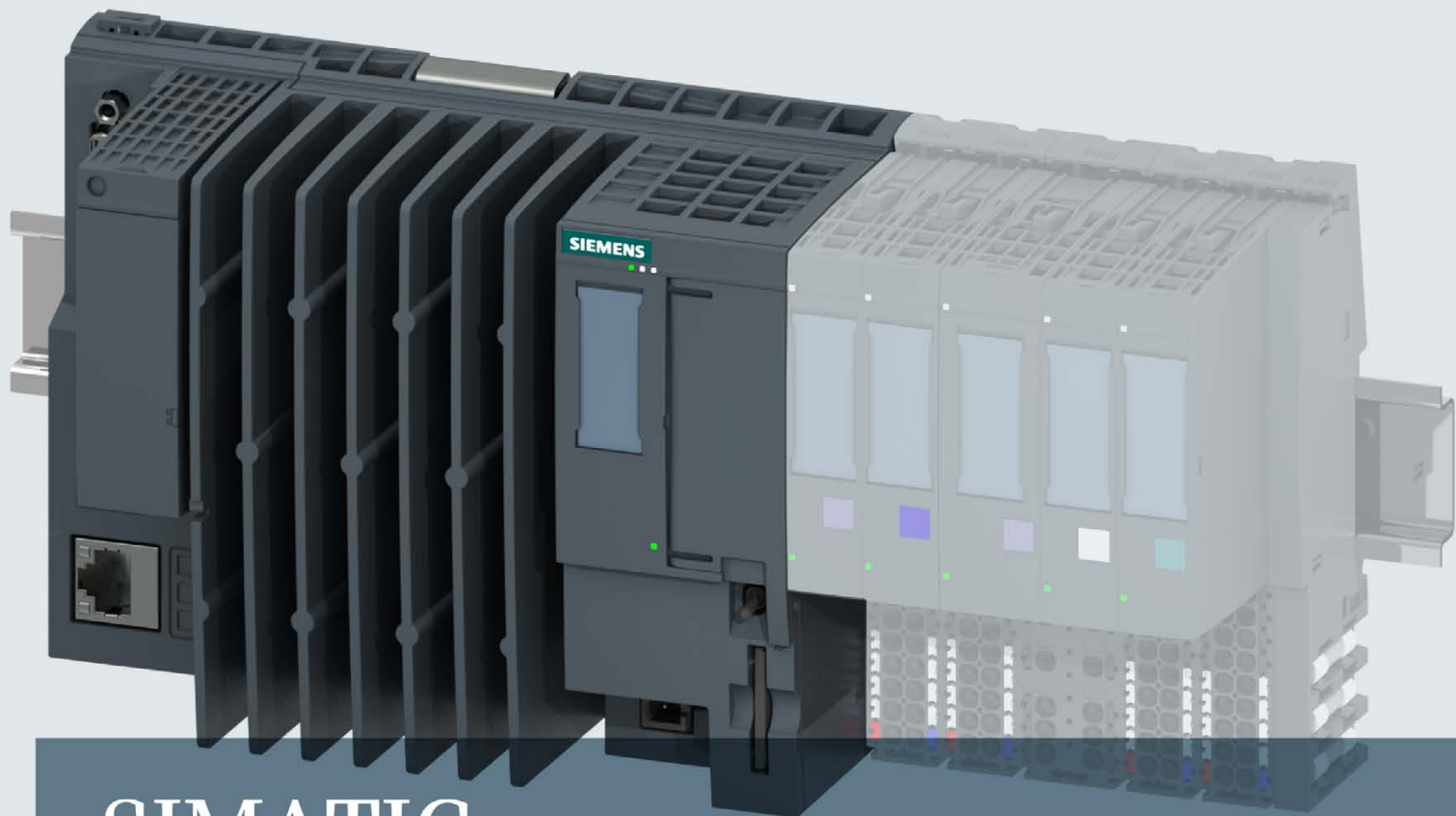


SIEMENS



SIMATIC

ET 200SP Open Controller
CPU 1515SP PC (6ES7677-2AAxx-0xx0)

Manual

Edition

12/2014

Answers for industry.

SIMATIC

ET 200SP Open Controller CPU 1515SP PC

Manual

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Warning notice system

This manual contains notices you have to observe in order to ensure your personal safety, as well as to prevent damage to property. The notices referring to your personal safety are highlighted in the manual by a safety alert symbol, notices referring only to property damage have no safety alert symbol. These notices shown below are graded according to the degree of danger.

DANGER

indicates that death or severe personal injury **will** result if proper precautions are not taken.

WARNING

indicates that death or severe personal injury **may** result if proper precautions are not taken.

CAUTION

indicates that minor personal injury can result if proper precautions are not taken.

NOTICE

indicates that property damage can result if proper precautions are not taken.

If more than one degree of danger is present, the warning notice representing the highest degree of danger will be used. A notice warning of injury to persons with a safety alert symbol may also include a warning relating to property damage.

Qualified Personnel

The product/system described in this documentation may be operated only by **personnel qualified** for the specific task in accordance with the relevant documentation, in particular its warning notices and safety instructions. Qualified personnel are those who, based on their training and experience, are capable of identifying risks and avoiding potential hazards when working with these products/systems.

Proper use of Siemens products

Note the following:

WARNING

Siemens products may only be used for the applications described in the catalog and in the relevant technical documentation. If products and components from other manufacturers are used, these must be recommended or approved by Siemens. Proper transport, storage, installation, assembly, commissioning, operation and maintenance are required to ensure that the products operate safely and without any problems. The permissible ambient conditions must be complied with. The information in the relevant documentation must be observed.

Trademarks

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Disclaimer of Liability

We have reviewed the contents of this publication to ensure consistency with the hardware and software described. Since variance cannot be precluded entirely, we cannot guarantee full consistency. However, the information in this publication is reviewed regularly and any necessary corrections are included in subsequent editions.

Preface

Purpose of the documentation

This manual supplements the system manual for the ET 200SP distributed I/O system. Functions that generally relate to the system are described in this manual.

The information provided in this manual and in the system/function manuals supports you in commissioning the CPU 1515SP PC.

Basic knowledge required

The system must be operated and used by qualified staff only.
The following knowledge is required:

- Installation guidelines for SIMATIC ET 200SP
- Programming with STEP 7
- PC-based automation using an S7-1500 software controller and WinCC Runtime Advanced
- Basic knowledge of PC technology
- Windows Embedded Standard 7 operating system

Scope of validity of the documentation

This documentation is valid for the following devices:

ET 200SP Open Controller	Article number	
	Hardware variant WES7 E 32Bit 2GB RAM	Hardware variant WES7 P 64Bit 4GB RAM
CPU 1515SP PC	6ES7677-2AA31-0EB0	6ES7677-2AA41-0FB0
CPU 1515SP PC + HMI 128PT	6ES7677-2AA31-0EK0	6ES7677-2AA41-0FK0
CPU 1515SP PC + HMI 512PT	6ES7677-2AA31-0EL0	6ES7677-2AA41-0FL0
CPU 1515SP PC + HMI 2048PT	6ES7677-2AA31-0EM0	6ES7677-2AA41-0FM0
CPU 1515SP PC, spare part, without CFast card	6ES7677-2AA30-0AA0	6ES7677-2AA40-0AA0

Conventions

Conventions STEP 7: In this documentation, "STEP 7" is used as a synonym for all versions of the configuration and programming software "STEP 7 (TIA Portal)".

Please also observe notes marked as follows:

Note

A note contains important information on the product described in the documentation, on the handling of the product or on the section of the documentation to which particular attention should be paid.

Security information

Siemens provides products and solutions with industrial security functions that support the secure operation of plants, solutions, machines, equipment and/or networks. They are important components in a holistic industrial security concept. With this in mind, Siemens' products and solutions undergo continuous development. Siemens recommends strongly that you regularly check for product updates.

For the secure operation of Siemens products and solutions, it is necessary to take suitable preventive action (e.g. cell protection concept) and integrate each component into a holistic, state-of-the-art industrial security concept. Third-party products that may be in use should also be considered. For more information about industrial security, visit (<http://www.siemens.com/industrialsecurity>).

To stay informed about product updates as they occur, sign up for a product-specific newsletter. For more information, visit (<http://support.automation.siemens.com>).

Information about third-party software updates

This product contains third-party software. Siemens accepts liability with respect to updates/patches for the third-party software only when these are distributed by Siemens in the context of a Software Update Service contract or officially approved by Siemens. Otherwise, updates/patches are installed at the user's own risk. You can find more information about our software update service offer under (<http://www.automation.siemens.com/mcms/automation-software/en/software-update-service/Pages/Default.aspx>).

Notes on protecting administrator accounts

A user with administrator rights has extensive access and manipulation possibilities.

Therefore, make sure that the administrator account is adequately protected to prevent unauthorized changes. To do this, set secure passwords and use a standard user account for regular operation. Other measures, such as the use of security policies, should be applied as required.

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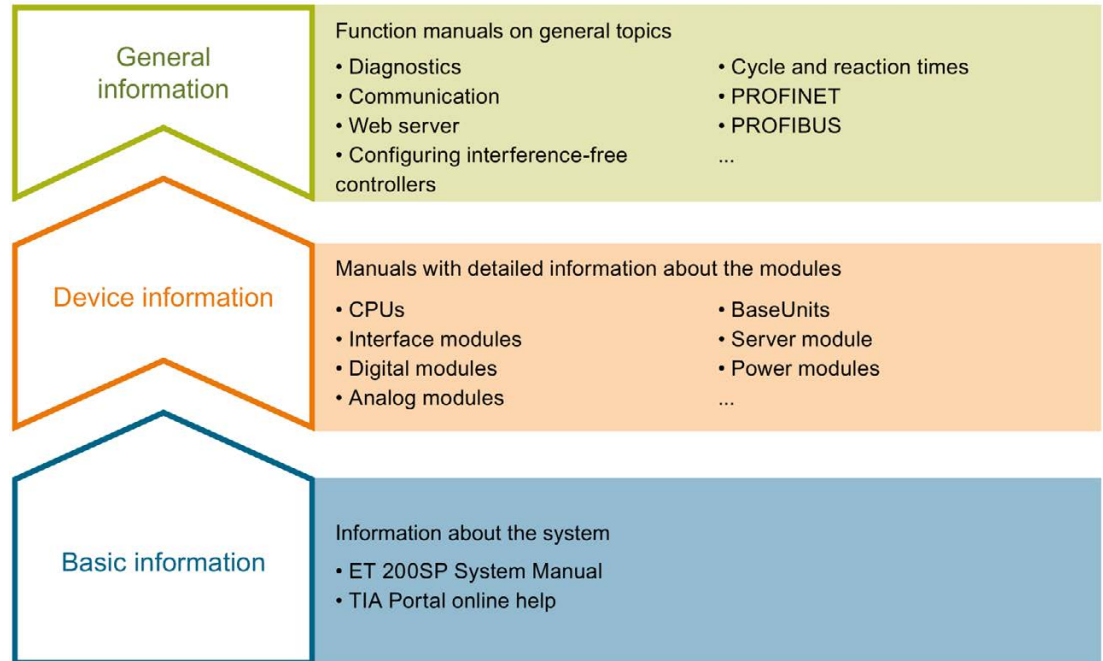
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Documentation guide

The documentation for the SIMATIC ET 200SP distributed I/O system is arranged into three areas.

This arrangement enables you to access the specific content you require.



Basic information

The system manual describes in detail the configuration, installation, wiring and commissioning of the SIMATIC ET 200SP. distributed I/O system. The STEP 7 online help supports you in the configuration and programming.

Device information

Product manuals contain a compact description of the module-specific information, such as properties, terminal diagrams, characteristics and technical specifications.

General information

The function manuals contain detailed descriptions on general topics regarding the SIMATIC ET 200SP distributed I/O system, e.g. diagnostics, communication, Web server, designing interference-free controllers.

You can download the documentation free of charge from the Internet (<http://w3.siemens.com/mcims/industrial-automation-systems-simatic/en/manual-overview/tech-doc-et200/Pages/Default.aspx>).

Changes and supplements to the manuals are documented in a Product Information.

Manual Collection ET 200SP

The Manual Collection contains the complete documentation on the SIMATIC ET 200SP distributed I/O system gathered together in one file.

You can find the Manual Collection on the Internet
(<http://support.automation.siemens.com/WW/view/en/84133942>).

My Documentation Manager

The My Documentation Manager is used to combine entire manuals or only parts of these to your own manual.

You can export the manual as PDF file or in a format that can be edited later.

You can find the My Documentation Manager on the Internet
(<http://support.automation.siemens.com/WW/view/en/38715968>).

Applications & Tools

Applications & Tools supports you with various tools and examples for solving your automation tasks. Solutions are shown in interplay with multiple components in the system - separated from the focus in individual products.

You can find Applications & Tools on the Internet
(<http://support.automation.siemens.com/WW/view/en/20208582>).

CAX Download Manager

The CAX Download Manager is used to access the current product data for your CAX or CAE systems.

You configure your own download package with a few clicks.

In doing so you can select:

- Product images, 2D dimension drawings, 3D models, internal circuit diagrams, EPLAN macro files
- Manuals, characteristics, operating manuals, certificates
- Product master data

You can find the CAX Download Manager on the Internet
(<http://support.automation.siemens.com/WW/view/en/42455541>).

TIA Selection Tool

With the TIA Selection Tool, you can select, configure and order devices for Totally Integrated Automation (TIA).

This tool is the successor of the SIMATIC Selection Tool and combines the known configurators for automation technology into one tool.

With the TIA Selection Tool, you can generate a complete order list from your product selection or product configuration.

You can find the TIA Selection Tool on the Internet
(<http://w3.siemens.com/mcms/topics/en/simatic/tia-selection-tool>).

1.1 Documentation on CPU 1515SP PC

The following additional documentation is required to use the CPU 1515SP PC:

- Operating manual S7-1500 software controller
(<http://support.automation.siemens.com/WW/view/en/10805639/133300>)
- System manual WinCC Advanced V13
(<http://support.automation.siemens.com/WW/view/en/68075405>)
- System manual ET 200SP distributed I/O system
(<http://support.automation.siemens.com/WW/view/en/58649293>)
- Manual Server module (<http://support.automation.siemens.com/WW/view/en/63257531>)

WARNING

Life-endangering voltage when control cabinet is open

If the device is installed in a control cabinet, areas or components can be under life-endangering voltage when the control cabinet is open.

Contact with these areas or components may lead to death through electric shock.

Switch off the power before opening the control cabinet.

If the device is operated in a machine in accordance with the machinery directive, the provisions of the guideline 2006/42/EC apply.

Safe operation of a plant

WARNING

Risk of fire

The device is classified for use in the area of Industrial Control Equipment as "Open Type" according to UL508. If overheating occurs, burning material may leak and cause a fire.

For this reason, observe the following information:

- For approval and operation in accordance with UL508, the device must be installed in a housing complying with UL508.
- Install the device in a housing complying with the requirements of Sections 4.6 and 4.7.3 of the standards EN 60950-1:2006 and IEC/UL/EN/DIN-EN 60950-1.

If you have questions about the validity of installation in the planned environment, please contact our service representatives.

NOTICE

Protective measures

To ensure safe operation of a plant, you have to take suitable IT security measures, for example, network segmentation.

Seal the cover to protect the CFast card with the operating system of the CPU 1515SP PC from unauthorized access.

For more information on Industrial Security, refer to the Internet (<http://www.siemens.com/industrialsecurity>).

Repairs

WARNING

Damage caused by opening the device

Unauthorized opening of and improper repairs to the device may result in substantial damage to equipment or endanger the user.

Only authorized personnel are permitted to repair the device.

For additional information on repairs, see section Sending the device to customer service (Page 80).

ESD guidelines

Modules containing electrostatic sensitive devices (ESDs) can be identified by the following label:



Strictly follow the guidelines mentioned below when handling modules which are sensitive to ESD:

- Always discharge yourself of static electricity before handling modules which are sensitive to ESD (for example, by touching a grounded object).
- All devices and tools must be free of static charge.
- Always pull the mains connector and disconnect the battery before installing or removing modules which are sensitive to ESD.
- Handle modules fitted with ESDs only by their edges.
- Do not touch any connector pins or conductors on modules containing ESDs.

See also

Electromagnetic compatibility (Page 87)

2.1 Notes on use



WARNING

Hazards at an unprotected machine or plant

According to the results of a risk analysis, hazards can occur at an unprotected machine. The hazards may lead to personal injury.

According to the risk analysis, the risk of injury to persons can be countered with the following measures:

- Additional protective equipment at the machine or plant. In this case, the programming, parameter assignment and wiring of the I/O used, in particular, must be performed in accordance with the safety criteria (SIL, PL or Cat.) ascertained by means of an appropriate risk analysis.
- Use of the device for its intended purpose, which can be established by performing a functional test on the plant. This allows errors in programming, parameter assignment and wiring to be detected.
- Documentation of the test results which can be entered, if required, into the relevant safety certificates.

NOTICE

Ambient conditions

Ambient conditions for which the device is not suitable can lead to faults or damage the device.

Note the following:

- Only operate the device in enclosed areas. If you do not comply with this instruction, the warranty becomes void.
- Only operate the device in accordance with the ambient conditions given in the technical specifications.
- Protect the device from dust, moisture and heat.
- Do not expose the device to direct sunlight or other strong sources of light.
- The device must not be used in places with more difficult operating conditions through corrosive vapors or gases without taking additional protective measures, for example, supply of clean air.

Product overview

3.1 Properties

Article number

6ES7677-2AAxx-0xx0

The complete article number depends on the hardware version and the order option.

View of the module

The figure below shows the CPU 1515SP PC.

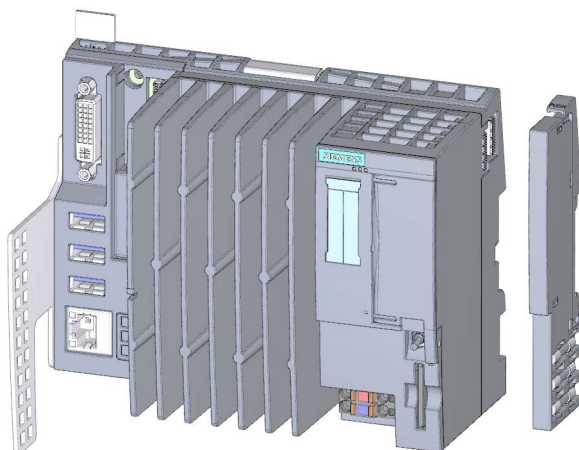


Figure 3-1 CPU 1515SP PC with supplied accessories

Properties

The CPU 1515SP PC is a PC-based automation device in the design of the ET 200SP. It is used for control and visualization purposes. The supplied IPC DiagBase software provides basic diagnostics functions and supports you in handling the BIOS.

The CPU 1515SP PC has the following technical properties:

- A removable CFast card with the following pre-installations is used as storage medium:
 - Windows Embedded Standard 7 operating system
 - S7 1500 software controller: CPU 1505S
 - Optionally with HMI: WinCC Runtime Advanced V13 SP1
- Interfaces
 - An interface for the exchangeable ET 200SP BusAdapters for connection of PROFINET IO (2 ports)
 - An interface for connecting devices using Industrial Ethernet (Gigabit Ethernet)
 - 3 interfaces for USB devices
 - A DVI-I interface for a monitor
 - A sealable slot for the CFast card
 - A slot for an SD/MMC card as additional optional drive
- Supply voltage 1L+ 24 V DC (SELV/PELV). The connection plug is included in the scope of delivery.
- The CPU 1515SP PC is suitable for use in industrial environments:
 - Compact design
 - Fan-less operation
 - High robustness
- The CPU 1515SP PC complies with IP 20 degree of protection and is intended for installation in a control cabinet.

