontal integration into TIA
- Vertical integration into hierarchical communication
- System-integrated tools for engineering tasks
- Integration of the field level, including drives, switchgear, etc.
- Integrated functions, e.g. for batch process automation, route control, process safety, energy management, telecontrol tasks, etc.

Horizontal integration

A system for integrated automation of the entire process chain, from incoming raw materials to outgoing goods – this is one of the decisive advantages resulting from the seamless integration of SIMATIC PCS 7 into Totally Integrated Automation.

The process control system is mainly responsible for automating the primary processes here, but it can do much more: All auxiliary facilities, as well as the electrical infrastructure in the form of low-voltage or medium-voltage switchgear and the building management system, can also be integrated into the system.

Integration of selected SIMATIC standard components – automation systems, industrial PCs, network components, or distributed process I/O – into the process control system guarantees optimum interaction of individual components, and secures economic benefits such as simple selection, reduced stock keeping, and global support.

Vertical integration

The hierarchal communication of a company encompasses the field level, the control level, and the process level, up to management and enterprise resource planning (ERP). Thanks to standardized interfaces – based on international industry standards as well as internal interfaces – SIMATIC PCS 7 is able to provide process data for analysis, planning, coordination, and optimization of plant sequences or production and business processes – in real time, and at any location in the company.

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Overview (continued)

Central engineering

SIMATIC PCS 7 convinces with graded functional diversity, consistent operator control philosophy, and uniformly structured engineering and management tools. A central engineering system with a coordinated range of tools for integrated system engineering and configuring of batch automation, safety functions, material transport or telecontrol systems creates value added over the entire life cycle. Reductions in configuring and training costs result in minimization of total cost of ownership (TCO) over the entire plant life cycle.

Functional diversity

Depending on the typical process automation or customer-specific requirements, SIMATIC PCS 7 can be functionally expanded for the following, for example:

- Batch process automation (SIMATIC BATCH)
- Functional safety and protection functions (Safety Integrated for Process Automation)
- Route control for material transport (SIMATIC Route Control)
- Telecontrol of remote units (SIMATIC PCS 7 TeleControl)
- Automation of electrical switchgear (SIMATIC PCS 7 PowerControl)

Further additional functions that are also integrated, or can be integrated, seamlessly into the control system make optimization of processes and reductions in operating costs possible. SIMATIC PCS 7 has, for example, tools for energy and asset management, and it offers higher quality closed-loop control functions, as well as industry-specific automation solutions and libraries.

Custom automation

The unique scalable system architecture makes SIMATIC PCS 7 the ideal basis for cost-effective implementation of individual automation solutions and a cost effective operation of process plants.

SIMATIC PCS 7 users receive sustainable benefits from the modular system platform, based on SIMATIC standard components. Their integration makes the flexible scaling of hardware and software, perfectly matched within and across systems possible. The architecture of the process control system SIMATIC PCS 7 is designed in such a way that the control technology can be used for the project planning according to the customer's requirements, optimally adapted to the dimensions of the plant. The control technology allows retrofit or reconfiguration for capacity expansion or technological changes at any time. If the plant grows, then SIMATIC PCS 7 simply grows along with it – making expensive reserve capacities unnecessary!

Flexibility and performance in engineering

The workflow in the engineering of process plants is and remains a challenge: Numerous participants, many different data formats and multiple interfaces frequently result in transmission errors and system discontinuity and thus in greater time input and costs. Information generally gets lost or needs to be corrected manually when data is exchanged between multiple disciplines.

For the first time, a fully integrated solution is now available for planning and documenting plant projects: the SIMATIC PCS 7 Plant Automation Accelerator. Customers benefit in particular from consistent engineering without system discontinuities between automation planning and the control system.

The object-oriented approach of the SIMATIC PCS 7 Plant Automation Accelerator makes it possible to work on a central data platform, thus ensuring completely integrated planning – from plant engineering through to automation – based on an electronic workflow. This workflow ranges from planning, the preparation of bids – including bills of material – and the automatic generation of control data from the electrical plans of the SIMATIC PCS 7 process control system, through to controlled mass data engineering and direct as-is documentation of the plant.

This modular engineering approach enhances overall project efficiency and minimizes risks. A high level of standardization and simple configuration additionally save engineering time and costs during the implementation phase. Simple synchronization between planning and engineering avoids duplicate input and interface losses and reduces project runtimes.

Flexibility in operation

Process control also becomes more complex due to the multi-layer nature of automation engineering and the increased merging with information technology. Intuitive and fault-free operation is therefore more important than ever with regard to efficient working and the minimization of downtimes and servicing requirements. Using effective Advanced Process Control (APC) functions and an excellent operator system, SIMATIC PCS 7 supports optimization as well as user-friendly and safe control of the process. Monitoring of product quality and performance indicators additionally allows the process to be operated more economically. At the same time, SIMATIC PCS 7 convinces with high flexibility, plant availability, and investment security.

Process control and maintenance

SIMATIC PCS 7's operator system is used to monitor process operation using various views, and permits interventions when necessary. Its architecture is flexible and scalable – from single-user systems up to multi-user systems with a redundant client/server architecture. The operator interface takes account of the current specifications of NAMUR (user association of automation technology in the process industries) and PI (Profibus International) and offers a high level of user-friendliness for simple, intuitive interaction with the plant. Ergonomic symbols, task-oriented faceplates, uniform representation of status information, and optimized alarm functions allow safe process control.

The alarm management function integrated in SIMATIC PCS 7 is able to focus on essential alarms and to specifically guide the operator in exceptional circumstances. In this way, it systematically reduces the workload of operating staff.

Preventive and predictive maintenance strategies reduce total cost of ownership. With the SIMATIC PCS 7 Maintenance Station, maintenance personnel always have a watchful eye on critical production equipment such as pumps, valves, distillation columns or motors, and can carry out the relevant maintenance measures in good time before servicing is required – independent of the maintenance plan and without the risk of an unplanned plant standstill.

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Overview (continued)

Process optimization

SIMATIC PCS 7 supports process optimization in many different manners, including:

- Control Performance Monitoring
- Advanced Process Control
- Process Historian

The Control Performance Monitoring function monitors and signals the control quality of the closed-loop control block. If the performance declines, the controller can be optimized in good time or specific maintenance measures can be initiated.

The integrated I&C libraries of SIMATIC PCS 7 also provide higher quality closed-loop control functions with which cost-effective Advanced Process Control applications can be implemented: multi-variable control, predictive control, or override control. It is thus possible to effectively improve profitability, product quality, safety, and environmental protection in small and medium-sized plants.

Current and historic process data form the basis of all optimization. Secure and user-friendly real-time data storage and analysis is handled using the Process Historian. The process values, messages, and batch data managed in the database of the Process Historian can be called extremely rapidly. User-specific processing and visualization of this historic data are supported by the information server, which is a reporting system based on the Microsoft Reporting Services.

SIMATIC PCS 7 system and technology components

With the rugged, high-performance SIMATIC PCS 7 system components from Catalog ST PCS 7, you already have a versatile platform for cost-effective implementation and economical operation of your process control systems. Perfect interplay of these system components makes it possible for you to sustain high-quality production and to establish new products significantly faster on the market.

With SIMATIC PCS 7 technology components from Catalog ST PCS 7 T that can be seamlessly integrated into the process control system, you can expand the functional scope of the system components in a carefully targeted manner for specific automation tasks.

This covers a wide spectrum, for example:

- Telecontrol for monitoring and controlling remote plant units
- Automation technology for electrical low-voltage or medium-voltage switchgear
- Industry-specific automation systems for the cement and mining industries, as well as for laboratory and training facilities
- Graphical objects for task-oriented optimization of process visualization
- Block libraries for technological functions, package unit and panel integration, monitoring and analyzing mechanical assets, as well as for building automation systems (heating, ventilation, air-conditioning – FMCS/HVAC)
- Editors and function blocks for the efficient configuration of small or medium-sized automation systems with simple parameter control and materials management
- Process analytical technology for quality assurance through optimization of development and production processes based on up-to-date measurements, and critical quality and performance attributes
- Simulation system for testing and commissioning of plant-specific application software
- Flexible, high-performance Manufacturing Execution System (MES)
- System expansion for operator systems for the integration of third-party controllers, programmable logic controllers and package units
- Products for migration of the process control systems TELEPERM M, APACS+/QUADLOG or Bailey INFI 90/NET 90 with SIMATIC PCS 7

SIMATIC PCS 7 technology components have been released for all versions and service packs of SIMATIC PCS 7 system components. Development and testing of SIMATIC PCS 7 technology components are dependent on the corresponding SIMATIC PCS 7 system components, so versioning and release is normally performed asynchronously, that is following a delay of between 3 and 6 months.

Additional functionality can be integrated using add-on products

Modularity, flexibility, scalability, and the openness of SIMATIC PCS 7 offer optimal prerequisites for integrating supplementary components and solutions in the process control system in an applicative manner and thus extend and round off its functionality.

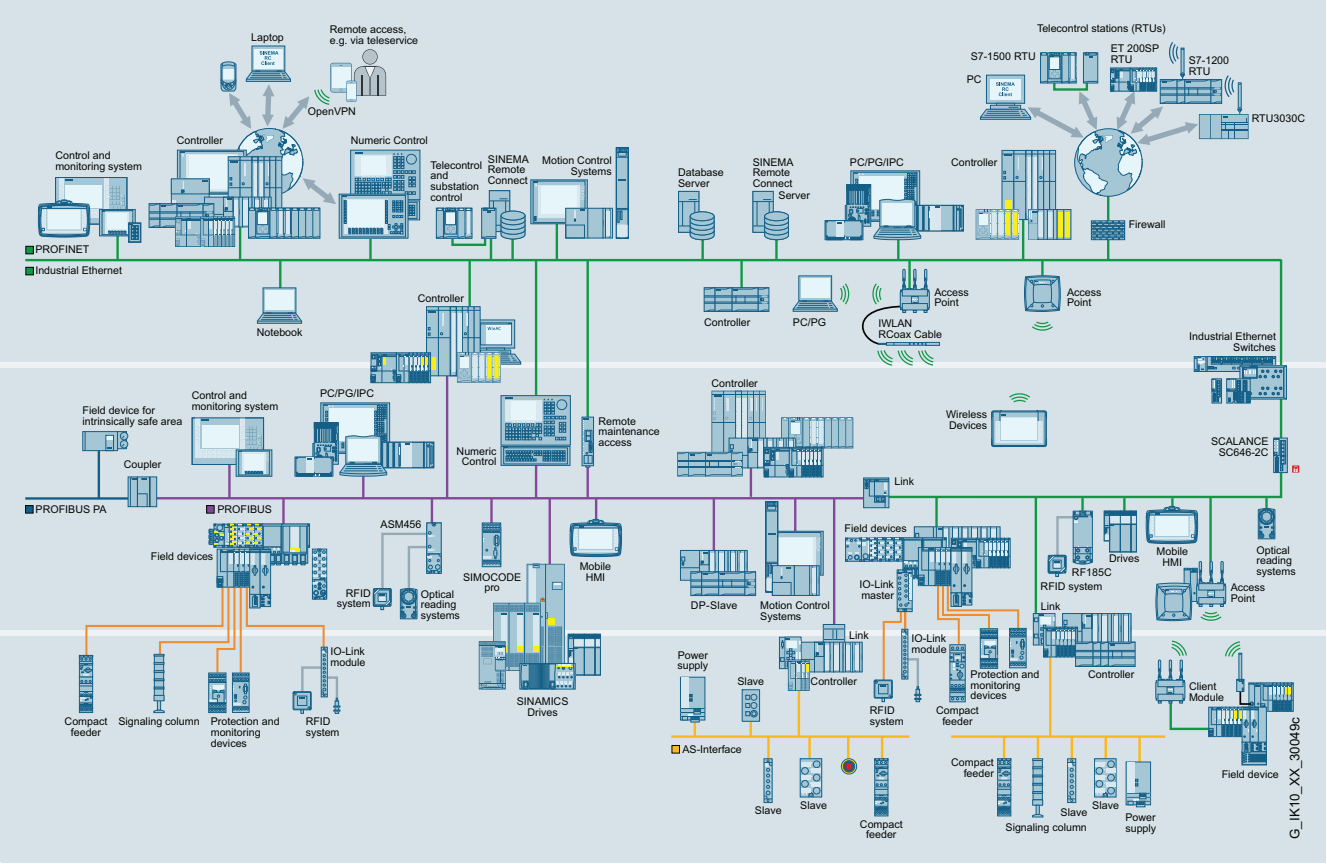
Many supplementary add-on products for SIMATIC PCS 7 have been developed by Siemens as well as by external partners (see Catalog ST PCS 7 AO, Add-ons for the SIMATIC PCS 7 Process Control System). These software packages and hardware components authorized by the system manufacturer enable cost-effective implementation of SIMATIC PCS 7 for special automation tasks.

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Introduction

Overview

SIMATIC NET
Industrial communication – the backbone of automation



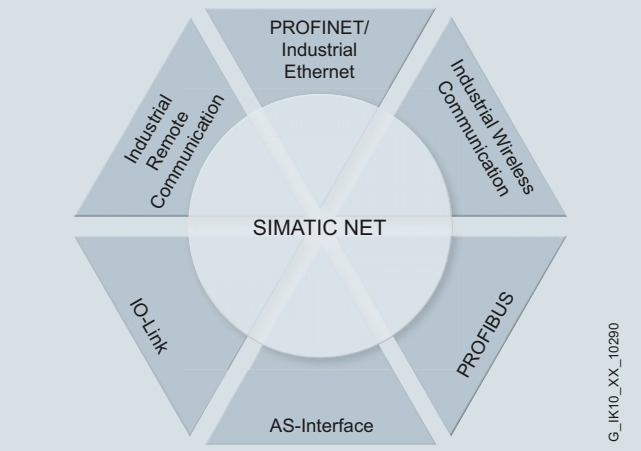
Powerful and open communication systems ensure trouble-free communication for automation systems, covering

- data communication or
- process or field communication.

