

Industrial Controls

Soft starters and solid-state switching devices SIRIUS 3RW5 PROFINET communication modules

Equipment Manual

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Legal information

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

All names identified by ® are registered trademarks of Siemens AG. The remaining trademarks in this publication may be trademarks whose use by third parties for their own purposes could violate the rights of the owner.

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.

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Siemens Industry Online Support

Information and service

At Siemens Industry Online Support you can obtain up-to-date information from our global support database:

- Product support
- Application examples
- Forum
- mySupport

Link: Siemens Industry Online Support (<https://support.industry.siemens.com/cs/ww/en/>)

Product support

You can find information and comprehensive know-how covering all aspects of your product here:

- **FAQs**
Answers to frequently asked questions
- **Manuals/operating instructions**
Read online or download, available as PDF or individually configurable.
- **Certificates**
Clearly sorted according to approving authority, type and country.
- **Characteristics**
For support in planning and configuring your system.
- **Product announcements**
The latest information and news concerning our products.
- **Downloads**
Here you will find updates, service packs, HSPs and much more for your product.
- **Application examples**
Function blocks, background and system descriptions, performance statements, demonstration systems, and application examples, clearly explained and represented.
- **Technical data**
Technical product data for support in planning and implementing your project

Link: Product support (<https://support.industry.siemens.com/cs/ww/en/ps>)

mySupport

The following functions are available in your personal work area "mySupport":

- **Support Request**
Search for request number, product or subject
- **My filters**
With filters, you limit the content of the online support to different focal points.
- **My favorites**
With favorites you bookmark articles and products that you need frequently.
- **My notifications**
Your personal mailbox for exchanging information and managing your contacts. You can compile your own individual newsletter in the "Notifications" section.
- **My products**
With product lists you can virtually map your control cabinet, your system or your entire automation project.
- **My documentation**
Configure your individual documentation from different manuals.
- **CAX data**
Easy access to CAX data, e.g. 3D models, 2D dimension drawings, EPLAN macros, device circuit diagrams
- **My IBase registrations**
Register your Siemens products, systems and software.

Siemens Industry Online Support app

The Siemens Industry Online Support app provides you access to all the device-specific information available on the Siemens Industry Online Support portal for a particular article number, such as operating instructions, manuals, data sheets, FAQs etc.

The Siemens Industry Online Support app is available for Android and iOS:



Android



iOS

1.1 Support Request

Use the Support Request online form to send your question directly to Technical Support:

Support Request:	Internet (https://www.siemens.com/support-request)
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1.2 Additional documentation

Manuals / online help

At this point, you will find further manuals and online helps that may be of interest to you for your automation system. They are available to download from the Internet free of charge. You can create your own individual system documentation in mySupport.

- 3RW5 topic page (<https://support.industry.siemens.com/cs/ww/en/view/109747404>)
- Equipment Manual for the 3RW50 soft starter (<https://support.industry.siemens.com/cs/ww/en/view/109753750>)
- Equipment Manual for the 3RW52 soft starter (<https://support.industry.siemens.com/cs/ww/en/view/109753751>)
- Equipment Manual for the 3RW55 and 3RW55 Failsafe soft starters (<https://support.industry.siemens.com/cs/ww/en/view/109753752>)
- Equipment Manuals for the 3RW5 soft starter (<https://support.industry.siemens.com/cs/ww/en/ps/16212/man>)
- Equipment Manual for the 3RW5 PROFINET communication modules (<https://support.industry.siemens.com/cs/ww/en/view/109753754>)
- Equipment Manual for the 3RW5 PROFIBUS communication module (<https://support.industry.siemens.com/cs/ww/en/view/109753753>)
- Equipment Manual for the 3RW5 Modbus communication modules (<https://support.industry.siemens.com/cs/ww/en/view/109753755>)
- Equipment Manual for the 3RW5 EtherNet/IP communication module (<https://support.industry.siemens.com/cs/ww/en/view/109758201>)
- SIMATIC PROFINET System Description (<https://support.industry.siemens.com/cs/ww/en/view/19292127>)
- Programming Manual "From PROFIBUS DP to PROFINET IO" (<https://support.industry.siemens.com/cs/ww/en/view/19289930>)
- "System Software for S7-300/400, System and Standard Functions" reference manual (<https://support.industry.siemens.com/cs/ww/en/view/1214574>)
- Online help for SIRIUS Soft Starter ES (TIA Portal)
- Online help for STEP 7
- The EMC Directive 2014/30/EU in practice (<http://www.siemens.com/emc-guideline>)

- Industrial Control Panels and Electronic Equipment of Industrial Machinery for North America (<http://www.siemens.com/UL508A>)
- Control Panels compliant with IEC Standards and European Directives (<http://www.siemens.com/iec60204>)

Interesting links

- Manuals in Siemens Industry Online Support (<https://support.industry.siemens.com/cs/ww/en/ps/man>)
- FAQs for 3RW5 soft starters (<https://support.industry.siemens.com/cs/ww/en/ps/16212/faq>)
- Downloads for 3RW5 soft starters (<https://support.industry.siemens.com/cs/ww/en/ps/16212/dl>)
- Catalog IC 10 (<https://support.industry.siemens.com/cs/ww/en/view/109747945>)
- Product support for STEP 7 (TIA Portal) (<https://support.industry.siemens.com/cs/ww/en/ps/14672>)
- PI - PROFIBUS & PROFINET International Home (<https://www.profinet.com>)
- Further information on PROFINET (<https://www.siemens.com/global/en/home/products/automation/industrial-communication/profinet.html>)
- OPC UA Foundation (<https://opcfoundation.org/>)
- Application description "Programming an OPC UA .NET client with C# for the SIMATIC NET OPC UA server" (<https://support.industry.siemens.com/cs/ww/en/view/42014088>)
- Application description "Creating OPC UA clients with .NET and Helper class" (<https://support.industry.siemens.com/cs/ww/en/view/109737901>)
- Premium Efficiency - Efficiency class IE3 (<http://w3.siemens.com/mcms/topics/en/application-consulting/ie3ready/Pages/Default.aspx>)

Safety notes

2.1 Security information

Siemens provides products and solutions with industrial security functions that support the secure operation of plants, systems, machines and networks.

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

Customers are responsible for preventing unauthorized access to their plants, systems, machines and networks. Such systems, machines and components should only be connected to an enterprise network or the internet if and to the extent such a connection is necessary and only when appropriate security measures (e.g. firewalls and/or network segmentation) are in place.

For additional information on industrial security measures that may be implemented, please visit

<https://www.siemens.com/industrialsecurity>.

Siemens' products and solutions undergo continuous development to make them more secure. Siemens strongly recommends that product updates are applied as soon as they are available and that the latest product versions are used. Use of product versions that are no longer supported, and failure to apply the latest updates may increase customer's exposure to cyber threats.

To stay informed about product updates, subscribe to the Siemens Industrial Security RSS Feed under

<https://www.siemens.com/industrialsecurity>.

2.2 Data security in automation

The topic of data security and access protection (security) is becoming more and more important in industrial environments. Increased networking of entire industrial plants, vertical integration and networking of the levels within a company, and new technologies, such as remote maintenance, are resulting in more increased requirements for protection of the industrial plant. Security is the generic term for all protection measures:

- Loss of confidentiality due to unauthorized accessing of data
- Loss of integrity due to data manipulation
- Loss of availability due to destruction of data

To provide protection from manipulation in sensitive plant and production networks, it is not enough to apply data security solutions for offices to industrial applications without any adaptation.

Requirements

The special requirements of communication in an industrial environment (e.g. communication in real time) result in additional requirements for security in industrial use:

- Protection against interaction between automated cells
- Protection of network segments
- Protection from unauthorized access
- Scalability of the security functionality
- No influence on the network structure.

Threats

Threats can arise from external and internal manipulation. Loss of data security is not always caused by deliberate actions.

Internal threats arise due to:

- Technical faults
- Operating errors
- Errors in programs

This internal hazards are compounded by external threats. The external hazards do not differ from the known threats in the office environment:

- Computer viruses and computer worms
- Trojan horses
- Unauthorized access
- Password phishing.

Password phishing means attempting to get a user to divulge access data and passwords by masquerading as a different identity in an e-mail.

Precautions

The most important precautions against manipulation and loss of data security in an industrial environment are:

- Filtering and verification of data traffic through virtual private networks (VPN). A virtual private network is used to exchange private data in a public network (e.g. the Internet). The most common VPN technology is IPsec. IPsec is a collection of protocols based on the IP protocol at the network layer.
- Segmentation into protected automation cells. The aim of this concept is to protect devices in the network through security modules. A group of protected devices forms a protected automation cell. Only security modules in the same group or the device protected by you can be interchanged.

- Authentication (identification) of the networked devices. The security modules identify themselves to each other via a secure (encrypted) channel using authentication procedures. This prevents access to a protected segment by unauthorized persons from outside.
- Encryption of the data traffic. The confidentiality of the data is ensured by encrypting the data traffic. For this purpose, every security module is given a VPN certificate which includes the encryption key.

VDI guidelines on information security in industrial automation

The VDI/VDE Association of German Engineers "Measurement and Automation" has published a guideline for implementation of a security architecture in the industrial environment in the VDI guideline "VDI/VDE 2182 Sheet 1, IT Security for Industrial Automation - General Model". You will find the guideline under "VDI Standards" on the VDI home page (<https://www.vdi.de/richtlinien>).

PROFINET Security Guideline on information security in industrial automation

The PROFIBUS & PROFINET user organization supports you with building up safety standards in your company with the PROFINET Security Guideline. You will find these guidelines under downloads on the home page of the PROFIBUS & PROFINET user organization: PI - PROFIBUS & PROFINET International Home (<https://www.profibus.com>)

2.3 ESD Guidelines

ESD

All electronic devices are equipped with large-scale integrated ICs or components. Due to their design, these electronic elements are highly sensitive to overvoltage, and thus to any electrostatic discharge.

The acronym ESD has become the established designation for such electrostatic sensitive components/devices. This is also the international abbreviation for such devices.

ESD devices are identified by the following symbol:



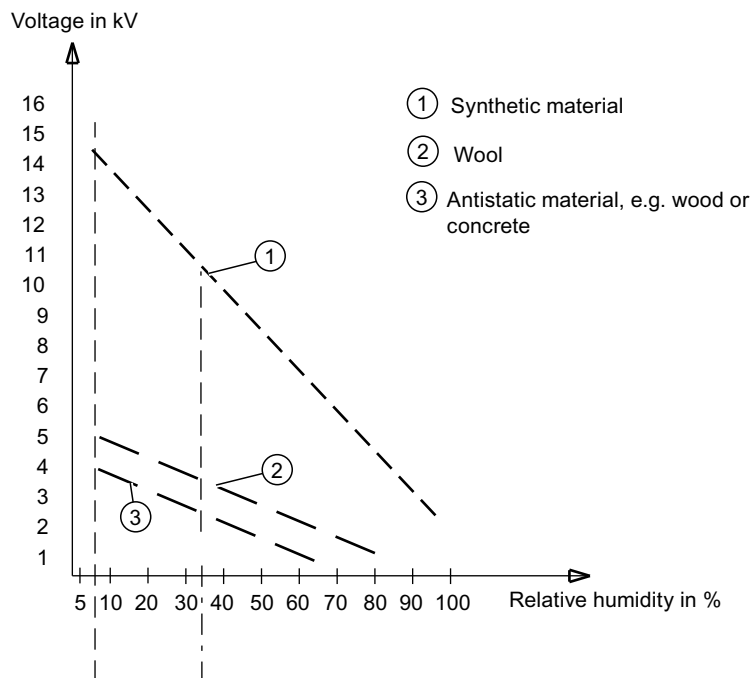
NOTICE**Electrostatic discharge**

ESD devices can be destroyed by voltages well below the threshold of human perception. These static voltages develop when you touch a component or electrical connection of a device without having drained the static charges present on your body. The damage caused to a device by overvoltage is usually not immediately evident and is only noticed after an extended period of operation.

Electrostatic charging

Anyone who is not connected to the electrical potential of their surroundings can be electrostatically charged.

The diagram below shows the maximum electrostatic voltage which may build up on a person coming into contact with the materials specified in the diagram. These values correspond to IEC 801-2 specifications.



Basic protective measures against electrostatic discharge

- Make sure the grounding is good:
When handling electrostatic sensitive devices, ensure that your body, the workplace and packaging are grounded. In this way, you can avoid becoming electrostatically charged.
- Avoid direct contact:
As a general rule, only touch electrostatic sensitive devices when this is unavoidable (e.g. during maintenance work). Handle the devices without touching any chip pins or PCB traces. In this way, the discharged energy cannot reach or damage sensitive devices.
Discharge your body before taking any necessary measurements on a device. Do so by touching grounded metallic parts. Use only grounded measuring instruments.

2.4 Electromagnetic compatibility (EMC) according to IEC 60947-4-1

This product is designed for Environment A. It may produce radio interference in domestic environments, in which case the user may be required to take adequate mitigation measures.

2.5 Firmware update

In order to be able to use the 3RW5 soft starter without any problems and with its full range of functions, ensure that the firmware and software of all components are up-to-date (Page 139):

- 3RW5 soft starter, 3RW5 communication module, 3RW5 HMI High Feature
- HSP, GSDML file
- SIRIUS Soft Starter ES (TIA Portal)

You will find current downloads and a history of the versions with new features on the 3RW5 topic page (<https://support.industry.siemens.com/cs/ww/en/view/109747404>).

2.6 Recycling and disposal

For environmentally friendly recycling and disposal of your old device, please contact a company certified for the disposal of old electrical and/or electronic devices and dispose of the device in accordance with the regulations in your country.

Description

You can equip SIRIUS soft starters of the 3RW5 series with an optional 3RW5 communication module and therefore also with network functionality. Using the 3RW5 communication module, you integrate the 3RW5 soft starters into the associated network environment with their complete functionality.

The 3RW5 soft starters can be equipped with a slot for fitting the 3RW5 communication modules. If the 3RW5 soft starter does not feature a slot, install the 3RW5 communication module next to the 3RW5 soft starter on a level surface, e.g. a mounting plate.

Preconditions for using the 3RW5 communication modules on the 3RW5 soft starter

Note

3RW5 PROFINET Standard communication module

The 3RW5 PROFINET Standard communication module is supported by the following 3RW5 soft starters:

- 3RW50 soft starter¹⁾
- 3RW52 soft starter
- 3RW55 soft starter¹⁾
- 3RW55 Failsafe soft starter¹⁾

The 3RW5 PROFINET Standard communication module is supported by the 3RW5 HMI High Feature¹⁾.