Hardware variants and ordering options

The following hardware variants are available for the **CPU 1515SP PC**:

- WES7 E 32-bit 2GB RAM, 8 GB CFast card
- WES7 P 64-bit 4GB RAM, 16 GB CFast card, suitable for Multitouch panels

The following order options are available:

- CPU 1515SP PC with preinstalled software controller
- CPU 1515SP PC + HMI (128PT, 512PT, 2040PT) with preinstalled software controller and WinCC Runtime Advanced V13 SP1

3.2 Sample configuration

Configuration

The CPU 1515SP PC is mounted on a mounting rail according to EN 60715. A modular system is formed with ET 200SP modules in the central rack.

The CPU 1515SP PC can be used as PROFINET IO controller. The PROFINET IO devices are connected via the ports of the X1 PN (LAN) interface using the SIMATIC BusAdapter BA 2xRJ45.

Devices can be connected via Industrial Ethernet using the integrated interface X2 PN/IE (LAN).

The connection to PROFIBUS can be made using the DP master module.

Sample configuration

The figure below shows a sample configuration with the CPU 1515SP PC.

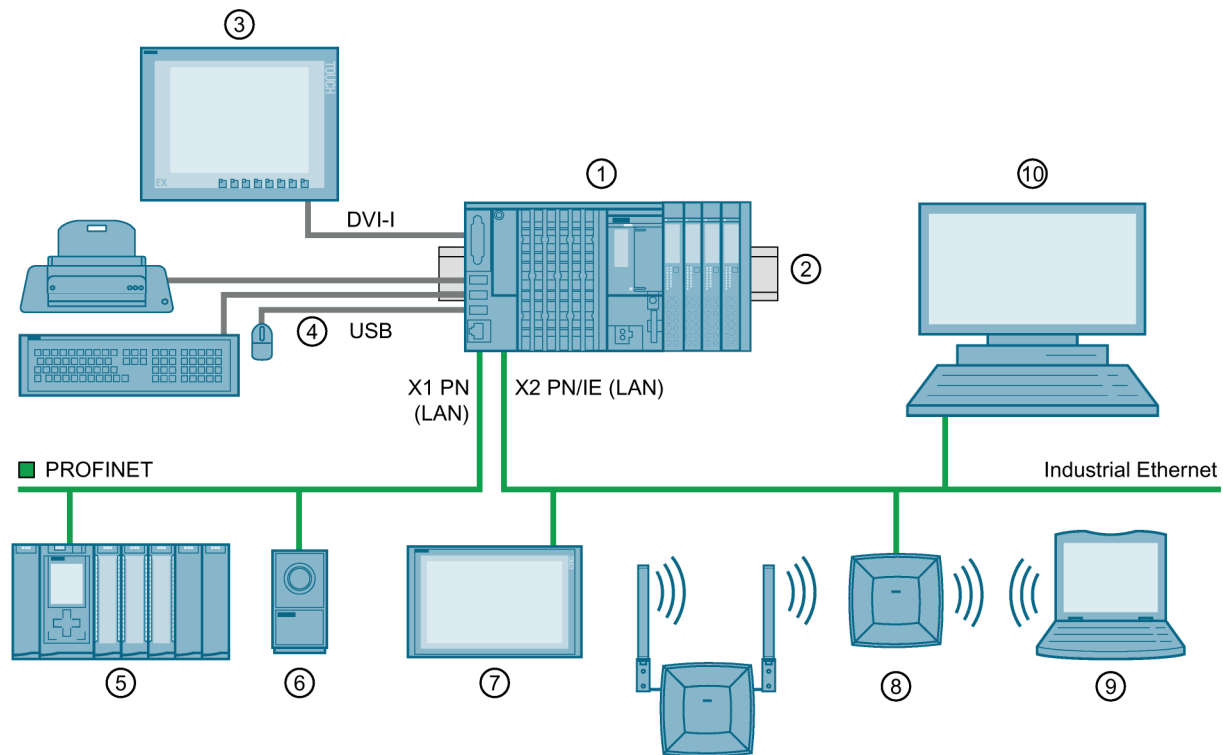


Figure 3-2 Sample configuration with the CPU 1515SP PC

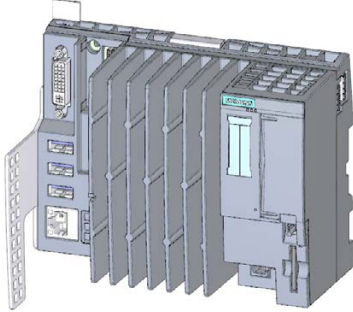
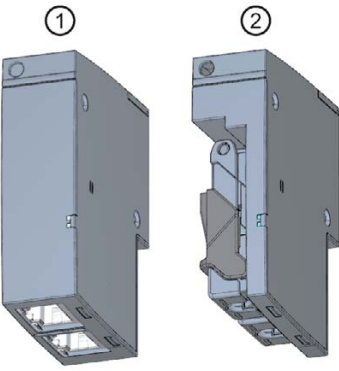
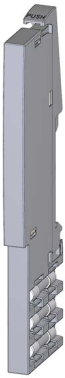
- ① CPU 1515SP PC, I/O modules, server module
- ② Mounting rail
- ③ Flat Panel - Wide Screen Display
- ④ USB devices: Keyboard, mouse, printer ...
- ⑤ PROFINET IO device
- ⑥ Camera
- ⑦ Industrial Thin Client ITC
- ⑧ SCALANCE W786
- ⑨ Field programming device
- ⑩ PC/Programming device

3.3 Components

Components of the CPU 1515SP PC

The following table provides an overview of the components of the CPU 1515SP PC:

Table 3- 1 Components of the CPU 1515SP PC

Component	Function	Figure
Mounting rail in accordance with EN 60715	The mounting rail is the rack for the CPU 1515SP PC.	
CPU 1515SP PC	CPU with strain relief and white reference labels	
BusAdapter	The BusAdapter allows free selection of the connection technology for PROFINET IO. The following variants are available for the CPU 1515SP PC: - For standard RJ45 plug (BA 2×RJ45) ① - For direct connection of the bus cable (BA 2×FC) ②	
Server module	The server module completes the configuration of the CPU 1515SP PC with I/O modules. The server module is included in the CPU's scope of delivery.	

3.4 Configuration of the devices

Front view

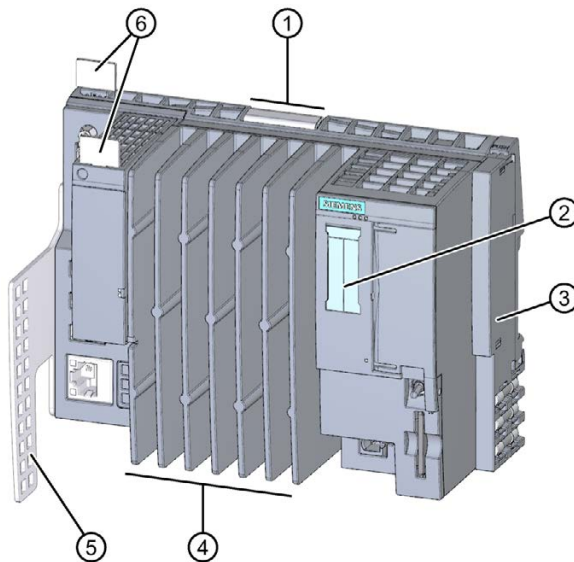


Figure 3-3 Front view of CPU 1515SP PC

- ① Mounting rail release mechanism
- ② Labeling strips
- ③ Server module
- ④ Cooling fins
- ⑤ Strain relief
- ⑥ Reference labels

3.5 Operator controls and display elements

Front view of the module

The following figure shows the operator controls and connection elements of the CPU 1515SP PC.

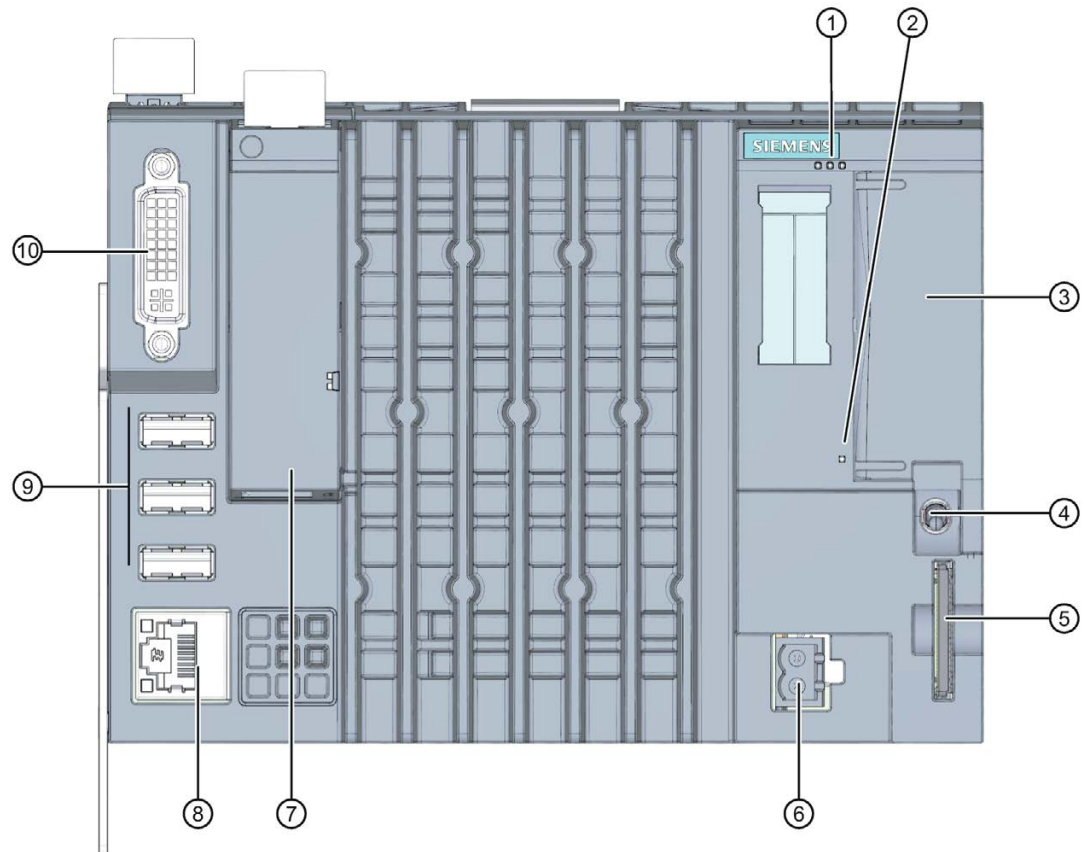


Figure 3-4 View of the CPU 1515SP PC

- ① LED displays for the current operating mode and diagnostic status of the CPU
- ② Power LED
- ③ **X50:** Slot for the CFast card (flash memory), sealable
- ④ Mode selector
- ⑤ **X51:** Slot for an optional SD/MMC card
- ⑥ **X80:** Connector for 24 V DC supply voltage
- ⑦ **X1 PROFINET (LAN):** Slot for BusAdapter for connection of PROFINET IO; status display for PROFINET
- ⑧ **X2 PN/IE (LAN):** GbE Ethernet connection with integrated display
- ⑨ **X60, X61, X62:** 3 USB connections
- ⑩ **X70 DVI-I:** Connection for monitor

Slot for CFast card

The operating system, Runtime software and project are installed on the supplied SIMATIC CFast card. The CFast card is the only mass storage device of the CPU 1515SP PC.

Note

Unauthorized access

Seal the cover of the slot to protect the CFast card with the operating system of the CPU 1515SP PC from unauthorized access and manipulation.

Slot for SD/MMC card

A SIMATIC SD or MMC card can be used as additional storage drive. This drive can be used to store data via Windows, for example a backup, but not the operating system, the Runtime software or the project.

Permitted SD cards: SDHC up to 32 GB, SDXC up to 2 TB.

USB connections

Two USB high-current (500 mA) interfaces and one low-current (100 mA) interface can be used at the same time.

MAC addresses

The MAC address consists of a 3-byte manufacturer ID and a 3-byte device ID (consecutive number).

Each device is already assigned four MAC addresses in the factory. The front of the CPU 1515SP PC is lasered with the MAC address 1 and 4. With the MAC addresses 2 and 3, the consecutive numbers are incremented. If, for example, the first MAC address is 08-00-06-6B-80-C0, the second MAC address is 08-00-06-6B-80-C1.

Table 3- 2 Assignment of the MAC addresses

	Assignment
MAC address 1	X2 PN/IE (LAN) - Visible in STEP 7 for accessible devices - Lasered on the front of the CPU (start of the number range)
MAC address 2	X1 PROFINET (LAN) Visible in STEP 7 for accessible devices
MAC address 3	Port X1 P1 (required for LLDP, for example)
MAC address 4	Port X1 P2 R (required for LLDP, for example) Lasered on the front of the CPU (end of the number range)

Connector for supply voltage

The CPU 1515SP PC is equipped with a 2-pin connection terminal for the power supply.

The connection plug for the supply voltage is plugged in when the CPU is shipped from the factory.

Mode selector

Use the mode selector to set the CPU operating mode.

Table 3- 3 Mode selector positions

Position	Meaning	Description
RUN	Operating mode RUN ¹	The CPU is processing the user program.
STOP	Operating mode STOP ¹	The CPU is not processing the user program. The outputs are set to a "safe" state.
MRES	Memory reset	For active S7-1500 software controller² only: CPU memory reset

¹ RUN and STOP indicate the **selected** operating state. The RUN and STOP LEDs indicate the **actual** operating mode of the CPU 1515SP PC.

² See the S7-1500 software controller manual

3.6 Scope of delivery

3.6.1 Unpacking the device

When unpacking

When unpacking, make sure to check the following:

- Check packaging and contents for visible damage from transport.
- Check the delivery for completeness.
Please inform your Siemens contact partner should you determine damages from transport or any irregularities.
- Keep the supplied documentation and licenses. They belong to the device and are the proof that you have purchased the software preinstalled on the CFast card.
Documentation and licenses are required for initial commissioning and for any questions that arise.
- Keep the original packaging in case the device needs to be transported again.

NOTICE

Damage to the device during transport and storage

If a device is transported or stored without packaging, it is unprotected from shocks, vibrations, pressure and moisture. Damaged packaging indicates that environmental conditions have already had a significant impact on the device.

The device might be damaged.

Do not dispose of the original packaging. Pack the device for transport and storage.

NOTICE

Damage to the device caused by condensation

If the device was exposed to low temperatures or extreme variations in temperature during transport, this may cause moisture to build up on or in the device (condensation).

Moisture may cause a short-circuit and damage the device.

Proceed as follows to avoid damage:

- Store the device in dry conditions.
- Make sure it adapts to room temperature before commissioning.
- Do not expose the device to direct heat radiation from a heater.
- If condensation has developed, wait for approximately 12 hours or until the device is completely dry before you switch it on.

 WARNING

Electric shock and fire hazard from damaged device

A damaged device can carry dangerous voltage and trigger a fire in the machine or plant. A damaged device has unpredictable properties and states.

Death or severe injury could occur.

Make sure that the damaged device is not installed and commissioned accidentally. Label the damaged device correspondingly and keep it locked up. Have the device repaired without delay.

Identification data

The identification data can be used to clearly identify the device when a repair is necessary.

Make a note of the following data for your devices:

- The article number of the CPU 1515SP PC can be found on the order slip.
- Depending on the scope of delivery, the "Certificate of License" is provided as proof of license for the S7-1500 software controller and for WinCC Runtime Advanced V13 SP1.
- The "Microsoft Windows Product Key" can be found on the "Certificate of Authenticity" label.
- The first and the last MAC address are provided on the device.

3.6.2 Scope of delivery - Hardware variant WES7 E 32Bit 2GB RAM

Note

The device always comes with the **CPU 1515SP PC** label with article number **6ES7677-2AA30-0AA0**, regardless of the order options.

The following components are included in the scope of delivery of the CPU 1515SP PC:

Table 3- 4 Scope of delivery - Hardware variant WES7 E 32Bit 2GB RAM

Order option	CPU 1515SP PC	CPU 1515SP PC + HMI	CPU 1515SP PC (spare part)
Article number	6ES7677-2AA31-0EB0	6ES7677-2AA31- • 0EK0 HMI 128PT • 0EL0 HMI 512PT • 0EM0 HMI 2048PT	6ES7677-2AA30-0AA0
CPU	X	X	X
Strain relief with fixing screws	X	X	X
Server module	X	X	X
8 GB CFast card with the following pre-installations:			
• Windows Embedded Standard 7 E operating system	X	X	–
• S7-1500 software controller CPU 1505S	X	X	–
• WinCC RT Advanced V13 SP1	–	X	–
Restore DVD for image restore	X	X	–
"Documentation and Drivers" DVD	X	X	–
Windows Certificate of Authenticity (CoA)	X	X	–
Certificate of License (CoL)	X	X	–
USB stick with SIMATIC license keys	X	X	–
Product information	X	X	–

3.6.3 Scope of delivery - Hardware variant WES7 P 64Bit 4GB RAM

Note

The device always comes with the **CPU 1515SP PC** label with article number 6ES7677-2AA40-0AA0, regardless of the order options.

The following components are included in the scope of delivery of the CPU 1515SP PC:

Table 3- 5 Scope of delivery - Hardware variant WES7 P 64Bit 4GB RAM

Order option	CPU 1515SP PC	CPU 1515SP PC + HMI	CPU 1515SP PC (spare part)
Article number	6ES7677-2AA41-0FB0	6ES7677-2AA41- • 0FK0 HMI 128PT • 0FL0 HMI 512PT • 0FM0 HMI 2048PT	6ES7677-2AA40-0AA0
CPU	X	X	X
Strain relief with fixing screws	X	X	X
Server module	X	X	X
16 GB CFast card with the following pre-installations:			
• Windows Embedded Standard 7 P operating system	X	X	–
• S7-1500 software controller CPU 1505S	X	X	–
• WinCC RT Advanced V13 SP1	–	X	–
Restore DVD for image restore	X	X	–
"Documentation and Drivers" DVD	X	X	–
Windows Certificate of Authenticity (CoA)	X	X	–
Certificate of License (CoL)	X	X	–
USB stick with SIMATIC license keys	X	X	–
Product Information	X	X	–

Installing

4.1 Basics

Introduction

The CPU 1515SP PC is an open resource. This means that you may only install it in enclosures, cabinets or electrical operating areas. These housings, cabinets or electrical operating areas must only be accessible with a key or tool. Access may only be possible for instructed or authorized personnel.

Installation location

Install the CPU 1515SP PC in a suitable enclosure/control cabinet with at least IP54 degree of protection according to EN 60529 and take into consideration the ambient conditions for operating the devices.

Installation position

You can install the ET 200SP distributed I/O system in any position. The preferred mounting position is horizontal mounting on a vertical wall.

Depending on the mounting position, restrictions on ambient temperature and maximum configuration apply to the CPU 1515SP PC.

NOTICE
Damage to the modules Modules can be damaged if exposed to ambient temperatures higher than permitted. The following ambient temperatures must not be exceeded during operation: • Horizontal mounting – 60 °C for an installation with up to 32 I/O modules. – 55 °C for an installation with up to 64 I/O modules. • Vertical mounting – 50 °C for an installation with up to 32 I/O modules.

For more detailed information, refer to section Mechanical and climatic ambient conditions (Page 89)

Mounting rail

The CPU 1515SP PC is mounted on a mounting rail according to EN 60715 (35 × 7.5 mm or 35 × 15 mm).

The mounting rail must be grounded separately in the control cabinet. Exception: If you install the rail on grounded, zinc-plated mounting plates, there is no need to ground the rail separately.

Note

If the ET 200SP distributed I/O system is exposed to vibration and shock loads, both ends of the ET 200SP system assembly must be mechanically fixed to the mounting rail (e.g using 8WA1010-1PH01 ground terminals). This measure prevents the ET 200SP from shifting to the side.