Openness and flexibility of the individual communication systems in different topologies enable linking of a wide variety of systems and their subsequent expansions. By using standardized communication systems, it is possible to connect standardized components from different suppliers without any problems. This ensures maximum protection of investment, as existing networks can be extended without any adverse effects.

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Overview (continued)



SIMATIC NET provides components for an integrated overall solution beyond network boundaries.

These include:

- Passive network components, e.g. FastConnect cabling systems
- Active network components, e.g. SCALANCE X Industrial Ethernet switches
- Interfaces for connecting programmable controllers to the communication systems:
  - Integrated interfaces
  - Communications processors
- Components for wireless networks, e.g. Industrial Wireless LAN, SCALANCE W Access Points, and Client Modules
- Components for industrial security
- Components for Industrial Remote Communication, worldwide access to outlying plants, distant machines, and for mobile applications such as TeleControl.
- Components for the connection to remote networks, e.g. SCALANCE M and SINEMA Remote Connect
- Network transitions, e.g. IE/PB LINK PN IO
- Components for AS interface
- Software for configuration, monitoring and diagnosis of the network, e.g. SINEC NMS

More information

- Catalog IK PI
- Catalog IC 10
- Interactive catalog CA 01 on DVD
- Internet:
  www.siemens.com/industrial-communication

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Overview

SIMATIC Ident – Intelligent data management through industrial identification

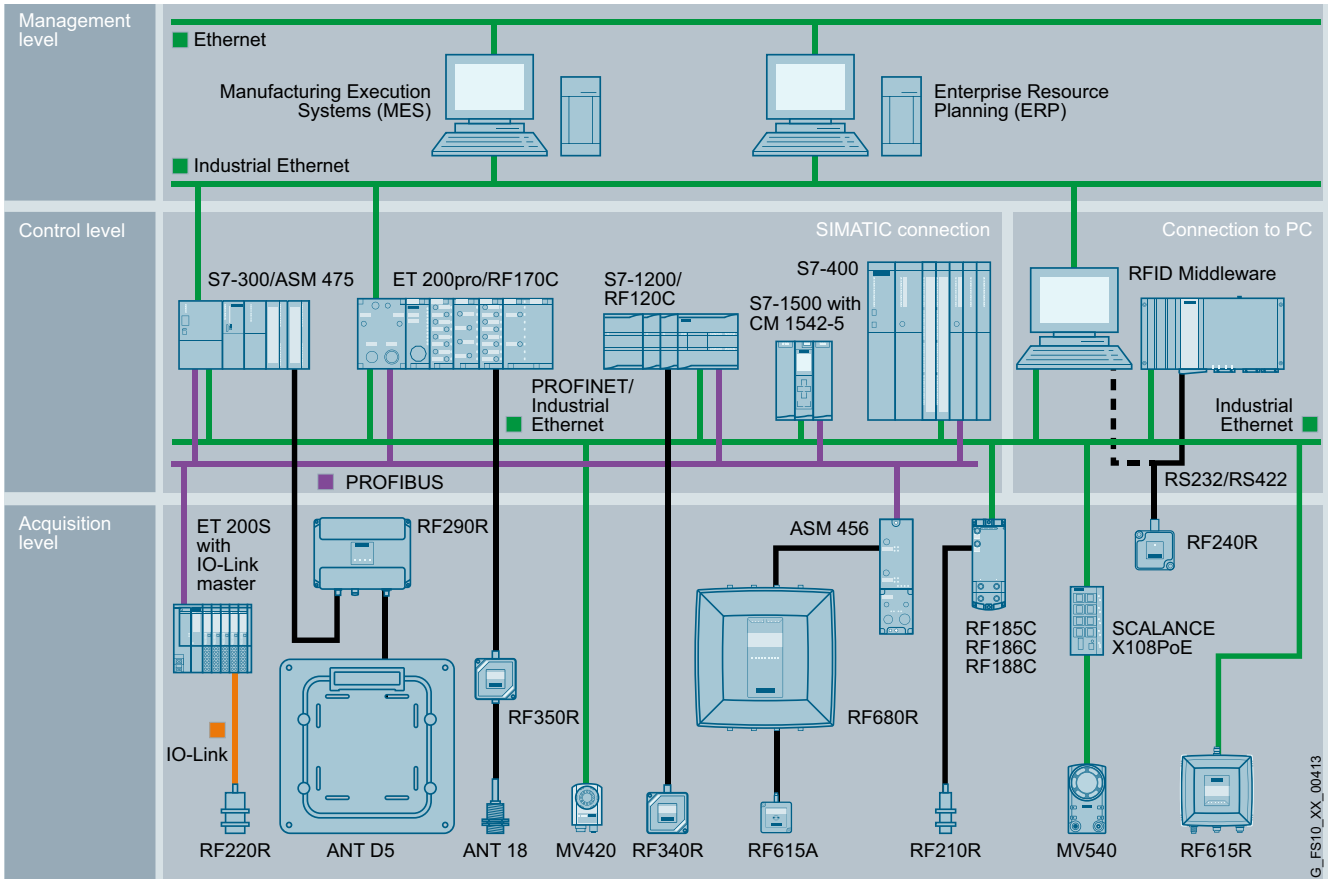
Small batch sizes, a wide range of increasingly complex products, an extremely high degree of customization and complicated processes present major challenges for industry.

For all these challenges Siemens offers SIMATIC Ident, a unique integrated and scalable range of RFID and optical identification systems. These enable virtual data flows from IT systems to be synchronized with the actual flow of goods – throughout the value chain. This provides the necessary clarity and answers the question: When is which product in which location and what is its status? Because data transparency is becoming an increasingly central factor of success, especially in the industrial environment.

With SIMATIC Ident, quality requirements can be reliably met, production can be more flexibly structured, the number of manual operations reduced, and potential sources of faults identified and removed immediately. This means greater efficiency in logistics, material management, production, and service. For competitiveness and for a flexible future.

In addition, SIMATIC Ident supplies production data to cloud applications, e.g. MindSphere – the cloud-based, open IoT operating system from Siemens.

This makes SIMATIC Ident a key technology for the digital enterprise. Our solutions close the gap between the real and the digital world – and open up new added value potential for our customers.



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Overview (continued)

RFID



Our SIMATIC RF RFID systems cover the most varied requirements when it comes to performance, range, and frequency band. With them, you can count on gap-free transparency throughout the supply chain.

Line of sight between the write/read device and the transponder is not necessary. Rugged, compact readers in a high degree of protection with either integrated or external antennas are available for interference-free data communication. Cost-efficient, maintenance-free, passive labels and passive transponders in various designs and with various memory capacities are likewise available, as are powerful antennas.

Optical identification



The SIMATIC MV optical readers are powerful, intelligent reading devices for both standard, high-contrast 1D/2D codes as well as difficult-to-read DPM codes applied straight onto the different product surfaces. The optical readers also permit text recognition, object recognition, and inspection of marking quality. The readers of the SIMATIC MV family boast powerful image acquisition capabilities for different resolutions and integrated lighting, allowing them to be used in a range of applications. Device configuration via web-based management and system integration via the TIA Portal ensure easy handling.

More information

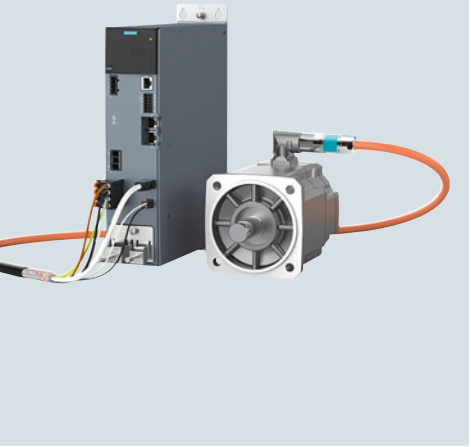
- Interactive Catalog CA 01
- Internet: www.siemens.com/simatic-ident

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Notes

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Supplementary Components



15/2 **Drive systems**
15/2 SINAMICS drive system

15/11 **Overvoltage protection**
15/11 SICROWBAR overvoltage protection

15/12 **Timing, coupling and monitoring relays**
15/12 SIRIUS relays

15/14 **Measuring systems**
15/14 Motion Control Encoder measuring systems

15/14 **Automation systems**
15/14 SIMOTION Motion Control System
15/16 SINUMERIK CNC automation systems
15/16 - SINUMERIK 828D with SINAMICS S120 Combi
15/17 - SINUMERIK 840D sl

15/18 **System cabling**
15/18 MOTION-CONNECT connection systems

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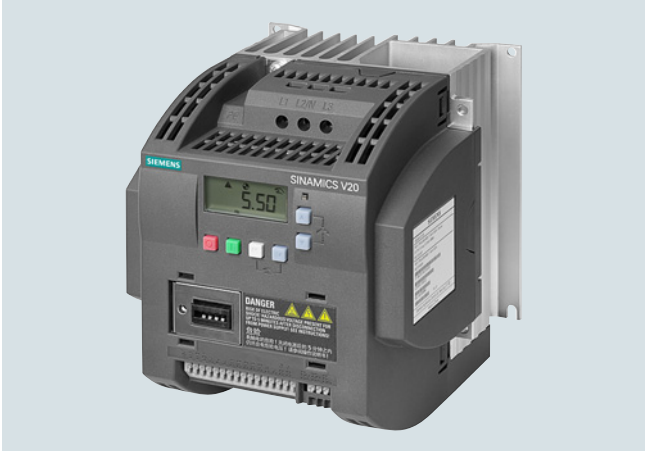
Overview

The SINAMICS range



- Totally integrated range of drives for any application and every industry
- Wide range of power ratings from 0.05 kW to 85 MW
- Broad functional scope, from simple U/f control through to highly dynamic servo control
- Designed for problem-free interaction with other Siemens automation components
- Shared platform concept with uniform functionality, engineering, commissioning, operation as well as a uniform diagnostics concept and communication mechanisms

SINAMICS V20 – the perfect solution for basic applications



- Power range from 0.12 kW to 30 kW
- Voltage:
  - 230 V 1 AC: 200 V to 240 V 1 AC (-15 % to +10 %)
  - 400 V 3 AC: 380 V to 480 V 3 AC (-15 % to +10 %)
- Integrated USS and Modbus RTU interfaces
- Integrated braking module for 7.5 kW to 30 kW
- Parameter readout and cloning without power supply
- Integrated connection and application macros
- ECO mode for *U/f*, U^2/f
- Integrated hibernation mode in idle state
- Wireless commissioning, operation and diagnostics via mobile device or laptop thanks to optional SINAMICS V20 Smart Access (web server module)
- Expansion of 400 V converters with two digital inputs and two digital outputs (relay outputs) thanks to optional SINAMICS V20 I/O Extension Module

More information

- Catalog D 31.1
- Interactive Catalog CA 01
- Internet:
  www.siemens.com/sinamics-v20
  www.siemens.com/d31-1
  www.siemens.com/industrymall

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Overview (continued)

SINAMICS V90 basic servo drive system – the performance-optimized, easy-to-use servo drive system



- SINAMICS V90 and SIMOTICS S-1FL6 form an optimized servo drive system for positioning as well as speed and torque control. Thanks to the optimized design, the system permits enhanced servo performance combined with a high level of ruggedness in a simple, low-cost way.
- SINAMICS V90 is designed for all-purpose servo applications while taking into consideration the challenges for machine builders and system integrators in terms of costs and time-to-market.
- The SINAMICS V90 system can essentially be commissioned effortlessly by means of a simple plug-and-play procedure. The SINAMICS V90 drive offers optimum servo performance, can be integrated quickly into SIMATIC PLCs and provides a high level of reliability. The connection can be made via PROFINET, by means of a pulse-direction interface or via analog inputs/outputs. A seamless drive system can be created by combining the SINAMICS V90 servo drive with our SIMOTICS S-1FL6 servomotor.
- SINAMICS V90 offers internal positioning, positioning with pulse sequence, and speed and torque control.
- With integral auto-tuning in real time and automatic suppression of machine resonances, the system automatically optimizes itself to achieve a highly dynamic performance and smooth operation. In addition, the pulse train input makes it easier to achieve excellent positioning accuracy on the basis of its high frequency limit of up to 1 MHz.