A history of the firmware versions with new features can be found in the downloads on the 3RW5 topic page (<https://support.industry.siemens.com/cs/ww/en/view/109747404>).

¹⁾ 3RW5 PROFINET Standard communication module from firmware version V1.0.1

Note

3RW5 PROFINET High Feature communication module

The 3RW5 PROFINET High Feature communication module is supported by the following 3RW5 soft starters:

- 3RW55 soft starter from firmware version V2.0
- 3RW55 Failsafe soft starter

The 3RW5 PROFINET High Feature communication module is supported by the 3RW5 HMI High Feature from firmware version V2.0.

A history of the firmware versions with new features can be found in the downloads on the 3RW5 topic page (<https://support.industry.siemens.com/cs/ww/en/view/109747404>).

Note the information in chapter Firmware update (Page 15).

When operating in an automation system:

- Programmable logic controller (PLC), e.g. SIMATIC S7-1500
- PC or programming device with installed controller configuration software, e.g. STEP 7 with HSP or GSDML file
- Parameterization software (optional), e.g. SIRIUS Soft Starter ES (TIA Portal) (Page 34)

For exclusive use of SIRIUS Soft Starter ES (TIA Portal) via the 3RW5 communication module:

- PC with SIRIUS Soft Starter ES (TIA Portal) Premium / Professional (Page 34)

Basic knowledge of the following areas:

- General electrical engineering
- Drive technology
- Automation technology
- Handling the automation system and the software used

Target group

The manual is intended for everyone involved in the following tasks:

- Planning and configuring systems
- Installation
- Commissioning
- Service and maintenance

3.1 History

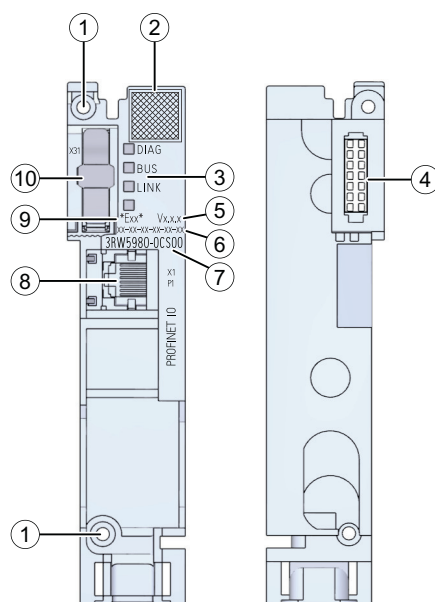
Release number	New features
03/2018	• Initial release
02/2019	• Revision of the manual • Supplementary functions for the 3RW5 PROFINET Standard communication module (e.g. PROFlenergy) • 3RW5 PROFINET High Feature communication module
06/2020	• Revision of the manual • Addition of contents for the 3RW50 and 3RW55 Failsafe soft starters • Addition of contents for web server and OPC UA server for the 3RW5 PROFINET High Feature communication module
05/2021	• Revision of the manual • Addition of content to firmware version V3.0 of the 3RW5 PROFINET High Feature communication module

3.2 Hardware configuration

Article number

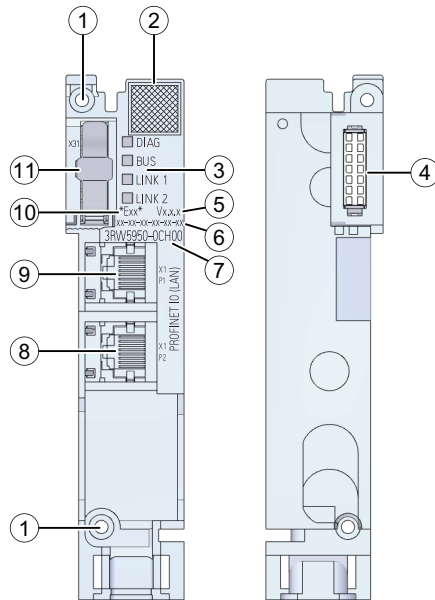
3RW5 PROFINET communication module	Article number
Standard	3RW5980-0CS00
High Feature	3RW5950-0CH00

3RW5 PROFINET Standard communication module



- ① Fastening holes
- ② Data Matrix Code
- ③ LED display
- ④ Plug-in connection to the 3RW5 soft starter
- ⑤ Firmware version of the 3RW5 communication module as delivered
- ⑥ MAC address
- ⑦ Article number
- ⑧ Fieldbus connection (RJ45 socket)
- ⑨ Product version
- ⑩ Plug-in connection to the 3RW5 soft starter with cover cap

3RW5 PROFINET High Feature communication module



- ① Fastening holes
- ② Data Matrix Code
- ③ LED display
- ④ Plug-in connection to the 3RW5 soft starter
- ⑤ Firmware version of the 3RW5 communication module as delivered
- ⑥ MAC address
- ⑦ Article number
- ⑧ Fieldbus connection (RJ45 socket, Port 2)
- ⑨ Fieldbus connection (RJ45 socket, Port 1)
- ⑩ Product version
- ⑪ Plug-in connection to the 3RW5 soft starter with cover cap

3.3 Functions of the 3RW5 PROFINET communication module

PROFINET IO

PROFINET IO is an open transmission system with real-time functionality defined in accordance with the PROFINET standard. This standard defines a non-manufacturer-specific communication, automation, and engineering model.

3.3 Functions of the 3RW5 PROFINET communication module

PROFINET IO has the following characteristics:

- Accessories for wiring the PROFINET components are available in industrial quality.
- The quantity framework is extended in accordance with the options offered on PROFINET IO. Parameter limits are not exceeded during configuration.
- Based on Switched Ethernet with full duplex mode, the transmission bandwidth is 100 Mbit/s.

Functionality of the 3RW5 communication module

Supported functions	3RW5 PROFINET communication module	
	Standard	High Feature ¹⁾
PROFINET IO functions		
Integrated switch with 2 ports	-	x
Ethernet services: Ping, ARP, LLDP	x	x
Ethernet services: Network diagnostics (SNMP) / MIB-2	-	x
Port diagnostics	x	x
Device replacement without removable medium or programming device	-	x
System redundancy S2 (Page 136)	-	x ⁶⁾
H-Sync forwarding	-	x ⁶⁾
Media Redundancy Protocol (MRP)	-	x
Media Redundancy with Planned Duplication (MRPD)	-	x ⁶⁾
Isochronous Real-Time Communication (IRT)	-	x
Dynamic Reconfiguration (DR) (Page 137)	-	x ⁶⁾
PROFenergy (Page 83)	x ^{2), 3)}	x
NTP (time synchronization) (Page 90)	-	x
Minimum update time	2 ms	0.25 ms
Resetting communication parameters to factory settings via PROFINET IO	x	x
Additional functions		
Web server	-	x ^{4), 5)}
OPC UA server	-	x ^{4), 5)}
Firmware update via PROFINET IO	x	x
Identification data I&M 0 to 3	x	x

¹⁾ Supported by SIRIUS 3RW55 soft starter from firmware version V2.0 and 3RW55 Failsafe soft starter from firmware version V1.0

²⁾ 3RW5 PROFINET Standard communication module from firmware version V1.0.1

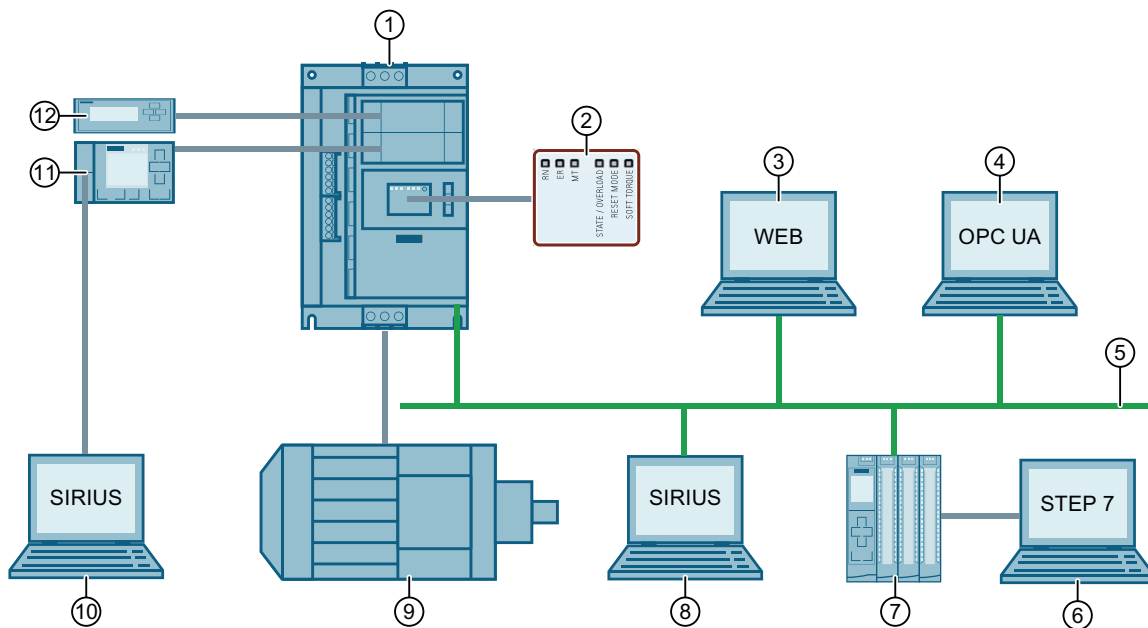
³⁾ 3RW50 and 3RW55 Failsafe soft starters from firmware version V1.0 or 3RW52 and 3RW55 soft starters from firmware version V2.0

⁴⁾ 3RW5 PROFINET High Feature communication module from firmware version V2.0

⁵⁾ Soft starter 3RW55 with firmware version V2.1.1 or higher or soft starter 3RW55 Failsafe with firmware version V1.1.0 or higher

⁶⁾ 3RW5 PROFINET High Feature communication module from firmware version V3.0

3.4 Access options for the 3RW5 soft starters



- ① SIRIUS 3RW5 soft starter (illustration similar)
- ② LED display on 3RW5 soft starter
- ③ PC with web client (only via 3RW5 PROFINET High Feature communication module)
- ④ PC with OPC UA client (only via 3RW5 PROFINET High Feature communication module)
- ⑤ PROFINET (via 3RW5 PROFINET communication module)
- ⑥ PC or programming device with configuration software of the controller, e.g. STEP 7
- ⑦ Programmable logic controller, e.g. SIMATIC S7-1500
- ⑧ PC with SIRIUS Soft Starter ES (TIA Portal) Premium / Professional via 3RW5 communication module
- ⑨ Motor
- ⑩ PC with SIRIUS Soft Starter ES (TIA Portal) via local interface on 3RW5 HMI High Feature
- ⑪ 3RW5 HMI High Feature (accessories depend on 3RW5 soft starter)
- ⑫ 3RW5 HMI Standard (accessories depend on 3RW5 soft starter)

Options for data transfer

-	Monitoring	Diagnostics	Control	Parameterization
3RW5 HMI High Feature	✓	✓	✓	(✓) ²⁾
3RW5 HMI Standard	✓	✓	✓	-
SIRIUS Soft Starter ES (TIA Portal) ¹⁾	✓	✓	✓	(✓) ²⁾
Fieldbus via 3RW5 communication module	✓ (via user program)	✓	✓	(✓) ²⁾
3RW5 soft starter	LEDs	LEDs	Via input IN or digital inputs	(✓) ²⁾

3.4 Access options for the 3RW5 soft starters

-	Monitoring	Diagnostics	Control	Parameterization
Web server ³⁾	✓	✓	✓ ⁴⁾	-
OPC UA server ³⁾	✓	✓	-	-

¹⁾ Via local interface on 3RW5 HMI High Feature or via 3RW5 communication module

²⁾ Dependent on the 3RW5 soft starter

³⁾ Only via 3RW5 PROFINET High Feature communication module

⁴⁾ Login necessary with "Operator personnel" or "Maintenance personnel" user role. For more information on user account management, refer to the 3RW55 and 3RW55 Failsafe Soft Starters Equipment Manual.

Possible number of applications per access path

The following number of applications are simultaneously possible via the 3RW5 PROFINET communication module for each access path:

Access path	3RW5 PROFINET communication module	
	Standard	High Feature
Programmable logic controller (e.g. SIMATIC S7-1500)	1	1
SIRIUS Soft Starter ES (TIA Portal) Premium / Professional	1	4 ¹⁾
Web client	-	5 ²⁾ , ³⁾
OPC UA client	-	2 ²⁾ , ³⁾

¹⁾ 3RW5 PROFINET High Feature communication module from firmware version V1.1 (previously only one application was possible)

²⁾ 3RW5 PROFINET High Feature communication module from firmware version V2.0

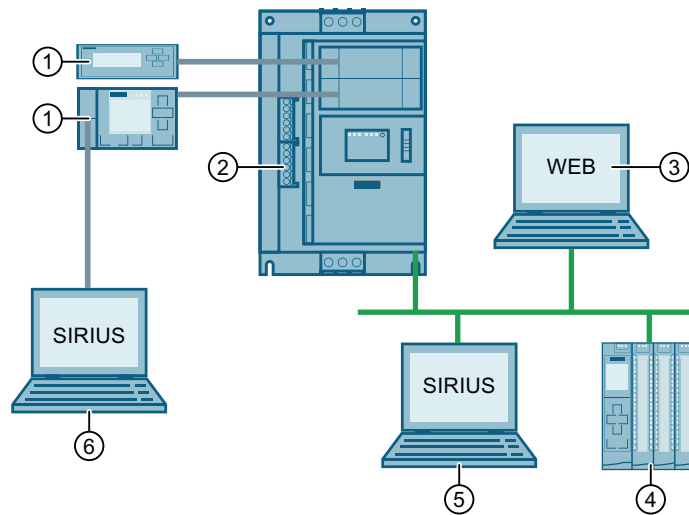
³⁾ Soft starter 3RW55 with firmware version V2.1.1 or higher or soft starter 3RW55 Failsafe with firmware version V1.1.0 or higher

3.5 Operating modes and master control function

3.5.1 Operating modes

Control source and motor control

The operating modes assign access rights to the various control sources (access sources). The control source that possesses the rights for controlling and writing access has control. As only one control source can ever have control at one time, different priorities are assigned to the operating modes. Read access is also possible without control.