Note

If the ET 200SP distributed I/O system is exposed to high vibration and shock load, we recommend that you screw the mounting rail to the mounting surface at intervals of approx. 200 mm.

Suitable surface finishes are:

- Steel strip in accordance with Appendix A of EN 60715 or
 - Tinned steel strip. We recommend the use of the mounting rails in section Accessories/spare parts (Page 103).
-

Note

Mounting rails of other manufacturers

If you use mounting rails from other manufacturers, ensure that they have the properties required for your climatic and mechanical ambient conditions.

Check whether the mounting rails meet the requirements for a protective conductor.

Minimum clearances

Make sure to maintain the following minimum clearances when installing or dismantling the CPU 1515SP PC.

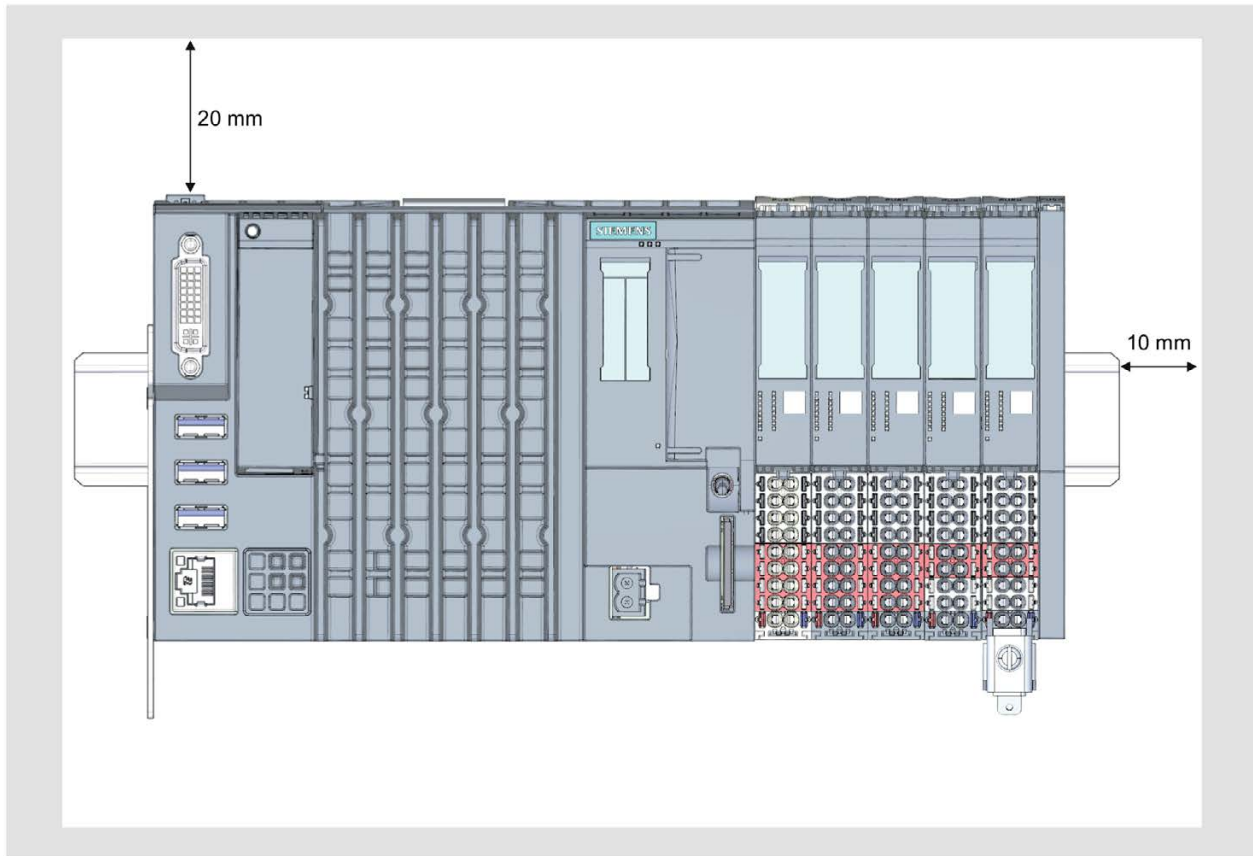


Figure 4-1 Minimum clearances

Installation rules

- After the CPU 1515SP PC, there is a BaseUnit BU..D with incoming supply voltage L+ (light-colored terminal box).
- This is followed by BaseUnits BU..B (with dark-colored terminal box).
- The respective corresponding I/O modules can be connected to the BaseUnits. Refer to the "Selection of a suitable BaseUnit" section in the ET 200SP manual for appropriate combinations of BaseUnits and I/O modules.
- The server module completes the installation.

Note

Install the CPU 1515SP PC only with disconnected supply voltage.

4.2 Hardware configuration

Maximum mechanical configuration

As soon as one of the following rules applies, the maximum configuration has been reached:

Table 4- 1 Maximum mechanical configuration

Properties	Rule
Number of modules	• Horizontal mounting – 0 to 60 °C ambient temperature: a maximum of 32 I/O modules and USB load – 0 to 55 °C ambient temperature: a maximum of 64 I/O modules and USB load • Vertical mounting – 0 to 50 °C ambient temperature: a maximum of 32 I/O modules and USB load
Backplane bus length	A maximum mounting width of 1 m (without CPU 1515SP PC, including server module)

Electrical maximum configuration

The number of operable I/O modules of a potential group is limited by the

- Power consumption of the I/O modules
- Power consumption of the components supplied via these I/O modules

The maximum current-carrying capability of the terminals on the BaseUnit L+/ground is 10 A.

USB load

When using the CPU 1515SP PC with the maximum configuration, the USB load must also be considered:

- Horizontal mounting
 - Ambient temperature of 0 to 60 °C with maximum 32 I/O modules **and** 3 x 100 mA USB load
 - Ambient temperature of 0 to 55 °C with maximum 64 I/O modules **and** 2 x 500 mA + 1 x 100 mA USB load
- Vertical mounting
 - Ambient temperature of 0 to 50 °C with maximum 32 I/O modules **and** 3 x 100 mA USB load

Address space

The address space is preset and can be adjusted in the user program.

4.3 Installing the CPU 1515SP PC

Requirements

The mounting rail is fitted.

Required tools

3 to 3.5 mm screwdriver (only to fix the strain relief and dismantle the BusAdapter)

Fixing strain relief

Fix the strain relief on the top and the bottom of the left-hand side of the CPU 1515SP PC with the supplied screws.

Installing the CPU 1515SP PC

1. Install the CPU on the mounting rail.
2. Swivel the CPU back until you hear the mounting rail release click into place
3. To check that the CPU has correctly clicked into place, pull on the underside of the enclosure.

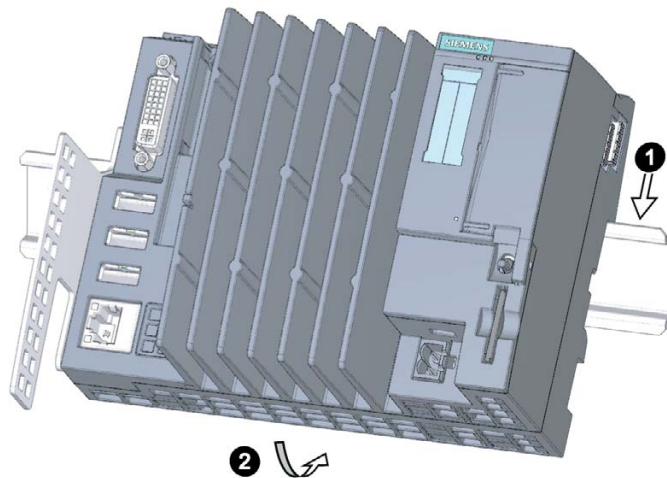


Figure 4-2 Installing the CPU 1515SP PC

Dismantling the CPU 1515SP PC

The BaseUnits with the I/O modules are located to the right of the CPU 1515SP PC:

1. Switch off the supply voltage on the CPU.
2. Press the mounting rail release button on the first BaseUnit and, at the same time, move the CPU parallel to the left until it comes off the rest of the module group.

Note: The mounting rail release button is located above the CPU.

3. While pressing the mounting rail release button on the CPU, swivel the CPU out of the mounting rail.

Note

It is not necessary to remove the BusAdapter from the CPU 1515SP PC.

Connection

5.1 Notes on connection

Note**Rules and regulations for operation**

Observe the information contained in the *Wiring* section in the system manual ET 200SP distributed I/O system (<http://support.automation.siemens.com/WW/view/en/58649293>) and in the function manual Designing interference-free controllers (<http://support.automation.siemens.com/WW/view/en/59193566>).

NOTICE**Fault caused by I/O devices**

The connection of I/O devices can lead to faults on the device.

Injury to persons and damage to the machine or plant could result.

Note the following when connecting I/O devices:

- Read the documentation related to the I/O devices. Follow all instructions given in the documentation.
- Only connect I/O devices which are suitable for use in industrial environments according to EN 61000-6-2/EC 61000-6-2.
- I/O devices which are not hot-plug capable may only be connected when the power supply of the device is switched off.

Note**Feedback through USB devices**

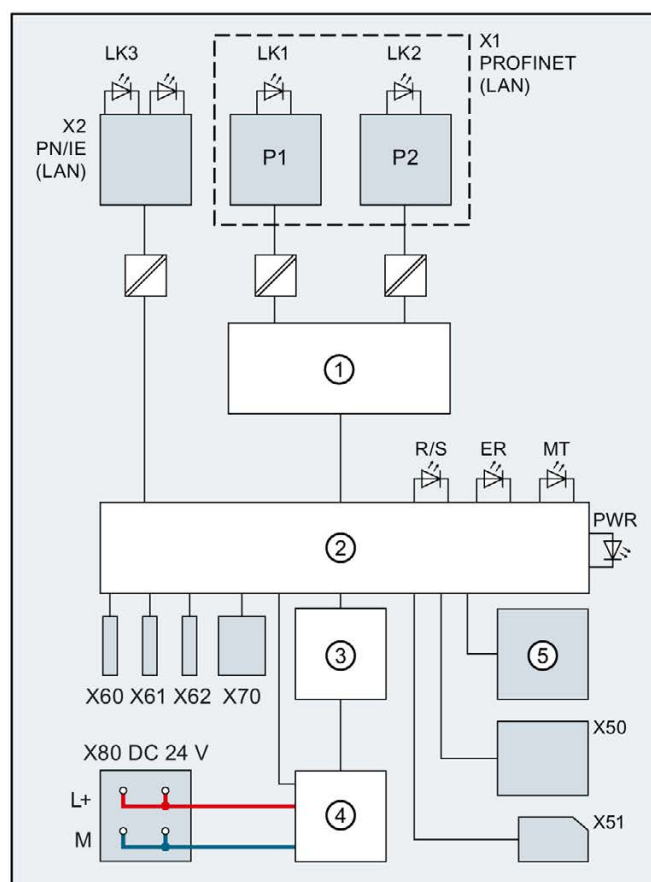
The startup of the CPU 1515SP PC at power on is not guaranteed for USB devices which - contrary to the USB 2.0 specification - feed back voltage to the host interface.

Regenerative feedback is generally not permitted.

5.2 Terminal and block diagram

Block diagram

The figure below shows the block diagram for the CPU 1515SP PC.



①	Switch	X1 PN (LAN)	PROFINET interface X1
②	Electronics	P1	PROFINET interface X1 Port 1
③	Backplane bus interface	P2	PROFINET interface X1 Port 2
④	Internal supply voltage	L+	24 V DC supply voltage
⑤	Mode selector	M	Ground
X50	CFAST card	LK1, LK2	LED Link TX/RX
X51	SD/MMC card	LK3	LED Link
X60	USB interface 2.0, 0.5 A	R/S	RUN/STOP LED (yellow/green)
X61, X62	USB interface 2.0, 0.5 A	ER	ERROR LED (red)
X70	DVI-I interface	MT	MAINT LED (yellow)
X80 24 V DC	Infeed of supply voltage	PWR	POWER LED (yellow/green)
X2 PN/IE (LAN)	Ethernet interface X2		

Figure 5-1 Block diagram for the CPU 1515SP PC

5.3 Electrical configuration

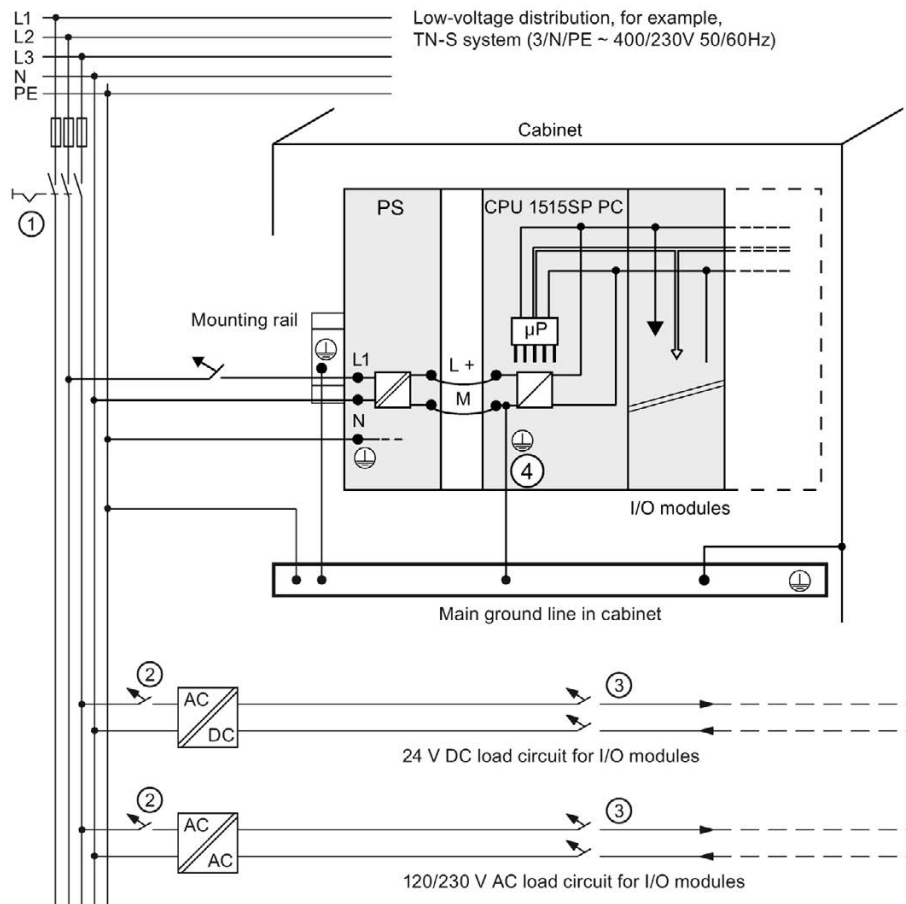
Non-isolated configuration

Note

Unlike the ET 200SP distributed I/O system, the CPU 1515SP PC can only be operated with a non-isolated configuration.

The following figure shows the overall configuration of a CPU 1515SP PC when supplied from a TN-S system. The power supply supplies the CPU 1515SP PC and the load circuit for the 24 V DC modules.

For the CPU 1515SP PC, there is a fixed connection between the ground infeed terminal and the contact springs to the mounting rail. The mounting rail must be grounded separately in the control cabinet.



- ① Master switch
- ② Short-circuit and overload protection
- ③ Load current supply (galvanic isolation)
- ④ This connection is established automatically with the CPU 1515SP PC.

The represented layout of the power connections does not correspond to the actual layout; it was chosen for demonstration purposes only.

Figure 5-2 Connecting the load voltage reference potential

5.4 Connecting devices to networks

The following options are available for integrating devices into existing or planned system environments and networks.

Ethernet

You can use the integrated Ethernet interface X2 PN/IE (LAN) (10/100/1000 Mbps) for communication and data exchange with automation devices, for example, SIMATIC S7.

You need suitable software to do this: STEP 7, WinCC, SIMATIC NET.

Note

Use a Category 5e Ethernet cable (Cat-5e cable) for operation with 1000 Mbps.

PROFINET

PROFINET operation is possible via the X1 PN (LAN) interface and permitted BusAdapter.

PROFIBUS

The connection to PROFIBUS can be made using the DP master module.

5.5 Securing cables

The strain relief for connecting cables prevents the USB cables and PROFINET connectors detaching from the CPU 1515SP PC. The strain relief is included in the scope of delivery.

WARNING
Flying sparks due to loose cables
Risk of explosion in hazardous areas.
USB cables and PROFINET connectors may detach from the device in the case of strong oscillation and high vibrating loads.
Attach these cables to the strain relief of the device using cable ties.

Requirements

- The strain relief is fixed to the CPU.
- The CPU is installed.

Procedure

Secure the USB and PROFINET cables to the strain relief using cable ties.

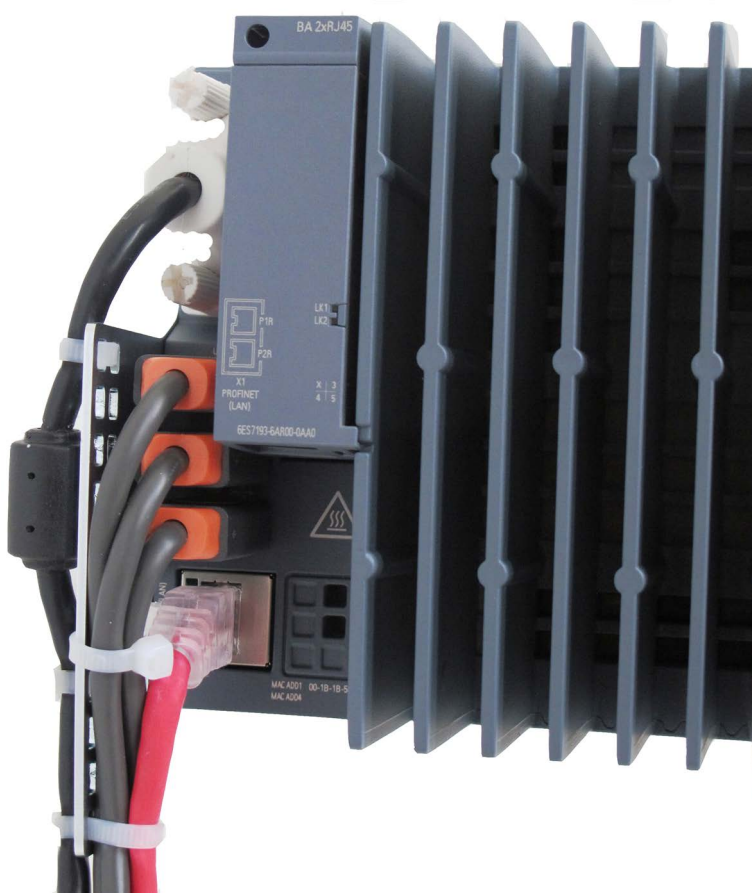


Figure 5-3 Secured cables

Diagnostics, error and system alarm

6.1 Status and error display

LED display

The following figure shows the LEDs of the CPU 1515SP PC.

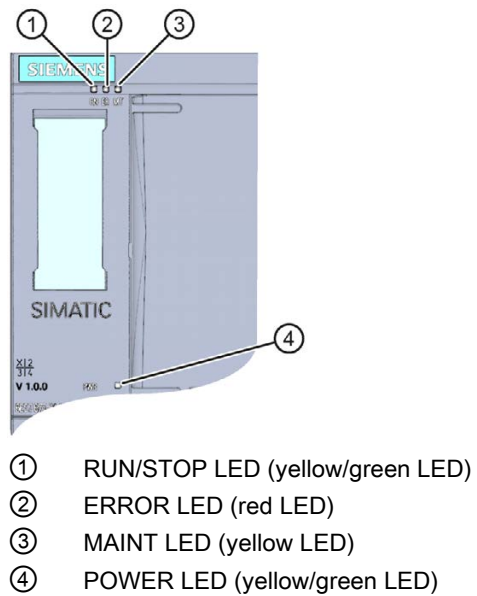


Figure 6-1 LEDs of the CPU 1515SP PC

Meaning of the LED displays with active software controller

The CPU 1515SP PC has three LED displays to indicate the current operating status and the diagnostic status.