More information

- Catalog D 33
- Interactive Catalog CA 01
- Internet:
  www.siemens.com/sinamics-v90
  www.siemens.com/d33
  www.siemens.com/industrymall

SINAMICS G120P – the specialist for pumps, fans, and compressors





- Power range from 0.37 kW to 630 kW
- Automatic switchover to line operation at rated speed
- Numerous functions for pumps, fans and compressors, e. g. energy-saving mode, Pt1000/LG-Ni1000/DIN-Ni1000 temperature sensor interface, cascade connection, programmable time switches, bypass mode, multi-zone control
- Communication: RS 485, USS, Modbus RTU, BACnet MS/TP, FLN P1, PROFINET, EtherNet/IP, PROFIBUS DP
- Integrated in the TIA Portal with SINAMICS Startdrive
- Energy efficient through minimal apparent power losses, automatic adaptation of the motor current to the actual load conditions with ECO mode

More information

- Catalog D 35
- Interactive Catalog CA 01
- Internet:
  www.siemens.com/sinamics-g120p
  www.siemens.com/industrymall

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Overview (continued)

SINAMICS G120X – the infrastructure converter for HVAC/water/wastewater



- Power range from 0.75 kW to 630 kW
- The specialist for pump, fan and compressor applications
- Thanks to the integrated DC link reactor with a maximum output of 250 kW and optional resistance to harmful gases up to environmental class 3C3, the rugged and dependable design ensures reliable, stable and largely robust operation.
- Numerous functions relevant for pumps, fans and compressors, e.g. deragging or pipe fill mode, automatic restart, flying restart, flux reduction, cascade connection, hibernation mode and real-time clock
- Functions especially for building technology as well as heating/air conditioning/ventilation applications, e.g. four integrated PID controllers, essential service mode, bypass mode and programmable time switches
- Communication: PROFINET, EtherNet/IP, available soon: PROFIBUS DP, USS, Modbus RTU, BACnet MS/TP
- SINAMICS CONNECT 300 for connecting up to eight converters to the MindSphere cloud
- Innovative hardware and software functions for saving energy, e.g. for controlling synchronous reluctance drive systems with SIMOTICS reluctance motors

More information

- Catalog D 31.5
- Interactive Catalog CA 01
- Internet:
  www.siemens.com/sinamics-g120x
  www.siemens.com/d31-5
  www.siemens.com/industrymall

SINAMICS G120D – the distributed single-motor drive for high-performance solutions



- Positioning capability
- Power range from 0.75 kW to 7.5 kW
- Energy efficient thanks to regenerative feedback and low line harmonic distortion
- Safety Integrated: STO, SS1, SDI, SSM and SLS encoderless
- Thanks to the modular design, electronics stocks are minimal
- Interchangeable memory card
- Communication via PROFIBUS DP, PROFINET, EtherNet/IP
- Integrated in the TIA Portal with SINAMICS Startdrive

More information

- Catalog D 31.2
- Interactive Catalog CA 01
- Internet:
  www.siemens.com/sinamics-g120d
  www.siemens.com/d31-2
  www.siemens.com/industrymall

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Overview (continued)

SINAMICS G120C –
the compact and versatile converter with optimum functionality



- Compact unit
- Highest power density in its class
- Power range from 0.55 kW to 132 kW
- Easy commissioning and maintenance
- With BOP-2 or IOP-2 operator panel
- Safety Integrated: STO
- Available communication: PROFIBUS DP, USS, Modbus RTU, PROFINET, EtherNet/IP
- Wireless commissioning, operation and diagnostics via mobile device or laptop thanks to optional SINAMICS G120 Smart Access (web server module)
- Integrated in the TIA Portal with SINAMICS Startdrive

More information

- Catalog D 31.1
- Interactive Catalog CA 01
- Internet:
  www.siemens.com/sinamics-g120c
  www.siemens.com/d31-1
  www.siemens.com/industrymall

SINAMICS G120 –
the modular single-motor drive for low to medium power ratings



- Power range from 0.37 kW to 250 kW
- Safety Integrated: STO, SS1, SBC, SLS, SDI and SSM encoderless
- Communication via PROFIBUS, PROFINET, EtherNet/IP, RS485, USS, Modbus RTU, CANopen, BACnet MS/TP
- Energy efficient thanks to regenerative feedback and low line harmonic distortion
- Parameter copy function for standard commissioning
- Wireless commissioning, operation and diagnostics via mobile device or laptop thanks to optional SINAMICS G120 Smart Access (web server module)
- Integrated in the TIA Portal with SINAMICS Startdrive

More information

- Catalog D 31.1
- Interactive Catalog CA 01
- Internet:
  http://www.siemens.com/sinamics-g120
  http://www.siemens.com/d31-1
  http://www.siemens.com/industrymall

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Overview (continued)

SINAMICS G110D –
the distributed single drive for simple solutions



- Continuous speed control of three-phase asynchronous (induction) motors
- Meets all the requirements of conveyor applications with frequency control
- Distributed configuration – ideal for applications covering large areas
- Integrated into TIA via AS-Interface
- Wide power range from 0.75 kW to 7.5 kW

More information

- Catalog D 31.2
- Interactive Catalog CA 01
- Internet:
  www.siemens.com/sinamics-g110d
  www.siemens.com/d31-2
  www.siemens.com/industrymall

SINAMICS G110M –
the distributed converter integrated in the motor



- Power range from 0.37 kW to 4 kW
- Integrated safety functions (STO locally via F-DI or via PROFIsafe)
- Integrated communication: USS, Modbus RTU, PROFIBUS, PROFINET, EtherNet/IP and AS-Interface
- Basic PLC functions and additional conveyor technology functions
- Local commissioning via DIP switch and potentiometer, memory card, USB interface or Intelligent Operator Panel (IOP-2)
- Integrated in the TIA Portal with SINAMICS Startdrive

More information

- Catalog D 31.2
- Interactive Catalog CA 01
- Internet:
  www.siemens.com/sinamics-g110m
  www.siemens.com/d31-2
  www.siemens.com/industrymall

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Overview (continued)

SINAMICS G130/SINAMICS G150 – the universal drive converter solution for single-motor drives with a high power rating





- Available as a standardized control cabinet or chassis unit
- Output range from 75 kW to 800 kW or 2700 kW with parallel switching
- Specially for drives with quadratic and constant load characteristics, medium performance requirements, but no regenerative feedback capability
- Service-friendly thanks to easy-to-access device modules
- Communication via PROFIBUS DP, PROFINET, EtherNet/IP, CANopen
- Energy-efficient due to variable-speed operation
- Sensorless vector control
- Safety Integrated: STO, SBC, SS1 with SBR/SAM; SLS, SSM, SDI, SBT
- Simple commissioning and parameterization via the AOP30 Advanced Operator Panel or PC-supported using the STARTER commissioning tool

More information

- Catalog D 11
- Interactive Catalog CA 01
- Internet:
  www.siemens.com/sinamics-g130
  www.siemens.com/sinamics-g150
  www.siemens.com/industrymall

SINAMICS S210 – the single-axis servo drive for highly dynamic applications



The new servo drive system comprises a SINAMICS S210 servo converter, a SIMOTICS S-1FK2 servomotor and a matching One Cable Connection (OCC) for connecting the motor to the converter. The SINAMICS S210 is a single-axis AC/AC servo converter system with high performance and dynamic response for mid-range motion control applications. SINAMICS S210 servo converters are available for line voltages of 200 ... 240 V 1 AC (1 AC series) and 200 ... 480 V 3 AC (3 AC series), and the SIMOTICS S-1FK2 servomotors for a torque range from 0.16 ... 3.2 Nm with shaft heights of 20 mm, 30 mm and 40 mm in High Dynamic (HD) and Compact (CT) versions.

More information

- Catalog D 32
- Interactive Catalog CA 01
- Internet:
  www.siemens.com/sinamics-s210
  www.siemens.com/d32
  www.siemens.com/industrymall

SINAMICS S110 – the specialist for simple positioning tasks



- Servo control
- Power range from 0.55 kW to 132 kW
- Safety Integrated
- Integrated positioning functions
- Straightforward system interface with higher-level controllers (e.g. PLC) with PROFIBUS DP or PROFINET

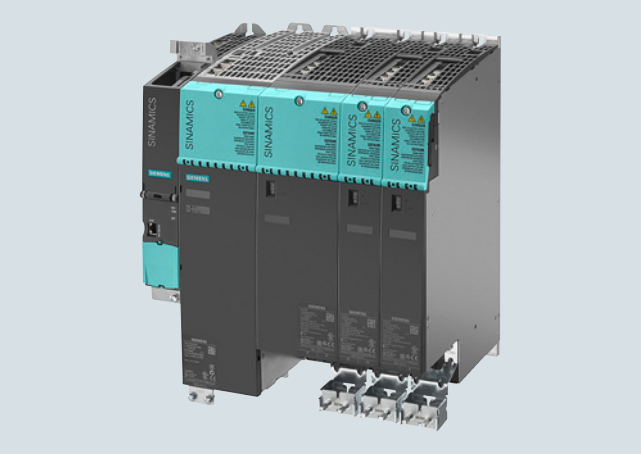
More information

- Catalog D 31.1
- Interactive Catalog CA 01
- Internet:
  www.siemens.com/sinamics-s110
  www.siemens.com/d31-1
  www.siemens.com/industrymall

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Overview (continued)

SINAMICS S120 –
the flexible, modular drive system for demanding single-axis and multi-axis applications from the low-end to the high-end performance range







- Modular drive system for single-axis and multi-axis applications in all areas of machine and plant manufacturing
- Servo/vector control, U/f control
- Power range from 0.12 kW to 5700 kW
- Various types of construction for different application areas
- Highly flexible due to, for example, modular system architecture, different cooling methods, support for a wide range of motors/encoders, easy expansion
- High degree of scalability with regard to performance, number of axes, functionality
- Integrated safety functions
- Comprehensive motion control functionality
- High availability and efficiency, even in unstable networks
- Automatic parameterization and easy drive commissioning/ optimization

More information

- Catalogs D 21.3, D 21.4, NC 62
- Interactive Catalog CA 01
- Internet:
  www.siemens.com/sinamics-s120
  www.siemens.com/d21-4
  www.siemens.com/industrymall

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Overview (continued)

SINAMICS S150 –
the sophisticated drive solution for mid to high-performance single-motor drives



- Particularly suitable for applications with high requirements regarding precision and dynamic response in the mid to high performance range, as well as for frequent braking cycles with high braking energies and four-quadrant operation
- Ready-to-operate control cabinet
- Power range from 75 kW to 1200 kW
- Straightforward configuring and commissioning provided by the SIZER for Siemens Drives and STARTER engineering tools
- High availability and efficiency, even in unstable networks
- Efficient operation through standard energy recovery
- Line-friendly operation thanks to Clean Power Filter (line feedback < 1 %)
- Reactive power compensation possible
- Equipped as standard with PROFIBUS DP interface for connection to higher-level controls

More information

- Catalog D 21.3
- Internet:
  www.siemens.com/sinamics-s150
  www.siemens.com/industrymall

SINAMICS GM150 –
the universal drive solution for single drives in the medium-voltage range



- Single drive for applications with quadratic and constant load characteristic, but no regenerative feedback capability
- Space-saving; quick and easy commissioning
- Ready-to-connect cabinet unit
- Particularly suitable for cost-effective use of pumps, fans, extruders, mixers, etc.
- Power unit with HV-IGBT technology for outputs up to 13 MVA, output voltage 2.3 kV to 4.16 kV, with choice of air or water-cooling
- Power unit with IGCT technology for outputs from 10 MVA to 24 MVA, output voltage 3.3 kV, water-cooled
- Optimum interaction with SIMATIC

More information

- Catalog D 12
- Internet:
  www.siemens.com/sinamics-gm150

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Overview (continued)

SINAMICS SM150 –
the advanced drive solution for single and multi-motor drives in the medium-voltage range



- Single or multi-motor drives for regenerative, highly dynamic applications
- Roller drives (cold, warm), hoisting drives, test rigs, belt systems
- Power unit with HV-IGBT technology for outputs from 3.4 MVA up to 5.8 MVA, output voltage 3.3 kV and 4.16 kV, with choice of air or water-cooling
- Power unit with IGCT technology for outputs from approx. 5 MVA to 31.5 MVA, output voltage 3.3 kV, water cooling
- Ideal for direct power exchange over the common DC bus in multi-motor drives with regenerative and motorized operation
- Optimum interaction with SIMATIC

More information

- Catalog D 12
- Internet:
  www.siemens.com/sinamics-sm150

SINAMICS DCM –
the scalable drive system for basic and sophisticated DC drive applications



- Power range 6 kW to 30 MW
- For machinery and plants in industry
  - Steel/aluminum
  - Plastic
  - Printing
  - Paper
  - Hoisting gear
  - Mining
  - Oil and gas
  - Static excitation units
  - Heating applications
  - Magnet applications
- New systems and retrofit business
- PROFIBUS DP as standard, PROFINET optional
- Control unit variance
- Field power supply in line with requirements
- Electronics power supply for connection to 24 V DC
- Power unit isolated to ground (isolated voltage sensing)
- Free function blocks and Drive Control Chart (DCC)
- Expandable functionality using SINAMICS components
- Single-phase operation possible
- Coated modules and nickel-plated copper busbars
- Wide temperature range
- High overload capability
- Low torque ripple at low speeds
- Very compact design

More information

- Catalog D 23.1
- Internet:
  www.siemens.com/sinamics-dcm

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Overview

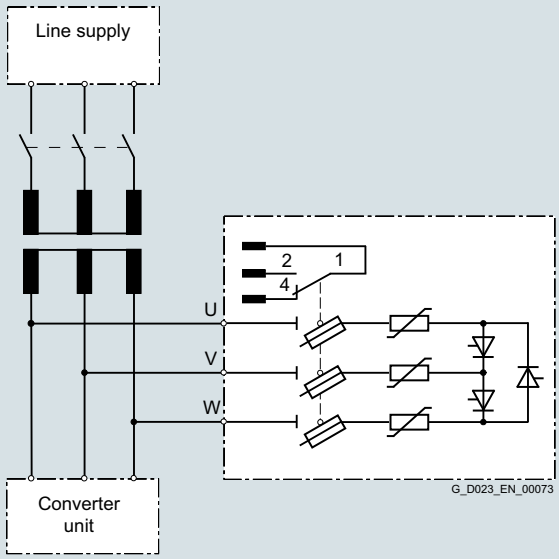
SICROWBAR AC



SICROWBAR AC is used to protect power semiconductors in converters (thyristors and diodes) against overvoltage that occurs between the phases of a three-phase network. The range of applications is not restricted to protecting DC drive converters, but also comprises infeed/regenerative feedback units of the AC drive technology that are equipped with thyristors.