- ① Control source: 3RW5 HMI, operating mode: Manual operation local - HMI controlled
- ② Control source: Input IN or digital inputs, operating mode: Manual operation local - input controlled or Automatic - input controlled
- ③ Control source: Web server, operating mode: Manual operation bus - Webserver controlled
- ④ Control source: PLC, operating mode: Automatic
- ⑤ Control source: SIRIUS Soft Starter ES (TIA Portal) Premium / Professional, operating mode: Manual operation bus - PC controlled
- ⑥ Control source: SIRIUS Soft Starter ES (TIA Portal), operating mode: Manual operation local - PC controlled

"Automatic" mode

The control source is connected to the 3RW5 Soft Starter via the 3RW5 communication module. In "Automatic" mode, a programmable logic controller (PLC) has master control.

Note

"Automatic operation - input controlled" mode

The "Automatic operation - Input controlled" mode is available for the soft starter 3RW55 from firmware version V2.1 and soft starter 3RW55 Failsafe with firmware version V1.1.0 or higher if the digital inputs have master control by activating the "Manual operation local - input controlled" bit in the process image output (PIQ). The PLC can fetch back control at any time.

Operating mode "Manual - bus"

The control source is connected to the 3RW5 soft starter via the 3RW5 communication module. In operating mode "manual - bus" a control source on the fieldbus has control:

- SIRIUS Soft Starter ES (TIA Portal) Premium / Professional
- Web server

Operating mode "manual - local"

In the operating mode "manual - local" the master control function rests with a control source directly on the 3RW5 soft starter:

- Input IN (3RW50 and 3RW52 Soft Starters) or digital inputs (3RW55 and 3RW55 Failsafe soft starters)
- 3RW5 HMI
- SIRIUS Soft Starter ES (TIA Portal) via local interface on the 3RW5 HMI High Feature

Priorities of the operating modes

Mode		Control source	Priority
Automatic	-	PLC	Lowest
	Input controlled ¹⁾	Digital inputs ²⁾	↓
Manual operation bus	-	Connection abort ³⁾	↓
	PC controlled	SIRIUS Soft Starter ES (TIA Portal) Premium / Professional	↓
	Webserver controlled	Web server	

3.5 Operating modes and master control function

Mode		Control source	Priority
Manual operation local	-	Connection abort ³⁾ (depending on the 3RW5 soft starter and the parameterization)	↓
	Input controlled	Input IN or digital inputs ⁴⁾	↓
	3RW5 HMI controls	3RW5 HMI	↓
	PC controlled	SIRIUS Soft Starter ES (TIA Portal)	Highest

- ¹⁾ Supported by soft starter 3RW55 with firmware version V2.1 or higher and soft starter 3RW55 Failsafe with firmware version V1.1.0 or higher
- ²⁾ Not possible for 3RW50, 3RW52, 3RW55 soft starters with firmware version earlier than V2.1 and 3RW55 Failsafe soft starters with firmware version V1.0.0. For soft starters 3RW55 from firmware version V2.1 and soft starters 3RW55 Failsafe with firmware version V1.1.0 or higher if the digital inputs have master control by activating the "Manual operation local - input controlled" bit in the process image output (PIQ). The PLC can fetch back control at any time.
- ³⁾ Explanation in text below.
- ⁴⁾ Possible for 3RW50, 3RW52, 3RW55 and 3RW55 Failsafe soft starters. For soft starters 3RW55 from firmware version V2.1 and soft starters 3RW55 Failsafe with firmware version V1.1.0 or higher only if the input action "Operating mode manual - local" has been parameterized and activated.

Connection abort

On failure of the bus connection or a CPU stop, the 3RW5 soft starter behaves as follows, irrespective of the operating mode:

- 3RW50 soft starter: The 3RW50 soft starter behaves in accordance with the parameter "Control via digital input" (Page 33).
- 3RW52 soft starter with firmware version earlier than V2.0.1: The 3RW52 soft starter remains in "Automatic" mode or switches to "Automatic" mode.

Note

Response of 3RW52 soft starter in the event of bus connection failure or CPU stop (3RW52 Soft Starter with firmware version earlier than V2.0.1)

To enable you to continue controlling the 3RW52 soft starter after failure of the bus connection or CPU stop, you will need a 3RW5 HMI (accessory), which enables you to switch to "Manual operation local" mode.

Without 3RW5 HMI you cannot control the 3RW52 soft starter until the bus connection has been restored.

Alternatively, you can remove the 3RW5 communication module (Page 40). Then restore the 3RW52 soft starter on the device to the factory setting, in order to switch to the "Manual operation local - Input controlled" mode.

- 3RW52 soft starter from firmware version V2.0.1: The 3RW52 soft starter behaves in accordance with the parameter "Control via digital input" (Page 33).
- 3RW55 and 3RW55 Failsafe soft starters: The 3RW55 soft starter behaves in accordance with the parameter "Response to CPU/master stop" (Page 64).

If other connections to the control source are aborted, the master control automatically switches back to the lowest priority of the current mode.

- "Automatic" mode: The 3RW5 soft starter responds as it does upon failure of the bus connection or CPU stop.
- Operating mode "Manual - bus": Control switches to "Manual - bus - Connection abort".
- Operating mode "Manual - local": Master control switches either to "Manual - local - Connection abort" or to "Manual operation local - input controlled". For certain 3RW5 soft starters and parameter assignments, "Manual - local - Connection abort" is not possible. In the following cases, control switches to "Manual operation local - input controlled":
 - 3RW50 soft starter
 - 3RW52 soft starter
 - 3RW55 and 3RW55 Failsafe soft starters: Input action "Operating mode manual - local" is parameterized and activated.

Example of a 3RW55 soft starter: The 3RW5 HMI High Feature has master control. Input 2 is assigned the input action "Operating mode manual - local" and the input action is activated. On a connection abort terminating the connection to the 3RW5 HMI High Feature, control switches to "Manual - local - input controlled".

Additional information

Further information on the 3RW5 soft starters and restoring the factory settings of the device can be found in the Equipment Manual of the respective 3RW5 soft starter.

3.5.2 Sets the operating mode

Basic behavior when the operating mode is changed

A higher-priority mode can fetch control from a lower-priority mode at any time; the reverse is not possible. The master control function can only be returned to the mode with the lowest priority. Control sources with higher priority must take the master control function from the mode with the lowest priority.

Requirement

A mode with lower priority can only take the master control function back while the motor is switched off.

"Automatic" mode

Note that the 3RW5 soft starters switch to "Automatic" mode after the 3RW5 communication module has been installed in the 3RW52 soft starter with a firmware version earlier than V2.0.1, 3RW55 or 3RW55 Failsafe. The 3RW5 soft starters switch to the "Automatic" mode after installation of the 3RW5 communication module in the 3RW52 soft starter as of firmware version V2.0.1 and after the 3RW5 communication module is connected to the 3RW50 soft starter only for the settings "Manual activation" or "No change on bus error" of the parameter "Control via digital input" (Page 33).

Receiving master control

"Automatic" mode receives control from the operating mode "manual - bus" or "manual - local" as follows:

- Command in SIRIUS Soft Starter ES (TIA Portal) Premium / Professional (fieldbus)
Brief overview: Window "Task Card" > Tab "Online Tools" > "SIRIUS Control Panel > Control > Release Control"
- Command in the web server
Web page "Control Panel" > "Master Control > Release Control"
- For 3RW55 and 3RW55 Failsafe soft starters if the input action "Operating mode manual - local" is parameterized: By deactivating the input action "Operating mode manual - local".
- 3RW50, 3RW52 soft starters and for 3RW55 and 3RW55 Failsafe soft starters if the input action "Operating mode manual - local" is not parameterized: By disabling the "Manual operation local - input controlled" bit in the process image output (PIQ) (Page 154), the "Automatic" mode receives the master control from the input IN or the digital inputs.
- "LOCAL / REMOTE" action on the 3RW5 HMI
- Command in SIRIUS Soft Starter ES (TIA Portal) (local interface on the 3RW5 HMI High Feature)
Brief overview: Window "Task Card" > Tab "Online Tools" > "SIRIUS Control Panel > Control > Release Control"

Withdrawal of control by other control sources

In "Automatic" mode, master control can be withdrawn by any control source.

Operating mode "Manual operation bus - PC controlled"

Fetching control

SIRIUS Soft Starter ES (TIA Portal) Premium / Professional actively fetches master control from the "Automatic" mode or "Automatic operation - input controlled" mode in response to a command to this effect.

Brief overview: Window "Task Card" > Tab "Online Tools" > "SIRIUS Control Panel > Master Control > Get Control"

Note**Fetching control from "Automatic operation - input controlled" mode**

The "Automatic operation - input controlled" mode is possible for the following 3RW5 soft starters:

- 3RW55 soft starter from firmware version V2.1
 - Soft starter 3RW55 Failsafe with firmware version V1.1.0 or higher
-

Giving back control

SIRIUS Soft Starter ES (TIA Portal) Premium / Professional actively passes master control to "Automatic" mode in response to a command to this effect.

Brief overview: Window "Task Card" > Tab "Online Tools" > "SIRIUS Control Panel > Control > Release Control"

Withdrawal of control by other control sources

Control is withdrawn from the operating mode "Manual operation bus - PC controlled" by the operating mode "Manual operation - local" as follows:

- 3RW50, 3RW52 soft starters and for 3RW55 and 3RW55 Failsafe soft starters if the input action "Operating mode manual - local" is not parameterized: By activating the "Manual operation local - input controlled" bit in the process image output (PIQ) (Page 154).
- For 3RW55 and 3RW55 Failsafe soft starters if the input action "Operating mode manual - local" is parameterized: By activating the input action "Operating mode manual - local".
- "LOCAL / REMOTE" action on the 3RW5 HMI
- Command in SIRIUS Soft Starter ES (TIA Portal) (local interface on the 3RW5 HMI High Feature)

Brief overview: Window "Task Card" > Tab "Online Tools" > "SIRIUS Control Panel > Master Control > Get Control"

Operating mode "Manual operation bus - Webserver controlled"**Fetching control**

The web server actively fetches master control from the "Automatic" mode or "Automatic operation - input controlled" mode in response to a command to this effect.

Web page "Control Panel" > "Master Control > Get Control"

Giving back control

The web server actively passes master control to "Automatic" mode in response to a command to this effect.

Web page "Control Panel" > "Master Control > Release Control"

Withdrawal of control by other control sources

Control is withdrawn from the operating mode "Manual operation bus - Webserver controlled" by the operating mode "Manual operation local" as follows:

- 3RW50, 3RW52 soft starters and for 3RW55 and 3RW55 Failsafe soft starters if the input action "Operating mode manual - local" is not parameterized: By activating the "Manual operation local - input controlled" bit in the process image output (PIQ) (Page 154).
- For 3RW55 and 3RW55 Failsafe soft starters if the input action "Operating mode manual - local" is parameterized: By activating the input action "Operating mode manual - local".
- "LOCAL / REMOTE" action on the 3RW5 HMI
- Command in SIRIUS Soft Starter ES (TIA Portal) (local interface on the 3RW5 HMI High Feature)
Brief overview: Window "Task Card" > Tab "Online Tools" > "SIRIUS Control Panel > Master Control > Get Control"

"Manual operation local - input controlled" and "Automatic operation - input controlled" mode

Fetching control

The input IN or the digital inputs receive master control from the "Automatic" mode or "Manual - bus" mode as follows:

- 3RW50, 3RW52 soft starters and for 3RW55 and 3RW55 Failsafe soft starters if the input action "Operating mode manual - local" is not parameterized: By activating the "Manual operation local - input controlled" bit in the process image output (PIQ) (Page 154).
- For 3RW55 and 3RW55 Failsafe soft starters if the input action "Operating mode manual - local" is parameterized: By activating the input action "Operating mode manual - local".

If the master control function is on the 3RW5 HMI or, in the case of the local interface, on the 3RW5 HMI High Feature (higher priority), you must actively give up the master control function beforehand. The input IN or the digital inputs can then fetch control.

Giving back control

"Automatic" mode fetches control as follows:

- 3RW50, 3RW52 soft starters and for 3RW55 and 3RW55 Failsafe soft starters if the input action "Operating mode manual - local" is not parameterized: By deactivating the "Manual operation local - input controlled" bit in the process image output (PIQ) (Page 154).
- For 3RW55 and 3RW55 Failsafe soft starters if the input action "Operating mode manual - local" is parameterized: By deactivating the input action "Operating mode manual - local".

Withdrawal of control by other control sources

Master control is withdrawn from the input IN or digital inputs as follows:

- Command in SIRIUS Soft Starter ES (TIA Portal) Premium / Professional (fieldbus)
Brief overview: Window "Task Card" > Tab "Online Tools" > "SIRIUS Control Panel > Master Control > Get Control"

Note

Fetching control from "Automatic operation - input controlled" mode

The "Automatic operation - input controlled" mode is possible for the following 3RW5 soft starters:

- 3RW55 soft starter from firmware version V2.1
 - Soft starter 3RW55 Failsafe with firmware version V1.1.0 or higher
-

- Command in the web server
Web page "Control Panel" > "Master Control > Get Control"

Note

Fetching control from "Automatic operation - input controlled" mode

The "Automatic operation - input controlled" mode is possible for the following 3RW5 soft starters:

- 3RW55 soft starter from firmware version V2.1
 - Soft starter 3RW55 Failsafe with firmware version V1.1.0 or higher
-

- "LOCAL / REMOTE" action on the 3RW5 HMI
- Command in SIRIUS Soft Starter ES (TIA Portal) (local interface on the 3RW5 HMI High Feature)
Brief overview: Window "Task Card" > Tab "Online Tools" > "SIRIUS Control Panel > Master Control > Get Control"

Operating mode "Manual operation local - HMI controlled"

Fetching control

The 3RW5 HMI actively fetches master control via the action "LOCAL / REMOTE" from the lower priority control source.

If master control at the local interface on the 3RW5 HMI High Feature (higher priority), you must first actively give up master control in SIRIUS Soft Starter ES (TIA Portal). You can then get master control with the action "LOCAL / REMOTE".

Giving back control

The 3RW5 HMI actively gives up the master control function via the action "LOCAL / REMOTE" to the "Automatic" mode or alternatively to the input IN or the digital inputs. In the following cases, the master control function is given back to input IN or the digital inputs:

- No 3RW5 communication module installed in the 3RW5 soft starter or connected to the 3RW50 soft starter.
- 3RW50 and 3RW52 soft starters: The parameter "Control via digital input" (Page 33) is set to "Permanent activation".

3.5 Operating modes and master control function

Withdrawal of control by other control sources

If a command to this effect is issued in SIRIUS Soft Starter ES (TIA Portal) at the local interface on the 3RW5 HMI High Feature, master control is taken from the 3RW5 HMI.