The following table shows the meaning of the color combinations of the LED displays in connection with the software controller.

Table 6- 1 Meaning of the LED displays

RUN/STOP LED	ERROR LED	MAINT LED	Meaning
 LED off	 LED off	 LED off	POWER OFF Missing or insufficient supply voltage on the CPU 1515SP PC.
 LED off	 LED flashes red	 LED off	An error has occurred.
 LED green	 LED off	 LED off	Software controller of the CPU 1515SP PC is in the operating state RUN.
 LED green	 LED flashes red	 LED off	A diagnostics event is pending.
 LED green	 LED off	 LED lights up yellow	Maintenance demanded for the plant. The affected hardware must be replaced within a short period of time.
 LED green	 LED off	 LED flashes yellow	Maintenance required for the plant. The affected hardware must be replaced within a reasonable time period.
 LED lights up yellow	 LED off	 LED off	Firmware update successfully completed Software controller of the CPU is in the operating state STOP.
 LED lights up yellow	 LED flashes red	 LED flashes yellow	The user program is causing an error. CPU defective
 LED flashes yellow	 LED off	 LED off	CPU is performing internal activities during STOP, e.g. ramp-up after STOP. Loading the user program
 LED flashes yellow/green	 LED off	 LED off	Startup (transition from RUN → STOP)
 LED flashes yellow/green	 LED flashes red	 LED flashes yellow	Startup (CPU booting) Test of LEDs during startup, inserting a module. LED flashing test

POWER LED

Table 6- 2 POWER LED

POWER LED	Meaning
 LED off	No supply voltage or supply voltage too low
 LED lights up yellow	Supply voltage present; running through BIOS phase; operating system is shut down
 LED green	Supply voltage present; Bootling or operation of the operating system

Commissioning

7.1 Notes on commissioning

WARNING

Improper commissioning in hazardous areas

Device failure or risk of explosion in hazardous areas.

- Do not commission the device unless it is fully mounted and connected according to the specifications in the section Enhanced Write Filter (EWF) (Page 67).
- Before commissioning, please consider the effects on other devices in the plant.

CAUTION

Hot surfaces

Risk of burns due to hot surfaces.

During operation, only touch the device with appropriate protective gloves.

NOTICE

Condensation in the device

Damage to the device due to condensation if the temperature between transport or storage and the installation site differs by more than 20 °C (36 °F).

Before commissioning the device, leave it to stand for several hours in the new environment.

NOTICE

Data loss

Data loss may occur if write filters are used incorrectly.

Therefore, note the information on write filters.

Two write filters are available for configuration under Windows Embedded:

- Enhanced Write Filter (Page 67)
- File Based Write Filter (Page 71)

7.2 Initial commissioning

When first starting up your CPU 1515SP PC, passwords, IP addresses and some basic settings are queried.

Then, the operating system which is pre-installed on the CFast card is set up automatically on the device.

Note

Initial commissioning is not possible with a Multitouch panel, because the Multitouch drivers are not available until after the installation of the operating system.

Requirements

- The CPU 1515SP PC is installed.
- The CFast card is inserted.
- No data carriers are connected via USB.
- The following hardware is available: A monitor, a USB keyboard, a USB mouse

Procedure

NOTICE
Faulty installation If you change the default values in the BIOS setup or switch off the device during the installation process, the installation is faulty and the operating system is not installed properly. The operational reliability of the device and the plant is compromised. Do not switch off the device at any time during the installation process. Do not change the default values in the BIOS setup.

1. Connect a monitor using a DVI-I cable.
2. Connect a keyboard and a mouse to the CPU via USB.
3. Connect the power supply.
 - The PWR LED lights up yellow first, then green.
 - The device carries out the hardware initialization.
4. Wait until the Siemens logo disappears from the screen.
5. Follow the instructions on the screen to configure the device

Note

Restart the device after the operating system has been set up.

Result

- The WES7 operating system is installed.
- WES7 P: The Multitouch functions are available.
- The operating system's start screen is displayed after each startup.
- A login window appears if a password was entered during the initial commissioning.

Screen resolution

Under Windows Embedded Standard 7, the values transmitted from the monitor are set for the screen resolution.

7.3 Installing license keys

Licensing the software

The S7-1500 software controller and WinCC RT Advanced require product-specific license keys. These can be found on the supplied USB stick.

Before commissioning, the license keys must be installed using the *Automation License Manager (ALM)*.

Perform the licensing directly via the CPU 1515SP PC.

Requirements

- Initial commissioning was successfully completed.
- Windows Embedded Standard 7 has started.
- The extended write filter **EFW must be deactivated** on the CPU 1515SP PC.

Installing License keys with local configuration

The *Automation License Manager* is pre-installed on the CPU 1515SP PC.

The software can be opened using the desktop icon or a menu command.

1. In the Windows Start bar, select **Start > Programs > Siemens Automation > Automation License Manager**.
2. Follow the instructions of the *Automation License Manager*.

Using a programming device/PC to install the license keys

The *Automation License Manager* is pre-installed on a programming device/PC with STEP 7 and the CPU 1515SP PC.

1. Connect the CPU 1515SP PC to a programming device/PC.
2. Connect the supplied USB stick to the programming device/PC.
3. Select the menu command **Start > SIMATIC > License Management > Automation License Manager**.
4. Select the **Edit > Connect Computer** menu command and type in the IP address of the CPU 1515SP PC (default 192.168.1.1).
5. Drag the license keys from the USB stick to the system partition C: of the CPU 1515SP PC.

Saving and securing license keys in the case of restore and repair

Note

Loss of license keys

A SIMATIC license key cannot be copied or duplicated. No more license key copies exist on the USB stick once you have dragged the license keys from the USB stick to the CPU 1515SP PC.

Secure your purchased license keys **before** restoring the delivery state (Restore) or in the case of repair. To do this, move the license keys to a USB stick and keep this stick in a safe place.

If an error occurs on your license keys on the CPU 1515SP PC, contact your Siemens representative. Make sure to have the "Certificate of License" (CoL) to hand.

Note

The EWF (Page 67) write filter serves to protect your license keys and your configuration.

Reference

For additional information on licenses, refer to the *Automation License Manager* manual. This can be found on the CPU 1515SP PC under **Start > All Programs > Siemens Automation > Documentation** and on the Internet (<http://support.automation.siemens.com/WW/view/fr/56956174>).

7.4 Windows Security Center

Warning from the Windows Security Center

A warning from the Windows Security Center appears when you first switch on your device. The Security Center checks the status of the device regarding the three important security aspects listed below. If a problem is detected, the Security Center provides recommendations on how you can better protect the device.

- **Firewall:** The Windows firewall contributes to protecting the device by preventing non-authorized users from accessing the device via a network or the Internet. Windows checks whether the device is protected by a software firewall. In the delivery state, the firewall is enabled.
- **Antivirus software:** Antivirus programs contribute to protecting the device against viruses and other security threats. Windows checks whether a comprehensive, up-to-date antivirus program is used on the device. In the delivery state, no antivirus software is installed.
- **Automatic updates:** With the help of automatic updates, Windows can routinely check for the latest major updates for the device and install these automatically. In the delivery state, this option is disabled.

Configure the Security Center to suit your requirements.

7.5 Switching on/off the CPU 1515SP PC

Requirements

Initial commissioning was successfully completed.

Switching on the CPU 1515SP PC

1. Switch on the power supply of the CPU.
 - The Boot Manager GRUB4DOS opens.
2. Select the mode in which the CPU 1515SP PC is to start:
 - Only with the Windows operating system.
 - With the Windows operating system and the S7-1500 software controller (default).

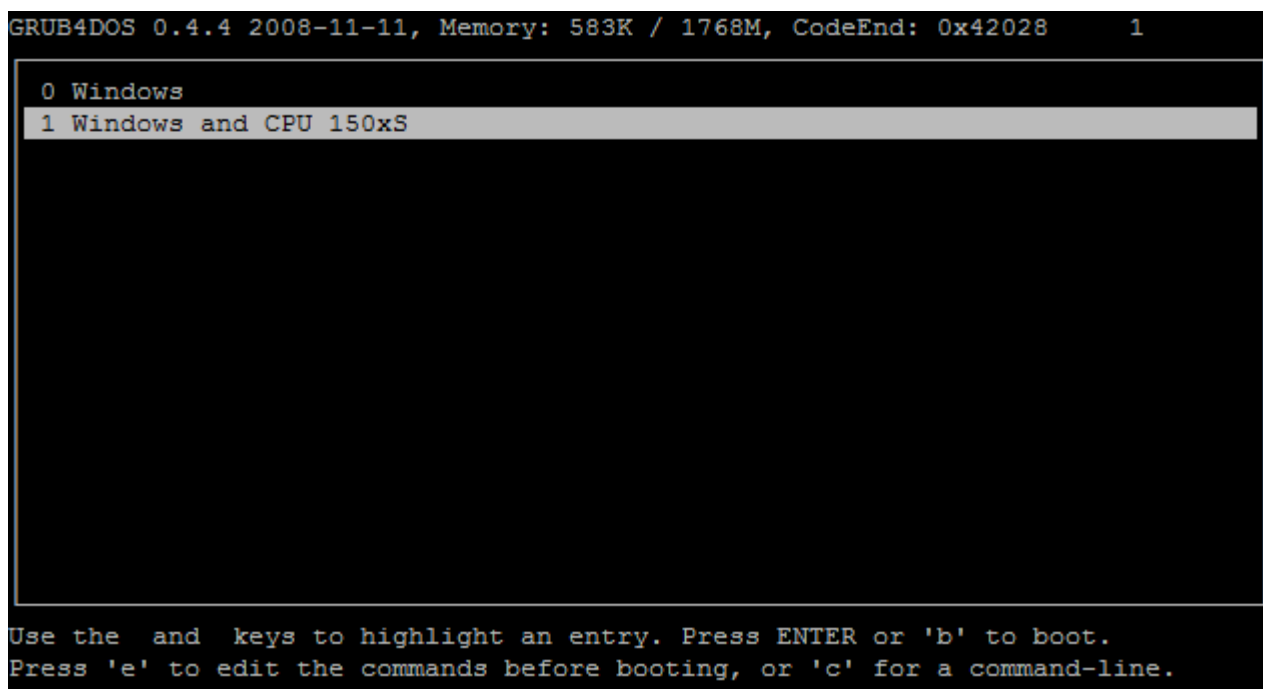


Figure 7-1 Boot Manager GRUB4DOS

Switching off the CPU 1515SP PC

Use the **Start > Shut down** Windows function to switch off.

→ The PWR LED changes from green to yellow.

→ The Windows function shuts down the Windows operating system and the S7-1500 software controller.

If you do not intend to use the device for a long period after the shutdown, disconnect it from the power supply.

Functions

8.1 Monitoring functions

Introduction

The CPU 1515SP PC features monitoring functions that can be used with the corresponding software. The following display, monitoring and control functions are available.

- Temperature monitoring
- Monitoring of drives with SMART functionality
- Operating hours counter (information on the total runtime)

SIMATIC IPC DiagBase

The SIMATIC IPC DiagBase software is included in the scope of delivery of the CPU 1515SP PC.

With the SIMATIC IPC DiagBase software, you use the functions for local monitoring. Use the DiagBase Management Explorer application to obtain a clearer overview for monitoring. The DiagBase Alarm Manager notifies you of individual alarms.

Note

For additional information, refer to the online help for the SIMATIC IPC DiagBase software.

SIMATIC IPC DiagMonitor

The SIMATIC IPC DiagMonitor software is provided on a CD.

The diagnostics and alarm software is used for early detection and reporting of potential system failures. The software is also used for remote diagnostics.

The software contains:

- The software for the stations to be monitored
- A library for creating your own applications

Temperature monitoring

Three temperature sensors monitor the temperature at different locations of the CPU 1515SP PC:

- Processor temperature
- Temperature in the vicinity of the RAM ICs/blocks
- Temperature of the basic module

If one of the temperature values exceeds the set temperature threshold, a temperature error is triggered which activates the IPC DiagBase or IPC DiagMonitor software.

The temperature error remains stored until the temperatures fall below the temperature threshold again and it is reset using one of the following measures:

- Acknowledgment of the error message by the monitoring software
- Restart of the device

8.2 Retentive memory NVRAM

Retentive memory is non-volatile memory for saving a limited quantity of data in the event of power failure.

The data defined as retentive is stored in retentive memory. This data is retained beyond a power-off or power failure.

A corresponding function is implemented in the S7-1500 software controller to allow NVRAM to be used there. This saves up to 183.5 KB of data in non-volatile data memory in the case of power failure. This function can be set on the engineering station in the TIA Portal.

8.3 BIOS description

8.3.1 Introduction

BIOS setup

The BIOS setup is located in the BIOS ROM. The information on the system configuration is stored in the memory of the CPU 1515SP PC.

Using the Setup, you can set the following:

- The hardware configuration, for example, drive type
- The system properties
- time and date

Note

The American keyboard layout applies in the BIOS.

Changing the device configuration

The device configuration is preset for working with the supplied software.

Only change the set values if you have made technical changes to your device.

8.3.2 Starting BIOS setup

Start the setup program as follows:

1. Disconnect the device from the power supply and switch it on again (cold restart).

With the CPU 1515SP PC default settings, the following screen appears after the device has been switched on:



Figure 8-1 BIOS setup

After completion of the startup test, you have the option of starting the SETUP program.

The following BIOS message appears:

Press F2 go to Setup Utility

Press F12 go to Boot Manager

2. Press the <F2> button while the message is on the screen.

8.3.3 BIOS setup menus

Overview of BIOS setup

The menus and submenus are shown on the following pages.

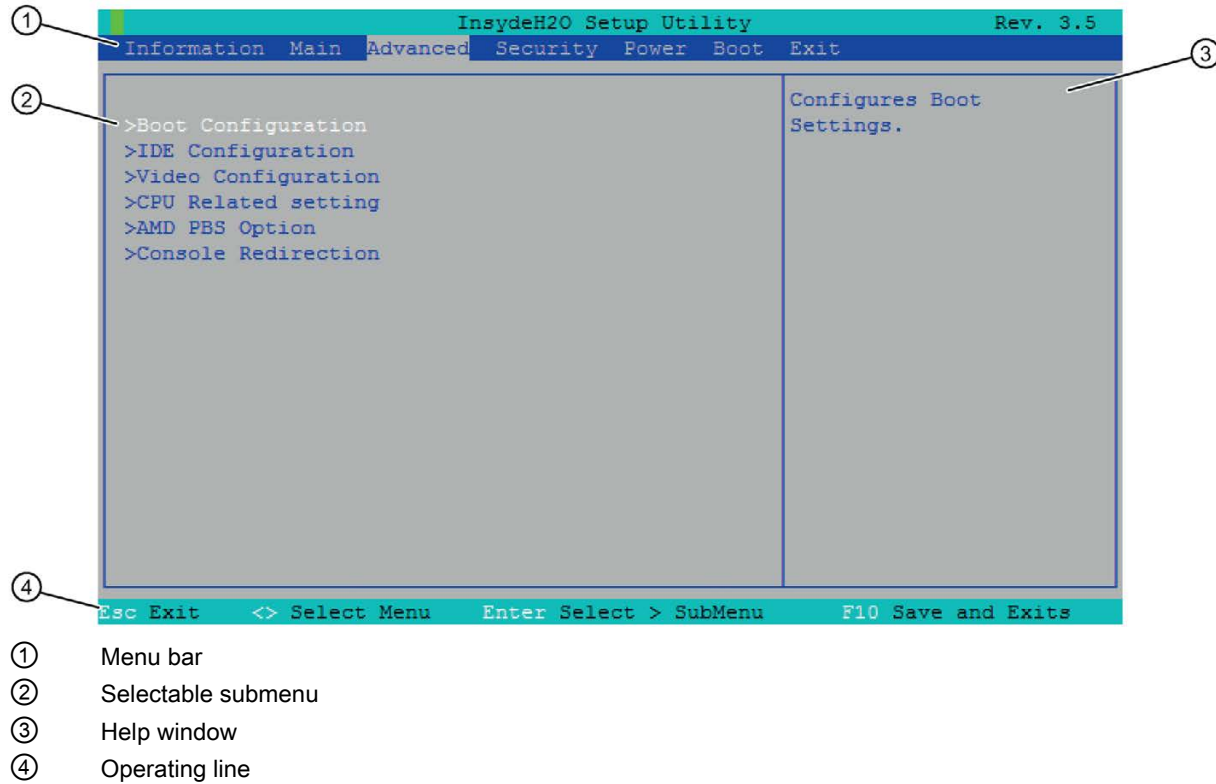


Figure 8-2 Structure of the BIOS setup menus

Menu structure

In the menu bar ①, you can select between the following menu forms:
[Information] [Main] [Advanced] [Security] [Power] [Boot] [Exit].

In the main window ②, various settings are displayed or submenus selected.

In the Help window ③ of the respective menu, you can find information on the selected setup entry.

The operating line ④ contains notes on operation.

You can use the cursor keys [←] left and [→] right to switch between the menu forms.

Menu	Meaning
Information	Device-specific information, for example, product version
Main	Setting system functions
Advanced	Advanced system configuration
Security	Safety functions, for example, setting a password
Power	Determining the switch-on behavior of the device
Boot	Determining boot options, such as boot priority
Exit	Exiting and saving

8.3.3.1 Information menu

This menu shows the versions of the device-specific functions.

Keep this information at hand for Customer Support when you have technical questions regarding your system.