Overvoltage that occurs on the AC side of converters is mainly caused by switching operations when disconnecting from the line supply at the transformer's primary side. This applies both to operational switching operations (shutdown at no-load) as well as in the case of a fault (shutdown under load).

The overvoltage protection is mainly used in the following configuration:



More information

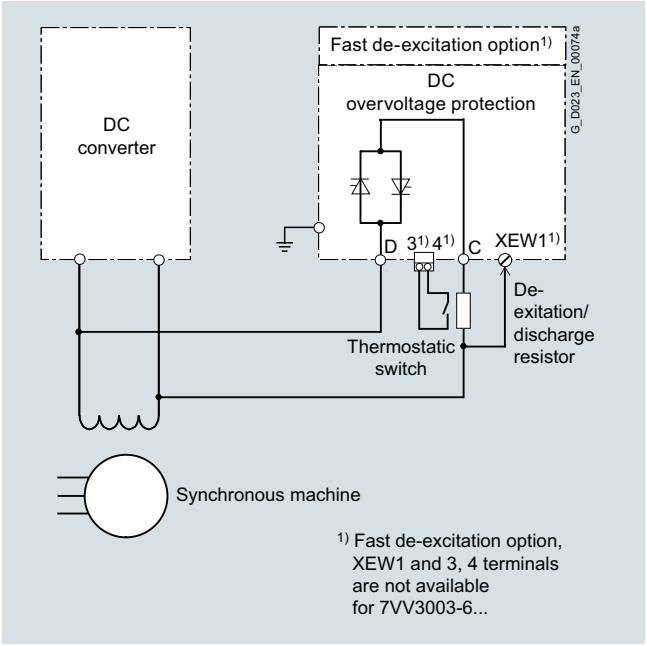
- Catalog D 23.1
- Internet: www.siemens.com/sinamics-dcm

SICROWBAR DC



SICROWBAR DC protects coils and converters against overvoltage conditions when they are used to supply large inductances, for instance, the excitation coils of synchronous machine motors, DC machine motors or hoisting solenoids. An appropriate de-excitation/discharge resistor must be provided. A thermostatic switch can be ordered as an option for the resistor from the manufacturer.

The fast de-excitation option G11 (module 7VV3003-7FG00) makes it possible to initiate fast de-excitation, triggered by a higher-level signal, for the 7VV3003-5... units.



More information

- Catalog D 23.1
- Internet: www.siemens.com/sinamics-dcm

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Overview



SIRIUS relays – one range for every application

Our range of SIRIUS relays offers you everything you need for a motor feeder application. Easy and convenient – and all from one source. Whether you require compact timing relays or reliable monitoring relays, particularly narrow coupling relays, plug-in relays, low-noise power relays or signal converters – it will not be easy to find a more complete and comprehensive range of relays anywhere. Quite simply, there is one for every possible need. What is more: all SIRIUS relays are particularly easy to use. So take a closer look at our range and convince yourself – you will be surprised.

SIRIUS 3UG, 3RR, 3RN, 3RS monitoring relays Reliable monitoring and protection

SIRIUS relays from Siemens offer maximum protection for machines and plants, and they now also communicate with the control level thanks to IO-Link. The new SIRIUS relays for IO-Link reliably monitor network quality, power values, voltages, speeds and temperatures and at the same time they open up an even wider field of applications for you.

3UG monitoring relays are used to monitor electric and non-electric variables which cannot (or should not) be directly recorded by an automation system.

- Monitoring of networks for overvoltage or undervoltage, direction of rotation, or asymmetry
- Monitoring of loads using Cos-phi or current measurement
- Monitoring for insulation faults and fault currents
- Monitoring of levels or speeds of rotation

The 3RR current monitoring relays are suitable not only for monitoring motors or other loads, but are also well suited to monitoring multiphase currents of the entire plant or the driven process. In this way, for example, an idling pump or an overload is promptly detected and reported in good time.
The 3RR2 monitoring relays can be set up individually or integrated directly into the load feeder.

3RN thermistor motor protection devices monitor the winding temperature of motors fitted with a PTC sensor.

- Compliance with the ATEX directive 2014/34/EC through conformity with EN 50495 and EN 60947-8 standards.
- Compliance with the safety requirements for PL c according to ISO 13849 or SIL 1 according to IEC 61508
- Fast fault diagnostics through display of open-circuit and short-circuit.
- Solid-state compatible output due to hard gold-plated contacts.

Note:
The 3RN1 relays have been replaced by the 3RN2 thermistor motor protection devices.

3RS temperature monitoring relays operate autonomously or in parallel with a closed temperature control loop and serve to monitor a defined limit temperature in solid, liquid or gaseous media.

SIRIUS speaks IO-Link

With the SIRIUS monitoring relay for IO-Link you are opting for maximum flexibility: As well as the autonomous monitoring function that is still available, measured values and data can also be transferred directly to the controller via IO-Link. Parameters can also be assigned locally or via IO-Link. This means that the SIRIUS relays for IO-Link are fully integrated into Totally Integrated Automation, our open system architecture for integrated automation. You also profit from significantly simplified device replacement – thanks to data matching and automatic re-parameterization via a parameter server.

SIRIUS 3RP, 7PV timing relays

Electronic timing relays are used for all delayed switching operations in open-loop control, starting, protection and closed-loop control circuits.

Thanks to their sophisticated and compact design, the 3RP timing relays are ideal timer modules for control cabinet, switchgear and controller manufacturers from the industry. Due to their narrower design, the 7PV timing relays are particularly suitable for use in heating, ventilation and air-conditioning systems and compressors.

SIRIUS 3RA28 function modules and solid-state time-delayed auxiliary switch blocks

The 3RA281. function modules permit the construction of starters and contactor combinations for direct and star-delta starting. They include the essential control functions that are needed for the respective feeder – for example, timing and electrical interlocking functions. Function modules that function as timing relays can easily and quickly be fitted to SIRIUS contactors – without any significant wiring effort. They permit both ON-delay and OFF-delay switching of contactors.

The 3RA283. solid-state time-delayed auxiliary switch blocks can be connected to contactors and are designed for contactor coil voltages in the 24 to 240 V AC/DC wide voltage range. Auxiliary switches for control and alarm signals are used specially for switching the smallest signals for electronics applications. They are used, for example, for allowing a pump or fan to run on, in a similar way to an OFF-delay time relay or for the delayed activation of a gate drive. Simply by snapping and locking it into place, both the electrical and mechanical connection is made. To attenuate switching overvoltages of the contactor coil, a varistor is integrated in the time-delayed auxiliary switch.

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Overview (continued)

SIRIUS 3RQ2, 3RQ3, 3TG10 and LZS coupling relays

The SIRIUS coupling relays are ideally suitable for coupling to and from controllers and are thus the perfect partner for SIMATIC controllers. They can be used for electrical isolation, for voltage conversion, for signal amplification and for overvoltage and EMC protection.

The ***3RQ2 coupling relays*** for universal use replace the 3RS18 coupling relays and set standards: as they have the same terminal assignment as the previous model the existing products can simply be changed over. The reduced variety of components simplifies product selection and standardization. With a wide voltage range from 24 V to 240 V AC/DC they are the star attraction on the coupler market. In this series, we offer you devices in the field-proven 22.5 mm industrial enclosure with one, two or three changeover contacts and with screw-type or spring-loaded connections (push-in technology). The versions with hard gold-plated contacts ensure an especially high contact reliability even at low currents. Thanks to the well-proven industrial enclosure, you can enjoy the benefits of user-friendly connection systems with permanent wiring, just the same as with our timing relays.

As the successors to the familiar 3TX7 coupling relays, the ***3RQ3 coupling relays*** are now available in a new uniform enclosure design. With their narrow width of 6.2 mm and low installation depth/height, they are ideal for space-optimized use in control cabinets with short gaps between tiers, and in flat control boxes. All versions are available with screw-type or spring-loaded terminals (push-in technology). Wiring time is reduced because conductors are inserted and clamped from the front.

3RQ3 coupling relays are available as:

- Coupling relay with relay output (not plug-in)
- Coupling relay with plug-in relay
- Coupling relay with semiconductor output (not plug-in)

3TG10 power relays/miniature contactors prove their worth wherever small, low-noise relays or contactors are required at a reasonable price. This makes them ideal for simple controllers, especially for use in large-series manufactured devices and controllers. For applications that do not require an overload relay and need only one auxiliary switch – and which therefore need more switching power, higher switching voltage, and a longer service life.

LZS coupling relays with plug-in relays are available as complete devices or as individual modules for self-assembly or spare parts requirements. This series is divided into three designs: RT, PT, and MT.

- Can be used for contact multiplication, adaptation of potential, or for switching small loads.
- Max. 4 changeover contacts in one device:
  - Wide-voltage versions with or without hard gold-plated contacts.
  - With screw-type or push-in spring-loaded terminals.

SIRIUS 3RS70 signal converters

The 3RS70 (previously 3RS17) signal converters (also innovated) share the enclosure concept with the 3RQ3 coupling relays. They are used mainly for the electrical isolation and conversion of analog signals. Sensors/actuators and controllers usually have different potentials and therefore require electrical isolation in the signal circuit. This is done either in the controller or by means of signal converters.

The conversion of one signal into another is required if, for example, a voltage signal has to be converted into a current signal for transmission over a longer distance, or if the output of a sensor and the input of a controller do not match.

The implemented frequency outputs offer another application. The input signal is converted to a proportional frequency here. This means that analog signals can be processed with digital inputs.

This is important if a controller offers no possibility for an analog input, or if all analog inputs are already occupied, for example, in the case of retrofits.

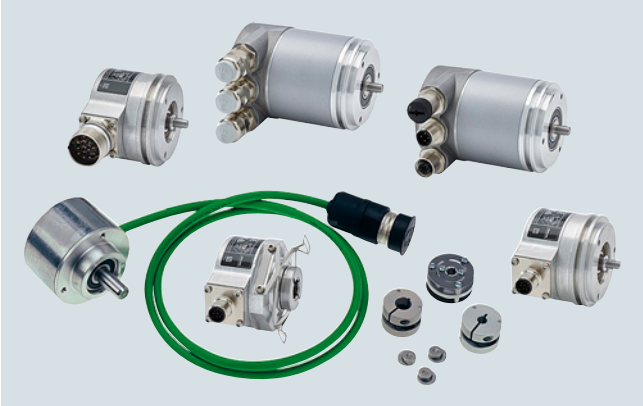
More information

- Catalog IC 10
- "SIRIUS relays" product brochure
- Internet:
  www.siemens.com/relays

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Motion Control Encoder measuring systems

Overview



- Measuring systems are encoders for recording distances, angles of rotation, and speeds.
- Can be used on machines in various industries, such as production machines, handling equipment, machine tools, and special-purpose machines.
- Can be connected to SIMATIC, SINAMICS, SINUMERIK and SIMOTION
- Couplings, mounting material, connectors, and completely pre-assembled signal cables are available as accessories.
- Built-on encoders are available as incremental or absolute encoders.

- Incremental encoders:
  - Interfaces RS422 (TTL), 1 V_{pp} and HTL
  - Operating voltage 5 V DC or 10 V to 30 V DC
- Absolute encoders:
  - All absolute encoders are available in single-turn and multiturn versions.
  - Synchronous serial interface (SSI) or connection for EnDat, PROFIBUS DP, PROFINET IO with RT/IRT and DRIVE-CLiQ.
  - Encoders with PROFIBUS DP support Class 1 ... 3 profiles as well as isochronous mode, slave-to-slave communication, and application-specific supplementary functions. They are parameterizable.
  - Encoders with PROFINET IO support Class 1 ... 4 profiles.

All measuring systems are available in synchro flange or clamp flange versions. The absolute encoders are available in a hollow shaft design.

More information

- Internet:
  www.siemens.com/sensor-systems
  www.siemens.com/industrymall
- Interactive Catalog CA 01
- Catalogs NC 62, D 21.4

SIMOTION Motion Control System

Overview



SIMOTION system

The well-proven, modular and scalable SIMOTION Motion Control System with high-end functions for motion control is the ideal solution for applications in mechanical engineering, in which modularity, maximum precision and speed are vital.

SIMOTION ensures a high level of flexibility at low engineering outlay with the modular technology object approach. Object-oriented programming and a programming model with units and libraries enable the creation of reusable software modules and the effective implementation of large quantity structures.

SIMOTION simplifies the development and integration of standard modules in an executable project with libraries for industry-specific applications and the SIMOTION easyProject project generator.

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Overview (continued)

The SIMOTION system is made up of three components:

Engineering system

The SCOUT engineering system enables Motion Control, PLC and technology functions to be incorporated in one comprehensive, integrated system and provides all the necessary tools: From programming and parameterization through testing and commissioning, to diagnostics.

SCOUT can be used in SIMATIC STEP 7, either with standardized data management and configuring procedures, or as a stand-alone engineering tool (SCOUT Stand-Alone). SCOUT TIA (SIMOTION in the TIA Portal) is available as an optional package for TIA Portal V13 and above and is included in the scope of supply of SCOUT.