Brief overview: Window "Task Card" > Tab "Online Tools" > "SIRIUS Control Panel > Master Control > Get Control"

Operating mode "Manual operation local - PC controlled"

Fetching control

In response to a command to this effect, SIRIUS Soft Starter ES (TIA Portal) actively fetches control from any control source.

Brief overview: Window "Task Card" > Tab "Online Tools" > "SIRIUS Control Panel > Master Control > Get Control"

Giving back control

If there is a corresponding command, SIRIUS Soft Starter ES (TIA Portal) actively gives up the master control function to the "Automatic" mode or alternatively to the Input IN or the digital inputs.

Brief overview: Window "Task Card" > Tab "Online Tools" > "SIRIUS Control Panel > Control > Release Control"

In the following cases, the master control function is given back to input IN or the digital inputs:

- No 3RW5 communication module installed in the 3RW5 soft starter or connected to the 3RW50 soft starter.
- 3RW50 and 3RW52 soft starters: The parameter "Control via digital input" (Page 33) is set to "Permanent activation".

Withdrawal of control by other control sources

The master control function cannot be withdrawn from SIRIUS Soft Starter ES (TIA Portal) by any control source.

Additional information

Further information on the 3RW5 soft starters can be found in the Equipment Manual of the respective 3RW5 soft starter.

Further information on the operation of SIRIUS Soft Starter ES (TIA Portal) can be found in the online help of SIRIUS Soft Starter ES (TIA Portal).

Messages about the mode

You will find more information on messages in chapter Messages about the mode (Page 81).

3.5.3 Control via digital input

Requirements

- 3RW50 soft starter from firmware version V1.0 or 3RW52 soft starter from firmware version V2.0.1

Operating principle

The parameter "Control via digital input" is helpful, for example, for applications in which the bus connection serves mainly for observation and monitoring purposes.

The parameter defines how the master control function behaves on failure of the bus connection or a CPU stop. A failure of the bus connection or a CPU stop can also occur in the operating mode "manual - local", for example when observing or monitoring via the bus connection. You can use the parameter to disable a switchover to the "Automatic" mode and operating mode "manual - bus".

Setting options

- 3RW5 HMI High Feature (firmware version V3.0 or higher)
Menu: "Parameters > Soft Starter > Additional parameters > Control via digital input"
You will find more information on operating the 3RW5 HMI High Feature in the Equipment Manual of the 3RW5 soft starter.
- Parameterization mode via key combination on the 3RW5 soft starter
Further information on the parameterization mode can be found in the Equipment Manual of the respective 3RW5 soft starter.

Parameter

Parameter	Description
Control via digital input	• Manual activation On failure of the bus connection or a CPU stop the 3RW5 soft starter remains in the "Automatic" mode or the 3RW5 soft starter switches to the "Automatic" mode. • Permanent activation A switch to the "Automatic" mode and operating mode "manual - bus" is not possible. If the 3RW5 soft starter is in the "Automatic" or "manual - bus" mode, the 3RW5 soft starter switches to the "Manual operation local - input controlled" mode. Control by means of a higher-level control (e.g. PLC) is not possible. • Activate on bus error (factory setting) On failure of the bus connection or a CPU stop, the 3RW5 soft starter switches from the "Automatic" mode to the "Manual operation local - input controlled" mode or the 3RW5 soft starter remains in the operating mode "manual - local" mode. • No change on bus error On failure of the bus connection or a CPU stop the master control function does not switch, but the 3RW5 soft starter remains in the current mode.

Additional information

For more information, see Chapter Operating modes (Page 24).

Further information on the 3RW5 soft starters can be found in the Equipment Manual of the respective 3RW5 soft starter.

3.6 Bus connection cable and connector

For connection, use only angled industrial bus connectors with a RJ45 socket for Industrial Ethernet.

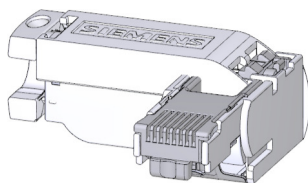


Illustration similar

NOTICE

Damage to the cable, bus connector and 3RW5 communication module

If you use unsuitable bus connectors, the following can happen:

- The hinged cover of the 3RW5 soft starter does not close.
- The connecting cable is impermissibly bent.
- The bus connector or the 3RW5 communication module is damaged.

Use bus connectors with a right-angled cable outlet and dimensions that match the recommended bus connector.

Recommended bus connector

Article number	Description
6GK1901-1BB20-2AA0	Industrial Ethernet FastConnect RJ45 Plug 90 2x 2, RJ45 plug connector (10/100 Mbit/s) with rugged metal housing and FC connecting method, for IE FC cable 2x 2; 90° cable outlet

3.7 Accessories

3.7.1 SIRIUS Soft Starter ES (TIA Portal)

SIRIUS Soft Starter ES (TIA Portal) as of V15 Update 2 is the central software for configuring, commissioning, operation, and diagnostics of 3RW5 soft starters.

You connect your PC or your programming device to the 3RW5 soft starter via the local interface on the optional 3RW5 HMI High Feature. With the Premium or Professional license, you can also connect your PC or your programming device from a central point to the 3RW5 soft starter via the 3RW5 communication module.

By displaying all operating data, service data and diagnostic data, SIRIUS Soft Starter ES (TIA Portal) provides reliable information, which helps you to avoid faults, or quickly locate and eliminate faults if they occur.

Download

You can download SIRIUS Soft Starter ES (TIA Portal) via the following link (<https://support.industry.siemens.com/cs/ww/en/ps/24231/dl>).

Available versions for V15 and V15.1

Supported functions (V15.1)	SIRIUS Soft Starter ES (TIA Portal)		
	Basic	Standard	Premium
Access via local interface on the 3RW5 HMI High Feature	x	x	x
Parameterization	x	x	x
Operator control	x	x	x
Diagnostics	x	x	x
Expert list	-	x	x
Parameter comparison	-	x	x
Service data (maximum pointer, statistic data)	-	x	x
Trace	-	x	x
Access via PROFIBUS or PROFINET	-	-	x
Teleservice via MPI	-	-	x
Routing	-	-	x
Bulk engineering (group function)	-	-	x

Versions available as of V16

Supported functions	SIRIUS Soft Starter ES (TIA Portal)	
	Basic	Professional ¹⁾
Access via local interface on the 3RW5 HMI High Feature	x	x
Parameterization	x	x
Operator control	x	x
Diagnostics	x	x
Expert list	-	x
Parameter comparison	-	x
Service data (maximum pointer, statistic data)	-	x
Trace	-	x
Access via PROFIBUS or PROFINET	-	x

Supported functions	SIRIUS Soft Starter ES (TIA Portal)	
	Basic	Professional ¹⁾
Teleservice via MPI	-	x
Routing	-	x
Bulk engineering (group function)	-	x

¹⁾ The "Professional" variant corresponds to the "Premium" version of V15.1

Additional information

You will find further information on SIRIUS Soft Starter ES (TIA Portal) and necessary versions and updates on the 3RW5 topic page (<https://support.industry.siemens.com/cs/ww/en/view/109747404>) and in the Catalog IC 10 (<https://support.industry.siemens.com/cs/ww/en/view/109747945>).

3.7.2 Use on the 3RW50 soft starter

The following accessories are needed for using the 3RW5 communication module on the 3RW50 soft starter:

- Push-in lugs for wall mounting (3ZY1311-0AA00)
- COM connecting cable (3RW5900-0CC00)

Mounting and dismantling

4.1 Installing the 3RW5 communication module in the 3RW5 soft starter

Requirements

- 3RW5 soft starter with integrated slot (3RW52, 3RW55, 3RW55 Failsafe)

NOTICE
Damage to property due to electrical voltage
Switch off the power to the 3RW5 soft starter before starting work (main and control supply voltage).

Procedure

1. Break out the cover of the slot (Page 37).
2. Mount the 3RW5 communication module (Page 39).

Result

You have mounted the 3RW5 communication module in the 3RW5 soft starter, which you can connect to the fieldbus (Page 50) via the 3RW5 communication module.

4.1.1 Break out the cover of the slot

Requirements

- 3RW5 soft starter with integrated slot (3RW52, 3RW55, 3RW55 Failsafe)
- Sharp, robust knife or diagonal cutter

Procedure

CAUTION

Sharp edges

Risk of injury from sharp edges or burrs.

Make sure that there are no sharp-edged burrs on the connecting webs and the preset breaking points after knocking out. Deburr spots with sharp edges properly to prevent injuries.

NOTICE

Damage to property

Hold the cover tight so that it does not fall into the interior.

Ensure that no further foreign matter can get into the slot.

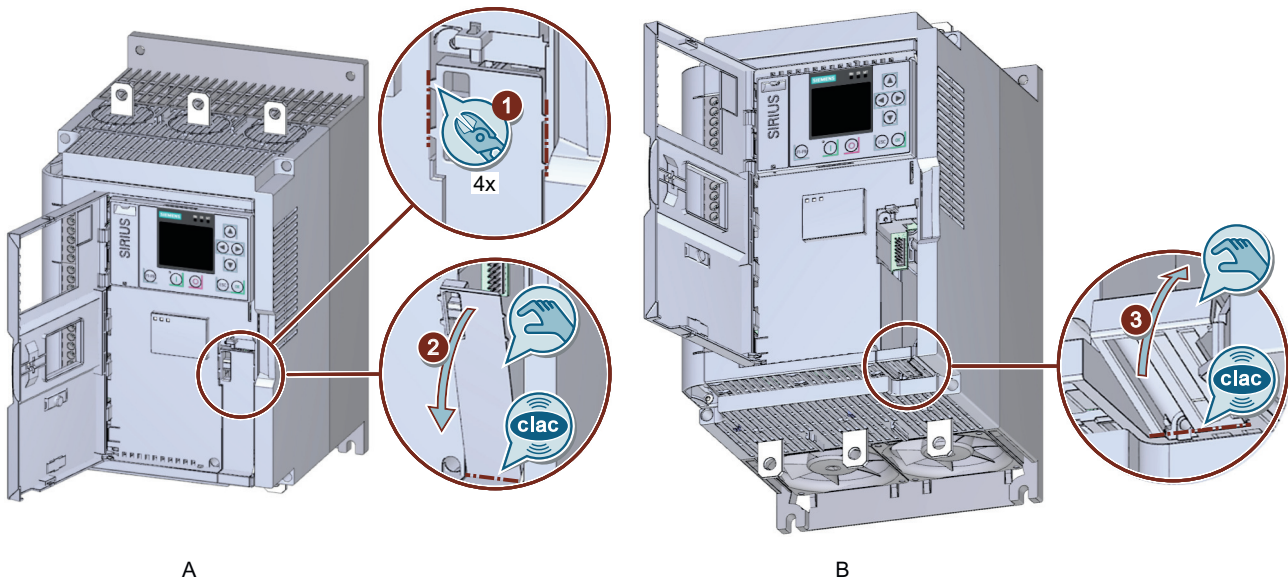


Illustration similar

A View at an angle from above.

B View at an angle from below.

1. Cut through the connecting webs of the cover. Use a sharp and robust knife or a diagonal cutter.
2. Lift the cover with a finger on the top side of the device and break the cover at the preset breaking point toward the outside.
3. Press the second part of the cover toward the interior of the device and break the cover inward at the preset breaking point.

Result

You can mount the 3RW5 communication module in the slot of the 3RW5 soft starter (Page 39).

4.1.2 Mount the 3RW5 communication module in the slot of the 3RW5 Soft Starter

Requirements

- 3RW5 soft starter with integrated slot (3RW52, 3RW55, 3RW55 Failsafe)
- Broken out slot cover (Page 37)
- Screwdriver PH1

Note

A magnetic screwdriver simplifies assembly.

Procedure

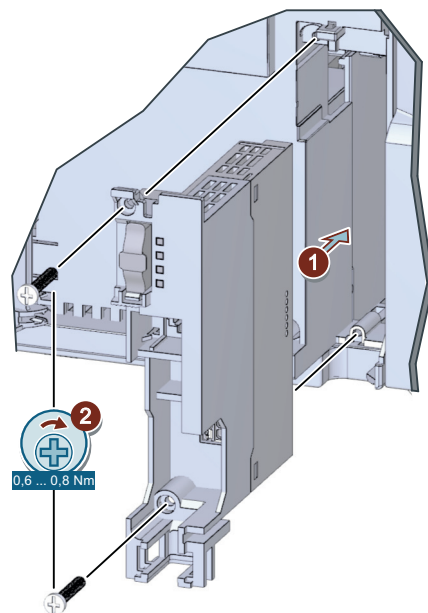


Illustration similar

1. Push the 3RW5 communication module into the slot.
2. Secure the 3RW5 communication module with the fastening screws supplied at the lower and upper mounting holes.

Result

You have mounted the 3RW5 communication module in the 3RW5 soft starter, which you can connect to the fieldbus (Page 50) via the 3RW5 communication module.

4.2 Removing the 3RW5 communication module from the 3RW5 soft starter

Requirements

- 3RW52, 3RW55 or 3RW55 Failsafe soft starters
- Removed bus connector (Page 51)
- Screwdriver PH1
- Slotted screwdriver with blade width 5.5 to 8 mm

NOTICE
Damage to property due to electrical voltage
Switch off the power to the 3RW5 soft starter before starting work (main and control supply voltage).

Note

A magnetic screwdriver simplifies disassembly.

Procedure

NOTICE
Damage to property
Ensure that no foreign matter can get into the slot.

4.3 Installing the 3RW5 communication module on a level surface

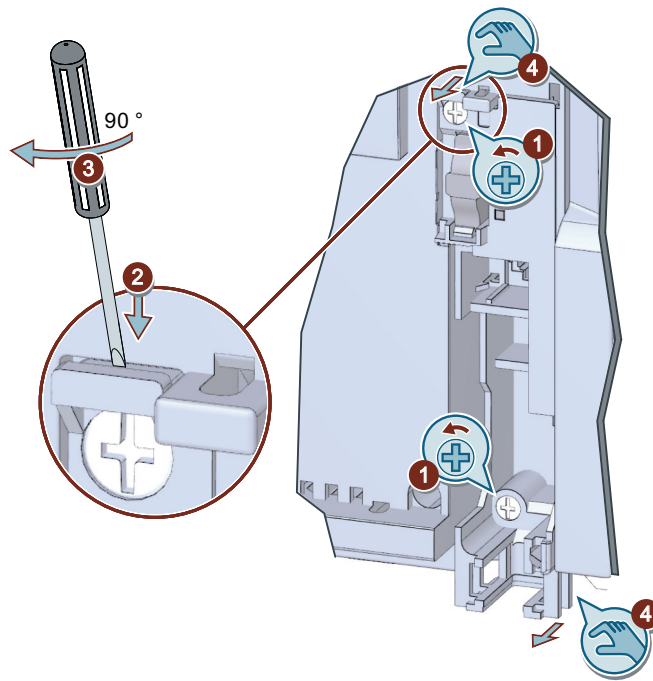


Illustration similar

1. Remove the fastening screws from 3RW5 communication module.
2. There is a small gap above the upper mounting hole on the 3RW5 communication module between the 3RW5 communication module and the 3RW5 soft starter. Insert the slotted screwdriver into this gap from above.
3. Turn the slotted screwdriver 90°. The turning movement lifts the 3RW5 communication module slightly out of the slot of the 3RW5 soft starter.
4. Pull the 3RW5 communication module out of the slot of the 3RW5 soft starter with your fingers.