Example

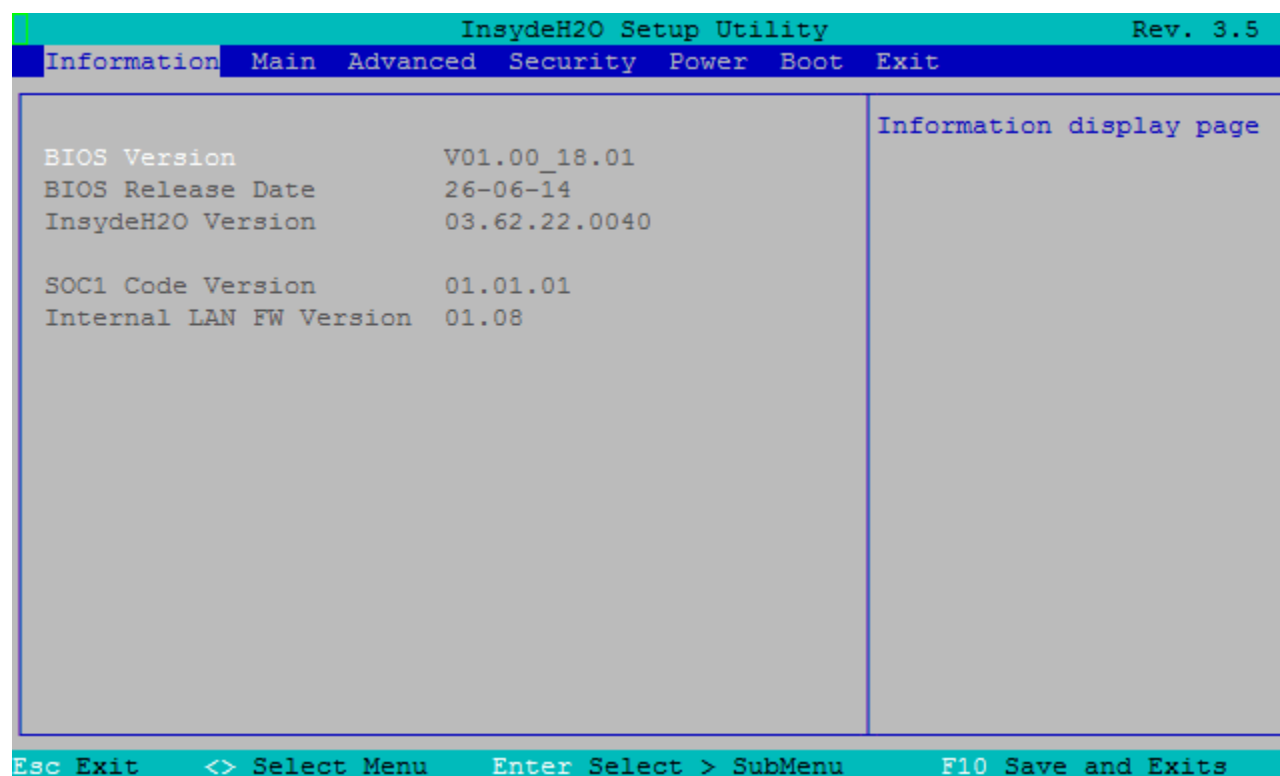


Figure 8-3 Information menu

8.3.3.2 Main menu

Settings in the Main menu

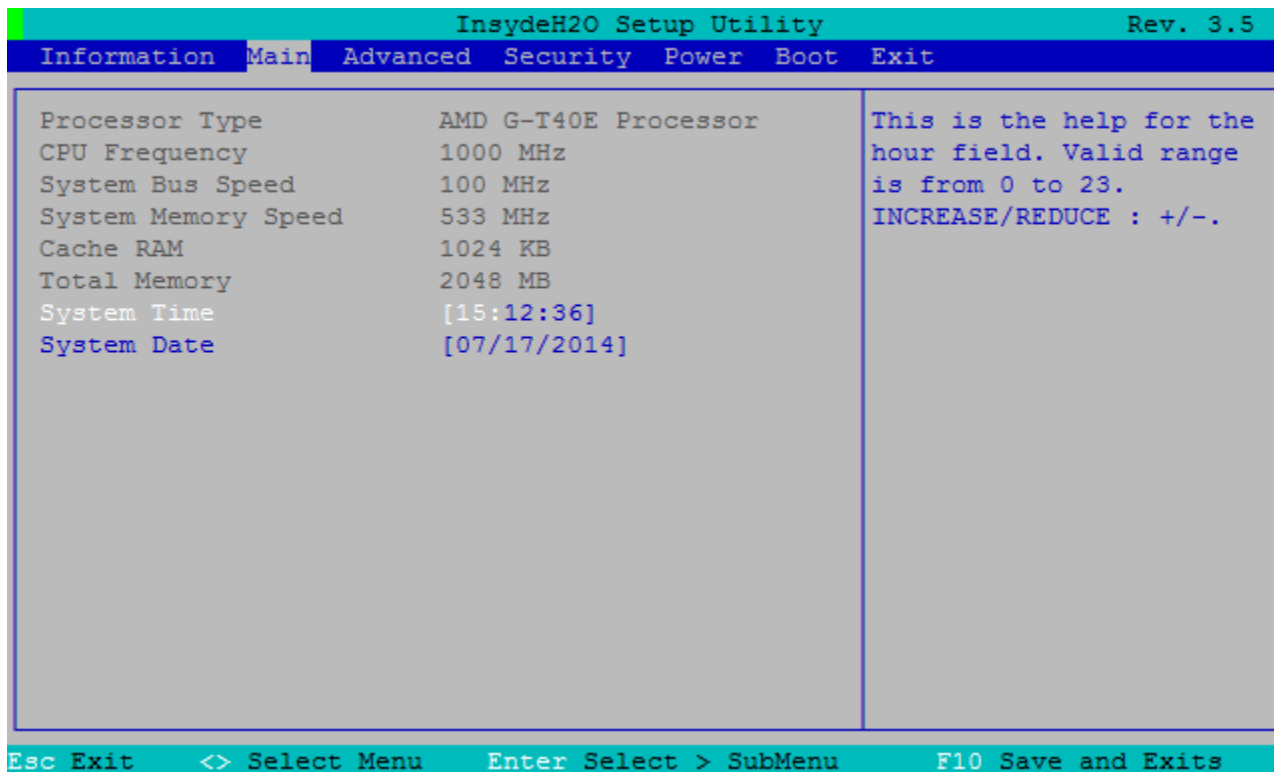


Figure 8-4 Main menu

In the Main menu, you can use the [↑] up and [↓] down arrow keys to select between the following system setting fields:

Array	Meaning
System Time	Displaying and setting the current time
System Date	Displaying and setting the current calendar date

System Time and System Date

System Time and System Date show the current values. After you have selected the corresponding field, you can change the following settings, one after the other, using the [+] and [-] keys:

- For the time of day: Hour: Minute: Second
- For the date: Month/day/year.

You can use the <ENTER> key to switch between the entries within the Date and Time fields (e.g., from hour to minute).

8.3.3.3 Advanced menu

Settings in the Advanced menu

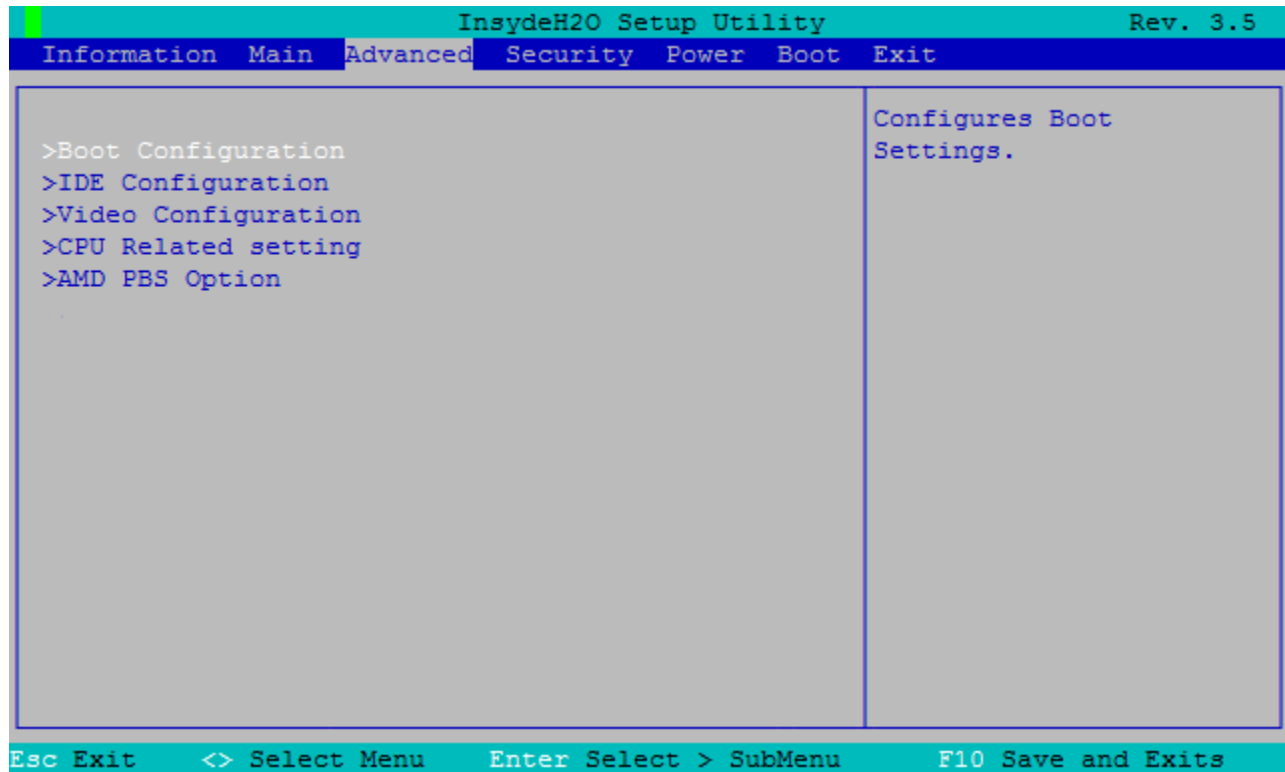


Figure 8-5 Advanced menu

Entry	Meaning
Boot Configuration	Configuring the boot settings
IDE Configuration	Configuring the devices
Video Configuration	Configuring the graphics parameters
CPU Related setting	Configuring CPU parameters
AMD PBS Option	Configuring interfaces

"IDE Configuration" submenu

Entry	Meaning
SATA configure as	Setting the SATA configuration type: IDE, LEGACY IDE, AHCI
Serial ATA Port 0	Serial ATA Port 0 device configuration

"Video Configuration" submenu

Entry	Meaning
UMA Sharing Memory Size (256 MB)	Setting the size of the work memory for the graphics processor. (Unified Memory Architecture; also Shared Memory)

"CPU Related setting" submenu

Entry	Meaning
SVM support	Enabling (Enabled) or disabling (Disabled) Secure Virtual Machine functionality .

"AMD PBS Option" submenu

Entry	Meaning
Internal LAN Controller	Integrated Ethernet interface (10/100/1000 Mbps) X2 PN/IE (LAN)
PXE Boot to INT_LAN	Enabling (Enabled) or disabling (Disabled) internal Southbridge Network Controller.

8.3.3.4 Security menu

Settings in the Security menu

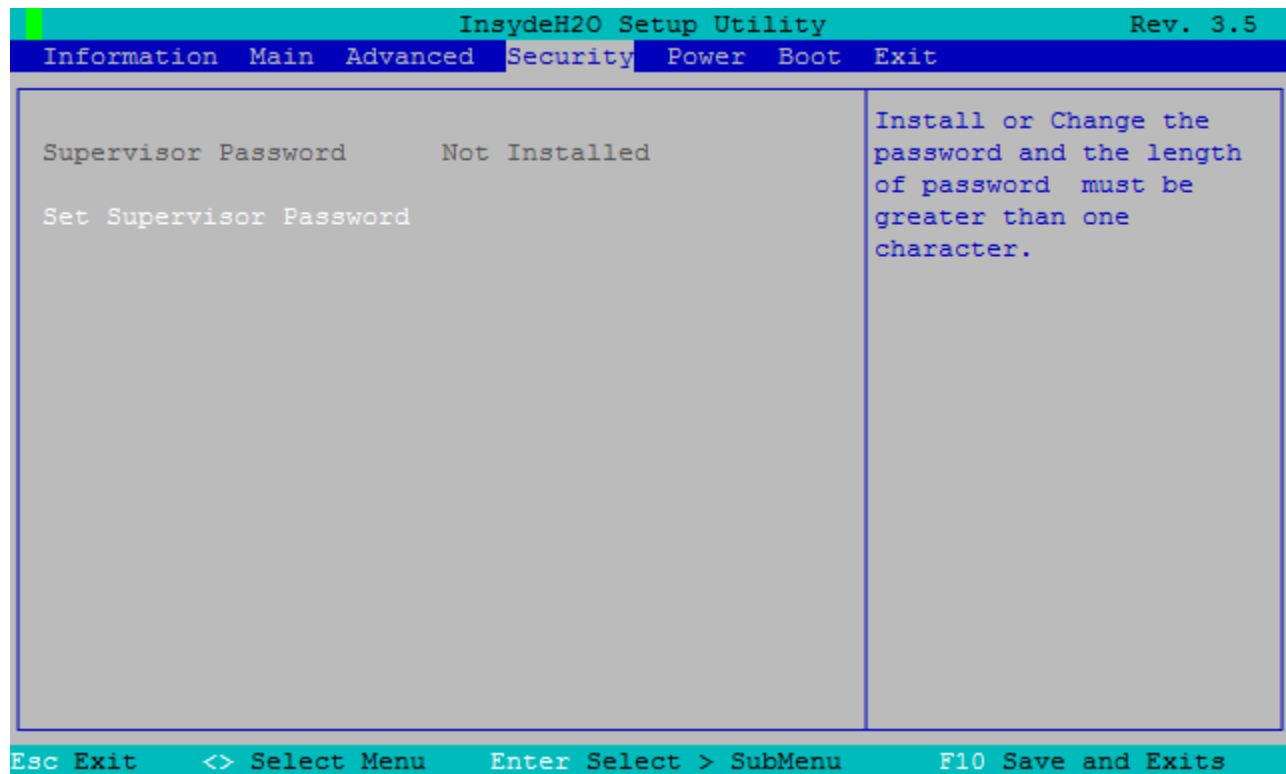


Figure 8-6 Security menu

You can assign a password to protect the CPU 1515SP PC against unauthorized access.

Supervisor Password	Installed	Specific setup fields, including the Supervisor password, can be modified by the user.
	Not installed	Password is disabled.
Set Supervisor Password	This field opens the password entry dialog box. Once a password has been entered, it can be changed by entering a new password or deleted and thereby disabled using the <Return> key.	

Note**Overwriting of the Supervisor password during a BIOS update**

A BIOS update overwrites the password.

After a BIOS update, set up the password again.

8.3.3.5 Power menu

Settings in the Power menu

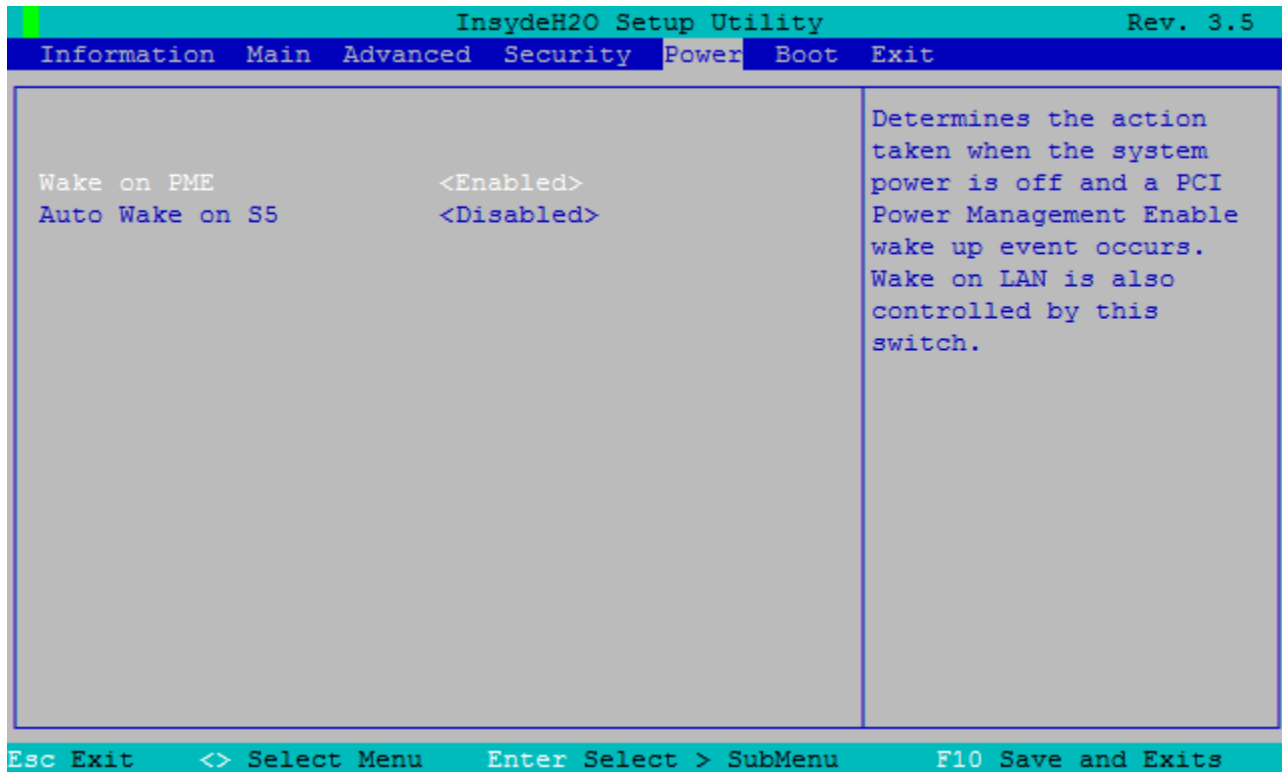


Figure 8-7 Power menu

The device response after a power failure and after a Wake Event is determined in the Power menu.

Entry	Meaning
Wake on PME	When activated (Enabled), the device switches itself on when a Power Management Event occurs. Otherwise, the device remains switched off.
Auto Wake on S5	When activated (Enabled), the device switches itself on when a Wake Event occurs. Otherwise, the device remains switched off.

8.3.3.6 Boot menu

Entries in the Boot menu

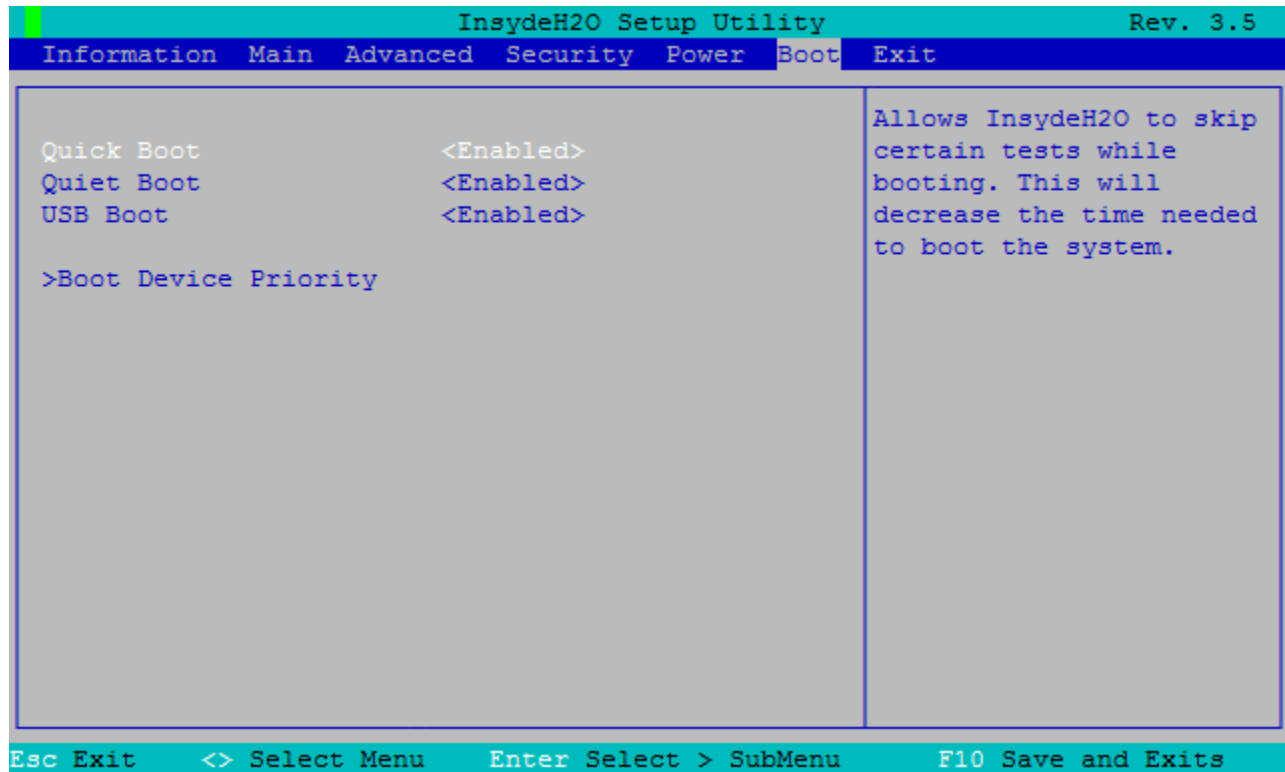


Figure 8-8 Boot menu

In this menu, you define the boot behavior of the device.

Entry	Meaning
Quick Boot	Enabling (Enabled) or disabling (Disabled). The device starts up faster when this option is enabled, because various hardware function tests are skipped.
Quiet Boot	When this option is disabled, the device boots in text mode. When it is enabled, a start screen with logo appears.
USB Boot	Bootting from connected USB devices permitted/not permitted.