The following options, for example, are available in the engineering system for programming:

- Graphic programming with Motion Control Chart (MCC)
- Ladder Diagram (LAD)/Function Block Diagram (FBD)
- High-level language Structured Text (ST), including object-oriented programming

Runtime system

The runtime system offers a high-performance execution system for cyclic and sequential tasks. The runtime software modules make the different PLC, Motion Control and technology functions available. By selecting the appropriate modules, the overall functionality of the system can be flexibly adapted to the machine.

Hardware platforms

The hardware platforms are the basis of the SIMOTION Motion Control System. The application created with the engineering system and the associated runtime software modules can be implemented on different hardware platforms. The scalable SIMOTION hardware supports centralized, distributed and mixed topologies for all machine designs with up to 128 axes per controller.

SIMOTION D – compact and integrated in the drive

- The complete machine automation with drive control, PLC, Motion Control and technology functionality in one compact unit of SINAMICS S120 design.
- Particularly fast response
- Versatile networking options via PROFINET, PROFIBUS or Ethernet
- Scalable since multiple performance versions available
- SIMOTION D is available in two configurations:
  - As a single-axis system SIMOTION D410-2 with multi-axis option (blocksize configuration). The Control Units are available in D410-2 DP and D410-2 DP/PN versions and are snapped onto the SINAMICS S120 PM240-2 Power Modules in blocksize format.
  - As a multi-axis system SIMOTION D4x5-2 in four performance variants for as many as 128 axes (booksize format)
- Ideal for:
  - Compact machines
  - Distributed automation concepts, e.g. on machines with a large number of axes
  - Modular machines
  - Time-critical demands on the axis couplings

SIMOTION P – open for other tasks

- This PC-based, open Motion Control System is available in two versions:
  - SIMOTION P320-4E for embedded PC solutions running on the Windows Embedded Standard 7 operating system
  - SIMOTION P320-4S for high-performance applications running on the Windows 7 Ultimate operating system
- Control, Motion Control, and HMI functions are executed together with standard PC applications on one platform. The advantage for the user:
  Using the PC platform and the Microsoft Windows operating system, with a real-time expansion for SIMOTION – the advantages of both worlds are combined in SIMOTION P:
- Openness thanks to the Windows operating system
- Real-time capability thanks to the SIMOTION operating system
- Ideal for:
  - Applications requiring an open PC world
  - Applications with particularly high performance requirements, e.g. hydraulics applications
  - Applications requiring control and visualization on one hardware system
  - Extensive data storage, evaluation and logging

SIMOTION C – modularity and flexibility

- Controllers in SIMATIC S7-300 design
- 2 versions, optionally with PROFINET interface or with integrated drive interfaces for analog and stepper drives
- Onboard inputs/outputs expandable using I/O modules from the SIMATIC S7-300 range of products
- With integrated isochronous PROFIBUS interfaces
- Ideal for:
  - Highest possible level of freedom for drive selection
  - Broad range of process signals
  - Retrofit applications by means of integrated analog interfaces

More information

- Catalog PM 21
- Catalog CA 01
- Internet:
  http://www.siemens.com/simotion
  http://www.siemens.com/industrymall

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Overview



SINUMERIK 828D – the powerhouse among the compact CNCs

With their unique CNC performance, SINUMERIK 828D CNCs set productivity benchmarks when it comes to milling and turning on standard machines as well as functions for easy automation of grinding machines.

Rugged and maintenance-free

Their die-cast magnesium operator panel fronts, the panel-based CNC design with minimal interfaces, as well as a high degree of protection, make SINUMERIK 828D CNCs reliable partners even in harsh environments.

Designed without a fan or hard disk, with NVRAM memory technology and no back-up battery, SINUMERIK 828D CNCs are completely maintenance-free.

User-friendly

The SINUMERIK 828D CNCs are very easy to operate thanks to a full QWERTY CNC keyboard with short-stroke keys and a high-resolution 10.4" TFT color display or 15.6" touch display.

CNC data are quickly and easily transferred via USB, CF card (for 10.4") and RJ45 interfaces on the operator panel front.

Optimum scalability

Based on the three CNC performance versions SW24x, SW26x and SW28x of the SINUMERIK 828D CNCs, favorably-priced compact as well as more complex machines with additional axes/spindles and 2 machining channels can be implemented.

Preconfigured technology for use in standard turning and milling machines

SINUMERIK 828D is perfectly adapted for use in standard machines and provides optimum support for turning and milling technologies. With two preconfigured system software variants for machining technology, the SINUMERIK 828D CNC systems are ready for use in turning and milling machines on dispatch from the factory.

The ideal basis for implementing a compact grinding machine

The G-Tech technology variant provides grinding machine manufacturers with a perfect platform for designing grinding machines – both cylindrical and surface grinding machines are supported.

Since grinding machine manufacturers want to fully incorporate their specific process know-how so that it is even reflected in the operating philosophy of the CNC, the G-Tech variant of the SINUMERIK 828D offers a number of sophisticated grinding and dressing cycles. Additionally, SINUMERIK Run MyScreens provides manufacturers with the option of designing their own HMI.

More information

- Internet:
  www.siemens.com/industrymall
  www.siemens.com/sinumerik
- Interactive Catalog CA 01
- Catalog NC 82

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Overview



SINUMERIK 840D sl –
ultimate performance in the premium class

The SINUMERIK 840D sl CNC offers modularity, openness, flexibility and uniform structures for operation, programming, and visualization. It provides a system platform with trend-setting functions for almost all technologies.

Integrated into the SINAMICS S120 drive system and complemented by the SIMATIC S7-300 automation system, the SINUMERIK 840D sl forms a complete digital system that is ideally suited for the mid- to upper-performance range.

The SINUMERIK 840D sl is characterized by:

- A high degree of flexibility
- Excellent dynamic response and precision
- Optimum integration into networks

Benefits

- Outstanding performance and flexibility for multi-axis systems of average to high complexity thanks to scalable hardware and software
- Universal openness of the user interface, the PLC and the NCK area to allow integration of your specialist know-how
- Integrated safety functions for man and machine: SINUMERIK Safety Integrated
- Comprehensive range of products for integrating machine tools into communication, engineering and production processes: SINUMERIK Integrate

Application

The SINUMERIK 840D sl can be deployed around the world for the following technologies:

- Turning
- Drilling
- Milling
- Grinding
- Laser machining
- Nibbling
- Punching
- Tool and mold making
- High-speed cutting applications
- Woodworking and glass processing
- Handling
- Transfer lines
- Rotary indexing machines
- Mass production
- JobShop production

The SINUMERIK 840DE sl is available as an export version for use in countries where approval is required.

More information

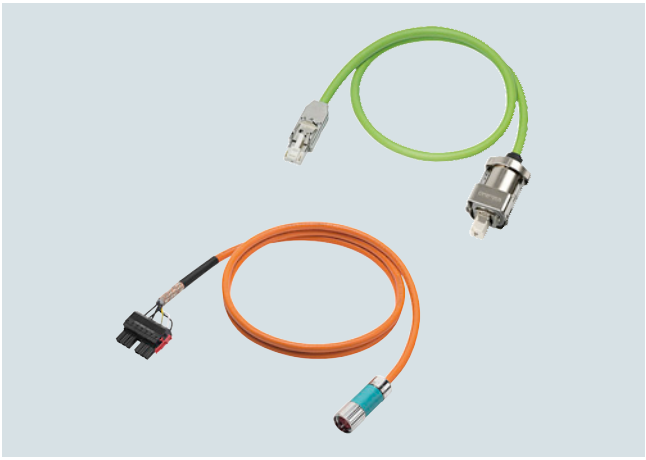
- Internet:
  www.siemens.com/industrymall
  www.siemens.com/sinumerik
- Interactive Catalog CA 01
- Catalog NC 62

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MOTION-CONNECT connection systems

Overview

MOTION-CONNECT includes connection systems and components which are optimally tailored to individual areas of application. MOTION-CONNECT cables feature state-of-the-art connection systems to ensure fast, reliable connection of different components, and offer maximum quality as well as system-tested reliability.



MOTION-CONNECT power cable and signal cable

MOTION-CONNECT cables are available as fully-assembled power and signal cables or sold by the meter. The pre-assembled cables can be ordered in length units of 10 cm (3.94 in) and can be extended, if necessary.

Whatever your machine requirements, MOTION-CONNECT offers the solution.

- **Robust, high-performance and easy to use**
  thanks to pre-assembled cables with a rugged metal connector in degree of protection IP67 and reliable SPEED-CONNECT quick-release lock
- **Outstanding and proven quality**
  achieved by consistent quality management and system-tested cables

Cables are available in two different qualities – MOTION-CONNECT 500 and MOTION-CONNECT 800PLUS.

MOTION-CONNECT 500	MOTION-CONNECT 800PLUS
• Cost-effective solution for predominantly fixed installation • Tested for travel distances up to 5 m (16.4 ft)	• Meets requirements for use in cable carriers • Oil-resistant • Tested for travel distances of up to 50 m (164 ft)

More information

- Catalogs D 21.4, NC 62, NC 82, PM 21
- Interactive Catalog CA 01
- Internet:
  www.siemens.com/motion-connect
  www.siemens.com/industrymall

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Appendix



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16/3 **Additional documentation**
16/3 SIMATIC Manual Collection

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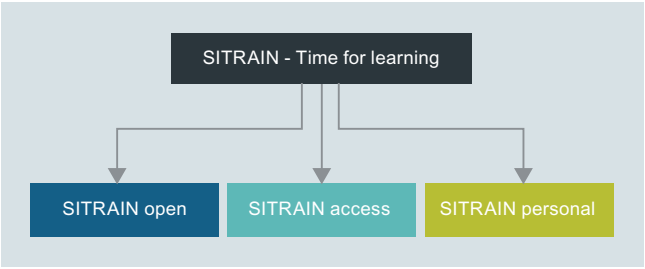
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Introduction



Time for learning

Today's demands on our knowledge are every bit as diverse and dynamic as our profession itself. We keep learning more and longer – for our work, for our career and for ourselves. Advancing digitalization entails new topics and is also changing the way we absorb and process knowledge. SITRAIN – Digital Industry Academy offers the right source of knowledge here, which we can use anytime in just the way we need it. The time for learning is now.



Knowledge for every need

With its three areas – SITRAIN open, SITRAIN access and SITRAIN personal – SITRAIN offers you an all-encompassing range of options for an ongoing expansion of your knowledge and skills, suited for every type of learner. And SITRAIN uses advancing digitalization to continuously expand content and offer new training methods.

Find your local offer here

SITRAIN – Digital Industry Academy
Customer Support Germany

Tel.: +49 911 895-7575
E-Mail: sitrain.digital.industry.academy.de@siemens.com

Knowledge you can always find

SITRAIN open bundles useful information, worthwhile data and up-to-date expert knowledge about Siemens products for industry. Search it anytime, find anything – and always the right stuff.

Knowledge that gets you ahead

SITRAIN access is learning in the digital age. It offers you individualized ways to build your knowledge and access to exclusive digital training courses. Take advantage of sustainable learning success with a wide range of learning methods. Improve your skills – whether working in groups with others, or by yourself. Whenever, wherever and however you need to.

Knowledge you can experience

We all want to learn from the best. And SITRAIN personal's training courses let you benefit from our well-practiced trainers' expert knowledge, along with direct access to our training equipment. That's the best way to convey knowledge – whether at your company or in our training classrooms.

SITRAIN – Digital Industry Academy

siemens.com/sitrain

- SITRAIN open: siemens.com/sitrain-open
- SITRAIN access: siemens.com/sitrain-access
- SITRAIN personal: siemens.com/sitrain-personal

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Übersicht

The SIMATIC manual collection brings together the manuals of Totally Integrated Automation in the smallest possible package. It is eminently suitable for startup and service, replaces the space-consuming paper version in the office and provides fast access to the information.

The manual collection contains manuals in 5 languages for

- LOGO!
- SIMADYN
- SIMATIC bus components
- SIMATIC C7
- SIMATIC Distributed I/O
- SIMATIC HMI
- SIMATIC Sensors
- SIMATIC NET
- SIMATIC PC-based Automation
- SIMATIC PCS 7
- SIMATIC PG/PC
- SIMATIC S7
- SIMATIC Software
- SIMATIC TDC

Manuals that are not yet available in all 5 languages will at least be included in English and German.

There is an update contract for the SIMATIC Manual Collection that encompasses supply of the up-to-date collection and three subsequent updates which is valid for one year. If the update contract is not cancelled, it is automatically extended and the list price will be charged to the customer.

Ordering data	Article No.
SIMATIC Manual Collection Electronic manuals on DVD, multilingual: LOGO!, SIMADYN, SIMATIC bus components, SIMATIC C7, SIMATIC Distributed I/O, SIMATIC HMI, SIMATIC Sensors, SIMATIC NET, SIMATIC PC-based Automation, SIMATIC PCS 7, SIMATIC PG/PC, SIMATIC S7, SIMATIC Software, SIMATIC TDC	**6ES7998-8XC01-8YE0**
SIMATIC Manual Collection update service for 1 year Current "Manual Collection" DVD and the three subsequent updates	**6ES7998-8XC01-8YE2**

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Overview

The electronic products described in this catalog comply with the requirements and protection objectives of the following EU directives insofar as they relate to the product concerned. They also comply with the corresponding harmonized European standards (EN) published for these products in the Official Journals of the European Community.