Result

You have removed the 3RW5 communication module and can now mount another 3RW5 communication module.

4.3 Installing the 3RW5 communication module on a level surface

Requirements

- 3RW50 soft starter
- Level surface, e.g. sufficiently strong mounting plate
- Observe the mounting positions, minimum clearances and ambient conditions stated on the data sheet.

4.3 Installing the 3RW5 communication module on a level surface

- 2 properly executed drill holes with thread or plugs on the level surface.
The 3RW5 communication module must be mounted to the left of the 3RW50 soft starter.
Observe the position of the 3RW5 communication module in the drilling pattern (Page 148).
The COM connecting cable has a limited length.
- 2 head screws M4 x 12 DIN ISO 7045 to fit the drill-holes
- Screwdriver (depending on the drive of the screws)
- 2 push-in lugs (accessories) for wall mounting (Page 36)

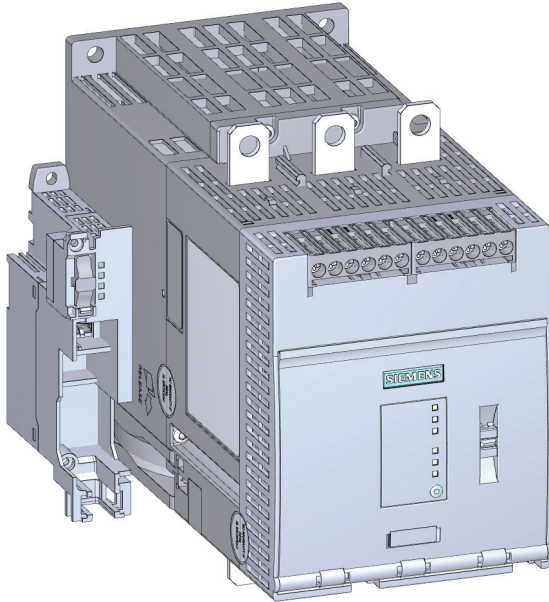


Illustration similar

Procedure

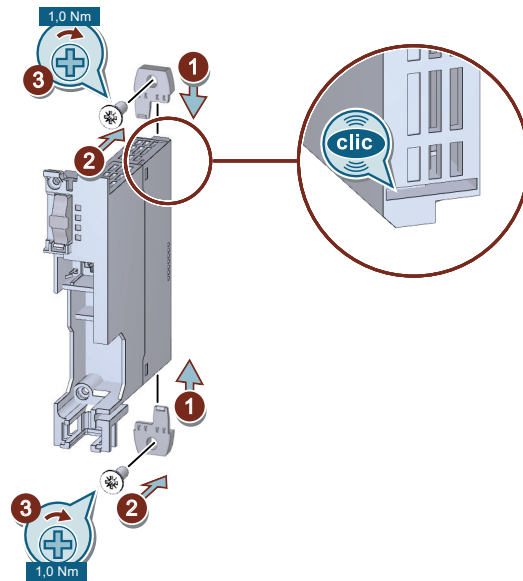


Illustration similar

1. Insert the push-in lugs into each side of the enclosure until you hear them engage.
2. Position the 3RW5 communication module on the level surface over the drill-holes and insert the head screws.
3. Attach the 3RW5 communication module on the bottom and top side of the level surface using the head screws.

Result

You have mounted the 3RW5 communication module on a level surface. You can connect the COM connecting cable to the 3RW50 soft starter (Page 45) and on the 3RW5 communication module (Page 46) and connect the 3RW50 soft starter to the fieldbus via the 3RW5 communication module (Page 50).

4.4 Removing the 3RW5 communication module from a level surface

Requirements

- 3RW50 soft starter
- Removed bus connector (Page 51)
- Removed COM connecting cable (Page 48)
- Screwdriver (depending on the drive of the screws)

Procedure

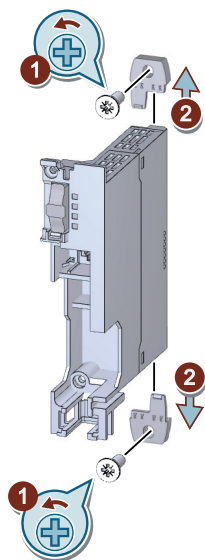


Illustration similar

1. Loosen the head screws on the 3RW5 communication module.
2. Pull out the push-in lugs from the 3RW5 communication module.

Result

You have removed the 3RW5 communication module and can now mount another 3RW5 communication module.

Connection

5.1 COM connecting cable

5.1.1 Connecting the COM connecting cable to the 3RW50 soft starter

Requirements

- 3RW50 soft starter
- Removed hinged cover
Further information on removing the hinged cover can be found in the Equipment Manual of the 3RW50 soft starter.
- COM connecting cable (accessory)

Procedure

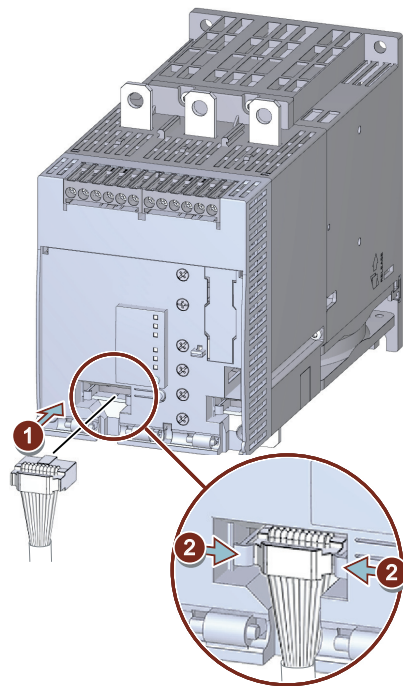


Illustration similar

5.1 COM connecting cable

1. Plug the bus connector of the COM connecting cable (without pin connectors) into the corresponding socket on the 3RW50 soft starter. Observe the coding of the bus connector and of the socket.
Further information on the connections on the 3RW50 soft starter can be found in the Equipment Manual for the 3RW50 soft starter.
2. Lock the bus connector in the socket.
3. Install the hinged cover.
Further information on installing the hinged cover can be found in the Equipment Manual of the 3RW50 soft starter.

Result

You have connected the COM connecting cable to the 3RW50 soft starter. You can connect the other side of the COM connecting cable to the 3RW5 communication module (Page 46).

5.1.2 Connecting the COM connecting cable to the 3RW5 communication module

Requirements

- 3RW5 communication module mounted on a level surface (Page 41)
- Removed cover cap
Loosen and remove the securing mechanism of the cover cap and keep the cover cap in a safe place.
- 3RW50 soft starter with connected COM connecting cable (accessory) (Page 45)

NOTICE
Damage to property due to electrical voltage Switch off the power to the 3RW5 soft starter before starting work (main and control supply voltage).

Procedure

NOTICE
Material damage due to incorrect plug-in connection Use the front plug-in connection of the 3RW5 communication module. The rear plug-in connection is not suitable for connecting to the COM connecting cable.

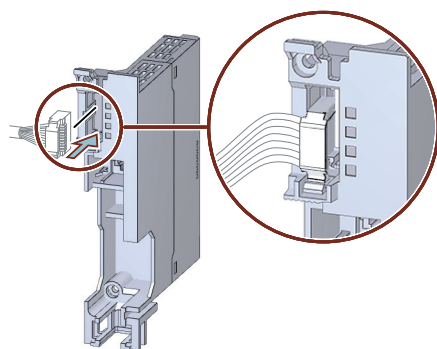


Illustration similar

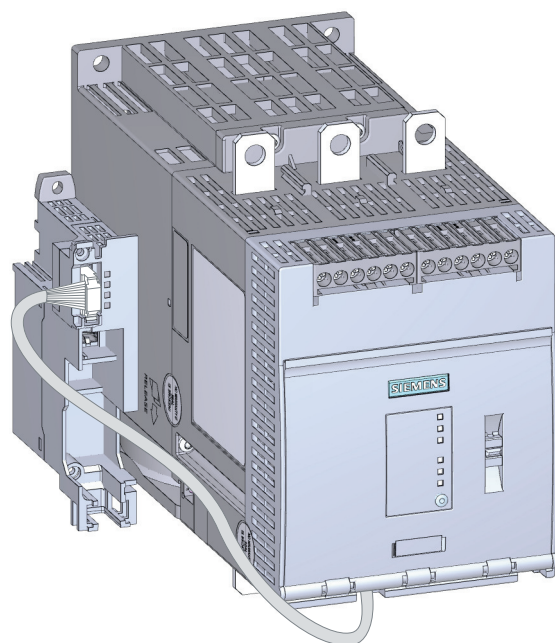


Illustration similar

Plug the bus connector of the COM connecting cable with the pin connectors into the front plug-in connection of the 3RW5 communication module until the securing mechanism on the bus connector of the COM connecting cable latches into place.

Route the COM connecting cable in front under the 3RW50 soft starter and then on the side next to the 3RW50 soft starter. Maintain sufficient distance from the main power connections and ensure that your routing is EMC-compliant.

Result

The 3RW5 communication module is now properly mounted and connected to the 3RW50 soft starter. You can connect the 3RW50 soft starter via the 3RW5 communication module on the fieldbus (Page 50).

5.1.3 Removing the COM connecting cable on the 3RW5 communication module

Requirements

- 3RW5 communication module mounted on a level surface (Page 41)
- Removed bus connector (fieldbus) (Page 51)
- Cover cap

NOTICE

Damage to property due to electrical voltage

Switch off the power to the 3RW5 soft starter before starting work (main and control supply voltage).

Procedure

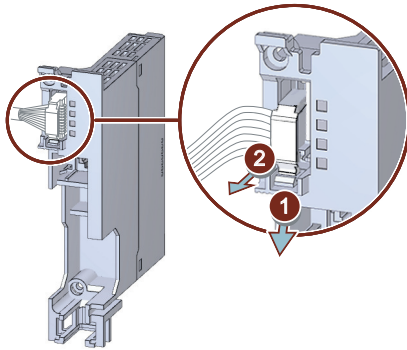


Illustration similar

1. Loosen die securing mechanism on the bus connector of the COM connecting cable.
2. Pull the bus connector of the COM connecting cable out of the plug-in connection of the 3RW5 communication module.

Result

You have disconnected the 3RW5 communication module from the 3RW50 soft starter. Place the cover cap onto the front plug-in connection of the 3RW5 communication module.

5.1.4 Remove the COM connecting cable on the 3RW50 soft starter

Requirements

- 3RW50 soft starter
- Removed hinged cover
Further information on removing the hinged cover can be found in the Equipment Manual of the 3RW50 soft starter.
- COM connecting cable removed from the 3RW5 communication module (Page 48)

Procedure

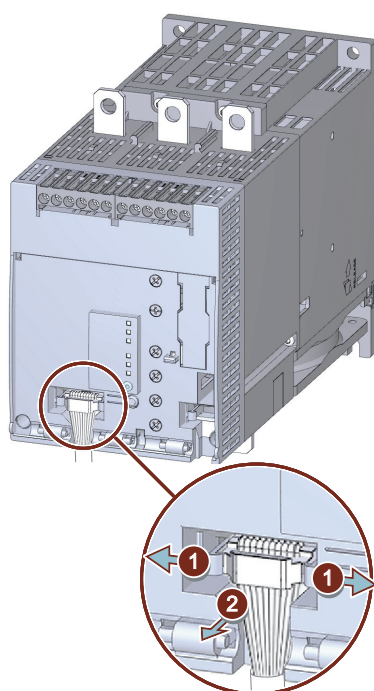


Illustration similar

1. Loosen the securing mechanism on the bus connector of the COM connecting cable.
2. Pull the bus connector of the COM connecting cable out of the socket on the 3RW50 soft starter.
3. Install the hinged cover.
Further information on installing the hinged cover can be found in the Equipment Manual of the 3RW50 soft starter.

Result

You have disconnected the COM connecting cable from the 3RW50 soft starter.

5.2 Fieldbus

5.2.1 Connecting the bus connector

Requirements

- Mounted 3RW5 PROFINET communication module
- Bus connector (Page 34)
- Cable tie

Note

Malfunctions caused by EMC interference

The purpose of shielding cables is to attenuate (dampen) magnetic, electrical or electromagnetic interference fields. Connect the cable shield of the fieldbus cable to system ground with low impedance to that interference currents on the cable shield can be conducted to ground.

Generally follow the instructions in the EMC Guide (<http://www.siemens.com/emc-guideline>) and implement the measures stated in it for shielding the cables and for connecting the shield.

Procedure - 3RW5 PROFINET Standard communication module

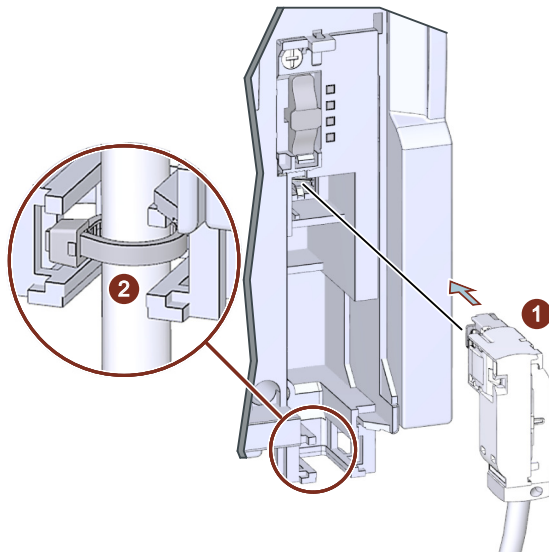


Illustration similar

1. Plug the bus connector of the cable into the socket of the 3RW5 PROFINET Standard communication module.
2. Secure the cable with a cable tie.