Boot menu > submenu "Boot Device Priority"

In this menu, you define the sequence of the boot media.

Entry	Meaning
Normal Boot Menu	Normal = boot sequence by component type Advance = individual boot sequence of all components

Boot Device Priority > submenu "Boot Type Order"

Entry	Meaning
Hard Disk Drive	Setting the boot sequence of the group of drives
USB	Setting the boot sequence of the group of USB drives
Others	Setting the boot sequence of the group Others,, e.g. Remote Boot Device

All connected boot-capable components and their boot position are displayed in this menu. The boot position of the components can be moved freely.

The component at the top (highest boot priority) is used for booting. If the component is not available, the system boots from the next component in the list.

You change the boot sequence as follows:

- Select the boot components using the keys <↑>, <↓>
- Move to the required position using the keys <+>, <->

Note

During the boot operation, you can start the Boot Manager with the <F12> key. The Boot Manager displays all available boot components and boots from the device selected by the user.

"Normal Boot Menu > Advance" setting

In the "Advance" setting, boot-capable components that are disconnected and reconnected by the CPU 1515SP PC between the boot processes are set to the top position by the BIOS.

Boot Device Priority > submenu "Hard Disk Drive"

The size of the CFast card is displayed in this menu.

8.3.3.7 Exit menu

Settings in the Exit menu

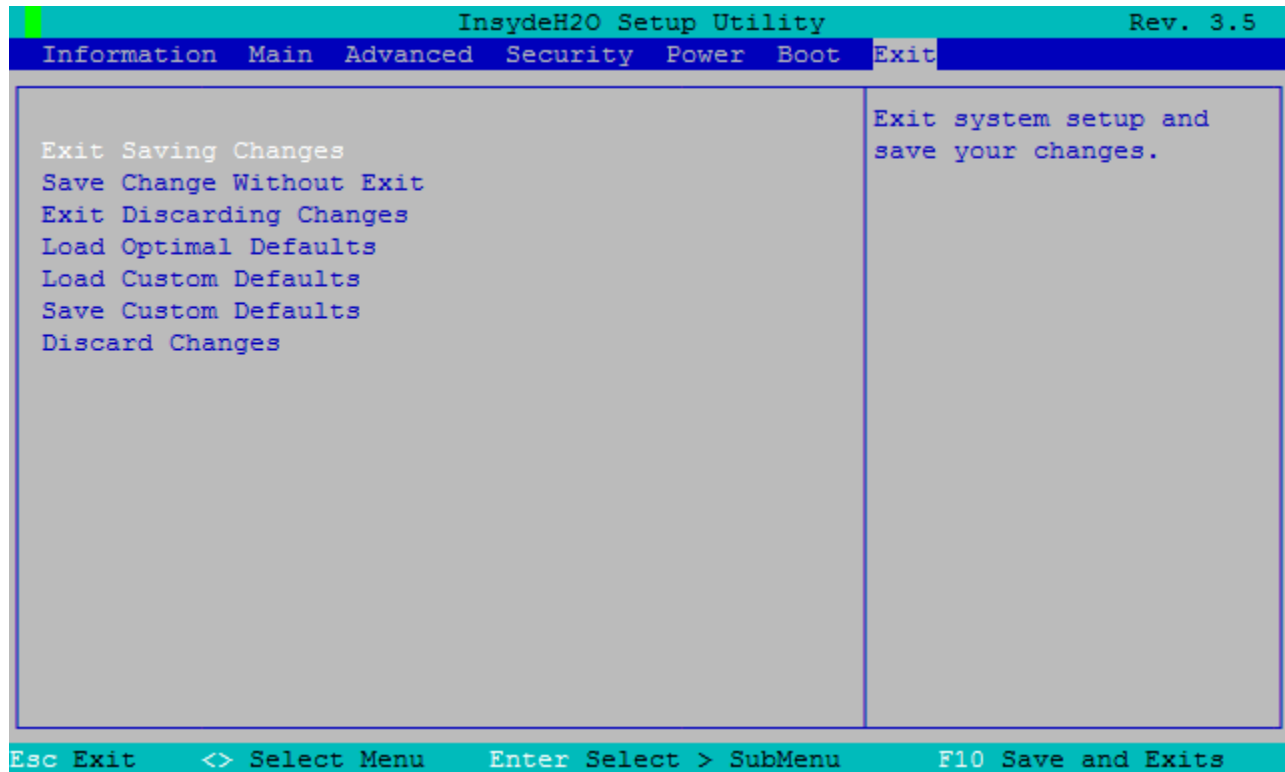


Figure 8-9 Exit menu

The setup program is always terminated via the Exit menu.

The menu is used to save or discard the changes made.

Entry	Meaning
Exit Saving Changes	All changes are saved; then, the system is restarted with the new parameters.
Save Change Without Exit	All changes are saved.
Exit Discarding Changes	All changes are discarded and then executed with the old parameters when the system is restarted.
Load Optimal Defaults	Loading optimum default values
Load Custom Defaults	Loading default values
Safe Custom Defaults	Saving default values
Discard Changes	All changes are discarded.

8.3.4 BIOS setup default settings

Documenting the device configuration

If you make changes to the default setting of the BIOS setup, enter these in the table below. This will ensure that values you set will be readily available if hardware changes are made later.

We recommend that you print out the table below and keep it in a safe place after you have made your entries.

Note

The default settings in the BIOS setup depend on the ordered device configuration.

BIOS setup default settings

Menu	System parameters	Default settings	User settings
Main	System Time	hh:mm:ss	
	System Date	MM/TT/JJJJ	
Advanced > IDE Configuration	SATA configure as	LEGACY IDE	
	Serial ATA Port 0	SIMATIC IPC CFast 8/16	
Advanced > Video Configuration	UMA Sharing Memory Size	256 MB	
Advanced > CPU Related setting	SVM Support	Enabled	
Advanced > AMD PBS Option	Internal LAN Controller	Auto	
	PXE Boot to INT_LAN	Disabled	
Security	Supervisor Password	Not installed	
	Set Supervisor Password	Inactive (no password assigned)	
Power	Wake on PME	Enabled	
	Auto Wake on S5	Disabled	
Boot	Quick Boot	Enabled	
	Quiet Boot	Disabled	
	USB Boot	Disabled	
Boot > Boot Device Priority > Normal Boot Menu	Normal Advance	Normal	
Boot > Boot Device Priority	Boot Type Order	Hard Disk Drive	
		USB	
		Others	
	Hard Disk Drive	SIMATIC IPC CFast 8/16 GByte	

Menu	System parameters	Default settings	User settings
Exit	Exit Saving Change	Standard	
	Save Change Without Exit		
	Exit Discarding Changes		
	Load Optimal Defaults		
	Load Custom Defaults		
	Safe Custom Defaults		
	Discard Changes		

8.3.5 BIOS update

With the SIMATIC IPC DiagBase software (included in scope of delivery), you can perform the following actions:

- Perform a BIOS update.
- Saving and updating the current BIOS version.
- Saving the BIOS settings or loading them from another backup.

For additional information, refer to the online help for the SIMATIC IPC DiagBase software.

Requirements

- The S7-1500 software controller CPU 1505S must be in STOP mode.
- The CPU 1515SP PC must be started in Windows mode.

NOTICE

Malfunctions in the software controllers due to critical actions

If a BIOS update is performed during CPU 1505S operation, malfunctions may occur in the software controller, such as communication breakdowns and failures.

During operation of the CPU 1505S, do not perform a BIOS update or other actions that place an extremely high demand on the hardware.

Before a BIOS update, switch the CPU 1505S to STOP.

Performing a BIOS update

1. Start the CPU 1515SP PC in the GRUB menu in **Windows mode** (see figure (Page 47)).
 - The PWR LED lights up yellow first, then green.
 - The device carries out the hardware initialization.
2. Follow the BIOS update steps described in the help for SIMATIC IPC DiagBase.
 - The update is performed.
 - You are prompted to restart the device.
3. Use the **Start > Shut down** Windows function to switch off the CPU 1515SP PC.
 - The PWR LED lights up green first, then yellow.
 - The Windows function closes the Windows operating system and the software controller.
4. Switch off the supply voltage on the CPU 1515SP PC.
5. Connect the power supply.
6. Wait until the Siemens logo disappears.
 - The CPU 1515SP PC restarts.

NOTICE

Overwriting of the Supervisor password during a BIOS update

A BIOS update overwrites the password.

After a BIOS update, set up the password again in the Security menu under "Set Supervisor Password".

8.4 Power options

A power plan with the name SIMATIC is set as default on the CPU 1515SP PC. This ensures that the CPU does not deviate from its maximum clock rate in order not to endanger the real-time capability of the software controller.

8.5 Protective functions for data carriers

NOTICE
Data loss The number of write cycles on CFast cards is limited due to technical reasons. To prevent data loss, the CFast card must therefore be provided with special protection. Use a write filter to extend the life of the CFast card and to avoid a possible failure of the CPU 1515SP PC.

Write filters

Two write filters are available for Windows Embedded:

- To protect an entire partition of the CFast card, use the Enhanced Write Filter EWF (Page 67).
Unlike the FBWF, the EWF can also be used for compressed NTFS file system.
- Use the File-Based Write Filter FBWF (Page 71) to update specific files dynamically.
The FBWF can be configured more flexibly and allows direct write access without restart.

NOTICE
Data loss If both write filters are activated, the EWF blocks direct write access of the FBWF. Data is lost after a restart of the CPU 1515SP PC. Activate only one of the two write filters per partition.

8.5.1 Enhanced Write Filter (EWF)

Purpose and function

The Enhanced Write Filter (EWF) allows you to write-protect individual partitions.

EWF is activated by default on the CPU 1515SP PC.

The EWF is activated by means of the pre-installed SIMATIC IPC EWF Manager or the Windows console application ewfmgr.exe.

SIMATIC IPC EWF Manager

Start the software via **Start > All Programs > Siemens Automation > SIMATIC > EWF Manager**.

In the status bar, you can use the SIMATIC IPC EWF Manager icon to check whether the EWF is active.

Table 8- 1 Meaning of the icons

Icons	Meaning
	The partition is protected by the EWF.
	The EWF is deactivated for this partition.
	The EWF is currently switched off, but will be activated after the restart.
	The EWF is currently active, but will be deactivated after the restart.
	The filter is active. A Commit command is executed before the next reboot.
	The filter is currently active, but will be deactivated after the restart. A Commit command will also be executed before the next reboot.

The operating instructions for the SIMATIC Industrial PC: IPC EWF Manager (<http://support.automation.siemens.com/WW/view/en/50867677>) is located on the CPU 1515SP PC in **Start > All Programs > Siemens Automation > Documents > Manuals**.

Console application ewfmgr.exe

The application is called via the Windows command line (Command Prompt).

The following functions are available, among others, for setting, switching on and switching off the EWF:

Table 8- 2 Enhanced Write Filter functions

Function	Command
Write-protect drive C: Switching on	<code>ewfmgr c: -enable</code>
Write-protect drive C: disable (modified data is accepted)	<code>ewfmgr c: -commitanddisable</code>
Modified files on drive C: Accept	<code>ewfmgr c: -commit</code>
Display information about the EWF drive	<code>ewfmgr c:</code>
Display help	<code>ewfmgr /h</code>

Note

The EWF commands for write protection become effective only after a restart.

Note

The EWF command `ewfmgr c: -commitanddisable` must not be used with the option `-Live`.

Special features when using the EWF

NOTICE
Data loss upon power failure and upon shutdown/restart
If the EWF is active, all changes made on the C drive are lost after power failure and on shutdown/restart.
Use an UPS to prevent data losses after power failure.

Back up the data in the EWF RAM Overlay to the CFast card before shutting down the CPU 1515SP PC. In the command line, enter the following commands:

```
ewfmgr c: -commit
```

Restart the device

Or

```
ewfmgr c: -commitanddisable
```

Restart the device

```
ewfmgr c: -enable
```

Restart the device

Note

Data loss

If EWF is active and you decline a restart after having set the `-commitanddisable` or `-commit` option, your data is lost after a power failure!

Note

Disabling automatic daylight saving changes

In systems without central time management and with activated EWF, the time is advanced or set back by one hour in the daylight saving time or standard time period each time the system performs a cold or warm restart, due to the system-specific function for automatic daylight saving changes.

Reason for this behavior: Windows Embedded Standard 7 sets a flag in a registry entry that indicates completion of the conversion to daylight saving time. Since this file is also protected against modification by the EWF, the marker is lost during the boot sequence and the adjustment is made again.

We therefore recommend that you deactivate the automatic adjustment and change the clock manually.

Proceed as follows:

1. Disable the EWF filter (`ewfmgr c: -commitanddisable`) and reboot the system.
 2. Deactivate automatic adjustment in the Control Panel:
Remove the check mark under Start > Control Panel > Date and Time > "Time Zone" tab at "Automatically adjust clock for daylight saving changes".
 3. Save the change (`ewfmgr c: -commit`).
 4. Switch on the EWF again (`ewfmgr c: -commitanddisable`) and reboot the system.
-

8.5.2 File-Based Write Filter (FBWF)

Purpose and function

The FBWF allows you to write-protect specific files and folders of a partition.

FBWF is deactivated by default on the CPU 1515SP PC.

The FBWF is activated by means of the Windows console application fbwfmgr.exe.

NOTICE

Data loss

If both write filters are activated, the EWF blocks direct write access of the FBWF. Data is lost after a restart of the CPU 1515SP PC.

Activate **only one** of the two write filters.

Console application fbwfmgr.exe

The application is called via the Windows command line (Command Prompt).

The following functions, among others, are available for setting, switching on and switching off the FBWF:

Table 8- 3 File-Based Write Filter

Function	Command
Show FBWF status	fbwfmgr /displayconfig
Activate FBWF after the next restart	fbwfmgr /enable
Write to protected files	fbwfmgr /commit c: \<path>\<file name>
Display help	fbwfmgr /?
Defining exclusions:	
• Add file	fbwfmgr /addexclusion c: \<path>\<filename.ext>
• Add folder	fbwfmgr /addexclusion c: \<path>
• Remove file	fbwfmgr /removeexclusion c: \<path>\<filename.ext>
• Remove folder	fbwfmgr /removeexclusion c: \<path>

Note

Note:

- The correct notation is as follows:
Drive letter: space character "\" relative file path
 - The write protection commands become effective only after a restart.
-

Rule for exclusion list

The following sequence applies if you define exclusions for files and folders that do not yet exist:

- Defining exclusions
- Restart CPU 1515SP PC
- Create file/folder

Display of the partition size with activated FBWF

The partition size displayed in the Explorer does not correspond with the actual size when the FBWF is active. The size displayed is derived from the amount of memory occupied on the partition and from memory released by the FBWF. After the maximum size of the overlay was reached, a message is output warning of insufficient space on the partition.

Reference

Additional information on the FBWF can be found on the Internet
([http://msdn.microsoft.com/en-us/library/ff794219\(v=winembedded.60\).aspx](http://msdn.microsoft.com/en-us/library/ff794219(v=winembedded.60).aspx)).

Maintenance

9.1 Backing up and restoring data

Introduction

The operating system and the Runtime software are located on the supplied Restore DVD. You can use this to restore the original software of the CPU 1515SP PC.

You can also create your own image of your CFast card. This includes the operating system, the Runtime software, and the complete project loaded from the TIA Portal.

Save your project to partition D: of the CFast card.

SIMATIC IPC Image & Partition Creator

To back up data in Windows Embedded Standard 7, we recommend the software tool SIMATIC IPC Image & Partition Creator (V3.3 or later). It provides for easy backup and fast restore of the contents of the CFAST card and of individual partitions (images).

Note

The SIMATIC Image & Partition Creator supports the X2 PN/IE (LAN) interface.

You can procure the SIMATIC IPC Image & Partition Creator:

- via the Siemens online ordering system (<http://www.siemens.de/automation/mall>).
- Pre-installed on the SIMATIC IPC Service USB flash drives.

For additional information, please refer to the corresponding product documentation.

SIMATIC IPC Service USB flash drive

You can use the SIMATIC IPC Service USB flash drives for data backup and restore.

You obtain these through the Siemens online ordering system (<http://www.siemens.de/automation/mall>).

9.2 Partitioning data carriers

Partitioning the CFast card

The following partitions are set up on the CFast card by default:

Partition	Name	8 GB CFast card (WES7 E 32Bit)	16 GB CFast card (WES7 P 64Bit)	File system
C:	SYSTEM	6150 MB	10240 MB	NTFS
D:	DATA	Rest	Rest	NTFS
-	-	400 MB	400 MB	RAW

Note

Partitions in Windows Embedded Standard 7

The partitions need to be set again if they are faulty or if the partitioning is to be changed.

NOTICE
CPU volume for software controller (400 MB RAW) Do not change the CPU volume for software controllers. This is the only way to ensure that the software controller continues to operate without error.

9.3 Restoring the delivery state

Introduction

The entire image of your operating system and your Runtime software are located on the supplied Restore DVD. You can use the SIMATIC restore menu to restore the original software of the CPU 1515SP PC.

Alternatively, you can use the Restore menu to create a bootable USB stick in order to restore the original software without a DVD-ROM drive. Refer to the section Restoring delivery state using USB stick (Page 78).

Note

Restoring existing system partition

If your projects are stored on partition D: you can use the option "Restore existing system partition" to restore partition C: with the operating system and the Runtime software, without your project data being affected.

Note

Using Multitouch panels

The restoration of the original software is not possible with a Multitouch panel, because the Multitouch driver is not available until after the installation of the operating system.

Requirements

To restore the original software of the CPU 1515SP PC, the following is required:

- A CFast card. Minimum size of the CFast card for the CPU 1515SP PC:
 - WES7 E 32Bit 2GB RAM: 8 GB
 - WES7 P 64Bit 4GB RAM: 16 GB
- A DVD drive with external power supply
- The supplied Restore DVD. Alternatively, a bootable USB stick
- A data backup

NOTICE
Data loss During restoration of the system to delivery state, the CFast card is completely erased and re-formatted, and is then loaded with the original software. All subsequently modified or added data, programs, license keys and partitions on the CFast card will be lost. Back up the data of the CPU 1515SP PC after you have assigned the parameters for the modules and if you are making changes to the configuration.

NOTICE
Loss of license keys Back up the license keys before the restore by dragging these to your USB stick via <i>Automation License Manager</i> . After the restart of the CPU 1515SP PC, re-install the license keys on the device via <i>Automation License Manager</i> .

Restoring the delivery state of the CPU 1515SP PC using the Restore DVD

Before the restore

1. Switch off the power supply of the CPU.
2. Remove all USB devices from the CPU.
3. Connect a DVD drive with restore DVD to a USB interface of the CPU.
4. Switch on the power supply of the CPU.
 - The CPU is started.
5. Press <F12> to start the Boot Manager.
6. Select the list entry for the DVD drive in the Boot Manager.
7. After the prompt, confirm the start by pressing any key.
 - The loading process is displayed (Windows logo).
 - The SIMATIC Restore menu opens.
 - Select a language.
 - Select "CPU1515SP PC" or "CPU1515SP PC + HMI".
 - Select the option "Completely restore system drive".
 - The original software is restored on Partition C:, Partition D: is deleted.

After the restore

1. Exit the Restore menu.
2. Remove all USB devices.
3. Proceed as described in Initial commissioning (Page 43).

Further procedure

- Reconnect the USB devices.
- Install the license keys.

9.4 Restoring delivery state using USB stick

Introduction

Alternatively, you can use the Restore menu to create a bootable USB stick in order to restore the original software of the CPU 1515SP PC without a DVD-ROM drive.

Minimum size of the USB sticks for the CPU 1515SP PC:

- WES7 E 32Bit 2GB RAM: 8 GB
- WES7 P 64Bit 4GB RAM: 16 GB

Preparing bootable USB stick using PC

NOTICE
Data loss If you transfer the data from the Restore-DVD to the USB stick, all existing data on the USB stick is deleted. You should back up the data on the USB stick before you create the Restore USB stick.