- 2014/30/EU "Electromagnetic Compatibility" (EMC Directive)
- 2014/35/EU "Electrical equipment designed for use within certain voltage limits" (Low Voltage Directive)
- 2014/34/EU "Equipment and protective systems intended for use in potentially explosive atmospheres" (Explosion Protection Directive)
- For ET 200SP fail-safe modules, the following also applies: 2006/42/EC "Machinery Directive"

The originals of the declarations of conformity are kept available by us for the responsible supervisory authorities.

Note on the EMC Directive:

In terms of their interference emissions, SIMATIC products are designed for industrial applications.

If individual products deviate from this specification, it is noted in the catalog with the products.

The installation instructions in the manuals must be adhered to when installing and operating the products described in this catalog. These contain, for example, important information on installation in cabinets and on the use of shielded cables.

Notes for machine manufacturers

The SIMATIC automation system is not a machine within the context of the EU machine guidelines. Therefore a declaration of conformity with regard to the EU machine directive 89/392/EEC or 2006/42/EU (new edition, applicable from end of 2009) may not be provided for SIMATIC.

The EU machine directive regulates the requirements placed on a machine or a part thereof. A machine is understood for the purposes of this guideline to be a combination of interconnected parts or mechanisms (see also EN 292-1, Paragraph 3.1).

SIMATIC is part of the electrical equipment of a machine, and must therefore be integrated into the evaluation of the complete machine by the machine manufacturer.

As electrical equipment, SIMATIC is subject to the low-voltage directive which, as a "total safety directive", covers all dangers just like the machine directive.

The EN 60204-1 standard (safety of machines, general requirements for the electrical equipment of machines) is applicable to the electrical equipment of machines.

The following table will help you in the provision of your declaration of conformity, and shows which criteria according to EN 60204-1 (2006-06) apply to SIMATIC. You can obtain further information from the enclosed declaration of conformity according to the low-voltage and EMC directives (with list of included standards).

EN 60204-1	Topic/criterion	Notes
Paragraph 4	General requirements	The requirements are met when the equipment is assembled/ installed in accordance with the installation guidelines. Please note the relevant information in the manuals.
Paragraph 11.2	Digital input/ output interfaces	The requirements are met
Paragraph 12.3	Programmable equipment	The requirements are met when the equipment is installed in lockable cabinets to protect against alteration of the memory contents by unauthorized persons
Paragraph 20.4	Voltage tests	The requirements are met

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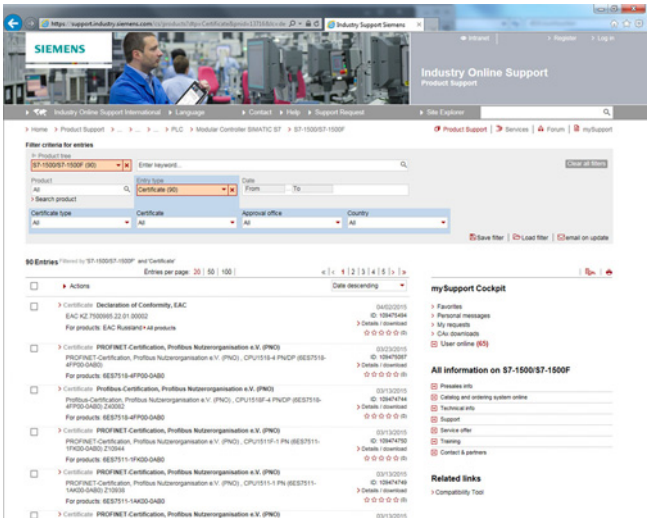
Certificates, authorizations, approbations, declarations of conformity

An overview of the certificates available for SIMATIC products (CE, UL, CSA, FM, shipping authorizations) can be found in the internet at

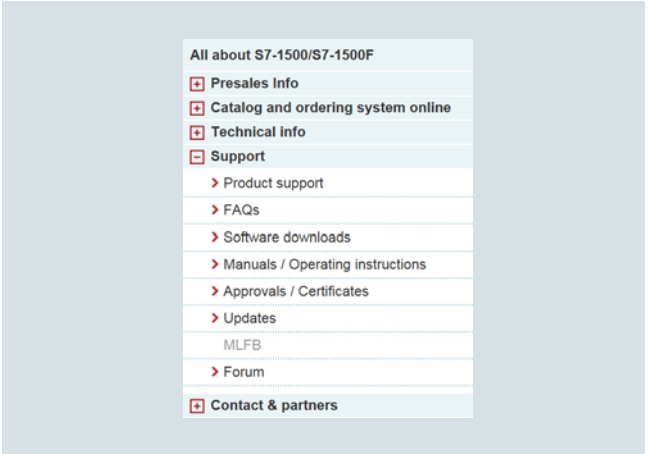
http://www.siemens.com/simatic/certificates

The lists are continously updated. The data for products which have not yet been included in the overview is continously collected and prepared for the subsequent edition.

You can also find certificates, approbations, verification certificates or characteristic curves under Product support "Entry list"



or by going directly to the Link Box:



Quality management

The quality management system of the Industry Sector, Industry Automation Division, complies with the international standard ISO 9001.

The products and systems described in this catalog are sold under application of a quality management system certified by DQS in accordance with DIN EN ISO 9001.

The DQS certificate is recognized in all IQ Net countries.

DQS Registered Certificate No.:

Siemens AG

- DF FA
  Reg. No.: 001323 QM15

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Teaching made easy - Comprehensive support on the way to Industry 4.0

Knowledge & technology – the keystones to success in digitalization





Digitalization is quickly and radically changing our world. What does this mean for education?

In the world of Industry 4.0, companies can expect a host of new opportunities and challenges. New systems are verified on the spot through simulations. Automated mass production processes can make every product on the conveyor belt a unique product.

New products are now market-ready much faster. Siemens is shaping this transformation as a technology leader in the field of automation and process lifecycle management (PLM).

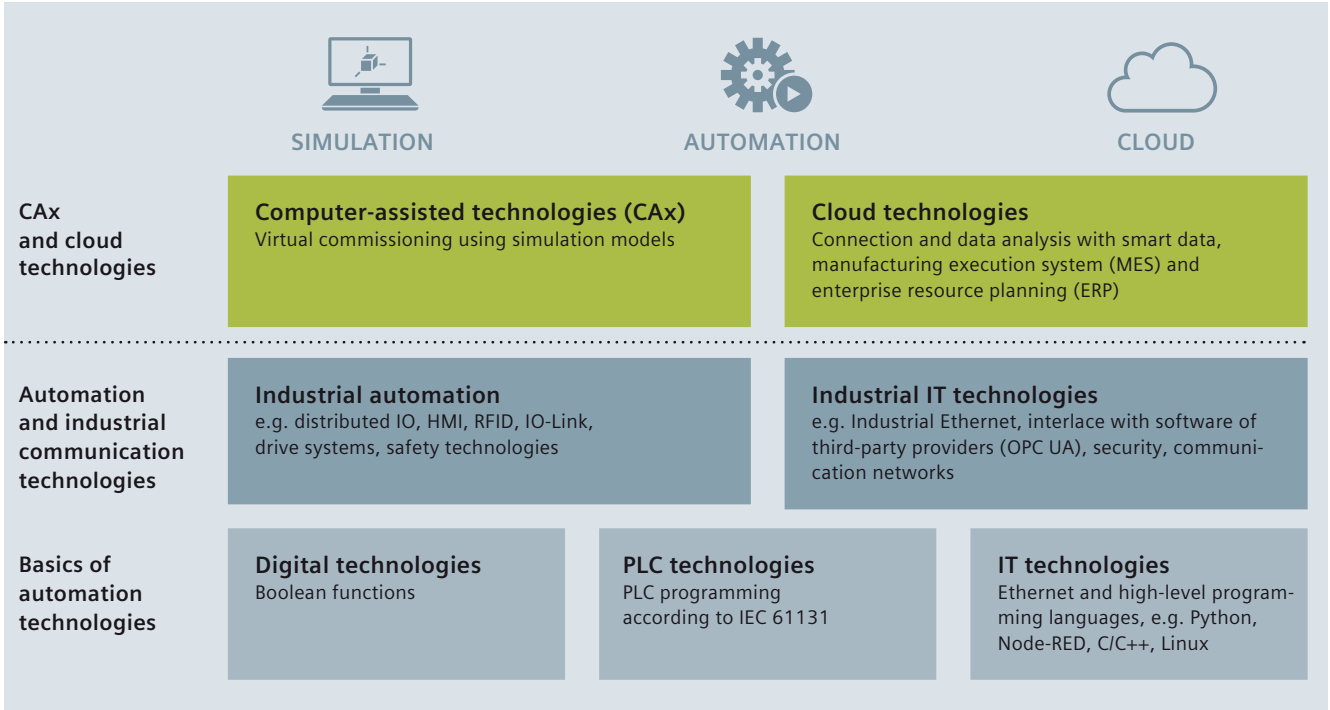
These new digitalization processes are changing the know-how requirements for employees. Many educational institutions are facing the challenge of conveying Industry 4.0 know-how as part of their teaching and training. The Siemens Automation Cooperates with Education (SCE) program is supporting educators on the way to Industry 4.0.

The SCE digitalization concept for educators

The SCE digitalization concept presented here shows how digitalization can be implemented in educational institutions – from vocational schools to universities.

Digitalization (or Industry 4.0) know-how is now introduced through CAx and cloud technologies. It is founded on the basics of automation, such as digital technologies, PLC and information technologies, and on advanced automation and industrial communication technologies.

The level of digitalization knowledge can be weighted, depending on the vocational field or branch of study – e.g. mechanical engineering, automation engineering or computer science.



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The SCE digitalization concept for educators (continued)



As part of their project work, students at Vocational School 2 in Wolfsburg, Germany, have implemented the three levels of the SCE Industry 4.0 concept. A virtual twin created with the Siemens NX Mechatronics Designer (MCD) CAD software was used for the design and virtual commissioning. This enables fast and efficient assembly of the real automation system, e.g. with SIMATIC S7-1500/ET 200SP/RFID, for use in classes. Production data, such as the number of bottles filled, production date and system parameters, are uploaded to a cloud using SIMATIC IOT2000.

siemens.com/iot2020

siemens.com/nx

The SCE offers



Learning and training documents

More than 100 didactically prepared learning and training documents are available through SCE and incorporate the digitalization concept. They are designed for use in classes, but can also be customized or used for individual study. These documents are available for free download, most of them in 7 languages.

siemens.com/sce/documents

Educator courses

Excellent teaching content is needed to introduce students to digitalization. For this purpose, SCE holds educator courses in certain regions. Based on our learning and training documents and through practical exercises, educators acquire the latest Industry 4.0 know-how.

siemens.com/sce/courses



Trainer packages

The 90 SCE trainer packages help educators teaching and implementing the SCE digitalization concept. Trainer packages comprise specially compiled, genuine Siemens hardware and software products. The trainer packages are based on the learning and training documents and are offered to schools, colleges and universities at special terms.

siemens.com/sce/tp

Support for your projects / textbooks

We support you on selected projects with advice and assistance from SCE contact partners.

As a special service, we support textbook authors. We maintain a list of textbooks on the SCE website.

siemens.com/sce/contact

siemens.com/sce/books

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Teaching made easy - Comprehensive support on the way to Industry 4.0

Partnerships for proliferation of Industry 4.0 in education





Partnership with WorldSkills

As a technology powerhouse, we support vocational training of students around the world. Since 2010, we have partnered with WorldSkills as a Global Industry Partner in order to amplify this cause.

WorldSkills is an international organization whose mission is to raise the profile and recognition of skilled people, and show how important vocational skills are in achieving economic growth and personal success. Every two years, WorldSkills hosts the world championships of skills.

Siemens provides the competitors with automation products, such as SIMATIC S7-1500 and LOGO!, for the disciplines: industrial control, electrical installations, Polymechanics/Automation and manufacturing technology.

The next international skill competitions are scheduled for Kazan/Russia, in 2019 and Shanghai/China, in 2021. Additionally, we support selected continental and regional competitions.

siemens.com/worldskills

Partnerships with educators

We provide support to educators and educational organizations in the form of one-on-one advice through SCE contact partners and Siemens experts as well as long-term cooperation.

siemens.com/sce/contact

Partnerships with producers of learning systems

For practical training in classrooms and labs, numerous producers of learning systems offer a wide range of complete didactic solutions based on SCE trainer packages.

siemens.com/sce/partner

Information portal



To facilitate your teaching assignment and/or for selfstudy, we offer educators and students a comprehensive SCE information portal. At this portal you have quick access to all SCE offers, e.g. learning and training documents including projects, Getting Started information, videos, manuals, trial software and newsletters.

siemens.com/sce

SIEMENS

Global Industry Partner of WorldSkills International

worldskills

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Overview

Siemens Solution and Approved Partner – Partners for your success



Highest competence in automation and drive technology

Siemens works closely together with selected partner companies around the world in order to ensure that customer requirements for all aspects of automation and drives are fulfilled as best as possible – wherever you are, and whatever the time.

We place great value on our customers acting in accordance with the same ideals which characterize Siemens as a whole: Competence, professionalism and quality. That is why continuous development through qualification and certification measures in line with global standards is a central aspect of our Partner Program. This means that with our partners, you benefit from the same high quality standards all over the world.
The partner emblem is the symbol for tried and tested quality.

The partner network for industry

The Siemens Partner Program offers you expertise and experience close at hand.