Procedure - 3RW5 PROFINET High Feature communication module

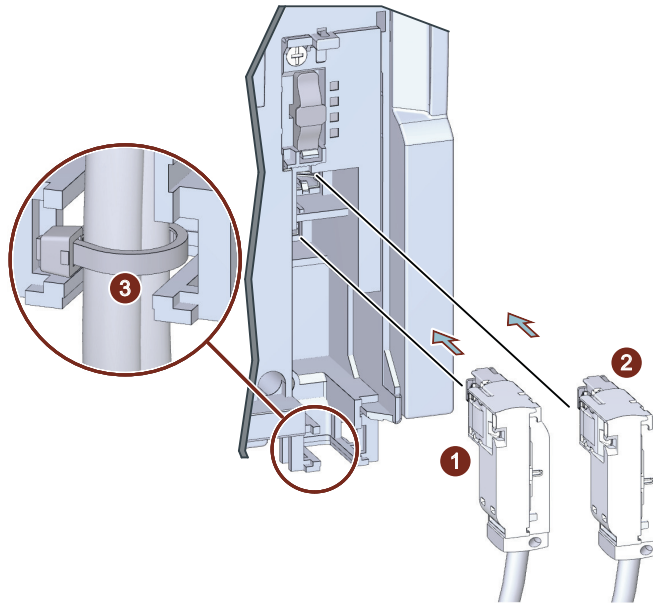


Illustration similar

1. Plug the bus connector of the first cable into the lower socket (Port 2) of the 3RW5 PROFINET High Feature communication module.

Note

3RW5 PROFINET High Feature communication module with 1 bus connector

If you only connect 1 bus connector you can choose a socket (Port 1 or 2).

2. Plug the bus connector of the second cable into the upper socket (Port 1) of the 3RW5 PROFINET High Feature communication module.
3. Secure the two cables together with a cable tie.

Result

The 3RW5 PROFINET communication module is now properly mounted and connected. You can integrate the 3RW5 soft starter into the associated network environment.

5.2.2 Removing the bus connector

Requirements

- Diagonal cutter
- Slotted screwdriver with blade width < 2.5 mm

Procedure

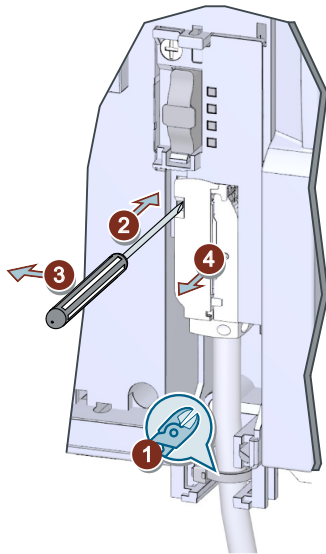


Illustration similar

1. Carefully cut through the cable ties with a diagonal cutter and remove the cable tie. Take care that you do not damage the cable.
2. Insert the slotted screwdriver into the opening on the bus connector (depending on which bus connector is used).
3. Hold back the locking bolt of the bus connector with the slotted screwdriver. Press the slotted screwdriver slightly to the left to do this.
4. Pull the bus connector of the cable out of the socket of the 3RW5 PROFINET communication module.

Note

3RW5 PROFINET High Feature communication module

The procedure for the bus connector in the lower socket (Port 2) is identical.

Result

You have disconnected the 3RW5 PROFINET communication module from the bus connection.

Configuring

6.1 Configuring the 3RW5 Soft Starter in the PROFINET IO system

Requirements

- Mounted 3RW5 PROFINET communication module
3RW50 soft starters must also be connected to the 3RW5 communication module.
The 3RW5 soft starter automatically detects the presence of the 3RW5 communication module when it is switched on.
- PROFINET IO system
 - IO controller (programmable logic controller, e.g. SIMATIC S7-1500)
 - IO supervisor (PC or programming device)
 - IO device (3RW5 PROFINET communication module)
- Configuration software of the controller, e.g. STEP 7 with HSP or GSDML file
- Parameterization software (optional), e.g. SIRIUS Soft Starter ES (TIA Portal) (Page 34)
- Basic knowledge of how to use PROFINET, e.g. for device name (Page 60) and IP parameter (Page 61)
- Note the information in chapter Firmware update (Page 15).

Procedure

1. Configure the 3RW5 soft starter in the PROFINET IO system.
The following procedures are possible, for example:
 - Configuring 3RW5 soft starters without assistance from a 3RW5 HMI High Feature (Page 55)
 - Configuring 3RW5 soft starters with the aid of a 3RW5 HMI High Feature (Page 57)Note the information in chapter Configuring the 3RW5 Soft Starter (Page 54).
2. Parameterize the 3RW5 soft starter. In particular, note the information in chapter Operation on failure of the bus connection to the controller (Page 64). You will find more information on parameterization in the Equipment Manual of the 3RW5 soft starter.
Depending on the selection and equipment of the 3RW5 soft starter, you can parameterize the 3RW5 soft starter in different ways via the 3RW5 communication module:
 - SIRIUS Soft Starter ES (TIA Portal) Premium / Professional on PC with PROFINET IO connection
 - Configuration software of the control on PC or programming device with PROFINET IO connection
 - User program via data sets (Page 157)

Note

During parameterization of the 3RW5 soft starter, it is possible to select impossible combinations of interdependent values. The diagnosis "Invalid parameter value" is then indicated in data set 92 of the 3RW5 soft starter (slot 2) (Page 168). You will find the dependencies of the parameters in the Equipment Manual of the 3RW5 soft starter.

Result

The 3RW5 soft starter is integrated into the PROFINET IO system as an IO device and parameterized. You can program the controller and commission the 3RW5 soft starter in the PROFINET IO system.

6.2 Configuring the 3RW5 Soft Starter

A requirement for communication via PROFINET is the setting of the device name (Page 60) and the IP parameters (Page 61) in the 3RW5 communication module.

Possible procedures for configuration can be found in chapters Configuring 3RW5 soft starters without assistance from a 3RW5 HMI High Feature (Page 55) and Configuring 3RW5 soft starters with the aid of a 3RW5 HMI High Feature (Page 57).

Note**Setting via the local interface and on the 3RW5 HMI High Feature**

The setting of the device name and the IP parameters via the local interface and on the 3RW5 HMI High Feature is always possible, even if no PROFINET connection is available.

6.2.1 Configuring the 3RW5 Soft Starter in the PROFINET IO system

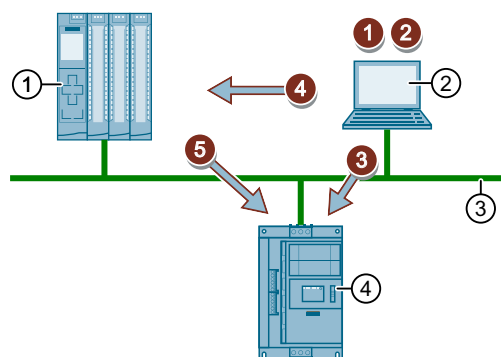
6.2.1.1 Configuring 3RW5 soft starters without assistance from a 3RW5 HMI High Feature

This section describes a possible configuration of the 3RW5 soft starter which you can only carry out via the configuration software of the controller. You do not need a 3RW5 HMI High Feature for this configuring option.

Requirements

- Connection of the 3RW5 soft starter via PROFINET
- Supply voltage (control supply voltage) switched on at 3RW5 soft starter
- MAC address
You can read the MAC address on the front of the 3RW5 communication module.

Procedure



- ① Programmable logic controller/IO controller, e.g. SIMATIC S7-1500
- ② PC or programming device with configuration software of controller
- ③ PROFINET
- ④ SIRIUS 3RW5 soft starter / IO device
- ① ... ⑤: Steps to be taken in the procedure

1. Integrate the 3RW5 soft starter in the configuration software of the controller as the IO device into the PROFINET IO system.

The following procedures are possible:

- Integrating 3RW5 soft starter via HSP in STEP 7 (TIA Portal) (Page 62)
- Integrating the 3RW5 Soft Starter into the PROFINET IO system with the GSDML file (Page 63)

Note

STEP 7 (TIA Portal) as of V16

3RW5 soft starters, 3RW5 communication modules and 3RW5 HMIs are already contained in the HW catalog of STEP 7 (TIA Portal) as of V16. Check the 3RW5 topic page for updates and ensure that your device and the current firmware are contained in the HW catalog.

2. Enter a device name for the IO device in the configuration software of the controller (e.g. in STEP 7 in the properties of the IO device).
Note the information in chapter Device name (Page 60).
3. Transfer the device name of the IO device online via the MAC address to the 3RW5 communication module (e.g. in STEP 7 in the "Assign device name" dialog box).
Note the information in chapter Device name (Page 60).

Note

Node flash test in STEP 7

Using the "Node flash test" (Page 70), you can quickly and easily identify the required IO device, by getting the LEDs of the 3RW5 communication module to flash. Compare the MAC address of the 3RW5 communication module with the displayed MAC address and select the required IO device.

Alternatively, you can also set the device name via SIRIUS Soft Starter ES (TIA Portal) Premium / Professional via fieldbus in the 3RW5 communication module.

Brief overview: Window "Project Navigation" with current project under created Soft Starter > "Online & Diagnostics" > Window "Work area" > "PROFINET IO ST / PROFINET IO HF >

Functions > Assign PROFINET device name"

Brief overview: Window "Project Navigation" with current project under created Soft Starter > "Device configuration" > Window "Work area" > Communication module "PROFINET IO ST / PROFINET IO HF" > Inspector window "PROFINET IO ST / PROFINET IO HF" > Tab "Properties" >

Tab "General" > "PROFINET interface > Ethernet addresses > PROFINET"

4. Load the configuration into the IO controller.
5. Set the IP parameters in the 3RW5 communication module.
The following procedures are possible:
 - During startup, the IO controller issues the IP parameters based on the device name and assigns these to the IO device (temporary IP parameters).
 - The IP parameters of the IO device are transferred online to the 3RW5 communication module (static IP parameters).

Note the information in chapter IP parameters (Page 61).

Result

The 3RW5 soft starter is configured in the PROFINET IO system and can communicate via the 3RW5 PROFINET communication module with other PROFINET devices.

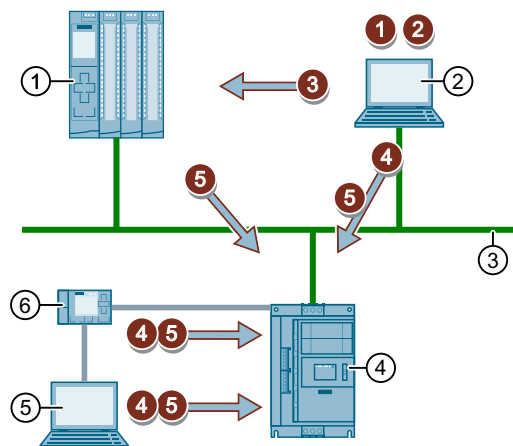
6.2.1.2 Configuring 3RW5 soft starters with the aid of a 3RW5 HMI High Feature

This chapter describes options for configuring the 3RW5 soft starter that you require for a 3RW5 HMI High Feature.

Requirements

- Input device (3RW5 HMI High Feature, PC)
- Supply voltage (control supply voltage) switched on at 3RW5 soft starter

Procedure



- ① Programmable logic controller/IO controller, e.g. SIMATIC S7-1500
- ② PC or programming device with configuration software of the controller and SIRIUS Soft Starter ES (TIA Portal) Premium / Professional (optional)
- ③ PROFINET
- ④ SIRIUS 3RW5 soft starter / IO device
- ⑤ PC with SIRIUS Soft Starter ES (TIA Portal)
- ⑥ 3RW5 HMI High Feature (accessories depend on 3RW5 soft starter)
- ① ... ⑤: Steps to be taken in the procedure

1. Integrate the 3RW5 soft starter in the configuration software of the controller as the IO device into the PROFINET IO system.

The following procedures are possible:

- Integrating 3RW5 soft starter via HSP in STEP 7 (TIA Portal) (Page 62)
- Integrating the 3RW5 Soft Starter into the PROFINET IO system with the GSDML file (Page 63)

Note

STEP 7 (TIA Portal) as of V16

3RW5 soft starters, 3RW5 communication modules and 3RW5 HMIs are already contained in the HW catalog of STEP 7 (TIA Portal) as of V16. Check the 3RW5 topic page for updates and ensure that your device and the current firmware are contained in the HW catalog.

2. Enter a device name for the IO device in the configuration software of the controller (e.g. in STEP 7 in the properties of the IO device).
Note the information in chapter Device name (Page 60).
3. Load the configuration into the IO controller.

4. Set the device name configured in the configuration software of the controller on the 3RW5 soft starter.

The following procedures are possible:

- Via SIRIUS Soft Starter ES (TIA Portal) Premium / Professional on the 3RW5 communication module
Brief overview: Window "Project Navigation" with current project under created Soft Starter > "Online & Diagnostics" > Window "Work area" > "PROFINET IO ST / PROFINET IO HF" > Functions > Assign PROFINET device name"
Brief overview: Window "Project Navigation" with current project under created Soft Starter > "Device configuration" > Window "Work area" > Communication module "PROFINET IO ST / PROFINET IO HF" > Inspector window "PROFINET IO ST / PROFINET IO HF" > Tab "Properties" > Tab "General" > "PROFINET interface > Ethernet addresses > PROFINET"
- Via SIRIUS Soft Starter ES (TIA Portal) over the local interface on the 3RW5 HMI High Feature
Brief overview: See SIRIUS Soft Starter ES (TIA Portal) Premium / Professional via 3RW5 communication module
- Via the 3RW5 HMI High Feature
Menu: "Parameter > Communication module > PROFINET / PROFINET HF > Device name"
You will find more information on operating the 3RW5 HMI High Feature in the Equipment Manual of the 3RW5 soft starter.

Note the information in chapter Device name (Page 60).