Transferring Restore DVD data to the USB stick

1. Place the Restore DVD into the DVD drive of a PC.
2. Double-click the file CD_Menu.exe in the root directory of the DVD.
 - Select a language.
 - Select "CPU1515SP PC" or "CPU1515SP PC + HMI".
 - Select the option " Create USB flash drive".
3. When all the data has been transferred, remove the Restore USB stick safely from the PC.

Restoring delivery state using USB stick

Before the restore

1. Switch off the power supply of the CPU.
2. Remove all USB devices from the CPU.
3. Connect the Restore USB stick directly to the CPU.
4. Switch on the power supply of the CPU.
 - The CPU is started.
 - The restore process starts.
5. Press <F12> to start the Boot Manager.
6. Select the list entry for the USB stick as boot medium in the Boot Manager.
7. After the prompt, confirm the start by pressing any key.
 - The loading process is displayed (Windows logo).
 - The SIMATIC Restore menu opens.
 - Select a language.
 - Select "CPU1515SP PC" or "CPU1515SP PC + HMI".
 - Select the option "Restore delivery state".
 - The original software is restored.

After the restore

1. Exit the Restore menu.
2. Remove all USB devices.
3. Proceed as described in Initial commissioning.

9.5 Updating software

Note

When you update software, start the CPU 1515SP PC in the GRUB menu in Windows mode (see figure (Page 47)).

Information on updating software can be found on the Internet (<http://www.siemens.com/automation/service&support>).

HMI devices

During the installation, make sure that you always use the latest drivers for the HMI devices used (SIMATIC Flat Panels).

Before you install a new driver version, you must uninstall the old driver version in order to ensure proper operation.

You can download the current driver software from SIMATIC Product Support.

9.6 Windows Embedded Standard 7

The Windows Embedded Standard 7 operating system is pre-installed on the CPU 1515SP PC. WES7 E 32 Bit and WES7 P 64 Bit are offered, depending on the order option.

The WES7 P version supports multi-touch functionality (gesture control).

You can install additional updates at a later time. Current information on the operating system is available at www.windows.com.

9.7 Sending the device to customer service

Before sending

Note

Back up data and remove memory cards

Before you send in the CPU 1515SP PC for repair:

- Create a backup of your data.
 - Back up your SIMATIC license keys on a USB stick.
 - Remove your SD/MMC cards.
 - Remove your **CFast card**.
-

9.8 Removing and inserting the CFast card

Introduction

The CPU 1515SP PC has a slot for a CFast card. On this card, you will find the operating system, your Runtime software and, after configuration, the project.

Seal the cover for the CFast card to protect the system against unauthorized access.

You must remove the CFast card before you send in the CPU, for example, for repair.

Requirements

- The CPU 1515SP PC is disconnected from the power supply.

Procedure – Removing the CFast card

1. Remove the seal.
2. Open the cover, using a screwdriver if necessary.
3. Press onto the CFast card.
The card is pressed out of the slot.
4. Pull the card out of the slot.
To do this, grip the rib on the underside of the memory card.

Procedure – Inserting the CFast card

1. Open the cover of the slot, using a screwdriver if necessary.
2. Insert the CFast card into the slot.
3. Press the CFast card into the slot.
The CFast card is properly inserted if the cover can be closed without any resistance.
4. Close the cover.

NOTICE
Unauthorized access
Seal the cover to protect the CFast card with the operating system of the CPU 1515SP PC from unauthorized access.

Technical data

10.1 Standards and approvals

Introduction

The general technical specifications cover the following:

- The standards and test values that the CPU 1515SP PC complies with and fulfills.
- The test criteria according to which the CPU 1515SP PC was tested.

Currently valid markings and approvals

Note

The currently valid markings and approvals are printed on the CPU 1515SP PC.

Safety information

** WARNING****Risk of personal injury and damage to property.**

In hazardous atmospheres, injury to persons and material damage may occur if you disconnect plug-in connections during operation of an ET 200SP.

Always switch off the power to the ET 200SP when disconnecting plug-in connections in hazardous atmospheres.

** WARNING****Flying sparks due to loose cables**

Risk of explosion in hazardous areas.

USB cables and PROFINET connectors may detach from the device in the case of strong oscillation and high vibrating loads.

Attach these cables to the strain relief of the device using cable ties.

 WARNING

Explosion hazard

If you replace components, compliance with Class I, DIV. 2 could be compromised.

 WARNING

Area of application

This device is only suitable for use in Class I, Div. 2, Group A, B, C, D, or in non-hazardous areas.

CE marking



The CPU 1515SP PC meets the requirements and safety objectives of the following EC guidelines and complies with the harmonized European standards (EN) for programmable logic controllers published in the official journals of the European Community:

- 2006/95/EC "Electrical equipment designed for use within certain voltage limits" (Low-Voltage Directive)
- 2004/108/EC "Electromagnetic Compatibility" (EMC Directive)
- 94/9/EC "Equipment and protective systems intended for use in potentially explosive atmospheres" (Explosion Protection Directive)

The EC declarations of conformity are available for the responsible authorities at:

Siemens Aktiengesellschaft
Sektor Industry
I IA AS FA DH AMB
Postfach 1963
D-92209 Amberg, Germany

These are also available for download on the Customer Support Internet pages, keyword "Declaration of Conformity".

cULus approval



Underwriters Laboratories Inc., complying with

- UL 508 (Industrial Control Equipment)
- CSA C22.2 No. 142 (Process Control Equipment)

OR

cULus HAZ. LOC. approval



Underwriters Laboratories Inc., complying with

- UL 508 (Industrial Control Equipment)
- CSA C22.2 No. 142 (Process Control Equipment)
- ANSI/ISA 12.12.01
- CSA C22.2 No. 213 (Hazardous Location)

APPROVED for use in
Class I, Division 2, Group A, B, C, D Tx;
Class I, Zone 2, Group IIC Tx

Installation Instructions for cULus haz.loc.

- WARNING - Explosion Hazard - Do not disconnect while circuit is live unless area is known to be non-hazardous.
- WARNING - Explosion Hazard - Substitution of components may impair suitability for Class I, Division 2 or Zone 2.
- This equipment is suitable for use in Class I, Division 2, Groups A, B, C, D; Class I, Zone 2, Group IIC; or non-hazardous locations.

WARNING: EXPOSURE TO SOME CHEMICALS MAY DEGRADE THE SEALING PROPERTIES OF MATERIALS USED IN THE RELAYS.

FM approval



Factory Mutual Research (FM) according to
Approval Standard Class Number 3611, 3600, 3810 (ANSI/ISA 82.02.01)
CSA C22.2 No. 213
CSA C22.2 No. 61010-1
APPROVED for use in Class I, Division 2, Group A, B, C, D Tx;
Class I, Zone 2, Group IIC Tx

ATEX approval



in accordance with EN 60079-15 (Electrical apparatus for potentially explosive atmospheres; Type of protection "n") and EN 60079-0 (Electrical apparatus for potentially explosive gas atmospheres - Part 0: General Requirements)



II 3 G Ex nA IIC Tx Gc
DEKRA 12ATEX0038X

IECEX approval



According to IEC 60079-15 (Explosive atmospheres - Part 15: Equipment protection by type of protection "n") and IEC 60079-0 (Explosive atmospheres - Part 0: Equipment - General requirements)



Ex nA IIC Tx Gc
IECEX DEK 13.0011X

Marking for Australia and New Zealand



The ET 200SP distributed I/O system meets the requirements of the standard AS/NZS CISPR 16.

Korea Certificate KCC-REM-S49-ET200SP



Note that this device corresponds to limit class A in terms of the emission of radio frequency interference. This device can be used in all areas, except residential areas.

이 기기는 업무용(A급) 전자파 적합기기로서 판매자 또는 사용자는 이 점을 주의하시기
바라며 가정 외의 지역에서 사용하는 것을 목적으로 합니다.

IEC 61131

The CPU 1515SP PC with the S7-1500 software controller CPU 1505S fulfills the requirements and criteria of the IEC 61131-2 standard (programmable logic controllers, Part 2: Equipment requirements and tests).

PROFINET standard

The ET 200SP distributed I/O system is based on IEC 61158 Type 10..

PROFIBUS standard

The ET 200SP distributed I/O system is based on IEC 61158 Type 3.

IO-Link standard

The ET 200SP distributed I/O system is based on IEC 61131-9.

Marine approval (available soon)

Classification societies:

- 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)

Use in industrial environments

SIMATIC products are designed for use in industry.

Table 10- 1 Use in industrial environments

Area of application	Interference emission requirements	Interference immunity requirements
Industry	EN 61000-6-4: 2011	EN 61000-6-2: 2005

Use in residential areas

Note

The ET 200SP is intended for use in industrial areas; use in residential areas may have an impact on radio/TV reception.

If you want to use the ET 200SP in residential areas, you must ensure that its radio frequency interference emission complies with limit class B in accordance with EN 55011.

Suitable measures for achieving RF interference level Class B include, for example:

- Installation of the CPU 1515SP PC in grounded control cabinets/control boxes
- Use of filters in the supply lines

Reference

The certificates for the markings and approvals can be found on the Internet under Service&Support (<http://www.siemens.com/automation/service&support>).

10.2 Electromagnetic compatibility

Definition

Electromagnetic compatibility (EMC) is the ability of an electrical installation to function satisfactorily in its electromagnetic environment without interfering with that environment.

Among other things, the CPU 1515SP PC also meets the requirements of the EMC legislation for the European single market. The prerequisite for this is that the CPU 1515SP PC complies with the requirements and guidelines relating to electrical configuration.

EMC according to NE 21

The CPU 1515SP PC meets the EMC specifications of the NAMUR guideline NE 21.

Pulse-shaped disturbance

The following table shows the electromagnetic compatibility of the CPU 1515SP PC with regard to pulse-shaped disturbances.

Table 10- 2 Pulse-shaped disturbance

Pulse-shaped disturbance	Test voltage	corresponds to degree of severity
Electrostatic discharge according to IEC 61000-4-2.	Air discharge: ± 8 kV Contact discharge: ± 6 kV	3 3
Burst pulses (high-speed transient disturbance) according to IEC 61000-4-4.	2 kV (power supply cable) 2 kV (signal cable > 30 m) 1 kV (signal cable < 30 m)	3 3
High-energy single pulse (surge) according to IEC 61000-4-5 External protective circuit required (see function manual Designing interference-free controllers (http://support.automation.siemens.com/WW/view/en/59193566))		3
• asymmetric coupling	2 kV (power supply cable) DC with protective elements 2 kV (signal cable/data cable only > 30 m), possibly with protective elements	
• symmetric coupling	1 kV (power supply cables) DC with protective elements 1 kV (signal cable/data cable only > 30 m), possibly with protective elements	

Sinusoidal disturbance

The following table shows the electromagnetic compatibility of the CPU 1515SP PC with regard to sinusoidal disturbance variables.

- RF radiation

Table 10- 3 Sinusoidal disturbance variables with RF radiation

RF radiation according to IEC 61000-4-3/NAMUR 21 Electromagnetic RF field, amplitude-modulated		corresponds to degree of severity
80 to 1000 MHz; 1.0 to 2.0 GHz	2.0 GHz to 2.7 GHz	3
10 V/m	3 V/m	
80% AM (1 kHz)		

- RF coupling

Table 10- 4 Sinusoidal disturbance variables with RF coupling

RF coupling according to IEC 61000-4-6	corresponds to degree of severity
(10 kHz) 150 kHz to 80 MHz	3
10 V _{rms} unmodulated	
80% AM (1 kHz)	
150 Ω source impedance	

Emission of radio interference

Interference emission of electromagnetic fields according to EN 55016: Limit class A, group 1 (measured at a distance of 10 m).

Table 10- 5 Interference emission of electromagnetic fields according to EN 55016

Frequency	Emitted interference
30 MHz to 230 MHz	< 40 dB (μV/m)Q
230 MHz to 1000 MHz	< 47 dB (μV/m)Q

Interference emission via the AC power supply according to EN 55016: Limit value class A, Group 1.

Table 10- 6 Interference emission via the AC power supply according to EN 55016

Frequency	Emitted interference
0.15 to 0.5 MHz	<79 dB (μV) Q
	<66 dB (μV) M
0.5 to 30 MHz	<73 dB (μV) Q
	<60 dB (μV) M

10.3 Shipping and storage conditions

Introduction

With respect to shipping and storage conditions, the CPU 1515SP PC exceeds the requirements according to IEC 61131-2. The following statements apply to modules that are transported and/or stored in the original packaging.

Table 10- 7 Shipping and storage conditions for modules

Type of condition	Permissible range
Free fall (in shipping package)	≤ 1 m
Temperature	From -40 °C to +70 °C
Barometric pressure	1080 hPa to 660 hPa (corresponds to an altitude of -1000 m to 3500 m)
Relative humidity	5% to 95%, without condensation
Sinusoidal vibrations according to IEC 60068-2-6	5 - 8.4 Hz: 3.5 mm 8.4 - 500 Hz: 9.8 m/s ²
Shock according to IEC 60068-2-27	250 m/s ² ; 6 ms, 1000 shocks

10.4 Mechanical and climatic ambient conditions

Note

Restrictions

In contrast to the ambient conditions for the ET 200SP distributed I/O system, the following restrictions apply to the CPU 1515SP PC:

- Mechanical ambient conditions:
 - 2 g constant acceleration when BusAdapter BA 2×FC is used
- Ambient temperature:
 - 0 to 60 °C for horizontal installation with maximum 32 I/O modules
 - 0 to 55 °C for horizontal installation with maximum 64 I/O modules
 - 0 to 50 °C for vertical installation with maximum 32 I/O modules

Operating conditions

The CPU 1515SP PC is suitable for use in weather-proof, fixed locations. The operating conditions exceed the requirements according to DIN IEC 60721-3-3:

- Class 3M3 (mechanical requirements)
- Class 3K3 (climatic requirements)

Mechanical ambient conditions

The table below shows the mechanical ambient conditions in the form of sinusoidal oscillations.

Table 10- 8 Mechanical ambient conditions

Frequency band	CPU 1515SP PC
$5 \leq f \leq 8.4 \text{ Hz}$	3.5 mm amplitude
$8.4 \leq f \leq 150 \text{ Hz}$	1 g constant acceleration
$10 \leq f \leq 60 \text{ Hz}$	0.35 mm amplitude
$60 \leq f \leq 1000 \text{ Hz}$	1 g constant acceleration (with BusAdapter BA 2×RJ45) 2 g constant acceleration (with BusAdapter BA 2×FC)

Test of mechanical ambient conditions

The table below provides important information with respect to the type and scope of the test of ambient mechanical conditions.

Table 10- 9 Test of mechanical ambient conditions

Condition tested	Test Standard	Comment
Vibration	Vibration test according to IEC 60068-2-6 (sine)	Type of oscillation: Frequency sweeps with a rate of change of 1 octave/minute. BA 2×RJ45 $5 \text{ Hz} \leq f \leq 8.4 \text{ Hz}$, 3.5 mm constant amplitude $8.4 \text{ Hz} \leq f \leq 150 \text{ Hz}$, 1 g constant acceleration BA 2×FC $10 \text{ Hz} \leq f \leq 60 \text{ Hz}$, 0.35 mm constant amplitude $60 \text{ Hz} \leq f \leq 1000 \text{ Hz}$, 2 g constant acceleration Duration of vibration: 10 frequency sweeps per axis in each of 3 vertically aligned axes
Shock	Shock, tested according to IEC 60068-2-27	Type of shock: Half-sine Shock intensity: 150 m/s^2 peak value, 11 ms duration Direction of shock: 3 shocks in each direction (+/-) at each of 3 vertically aligned axes

Climatic ambient conditions

You may use the CPU 1515SP PC under the following climatic ambient conditions:

Table 10- 10 Climatic ambient conditions

Ambient conditions	Permissible range	Comments
Temperature: Horizontal mounting position:	from 0 to 60 °C	For configuration with 32 I/O modules and 3 x 100 mA USB load
	from 0 to 55 °C	For configuration with 64 I/O modules and 2 x 500 mA + 1 x 100 mA USB load
Vertical installation:	0 to 50 °C	For configuration with 32 I/O modules and 3 x 100 mA USB load
Permitted temperature change	10 K/h	-
Relative humidity	from 10 to 95%	Without condensation, corresponds to relative humidity (RH) class 2 according to IEC 61131 part 2
Barometric pressure	1080 hPa to 795 hPa	Corresponds to an altitude of -1000 m to 2000 m
Concentration of pollutants	SO ₂ : < 0.5 ppm; RH < 60%, no condensation H ₂ S: < 0.1 ppm; RH < 60 %, no condensation	-
	ISA-S71.04 severity level G1; G2; G3	-

10.5 Information on insulation, protection class, degree of protection and rated voltage

Insulation

The insulation is designed according to the requirements of EN 61131-2: 2007.

Note

For modules with 24 V DC supply voltage, the electrical isolation is designed for max. 60 V AC/75 V DC and basic insulation is designed according to EN 61131-2: 2007.

Pollution degree/overvoltage category according to IEC 61131

- Pollution degree 2
- Overvoltage category: II

Protection class according to IEC 61131-2:2007

The CPU 1515SP PC meets protection class I and includes parts of protection classes II and III.

The grounding of the mounting rail must meet the requirements for functional earth FE.

The installation location (e.g. enclosure, control cabinet) must have a protective conductor connection that meets the standard to maintain protection class I.

Degree of protection IP20

Degree of protection IP20 according to IEC 60529, i.e.:

- Protection against contact with standard probe
- Protection against foreign objects with diameters in excess of 12.5 mm
- No protection against water

Rated voltage for operation

The CPU 1515SP PC works with the rated voltage and corresponding tolerances listed in the following table.

Table 10- 11 Rated voltage for operation

Rated voltage	Tolerance range
24 V	19.2 to 28.8 V DC ¹
	18.5 to 30.2 V DC ²

¹ Static value: Creation as functional extra-low voltage with safe electrical isolation in accordance with IEC 60364-4-41

² Dynamic value: including ripple, e.g. with three-phase bridge rectification

10.6 Use of the ET 200SP in zone 2 potentially explosive atmospheres

See product information Use of subassemblies/modules in a Zone 2 Hazardous Area (<http://support.automation.siemens.com/WW/view/en/19692172>).