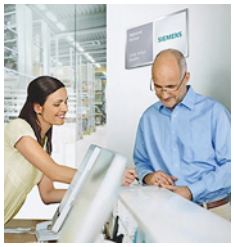
Within our global network, we distinguish between Solution Partners and Approved Partners. We currently work with more than 1,500 Solution Partners around the world. Our network of over 150 Approved Partners continues to grow. In more than 80 countries worldwide

Siemens Solution Partner – Automation Drives



At present we are working with more than 1,500 Solution Partners worldwide. They are characterized by extensive application, system and sector knowledge, as well as proven project experience, and are able to implement future-proof tailored solutions of the highest quality, based on our product and system portfolio.

Siemens Approved Partner – Value Added Reseller



With their detailed technical knowledge, Siemens Approved Partners – Value Added Resellers offer a combination of products and services that range from specialist technologies and customized modifications to the provision of high-quality system and product packages. They also provide qualified technical support and assistance.

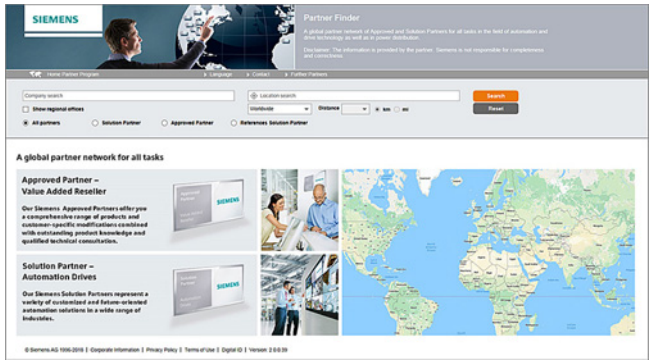
Siemens Approved Partner – Industry Services



Siemens Approved Partner – Industry Services:
put their unique expertise entirely at the service of enhancing your productivity and can be instrumental in ensuring the availability of your plants.

Partner Finder

The ideal partner for your task is just a mouse click away!



In the Siemens global Solution Partner program, customers are certain to find the optimum partner for their specific requirements – with no great effort. The Partner Finder is basically a comprehensive database that showcases the profiles of all our partners.

Easy selection:
Set filters in the search screen form according to the criteria that are relevant to you. You can also directly enter the name of an existing partner.

Skills at a glance:
Gain a quick insight into the specific competencies of any particular partner with the reference reports.

Direct contact option:
Use our electronic query form:

www.siemens.com/partnerfinder

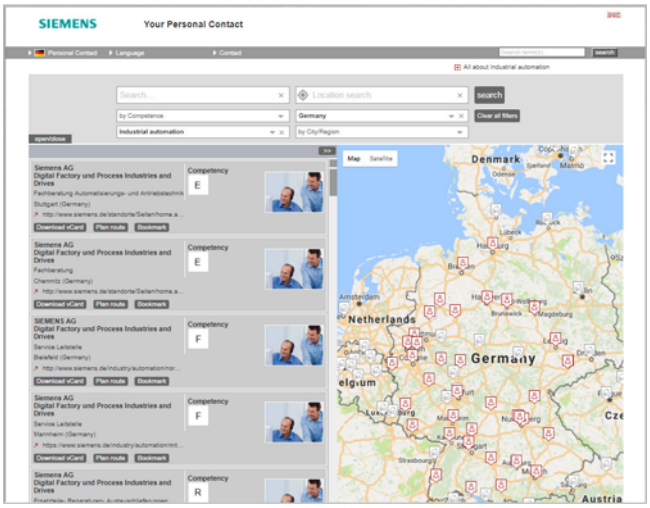
Additional information of the Siemens Parners for industry is available online at:

www.siemens.com/partnerprogram

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Partners at Siemens

Overview



At your service locally, around the globe for consulting, sales, training, service, support, spare parts on the entire portfolio of Digital Industries.

Your partner can be found in our Personal Contacts Database at: www.siemens.com/automation-contact

You start by selecting

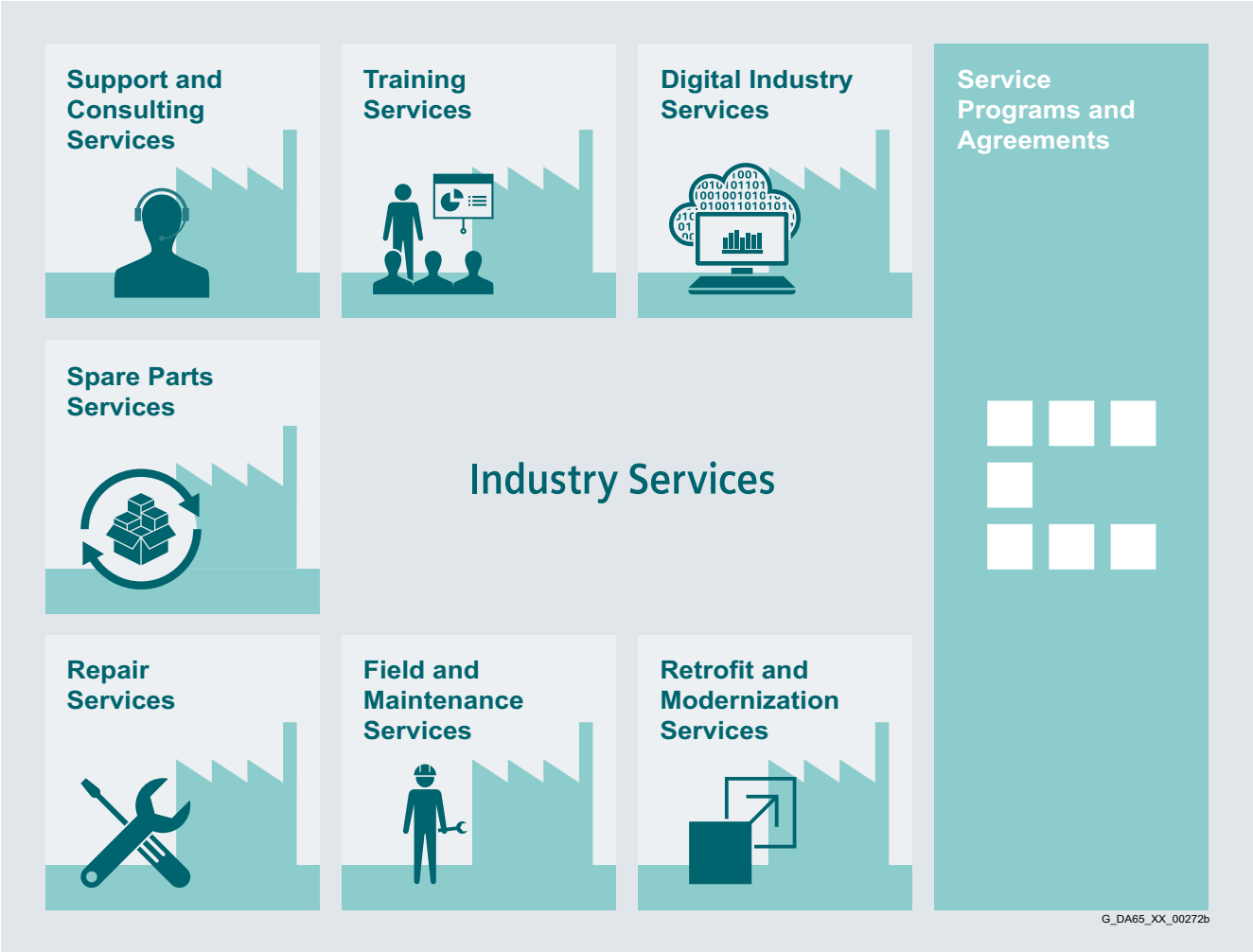
- the required competence,
- products and branches,
- a country and a city

or by a

- location search or free text search.

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Overview



Keep your business running and shaping your digital future – with Industry Services

Optimizing the productivity of your equipment and operations can be a challenge, especially with constantly changing market conditions. Working with our service experts makes it easier. We understand your industry's unique processes and provide the services needed so that you can better achieve your business goals.

You can count on us to maximize your uptime and minimize your downtime, increasing your operations' productivity and reliability. When your operations have to be changed quickly to meet a new demand or business opportunity, our services give you the flexibility to adapt. Of course, we take care that your production is protected against cyber threats. We assist in keeping your operations as energy and resource efficient as possible and reducing your total cost of ownership. As a trendsetter, we ensure that you can capitalize on the opportunities of digitalization and by applying data analytics to enhance decision making: You can be sure that your plant reaches its full potential and retains this over the longer lifespan.

You can rely on our highly dedicated team of engineers, technicians and specialists to deliver the services you need – safely, professionally and in compliance with all regulations. We are there for you, where you need us, when you need us.

www.siemens.com/industryservices

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Industry Services – Portfolio overview

Overview



Digital Industry Services

Digital Industry Services make your industrial processes transparent to gain improvements in productivity, asset availability, and energy efficiency.

Production data is generated, filtered and translated with intelligent analytics to enhance decision-making.

This is done whilst taking data security into consideration and with continuous protection against cyber-attack threats.
https://www.siemens.com/global/en/home/products/services/industry/digital-services.html



Training Services

From the basics and advanced to specialist skills, SITRAIN courses provide expertise right from the manufacturer – and encompass the entire spectrum of Siemens products and systems for the industry.

Worldwide, SITRAIN courses are available wherever you need a training course in more than 170 locations in over 60 countries.
https://support.industry.siemens.com/cs/ww/en/sc/2226



Support and Consulting Services

Industry Online Support site for comprehensive information, application examples, FAQs and support requests.

Technical and Engineering Support for advice and answers for all inquiries about functionality, handling, and fault clearance. The Service Card as prepaid support for value added services such as Priority Call Back or Extended Support offers the clear advantage of quick and easy purchasing.

Information & Consulting Services, e.g. SIMATIC System Audit; clarity about the state and service capability of your automation system or Lifecycle Information Services; transparency on the lifecycle of the products in your plants.
https://support.industry.siemens.com/cs/ww/en/sc/2235



Spare Parts

Spare Parts Services are available worldwide for smooth and fast supply of spare parts – and thus optimal plant availability. Genuine spare parts are available for up to ten years. Logistic experts take care of procurement, transport, custom clearance, storage and order management. Reliable logistics processes ensure that components reach their destination as needed.

Since not all spare parts can be kept in stock at all times, Siemens offers a preventive measure for spare parts provisioning on the customer's premises with optimized **Spare Parts Packages** for individual products, custom-assembled drive components and entire integrated drive trains – including risk consulting.

Asset Optimization Services help you design a strategy for parts supply where your investment and carrying costs are reduced and the risk of obsolescence is avoided.
https://support.industry.siemens.com/cs/ww/en/sc/2110



Repair Services

Repair Services are offered on-site and in regional repair centers for fast restoration of faulty devices' functionality.

Also available are extended repair services, which include additional diagnostic and repair measures, as well as emergency services.
https://support.industry.siemens.com/cs/ww/en/sc/2154



Field and Maintenance Services

Siemens specialists are available globally to provide expert field and maintenance services, including commissioning, functional testing, preventive maintenance and fault clearance.

All services can be included in customized service agreements with defined reaction times or fixed maintenance intervals.
https://support.industry.siemens.com/cs/ww/en/sc/2265



Retrofit and Modernization Services

Provide a cost-effective solution for the expansion of entire plants, optimization of systems or upgrading existing products to the latest technology and software, e.g. migration services for automation systems.

Service experts support projects from planning through commissioning and, if desired over the entire extended lifespan, e.g. Retrofit for Integrated Drive Systems for an extended lifetime of your machines and plants.
https://support.industry.siemens.com/cs/ww/en/sc/2286



Service Programs and Agreements

A technical Service Program or Agreement enables you to easily bundle a wide range of services into a single annual or multi-year agreement.

You pick the services you need to match your unique requirements or fill gaps in your organization's maintenance capabilities.

Programs and agreements can be customized as KPI-based and/or performance-based contracts.
https://support.industry.siemens.com/cs/ww/en/sc/2275

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Overview



Siemens Industry and Online Support with some 1.7 million visitors per month is one of the most popular web services provided by Siemens. It is the central access point for comprehensive technical know-how about products, systems and services for automation and drives applications as well as for process industries.

In connection with the challenges and opportunities related to digitalization you can look forward to continued support with innovative offerings.

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Overview

Software types

Software requiring a license is categorized into types.
The following software types have been defined:

- Engineering software
- Runtime software

Engineering software

This includes all software products for creating (engineering) user software, e.g. for configuring, programming, parameterizing, testing, commissioning or servicing.

Data generated with engineering software and executable programs can be duplicated for your own use or for use by third-parties free-of-charge.

Runtime software

This includes all software products required for plant/machine operation, e.g. operating system, basic system, system expansions, drivers, etc.

The duplication of the runtime software and executable programs created with the runtime software for your own use or for use by third-parties is subject to a charge.

You can find information about license fees according to use in the ordering data (e.g. in the catalog). Examples of categories of use include per CPU, per installation, per channel, per instance, per axis, per control loop, per variable, etc.

Information about extended rights of use for parameterization/configuration tools supplied as integral components of the scope of supply can be found in the readme file supplied with the relevant product(s).

License types

Siemens Industry Automation & Drive Technologies offers various types of software license:

- Floating license
- Single license
- Rental license
- Rental floating license
- Trial license
- Demo license
- Demo floating license

Floating license

The software may be installed for internal use on any number of devices by the licensee. Only the concurrent user is licensed. The concurrent user is the person using the program. Use begins when the software is started.
A license is required for each concurrent user.