5. Set the IP parameters in the 3RW5 communication module.

The following procedures are possible:

- During startup, the IO controller issues the IP parameters based on the device name and assigns these to the IO device (temporary IP parameters).
- The IP parameters of the IO device are transferred online to the 3RW5 communication module (static IP parameters).
- Via SIRIUS Soft Starter ES (TIA Portal) Premium / Professional on the 3RW5 communication module
Brief overview: Window "Project Navigation" with current project under created Soft Starter > "Online & Diagnostics" > Window "Work area" > "PROFINET IO ST / PROFINET IO HF" > Functions > Assign IP address"
Brief overview: Window "Project Navigation" with current project under created Soft Starter > "Device configuration" > Window "Work area" > Communication module "PROFINET IO ST / PROFINET IO HF" > Inspector window "PROFINET IO ST / PROFINET IO HF" > Tab "Properties" > Tab "General" > "PROFINET interface > Ethernet addresses > IP protocol"
- Via SIRIUS Soft Starter ES (TIA Portal) over the local interface on the 3RW5 HMI High Feature
Brief overview: See SIRIUS Soft Starter ES (TIA Portal) Premium / Professional via 3RW5 communication module

- Via the 3RW5 HMI High Feature
Menu: "Parameter > Communication module > PROFINET / PROFINET HF > IP address"
Menu: "Parameter > Communication module > PROFINET / PROFINET HF > Subnet mask"
Menu: "Parameter > Communication module > PROFINET / PROFINET HF > Router address"
You will find more information on operating the 3RW5 HMI High Feature in the Equipment Manual of the 3RW5 soft starter.

Note the information in chapter IP parameters (Page 61).

Result

The 3RW5 soft starter is configured in the PROFINET IO system and can communicate via the 3RW5 PROFINET communication module with other PROFINET devices.

6.2.1.3 Device name

Before the 3RW5 soft starter can be addressed as an IO device by an IO controller, it must have a device name. The device name of the 3RW5 soft starter must match the device name in the configuration, so that the IO controller can communicate.

Selecting the device name

Observe the following points when selecting the device name:

- Logical name, e.g. with reference to the function or the installation location
- PROFINET naming conventions

Note

Converted device name

If the device name entered does not conform to the PROFINET naming convention in STEP 7, the device name is converted. The program generates a converted device name that corresponds to the PROFINET naming conventions.

- The device name comprises one or more name components separated by a period [.].
- Total length: A maximum of 240 characters
- Permissible characters: Lowercase letters [a...z], numerals [0...9], hyphen [-], or period [.]
- Length of a name component: A maximum of 63 characters
- The device name must not start with a hyphen [-] or a period [.]
- The device name must not end with a hyphen [-] or a period [.]
- The device name must not begin with numbers.
- The device name must not take the form "n.n.n.n" (n = 0...999).
- The device name must not begin with the character sequence "port-xyz" or "port-xyz-abcde" (a, b, c, d, e, x, y, z = 0...9).

Note**Length of the device name**

The length of the device name is limited to 20 characters when the name is entered via the 3RW5 HMI High Feature. If a longer device name has already been set (e.g. via SIRIUS Soft Starter ES (TIA Portal)), the 3RW5 HMI High Feature can only display and change the first 20 characters.

MAC address

Via the MAC address, the 3RW5 communication module can be accessed via LAN. You can read the MAC address on the front of the 3RW5 communication module or display it on the 3RW5 HMI High Feature.

Menu: "Parameter > Communication module > PROFINET / PROFINET HF > MAC address"

Transferring or setting the device name

If you transfer the device name online or set it directly on the 3RW5 soft starter, the device name is stored retentively in the 3RW5 communication module.

Note**Restarting the communication interface**

Any change of the device name via SIRIUS Soft Starter ES (TIA Portal) requires a restart of the communication interface.

A new start interrupts all PROFINET links and reestablishes them afterward.

6.2.1.4 IP parameters

All PROFINET devices are capable of the TCP/IP protocol and therefore require an IP address to operate on the PROFINET.

IP parameters

- IP address
- Subnet mask
- Router address

Temporary IP parameters

During startup, the IO controller issues the IP parameters based on the device name and assigns these to the IO device. The IP parameters assigned by the IO controller are stored non-retentively in the 3RW5 communication module and are deleted again when the supply voltage (control supply voltage) is switched off.

Note the settings in the configuration software of the controller.

Note

Set static IP parameters

Static IP parameters that were previously set are overwritten and deleted by temporary IP parameters.

Static IP parameters

The IP parameters set on the 3RW5 soft starter or transferred online are stored retentively in the 3RW5 communication module. The IP parameters of the 3RW5 communication module must match the IP parameters in the configuration.

When assigning the IP parameters online, note the settings in the configuration software of the controller.

Note

Restarting the communication interface

Any change in the IP parameters via SIRIUS Soft Starter ES (TIA Portal) requires a restart of the communication interface.

A new start interrupts all PROFINET links and reestablishes them afterward.

6.2.2 Integrating the 3RW5 Soft Starter into PROFINET IO system

6.2.2.1 Integrating 3RW5 soft starter via HSP in STEP 7 (TIA Portal)

Requirements

- STEP 7 (TIA Portal) as of V15 Update 3
- Hardware Support Package (HSP0238)
The current Hardware Support Package (HSP0238) can be found on the 3RW5 topic page (<https://support.industry.siemens.com/cs/ww/en/view/109747404>).

Procedure

1. Install the file from the Hardware Support Package (HSP0238).
After installation, you will find the 3RW5 soft starter in the HW Catalog of STEP 7 (TIA Portal).

Note

STEP 7 (TIA Portal) as of V16

3RW5 soft starters, 3RW5 communication modules and 3RW5 HMLs are already contained in the HW catalog of STEP 7 (TIA Portal) as of V16. Check the 3RW5 topic page for updates and ensure that your device and the current firmware are contained in the HW catalog.

2. Select the required 3RW5 soft starter from the HW catalog by means of the article number.
3. Add the 3RW5 PROFINET communication module from the HW catalog.
4. Connect the 3RW5 PROFINET communication module of the 3RW5 soft starter to the PROFINET IO system or the controller.

Result

The 3RW5 soft starter is integrated into the PROFINET IO system as an IO device in STEP 7 (TIA Portal).

You can also integrate the 3RW5 soft starter via the GSDML file in STEP 7 (TIA Portal). (Page 63)

6.2.2.2 Integrating the 3RW5 Soft Starter into the PROFINET IO system with the GSDML file

Requirement

- GSDML file
The current PROFINET GSDML file can be found on the 3RW5 topic page (<https://support.industry.siemens.com/cs/ww/en/view/109747404>).
- Configuration software of the controller that supports the schema version of the GSDML file, e.g. STEP 7
 - GSDML files for STEP 7 V5.x (<https://support.industry.siemens.com/cs/ww/en/view/109778885>)
 - GSD files for STEP 7 (TIA Portal) (<https://support.industry.siemens.com/cs/ww/en/view/109738401>)

Procedure

1. Install the GSDML file.
After installation, you will find the 3RW5 soft starter in the configuration software of the controller under "Additional field devices" (e.g. for STEP 7 in the HW Catalog).
2. Select the 3RW5 soft starter in the configuration software of the controller.
3. Insert the 3RW5 soft starter into the PROFINET IO system.

Result

The 3RW5 soft starter is integrated into the PROFINET IO system as an IO device in the configuration software of the controller.

6.3 Operation on failure of the bus connection to the controller

An interruption in the connection between the 3RW5 soft starter and the controller must not result in an undefined plant status.

Depending on the 3RW5 soft starter, you can set parameters that define the behavior of the 3RW5 soft starter on interruption of the connection with the controller in "Automatic" mode.

- 3RW50 and 3RW52 Soft Starters (Page 64)
- 3RW55 and 3RW55 Failsafe Soft Starters (Page 65)

6.3.1 3RW50 and 3RW52 Soft Starters

The 3RW50 and 3RW52 soft starters do not support the parameters for "Operation with CPU / Master". On failure of the bus connection or CPU stop, all bits of the process image output (PIQ) are set to 0. In reference to the operating mode, the 3RW50 and 3RW52 soft starters respond as follows:

- 3RW50 soft starter: The 3RW50 soft starter behaves in accordance with the parameter "Control via digital input" (Page 33).
- 3RW52 soft starter with firmware version earlier than V2.0.1: The 3RW52 soft starter remains in the "Automatic" mode or switches to the "Automatic" mode.

Note**Response of 3RW52 soft starter in the event of bus connection failure or CPU stop (3RW52 soft starter with firmware version earlier than V2.0.1)**

To enable you to continue controlling the 3RW52 soft starter in the "Automatic" mode on failure of the bus connection, you require a 3RW5 HMI (accessory) which enables you to switch to the "Manual operation local" mode (Page 24).

Without 3RW5 HMI you cannot control the 3RW52 soft starter until the bus connection has been restored.

Alternatively, you can remove the 3RW5 communication module (Page 40). Then restore the 3RW52 soft starter on the device to the factory setting, in order to switch to the "Manual operation local - Input controlled" mode.

- 3RW52 soft starter from firmware version V2.0.1: The 3RW52 soft starter behaves in accordance with the parameter "Control via digital input" (Page 33).

Additional information

You will find more information on restoring the factory setting on the device in the Equipment Manual of the 3RW52 soft starter.

6.3.2 3RW55 and 3RW55 Failsafe Soft Starters

Setting options

- SIRIUS Soft Starter ES (TIA Portal) Premium / Professional via 3RW5 communication module
Brief overview: Window "Project Navigation" with current project under created Soft Starter > "Parameters" > Window "Work area" > "Soft Starter > Additional parameters > Operation with CPU / Master"
- SIRIUS Soft Starter ES (TIA Portal) via local interface on the 3RW5 HMI High Feature
Brief overview: See SIRIUS Soft Starter ES (TIA Portal) Premium / Professional via 3RW5 communication module
- 3RW5 HMI High Feature
Menu: "Parameter > Soft Starter > Additional parameters > Operation with CPU / Master"
You will find more information on operating the 3RW5 HMI High Feature in the Equipment Manual of the 3RW5 soft starter.
- Starting parameters for start-up of the automation system
- User program via data set 131 (Page 177)

Parameter

Parameter	Description
Response to CPU/Master Stop	This parameter defines how the 3RW55 and 3RW55 Failsafe soft starters behave on failure of the bus connection or CPU stop. - Switch substitute value (factory setting) The process image output of the 3RW5 soft starter is automatically changed to the values defined in the following parameter "Substitute value". - Keep last value The 3RW5 soft starter does not change the process image output. The current control commands are retained.
Substitute value ¹⁾	On failure of the bus connection or CPU stop, the 3RW55 and 3RW55 Failsafe soft starters can be controlled by a substitute process image output. - Motor CW - Motor CCW - Reset - Emergency start - Creep speed - Output 1 - Output 2 - Parameter set bit 0²⁾ - Parameter set bit 1²⁾ - Disable Quick-stop - Output 3 - Activate pump cleaning (only adjustable via user program) - Manual operation local - input controlled (only adjustable via user program) - Use alternative stopping mode - Motor standstill
Parameters of CPU / master disabled	This parameter defines how the 3RW55 and 3RW55 Failsafe soft starters process the parameter values received from the controller. Setting the parameters only affects the device parameters of the 3RW55 and 3RW55 Failsafe soft starters. Device parameters of the 3RW5 HMI High Feature and of the 3RW5 communication module are always overwritten regardless of how the parameters are set. - Deactivate (factory setting) The parameters set on the 3RW55 or 3RW55 Failsafe soft starter are overwritten on bus startup by the values stored in the configuration software of the controller. - Activate The soft starter acknowledges to the controller the correct receipt of all the parameter values sent to it by the controller via cyclic and acyclic communication channels. The 3RW55 or 3RW55 Failsafe soft starter then rejects these values. This prevents the parameters stored in the 3RW55 and 3RW55 Failsafe soft starters from being overwritten. - Activate only for startup parameter The parameterization block only affects the starting parameters when the controller is starting up.

¹⁾ In the 3RW5 HMI High Feature, the parameter is only visible if "Switch substitute value" is selected in the parameter "Response to CPU/Master Stop".

- ²⁾ Explanation in the following table. When making the settings via the 3RW5 HMI High Feature, observe the Equipment Manual of the 3RW5 soft starter. You can select the parameter set directly in the SIRIUS Soft Starter ES (TIA Portal).

Additional information

The following table describes the assignment of the substitute values "Parameter set bit 0" and "Parameter set bit 1":

Parameter set	Parameter set bit 0	Parameter set bit 1
Process image error	1	1
Parameter set 1 (PS1)	0	0
Parameter set 2 (PS2)	1	0
Parameter set 3 (PS3)	0	1

Messages and diagnostics

The 3RW5 communication module provides you with the following diagnostics options:

- LED display (Page 69)
- 3RW5 HMI High Feature
Menu: "Diagnosis > Communication module"
You will find more information on operating the 3RW5 HMI High Feature in the Equipment Manual of the 3RW5 soft starter.
- SIRIUS Soft Starter ES (TIA Portal) Premium / Professional via 3RW5 communication module
Brief overview: Window "Project Navigation" with current project under created Soft Starter > "Commissioning" > Window "Work area" > "Soft Starter / HMI > Diagnosis"
- SIRIUS Soft Starter ES (TIA Portal) via local interface on the 3RW5 HMI High Feature
Brief overview: See SIRIUS Soft Starter ES (TIA Portal) Premium / Professional via 3RW5 communication module
- Controller (e.g. SIMATIC S7-1500)
 - Configuration software of the controller (e.g. STEP 7) (Page 71)
 - User program via data sets (Page 77)
- Web server (Page 92) (only for 3RW5 PROFINET High Feature communication module)
- OPC UA server (Page 106) (only for 3RW5 PROFINET High Feature communication module)

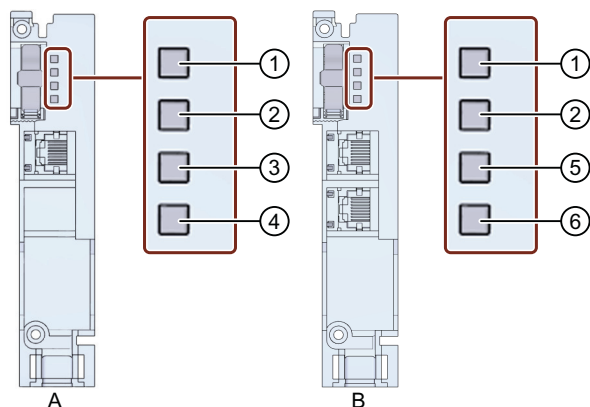
You will find faults and remedial measures for the 3RW5 communication module in chapter Errors and remedial measures on the 3RW5 communication module (Page 80).

7.1 LED display

7.1.1 Device LEDs on the 3RW5 PROFINET communication modules

The diagnostics of the 3RW5 communication module is displayed by LEDs on the 3RW5 communication module under the hinged cover of the 3RW5 soft starter. The LEDs briefly light up simultaneously at the start-up of the 3RW5 communication module (LED test).