10.7 Technical specifications

10.7.1 CPU 1515SP PC (6ES7677-2AA30-0AA0)

CPU 1515SP PC (spare part)

	6ES7677-2AA30-0AA0
Product type designation	CPU 1515SP PC
General information	
Hardware version	FS01
Engineering with	
STEP 7 TIA Portal can be configured/integrated as of version	V13 SP1
PC configuration	
Computer platform	ET 200SP Open Controller
Processor	Dual-Core 1 GHz, AMD G Series APU T40E
Main memory	2 GB RAM
Installed SW	
Visualization	No
Controller	No
Operator controls	
Mode selector	1
Installation type/mounting	
Rack mounting possible	No
Front installation possible	No
Rail mounting possible	Yes
Wall/direct mounting possible	No
Supply voltage	
Type of supply voltage	24 V DC
Low limit of permitted range (DC)	19.2 V
High limit of permitted range (DC)	28.8 V
Reverse polarity protection	Yes
Power and voltage failure backup	
Power/voltage failure backup time	5 ms
Input current	
Current consumption (rated value)	1.5 A; full processor load, incl. ET 200SP modules and USB use
Current consumption (in no-load operation), typ.	0.6 A
Inrush current, max.	4.7 A; rated value
Power	
Power consumption, max.	36 W; incl. ET 200SP modules and USB use
Incoming power to the backplane bus	8.75 W

	6ES7677-2AA30-0AA0
Power loss	
Power loss, typ.	15 W; without ET 200SP modules and without USB use
Memory	
Type of memory	DDR3-SDRAM work memory
CFast card	No
Work memory	
Integrated	2 GB
Hardware configuration	
Integrated power supply	Yes
Number of DP masters	
Via CM	1
Racks	
Modules per rack, max.	64; CPU + 64 modules + server module (configuration width max. 1 m)
Rack, number of rows, max.	1
Time-of-day	
Clock	
Type	Hardware clock
Deviation per day, max.	10 s; typ.: 2 s
Buffered period	6 wk; at 40 °C ambient temperature, typ.
Interfaces	
Number of Industrial Ethernet interfaces	2
Number of PROFINET interfaces	1; X1 via BusAdapter BA 2x RJ45
Number of PROFIBUS interfaces	1; via CM DP module
Number of USB interfaces	3; 3x USB 2.0 front, 500 mA each – of which 2 x 500 mA and 1 x 100 mA simultaneously
Number of RS 485 interfaces	1; via CM DP module
Graphic interface	1 X DVI-I
1st interface	
Interface hardware	
• Number of ports	2
• Integrated switch	Yes
• RJ 45 (Ethernet)	Yes; via BusAdapter BA 2x RJ45
• Transmission rate, max.	100 Mbps
• Industrial Ethernet status LED	Yes

	6ES7677-2AA30-0AA0
2nd interface	
Interface hardware	
• Number of ports	1
• RJ 45 (Ethernet)	Yes; integrated
• Transmission rate, max.	1000 Mbps
• Industrial Ethernet status LED	No
3rd interface	
Interface hardware	
• RS 485	Yes; via CM DP module
Interface hardware	
RJ 45 (Ethernet)	
100 Mbps	Yes; for 1st interface X1
1000 Mbps	Yes; for 2nd interface X2
Autonegotiation	Yes
Autocrossing	Yes
RS 485	
Transmission rate, max.	12 Mbps
Ambient conditions	
Ambient temperature in operation	
Min.	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
Horizontal installation, min.	0 °C
Horizontal installation, max.	60 °C
Vertical installation, min.	0 °C
Vertical installation, max.	50 °C
Storage/transport temperature	
Min.	-40 °C
Max.	70 °C
I/O / Options	
I/O	
• SD card	Optional for additional mass storage
Dimensions	
Width	160 mm
Height	117 mm
Depth	75 mm
Weights	
Weight, approx.	0.83 kg

10.7.2 CPU 1515SP PC (6ES7677-2AA40-0AA0)

CPU 1515SP PC (spare part)

	6ES7677-2AA40-0AA0
Product type designation	CPU 1515SP PC
General information	
Hardware version	FS01
Engineering with	
STEP 7 TIA Portal can be configured/integrated as of version	V13 SP1
PC configuration	
Computer platform	ET 200SP Open Controller
Processor	Dual-Core 1 GHz, AMD G Series APU T40E
Main memory	4 GB RAM
Installed SW	
Visualization	No
Controller	No
Operator controls	
Mode selector	1
Installation type/mounting	
Rack mounting possible	No
Front installation possible	No
Rail mounting possible	Yes
Wall/direct mounting possible	No
Supply voltage	
Type of supply voltage	24 V DC
Low limit of permitted range (DC)	19.2 V
High limit of permitted range (DC)	28.8 V
Reverse polarity protection	Yes
Power and voltage failure backup	
Power/voltage failure backup time	5 ms
Input current	
Current consumption (rated value)	1.5 A; full processor load, incl. ET 200SP modules and USB use
Current consumption (in no-load operation), typ.	0.6 A
Inrush current, max.	4.7 A; rated value
Power	
Power consumption, max.	36 W; incl. ET 200SP modules and USB use
Incoming power to the backplane bus	8.75 W
Power loss	
Power loss, typ.	15 W; without ET 200SP modules and without USB use

	6ES7677-2AA40-0AA0
Memory	
Type of memory	DDR3-SDRAM work memory
CFlash card	No
Work memory	
Integrated	4 GB
Hardware configuration	
Integrated power supply	Yes
Number of DP masters	
Via CM	1
Racks	
Modules per rack, max.	64; CPU + 64 modules + server module (configuration width max. 1 m)
Rack, number of rows, max.	1
Time-of-day	
Clock	
Type	Hardware clock
Deviation per day, max.	10 s; typ.: 2 s
Buffered period	6 wk; at 40 °C ambient temperature, typ.
Interfaces	
Number of Industrial Ethernet interfaces	2
Number of PROFINET interfaces	1; X1 via BusAdapter BA 2x RJ45
Number of PROFIBUS interfaces	1; via CM DP module
Number of USB interfaces	3; 3x USB 2.0 front, 500 mA each – of which 2 x 500 mA and 1 x 100 mA simultaneously
Number of RS 485 interfaces	1; via CM DP module
Graphic interface	1 X DVI-I
1st interface	
Interface hardware	
• Number of ports	2
• Integrated switch	Yes
• RJ 45 (Ethernet)	Yes; via BusAdapter BA 2x RJ45
• Transmission rate, max.	100 Mbps
• Industrial Ethernet status LED	Yes
2nd interface	
Interface hardware	
• Number of ports	1
• RJ 45 (Ethernet)	Yes; integrated
• Transmission rate, max.	1000 Mbps
• Industrial Ethernet status LED	No

	6ES7677-2AA40-0AA0
3rd interface	
Interface hardware	
RS 485	Yes; via CM DP module
Interface hardware	
RJ 45 (Ethernet)	
100 Mbps	Yes; for 1st interface X1
1000 Mbps	Yes; for 2nd interface X2
Autonegotiation	Yes
Autocrossing	Yes
RS 485	
Transmission rate, max.	12 Mbps
Ambient conditions	
Ambient temperature in operation	
Min.	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
Horizontal installation, min.	0 °C
Horizontal installation, max.	60 °C
Vertical installation, min.	0 °C
Vertical installation, max.	50 °C
Storage/transport temperature	
Min.	-40 °C
Max.	70 °C
I/O / Options	
I/O	
SD card	Optional for additional mass storage
Dimensions	
Width	160 mm
Height	117 mm
Depth	75 mm
Weights	
Weight, approx.	0.83 kg

10.7.3 CPU 1515SP PC, CPU 1515SP PC + HMI

The technical specifications of the following devices modules can be found in the product information under (<http://support.automation.siemens.com/WW/view/en/104117388>).

ET 200SP Open Controller	Article number	
	Hardware variant WES7 E 32Bit 2GB RAM	Hardware variant WES7 P 64Bit 4GB RAM
CPU 1515SP PC	6ES7677-2AA31-0EB0	6ES7677-2AA41-0FB0
CPU 1515SP PC + HMI 128PT	6ES7677-2AA31-0EK0	6ES7677-2AA41-0FK0
CPU 1515SP PC + HMI 512PT	6ES7677-2AA31-0EL0	6ES7677-2AA41-0FL0
CPU 1515SP PC + HMI 2048PT	6ES7677-2AA31-0EM0	6ES7677-2AA41-0FM0

10.7.4 S7-1500 Software Controller CPU 1505S

The CPU 1505S is a PC-based controller from the range of SIMATIC S7-1500 software controllers.

Technical specifications

All technical specifications for CPU 1505S with the article number 6ES7672-5AC00-0YA0 can be found under (<http://support.automation.siemens.com/WW/view/en/6ES7672-5AC00-0YA0>).

10.8 Dimension drawings

10.8.1 CPU 1515SP PC

This section contains a dimension drawing of the module mounted on a mounting rail.
Always observe the specified dimensions for installation in cabinets.

Dimension drawings of the CPU 1515SP PC

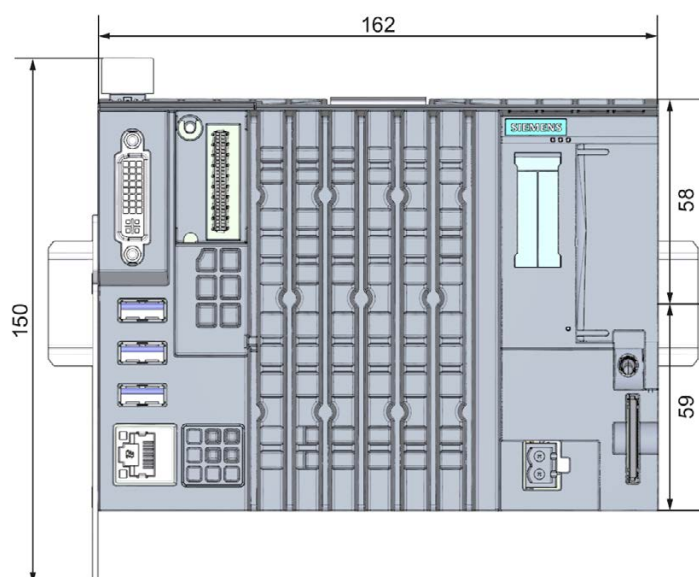


Figure 10-1 Dimension drawing of CPU 1515SP PC, front view

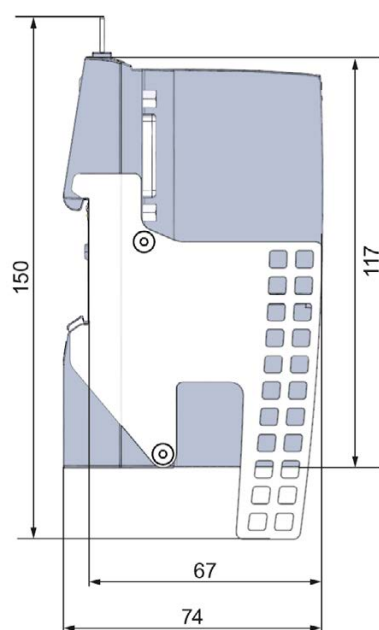


Figure 10-2 Dimension drawing of CPU 1515SP PC, side view

Accessories/spare parts

Order options and accessories for CPU 1515SP PC

Table A- 1 Order options for CPU 1515SP PC

Description	Article number
Hardware variant	
WES7 E 32Bit 2GB RAM ¹	
CPU 1515SP PC, spare part (without CFast card)	6ES7677-2AA30-0AA0
CPU 1515SP PC, 8 GB CFast card, with pre-installed S7-1500 software controller CPU 1505S	6ES7677-2AA31-0EB0
CPU 1515SP PC, 8 GB CFast card, with pre-installed S7-1500 software controller CPU 1505S and WinCC Runtime Advanced V13 SP1	
• CPU 1515SP PC + HMI 128PT	6ES7677-2AA31-0EK0
• CPU 1515SP PC + HMI 512PT	6ES7677-2AA31-0EL0
• CPU 1515SP PC + HMI 2048PT	6ES7677-2AA31-0EM0
Hardware variant	
WES7 P 64Bit 4GB RAM ¹	
CPU 1515SP PC, spare part (without CFast card)	6ES7677-2AA40-0AA0
CPU 1515SP PC, 16 GB CFast card, with pre-installed S7-1500 software controller CPU 1505S	6ES7677-2AA41-0FB0
CPU 1515SP PC, 16 GB CFast card, with pre-installed S7-1500 software controller CPU 1505S and WinCC Runtime Advanced V13 SP1	
• CPU 1515SP PC + HMI 128PT	6ES7677-2AA41-0FK0
• CPU 1515SP PC + HMI 512PT	6ES7677-2AA41-0FL0
• CPU 1515SP PC + HMI 2048PT	6ES7677-2AA41-0FM0

¹ Windows Embedded Standard 7

Table A- 2 Accessories for CPU 1515SP PC

Description	Article number
BusAdapter, 1 unit	
BA 2×RJ45 (PROFINET BusAdapter with standard Ethernet socket)	6ES7193-6AR00-0AA0
BA 2×FC (PROFINET BusAdapter with Fast Connect Ethernet connection)	6ES7193-6AF00-0AA0
Server module; 1 unit	6ES7193-6PA00-0AA0
Strain relief for CPU 1515SP PC	A5E32291462
SIMATIC IPC Service USB flash drive 8 GB (SLC), pre-installed BIOS-MANAGER V3.3, Image/Partition Creator V3.3 and installation CD	6AV7672-8JD01-0AA0
SIMATIC IPC Service USB flash drive 16 GB, USB3.0, pre-installed BIOS-MANAGER V3.3, Image/Partition Creator V3.3 and installation CD	6AV7672-8JD02-0AA0
SIMATIC IPC DiagMonitor Software V4.4.1	6ES7648-6CA04-4YX0
SIMATIC PC, adapter cable, DVI-I compliant with VGA, 250 mm long	6ES7648-3AB00-0XA0
Reference identification label, sheet with 16 labels, 10 units	6ES7193-6LF30-0AW0
Mounting rails, tin-plated steel strip	
Length: 483 mm	6ES5710-8MA11
Length: 430 mm	6ES5710-8MA21
Length: 830 mm	6ES5710-8MA31
Length: 2000 mm	6ES5710-8MA41
SIMATIC IPC CFast cards	
CFast 2 GB Industrial Grade	6ES7648-2BF10-0XF10
CFast 4 GB Industrial Grade	6ES7648-2BF10-0XG10
CFast 8 GB Industrial Grade	6ES7648-2BF10-0XH10
CFast 16 GB Industrial Grade	6ES7648-2BF10-0XJ10
CFast 32 GB Industrial Grade	6ES7648-2BF10-0XK10

Online catalog

Additional article numbers can be found on the Internet in the online catalog and online ordering system (<http://www.siemens.de/automation/mall>).

Abbreviations

Abbreviation	Term	Meaning
AC	Alternating current	Alternating current
ALM	Automation License Manager	Tool for managing license keys in STEP 7
BIOS	Basic Input Output System	Basic Input Output System. A set of important software routines used after the startup of the CPU to load the operating system and to provide the routines for data exchange between hardware components.
CE	Communauté Européenne	CE label
CFast	CompactFlash ATA Serial Transfer	Memory card
CoA	Certificate of Authenticity	Certificate of Authenticity, label with Microsoft Windows "Product Key"
CoL	Certificate of License	Certificate of License for the SIMATIC software loaded
DC	Direct Current	DC current
DVD	Digital Versatile Disc	Digital storage medium with high memory capacity.
DVI-I	Digital Visual Interface	Interface for transfer of image and video data for DVI-I monitors.
ESD	Components sensitive to electro-static charge	
EN	European standard	
EWf	Enhanced Write Filter	Enhanced write filter
FBWF	File Based Write Filter	File based write filter
GbE	Gigabit Ethernet	
GRUB / GRUB4DOS	GRand Unified Bootloader	Boot Manager
HMI	Human Machine Interface	User interface
IEC	International Electrotechnical Commission	
IM	Interface module	The interface module connects the ET 200SP distributed I/O system with the IO controller and exchanges data with the I/O modules via the backplane bus.
LAN	Local Area Network	Computer network that is limited to a local area.
LED	Light Emitting Diode	Light emitting diode
LLDP	Link Layer Discovery Protocol	Protocol that enables the exchange of information between adjacent devices.
MMC	Multi Media Card	Memory card
NTFS	New Technology File System	File system that offers targeted access protection at the file level.
NVRAM	Non-Volatile Random-Access Memory	Non-volatile data memory that is RAM-based, the data content of which is retained without external power supply.
PC	Personal Computer	

Abbreviation	Term	Meaning
PELV	Protective Extra Low Voltage	PELV, previously called "extra low voltage with safe isolation", is a protective measure against electrical shock. See EN 50178.
PN	PROFINET	
PG	Programming device	Compact programming device which meets the special requirements of industry. The PG is fully equipped for programming SIMATIC PLCs.
PS	Power supply	Power supply
PT	Power Tags	Process tags; tags enable data exchange between the components of an automation process, for example, between the HMI device and the controller.
RAM	Random Access Memory	Main or work memory of a computer with direct access, allowing read access to data and editing.
RT	Runtime	
SD	Secure Digital card	Memory card
SELV	Safety Extra Low Voltage	Safety extra-low voltage; protective measure in which circuits with a rated voltage of up to 50 V AC or 120 V DC are operated ungrounded and feeds from circuits with a higher voltage are separated from these by, for example, a safety transformer.
UL	Underwriters Laboratories Inc.	
USB	Universal Serial Bus	Serial bus system for connecting a computer to external devices.

Troubleshooting

Problem	Possible cause	Remedy
CPU 1515SP PC is not working.	CPU 1515SP PC is not supplied with current.	Check the power supply.
CPU 1515SP PC does not start.	Feedback through USB devices.	Use USB devices that comply with the USB 2.0 specification.
Windows no longer boots.	Settings in the BIOS setup are not correct.	Check the settings in the BIOS setup menu Boot.
Time and/or date of the CPU 1515SP PC not correct.	CPU 1515SP PC was not connected for more than 6 weeks.	Correct the settings in the BIOS setup menu Main or in Windows.
USB device is not working.	USB power supply is overloaded.	Use an external power supply for the USB device (see section Application planning (Page 31)).

Glossary

Cold restart

A startup procedure commencing when the CPU is switched on. Upon a cold restart, the system typically performs some basic hardware checks and then loads the operating system from the hard disk into the work memory.

Controller

Integrated hardware and software controlling the operation of a specific internal or I/O device (e.g. keyboard controller).

Device configuration

The device configuration of a PC/programming device includes information on the features and options of the PC/programming device such as memory configuration, drive types, monitor, network address etc. The data is stored in a configuration file and is used by the operating system to load the corresponding device drivers or assign device parameters.

Drivers

Program sections of the operating system. They convert data from the user programs to the specific formats required by the I/O devices (e.g. hard disks, monitors, printers).

Enhanced Write Filter (EWF)

Configurable write filter making it possible to boot Windows Embedded Standard from write-protected media (e.g. from CD-ROM), to write-protect individual partitions and to adapt file system performance to the user's requirements (e.g. when using CFast cards).

Ethernet

Local network (bus structure) for text and data communication with a data transmission rate of 10/100/1000 Mbps.

File-Based Write Filter (FBWF)

Configurable write filter making it possible to write-protect individual files.

Image

An image is a copy of hard-disk partitions, for example, which is stored as backup in a file so that it can be restored if necessary.

Interface

- Connection between individual hardware elements such as PCs, programming device, printer or screen by means of physical plug-in connections (cables).
- Connection between different programs to allow them to be used together.

LAN

Local Area Network: LAN refers to a local network consisting of a group of computers and other devices which are distributed over a relatively restricted area and connected through communication lines. The devices connected to a LAN are referred to as nodes. The purpose of networks is the shared use of files, printers or other resources.

License key

The license key is the electronic license stamp of a license. Siemens AG provides a license key for software that is protected by licensing laws.

Operating system

Generic term which describes all functions for controlling and monitoring user program execution and distribution of system resources to the user programs as well as maintenance of the operating mode in cooperation with the hardware.

Power options

The power options can be used to reduce the power consumption of the computer while still keeping it ready for immediate use. Can be configured in Windows via **Settings > Control Panel > Power Options**.

Restart

Restart of an already running computer which is performed without switching off the power supply, for example using the key combination <Ctrl + Alt + Del>.

Restore DVD

You use the Restore DVD to reset your system partition or the entire hard disk to the delivery state in the event of an error. The DVD contains all the image files required and is bootable.

ROM

Read Only Memory. ROM refers to a read-only memory where each memory location can be addressed individually. The stored programs or data are hard-coded and are preserved even in the event of a power failure.

S.M.A.R.T

Self-Monitoring, Analysis and Reporting Technology (SMART or S.M.A.R.T.) is an industry standard for storage media. It provides for permanent monitoring of relevant parameters and thus early recognition of pending defects.

SATA

Serial ATA. An interface for hard disk drives and optical drives with serial data transmission up to 300 Mbps.

SETUP (BIOS setup)

A program used to determine information on the device configuration. The device configuration of the CPU 1515SP PC is preset. Changes must be made whenever a memory expansion, new modules or drives are to be activated.

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Keine Indexeinträge gefunden.