Single license

Unlike the floating license, a single license permits only one installation of the software per license.

The type of use licensed is specified in the ordering data and in the Certificate of License (CoL). Types of use include for example per instance, per axis, per channel, etc.

One single license is required for each type of use defined.

Rental license

A rental license supports the "sporadic use" of engineering software. Once the license key has been installed, the software can be used for a specific period of time (the operating hours do not have to be consecutive).
One license is required for each installation of the software.

Rental floating license

The rental floating license corresponds to the rental license, except that a license is not required for each installation of the software. Rather, one license is required per object (for example, user or device).

Trial license

A trial license supports "short-term use" of the software in a non-productive context, e.g. for testing and evaluation purposes. It can be transferred to another license.

Demo license

The demo license support the "sporadic use" of engineering software in a non-productive context, for example, use for testing and evaluation purposes. It can be transferred to another license. After the installation of the license key, the software can be operated for a specific period of time, whereby usage can be interrupted as often as required.

One license is required per installation of the software.

Demo floating license

The demo floating license corresponds to the demo license, except that a license is not required for each installation of the software. Rather, one license is required per object (for example, user or device).

Certificate of License (CoL)

The CoL is the licensee's proof that the use of the software has been licensed by Siemens. A CoL is required for every type of use and must be kept in a safe place.

Downgrading

The licensee is permitted to use the software or an earlier version/release of the software, provided that the licensee owns such a version/release and its use is technically feasible.

Delivery versions

Software is constantly being updated.
The following delivery versions

- PowerPack
- Upgrade

can be used to access updates.

Existing bug fixes are supplied with the ServicePack version.

PowerPack

PowerPacks can be used to upgrade to more powerful software. The licensee receives a new license agreement and CoL (Certificate of License) with the PowerPack. This CoL, together with the CoL for the original product, proves that the new software is licensed.
A separate PowerPack must be purchased for each original license of the software to be replaced.

Upgrade

An upgrade permits the use of a new version of the software on the condition that a license for a previous version of the product is already held.
The licensee receives a new license agreement and CoL with the upgrade. This CoL, together with the CoL for the previous product, proves that the new version is licensed.
A separate upgrade must be purchased for each original license of the software to be upgraded.

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Overview

ServicePack

ServicePacks are used to debug existing products. ServicePacks may be duplicated for use as prescribed according to the number of existing original licenses.

License key

Siemens Industry Automation & Drive Technologies supplies software products with and without license keys.

The license key serves as an electronic license stamp and is also the "switch" for activating the software (floating license, rental license, etc.).

The complete installation of software products requiring license keys includes the program to be licensed (the software) and the license key (which represents the license).

Software Update Service (SUS)

As part of the SUS contract, all software updates for the respective product are made available to you free of charge for a period of one year from the invoice date. The contract will automatically be extended for one year if it is not canceled three months before it expires.

The possession of the current version of the respective software is a basic condition for entering into an SUS contract.

You can download explanations concerning license conditions from www.siemens.com/automation/salesmaterial-as/catalog/en/terms_of_trade_en.pdf

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1. General Provisions

By using this catalog you can purchase products (hardware, software and services) described therein from Siemens Aktiengesellschaft subject to the following Terms and Conditions of Sale and Delivery (hereinafter referred to as "T&C"). Please note that the scope, the quality and the conditions for supplies and services, including software products, by any Siemens entity having a registered office outside Germany, shall be subject exclusively to the General Terms and Conditions of the respective Siemens entity. The following T&C apply exclusively for orders placed with Siemens Aktiengesellschaft, Germany.

1.1 For customers with a seat or registered office in Germany

For customers with a seat or registered office in Germany, the following terms and conditions apply subordinate to T&C:

- for products, which include specific terms and conditions in the description text, these specific terms and conditions shall apply and subordinate thereto,
- for installation work the "General Conditions for Erection Works – Germany"[1)] ("Allgemeine Montagebedingungen – Deutschland" (currently only available in German)) and/or
- for stand-alone software products and software products forming a part of a product or project, the "General License Conditions for Software Products for Automation and Drives for Customers with a Seat or registered Office in Germany"[1)] and/or
- for consulting services the "General Terms and Conditions for Consulting Services of the Division DF – Germany"[1)] and/or
- for other supplies and/or services the "General Conditions for the Supply of Products and Services of the Electrical and Electronics Industry"[1)].
  In case such supplies and/or services should contain Open Source Software, the conditions of which shall prevail over the " General Conditions for the Supply of Products and Services of the Electrical and Electronics Industry "[1)], a notice will be contained in the scope of delivery in which the applicable conditions for Open Source Software are specified. This shall apply mutatis mutandis for notices referring to other third party software components.

1.2 For customers with a seat or registered office outside Germany

For customers with a seat or registered office outside Germany, the following terms and conditions apply subordinate to T&C:

- for products, which include specific terms and conditions in the description text, these specific terms and conditions shall apply and subordinate thereto,
- for services the "International Terms & Conditions for Services"[1)] supplemented by "Software Licensing Conditions"[1)] and/or
- for consulting services the "General Terms and Conditions for Consulting Services of the Division DF – Germany"[1)] and/or
- for other supplies of hard- and software the "International Terms & Conditions for Products"[1)] supplemented by "Software Licensing Conditions" [1)]

1.3 For customers with master or framework agreement

To the extent our supplies and/or services offered are covered by an existing master or framework agreement, the terms and conditions of that agreement shall apply instead of T&C.

2. Prices

The prices are in € (Euro) ex point of delivery, exclusive of packaging.

The sales tax (value added tax) is not included in the prices. It shall be charged separately at the respective rate according to the applicable statutory legal regulations.

Prices are subject to change without prior notice. We will charge the prices valid at the time of delivery.

To compensate for variations in the price of raw materials (e.g. silver, copper, aluminum, lead, gold, dysprosium and neodym), surcharges are calculated on a daily basis using the so-called metal factor for products containing these raw materials. A surcharge for the respective raw material is calculated as a supplement to the price of a product if the basic official price of the raw material in question is exceeded.

The metal factor of a product indicates the basic official price (for those raw materials concerned) as of which the surcharges on the price of the product are applied, and with what method of calculation.

An exact explanation of the metal factor can be downloaded at:

www.siemens.com/automation/salesmaterial-as/catalog/en/terms_of_trade_en.pdf

To calculate the surcharge (except in the cases of dysprosium and neodym), the official price from the day prior to that on which the order was received or the release order was effected is used.

To calculate the surcharge applicable to dysprosium and neodym ("rare earths"), the corresponding three-month basic average price in the quarter prior to that in which the order was received or the release order was effected is used with a one-month buffer (details on the calculation can be found in the explanation of the metal factor).

3. Additional Terms and Conditions

The dimensions are in mm. In Germany, according to the German law on units in measuring technology, data in inches apply only to devices for export.

Illustrations are not binding.

Insofar as there are no remarks on the individual pages of this catalog – especially with regard to data, dimensions and weights given – these are subject to change without prior notice.

[1)] The text of the Terms and Conditions of Siemens AG can be downloaded at
www.siemens.com/automation/salesmaterial-as/catalog/en/terms_of_trade_en.pdf

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4. Export Regulations

We shall not be obligated to fulfill any agreement if such fulfillment is prevented by any impediments arising out of national or international foreign trade or customs requirements or any embargoes and/or other sanctions.

Export may be subject to license. We shall indicate in the delivery details whether licenses are required under German, European and US export lists.

Our products are controlled by the U.S. Government (when labeled with "ECCN" unequal "N") and authorized for export only to the country of ultimate destination for use by the ultimate consignee or end-user(s) herein identified. They may not be resold, transferred, or otherwise disposed of, to any other country or to any person other than the authorized ultimate consignee or end-user(s), either in their original form or after being incorporated into other items, without first obtaining approval from the U.S. Government or as otherwise authorized by U.S. law and regulations.

The export indications can be viewed in advance in the description of the respective goods on the Industry Mall, our online catalog system. Only the export labels "AL" and "ECCN" indicated on order confirmations, delivery notes and invoices are authoritative.

Products labeled with "AL" unequal "N" are subject to European / national export authorization. Products without label, with label "AL:N" / "ECCN:N", or label "AL:9X9999" / "ECCN: 9X9999" may require authorization from responsible authorities depending on the final end-use, or the destination.

If you transfer goods (hardware and/or software and/or technology as well as corresponding documentation, regardless of the mode of provision) delivered by us or works and services (including all kinds of technical support) performed by us to a third party worldwide, you must comply with all applicable national and international (re-)export control regulations.

If required for the purpose of conducting export control checks, you (upon request by us) shall promptly provide us with all information pertaining to the particular end customer, final disposition and intended use of goods delivered by us respectively works and services provided by us, as well as to any export control restrictions existing in this relation.

The products listed in this catalog may be subject to European/German and/or US export regulations. Any export requiring approval is therefore subject to authorization by the relevant authorities.

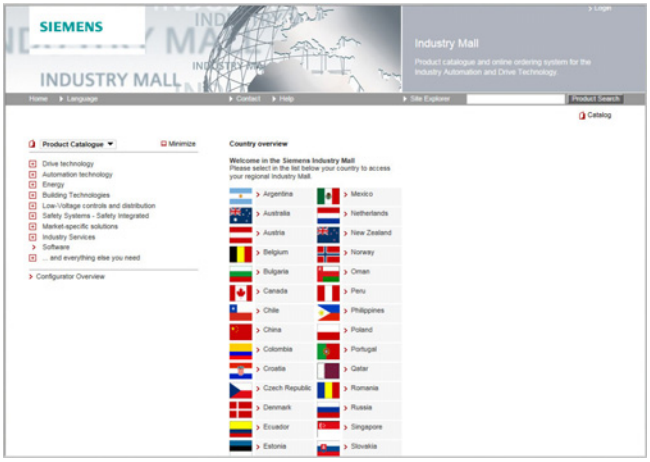
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Notes

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Easy product selection and ordering: Industry Mall and Interactive Catalog CA 01



Industry Mall

The Industry Mall is a Siemens AG Internet ordering platform. It provides you with online access to a comprehensive product spectrum that is presented in an informative, well-organized way.

Powerful search functions help you select the required products, while configurators enable you to configure complex product and system components quickly and easily. CAx data are also available for you to use.

Data transfer allows the entire procedure, from selection through ordering to tracking and tracing, to be carried out online. Availability checks, individual customer discounting, and quotation preparation are also possible.

www.siemens.com/industrymall

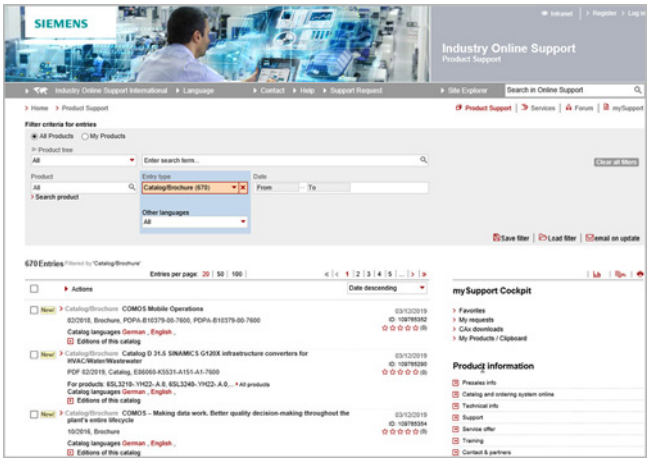


Interactive Catalog CA 01 – Products for automation and drives

The Interactive Catalog CA 01 combined with the Siemens Industry Mall unites the benefits of offline and online media in one application – the performance of an offline catalog with the availability of a wide range of up-to-date information on the Internet.
Select products and assemble orders using the CA 01, determine the availability of the selected products, and track and trace them via the Industry Mall.

Information and download:
www.siemens.com/automation/ca01

Downloading catalogs



Siemens Industry Online Support

You can download catalogs and brochures in PDF format from Siemens Industry Online Support without having to register.

The filter box makes it possible to perform targeted searches.

www.siemens.com/industry-catalogs

Ordering printed catalogs



Please contact your local Siemens branch if you are interested in ordering printed catalogs.
Addresses can be found at
www.siemens.com/automation-contact

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All product designations may be trademarks or product names of Siemens AG or other companies whose use by third parties for their own purposes could violate the rights of the owners.

Security information

Siemens provides products and solutions with industrial security functions that support the secure operation of plants, systems, machines and networks.

In order to protect plants, systems, machines and networks against cyber threats, it is necessary to implement – and continuously maintain – a holistic, state-of-the-art industrial security concept. Siemens' products and solutions constitute one element of such a concept.

Customers are responsible for preventing unauthorized access to their plants, systems, machines and networks. Such systems, machines and components should only be connected to an enterprise network or the internet if and to the extent such a connection is necessary and only when appropriate security measures (e.g. firewalls and/or network segmentation) are in place.

For additional information on industrial security measures that may be implemented, please visit

http://www.siemens.com/industrialsecurity.

Siemens' products and solutions undergo continuous development to make them more secure. Siemens strongly recommends that product updates are applied as soon as they are available and that the latest product versions are used. Use of product versions that are no longer supported, and failure to apply the latest updates may increase customer's exposure to cyber threats.

To stay informed about product updates, subscribe to the Siemens Industrial Security RSS Feed under

http://www.siemens.com/industrialsecurity.