LED display on the 3RW5 PROFINET communication modules



- A 3RW5 PROFINET Standard communication module
 B 3RW5 PROFINET High Feature communication module
- ① DIAG (red / green)
 ② BUS (red / green)
 ③ LINK (green)
 ④ No function
 ⑤ LINK 1 (green)
 ⑥ LINK 2 (green)

7.1.2 Status and error displays

"DIAG" LED

State	Meaning
 Lights up green	Device exchanging data with the IO controller.
 Flashes green	- The 3RW5 soft starter is not configured. - The 3RW5 communication module is starting. - The 3RW5 communication module is being parameterized. - Factory settings are being restored.
 Lights up red	Hardware or firmware defective.
 Flashes red	- Group error (only if the 3RW5 communication module is malfunctioning) - Switchover from old to new firmware after firmware update (flashes briefly)

State	Meaning
 Flashes green / red	The "node flash test" was activated.
☐ Off	No supply voltage (control supply voltage) available.

"BUS" LED

State	Meaning
 Lights up green	Device performing data exchange.
 Lights up red	Bus error
 Flashes red	Configuring error
☐ Off	• Device not performing data exchange (e.g. controller is in stop state). • No supply voltage (control supply voltage) available.

LED "LINK", "LINK 1" and "LINK 2"

State	Meaning
 Lights up green	There is a PROFINET connection between the 3RW5 communication module ¹⁾ and a communication partner (e.g. IO controller).
 Flashes green	The "node flash test" was activated.
☐ Off	• There is no PROFINET connection between the 3RW5 communication module¹⁾ and a communication partner (e.g. IO controller). • No supply voltage (control supply voltage) available.

¹⁾ For the 3RW5 PROFINET High Feature communication module, the assignment LINK 1 - Port 1 and LINK 2 - Port 2 applies.

7.2 Diagnostics via configuration software of the controller

When a certain fault occurs, the 3RW5 soft starter generates an interrupt as an IO device and sends it to the IO controller. The CPU of the controller then interrupts processing of the user program and calls up interrupt OBs automatically. The OB number and start information already provide you with information on the cause and type of fault.

The 3RW5 communication module supports the following interrupts:

- Diagnostic interrupt (error interrupt)
- Diagnostics interrupt (maintenance interrupt)
- Removal and insertion interrupt (3RW5 HMI High Feature)

7.2.1 Triggering of a diagnostics interrupt (error interrupt)

In the case of a coming or going event, with appropriate parameterization (Page 79), the 3RW5 soft starter triggers a diagnostic interrupt (error interrupt). The "ER" LED on the 3RW5 soft starter flashes red in this case.

The CPU of the controller then interrupts processing of the user program and processes the diagnostics interrupt OB (OB 82). The interrupt triggering event is logged in the start information of the diagnostic interrupt OB. Depending on the model, the controller switches to the "STOP" operating state if the diagnostics interrupt OB is not available.

7.2.2 Triggering of a diagnostics interrupt (maintenance interrupt)

The aim of maintenance interrupts is to enable early detection and correction of potential faults.

In the case of a coming or going event, with appropriate parameterization (Page 79), the 3RW5 soft starter triggers a diagnostic interrupt (maintenance interrupt). The LED "MT" on the 3RW5 soft starter lights up yellow in this case.

The CPU of the controller then interrupts processing of the user program and processes the diagnostics interrupt OB (OB 82). The interrupt triggering event is logged in the start information of the diagnostic interrupt OB. Depending on the model, the controller switches to the "STOP" operating state if the diagnostics interrupt OB is not available.

7.2.3 Triggering a PROFlenergy status interrupt

If the status of the PROFlenergy energy saving function changes (energy saving mode or operating mode), the 3RW55 or 3RW55 Failsafe soft starter triggers a status interrupt. The LED "MT" on the 3RW55 or 3RW55 Failsafe soft starter flashes yellow when energy saving mode is active.

Note the information in chapter PROFlenergy (Page 83).

Requirements

- 3RW5 PROFINET High Feature communication module from firmware version V1.1
- 3RW55 soft starter from firmware version V2.1 or 3RW55 Failsafe soft starter

7.2.4 Triggering of a removal and insertion interrupt

The removal and insertion interrupt is only triggered by removal or insertion of the 3RW5 HMI High Feature.

On a removal and insertion interrupt, the controller CPU interrupts processing of the user program and processes the removal and insertion OB (OB 83). The interrupt triggering event is logged in the start information of the removal and insertion interrupt OB.

7.2.5 Reading out the diagnostics information with STEP 7

In an automation system with a SIMATIC S7 controller as the IO controller, you can read out the diagnostics as follows:

- HW Config: Device diagnostics as plain text on the STEP 7 user interface
- SFB 52 (RDREC): Read data sets from the I/O device
- SFB 54 (RALRM): Receive interrupts from the I/O device

More information

You can find more information in the Online Help for STEP 7 and in the corresponding manuals for PROFINET.

7.2.6 Interrupt types

PROFINET interrupt types

ER Error interrupt
MT Maintenance interrupt
PE PROFIenergy status interrupt

Error types

Depending on the 3RW5 soft starter, the following error types can be transmitted. You will find information on rectification and acknowledgment of faults and warnings in the Equipment Manual of the 3RW5 soft starter. Information on which faults and warnings are supported by the 3RW5 soft starter can also be found in data set 92 of the 3RW5 soft starter (slot 2) (Page 168).

Error type	Inter-rupt type	Error / Warning	Cause	+ F ¹⁾	Byte.Bit ²⁾
0x0007	ER	Upper limit exceeded	- With sensors: The measured value has exceeded the range limits. - With actuators: The output value has exceeded an upper limit.	x	31.2
0x0019	ER	Safety-related shutoff	The module has detected a problem on the channel and has therefore executed a safety-related shutoff. The possible reason is a discrepancy error.	x	12.7
0x010A	ER	No supply voltage	- The power switch is open or the power supply is not correctly connected. - No current.	x	11.1 87.1
0x011B	ER	Invalid/inconsistent firmware present	The firmware is incomplete and/or the firmware expansions are incomplete or incompatible.	-	38.3
0x1000	ER	Residual current after ON command	No current flow is detected in the motor feeder after an ON command. - Main circuit is interrupted (fuse, motor starter protector). - Motor contactor or contactor control is defective. - The parameter "Execution time" is too short. - No load.	x	25.0
0x100A	ER	Test mode current flow	- Current is flowing in the motor feeder although the motor feeder is in test mode or the test position (TPF). - The main circuit is not interrupted in test mode.	x	87.0
0x1011	MT	Generator operation	The motor is coasting down. The motor cables may be energized.	-	13.6
0x1012	ER	Phase control failure	The fault occurs without the motor starting: - Motor terminals are incorrectly connected. - Error in configuration of inside-delta circuit. - There is a ground fault. The fault occurs during starting: - Chosen starting voltage too high. - Breakaway pulse wrongly set.	x	30.3
0x1013	MT	2-phase control active ³⁾	During 3-phase operation, only 2 phases are controlled, as one pair of thyristors is defective.	-	73.0

7.2 Diagnostics via configuration software of the controller

Error type	Inter- rupt type	Error / Warning	Cause	+ F ¹⁾	Byte.Bit ²⁾
0x1021	ER	Asymmetry	A limit value for asymmetry has been exceeded. Asymmetry can cause an overload. - Phase failure. - Fault in the motor windings.	-	14.0
0x1021	MT			-	62.6
0x1022	ER	Therm. motor model over- load	- The motor feeder has been overloaded. - The motor temperature rise has exceeded a limit.	x	12.3
0x1022	MT			-	62.3
0x1024	ER	Temperature sensor over- load	The temperature of the motor is too high.	x	12.0
0x1024	MT			-	22.5
0x1025	ER	Temperature sensor short circuit	A short circuit has occurred in the temperature sensor cable.	x	12.2
0x1025	MT			-	22.7
0x1026	ER	Temperature sensor wire break	A wire has broken in the sensor cable of the temperature sensor.	x	12.1
0x1026	MT			-	22.6
0x1027	ER	Ground fault	The ground-fault monitoring has responded. An impermissibly high residual current is flowing.	-	16.0
0x1027	MT			-	62.7
0x1033	ER	No start-up data received	Data necessary for device start-up are missing.	-	18.4
0x1034	MT	Starting time exceeded	The set maximum starting time is shorter than the starting time required by the motor.	-	92.2
0x1035	MT	Starting time undershot	The set minimum starting time is longer than the starting time required by the motor.	-	92.3
0x1036	MT	Parameters for Ex motor protection received ⁴⁾	Parameters for the EX motor protection have been received.	-	60.2
0x1040	ER	Threshold I exceeded	The current has exceeded a limit.	-	14.2
0x1040	MT			-	62.4
0x1041	ER	Threshold I undershot	The current has undershot a limit.	-	14.3
0x1041	MT			-	62.5
0x1042	MT	Threshold P exceeded	The active power of the motor has exceeded a limit value.	-	83.2
0x1042	ER			-	83.4
0x1043	MT	Threshold P undershot	The active power of the motor has undershot a limit value.	-	83.3
0x1043	ER			-	83.5
0x1046	ER	Actuator disconnection	The module has disconnected the actuator. An additional diagnostic message will be displayed to provide you with more detailed information about the cause.	-	12.4 14.1 14.4 83.6
0x1057	ER	Number of switch-on operations exceeded	The permissible number of switch-on operations in the monitoring period has been exceeded.	x	71.1
0x1057	MT			-	71.3
0x1080	ER	Device error	Irrecoverable error detected following self-diagnostics (self-test, contactor contacts, switching element, etc.).	-	19.2
0x1081	ER	Bypass defective	- Bypass defective - The error can also be generated by successive, brief interruptions of the control supply voltage.	x	29.3

7.2 Diagnostics via configuration software of the controller

Error type	Inter- rupt type	Error / Warning	Cause	+ F ¹⁾	Byte.Bit ²⁾
0x1082	ER	Power semiconductor defective	- Power semiconductor defective - The fault is also generated if the defective switching element (bypass or power semiconductor) cannot be accurately identified.	x	10.4 29.5 29.6 29.7
0x1083	ER	Switching element overload	Switching element (switching contact, power semiconductor) too hot.	x	10.3
0x1083	MT			-	31.1
0x1084	ER	Electronics supply voltage too low	The supply voltage is below the permissible value.	x	16.7
0x1085	ER	Bypass overload	An excessively high current has occurred in bypass mode.	x	29.4
0x1089	MT	Remaining time for tripping undershot	The time until overload release of the thermal motor type is shorter than the parameterized time for the tripping allowance.	-	62.2
0x1092	ER	Type of motor connection unknown or incorrect	The type of motor connection was not recognized or deviates from the configuration.	x	23.7
0x1094	ER	Incorrect module slot or fault configuration	Real and configured slot of the module are different.	-	22.3
0x1094	MT			-	23.6
0x1095	ER	Parameter error	The module is not or is incorrectly parameterized or changes to parameter settings are rejected in the current operating state.	x	18.1
0x1096	ER	Process image error	The process image output (PIQ) contains invalid control bit combinations (e.g. control bits for clockwise and counter-clockwise set simultaneously).	x	17.7
0x1097	ER	Phase failure	The main energy monitoring system has detected a phase failure.	x	25.2 25.3 25.4
0x1098	MT	Connection abort in manual mode	Connection to a local control station (e.g. device HMI) has been interrupted.	-	17.6
0x510A	MT	Fan fault	- Fan is dirty (not rotating freely) - Cabling fault - Internal fan faulty	-	77.5
0x510E	ER	Error in the phase sequence	The phase sequence is not correct.	x	75.0
0x510E	MT			-	75.3
0x9005	ER	Electronic component overload	The temperature in the components has exceeded the highest permissible limit.	-	90.0

¹⁾ Error type 0x1046 is additionally set.

²⁾ The specified bits in data set 92 of the 3RW5 soft starter (slot 2) are assigned to the error types. If several bits are assigned to one error type you can read out a more accurate diagnosis via the data set.

³⁾ 3RW55 soft starter from firmware version V2.1

⁴⁾ 3RW55 soft starter from firmware version V2.0

7.3 Diagnostics via data sets

Data set 92: Communication module diagnostics (slot 1)

The communication module diagnostics describes the current status of the 3RW5 PROFINET High Feature communication module.

Depending on the 3RW5 soft starter, you can read out and evaluate the communication module diagnostics via data set 92 of the 3RW5 communication module (slot 1) (Page 161).

Data set 92: Soft starter diagnostics (slot 2)

The soft starter diagnostics describes the current condition of the 3RW5 soft starter.

Depending on the 3RW5 soft starter, you can read out and evaluate the Soft Starter Diagnosis via data set 92 of the 3RW5 soft starter (slot 2) (Page 168).

Data set 92: HMI diagnostics (slot 3)

The HMI diagnostics describes the current status of the 3RW5 HMI High Feature.

Depending on the 3RW5 soft starter, you can read out and evaluate the HMI diagnostics via data set 92 of the 3RW5 HMI High Feature (slot 3) (Page 195).

Data set 94: Measured values

The current measured values of the 3RW5 soft starter are acquired in this data set.

Depending on the 3RW5 soft starter, you can read out and evaluate the measured values via data set 94 (Page 173).

Data set 95: Statistic data

The statistic data group together the operating states from the past that are relevant to the load.

Depending on the 3RW5 soft starter, you can read out and evaluate the statistic data via data set 95 (Page 174).

Data set 96: Maximum pointer

The maximum pointers are stored extreme values of measured values from the past.

Depending on the 3RW5 soft starter, you can read out and evaluate the maximum pointers data via data set 96 (Page 175).

Via a connection on the 3RW5 communication module, you can reset the maximum pointers in the following ways:

- SIRIUS Soft Starter ES (TIA Portal) Premium / Professional
Brief overview: Window "Project Navigation" with current project under created Soft Starter > "Commissioning" > Window "Work area" > "Soft Starter > Maximum pointer"
- "Reset maximum pointer" command via data set 93 (Page 160)

7.4 Error codes for negative data set acknowledgement

If a data set is rejected, an error code is sent with the negative acknowledgment. The error code provides information about the reason for the negative acknowledgment.

Evaluation of the error codes

You can evaluate the error codes in the following ways:

- Configuration software of the controller, e.g. STEP 7
The error codes are output via PROFINET IO Layer 2. Further information can be found in the corresponding manuals in the PROFINET IO protocol description.

Error codes

Error codes (bytes)		Error message	Cause
high	low		
00 _H	00 _H	No error	-
Communication interface			
80 _H	A0 _H	Negative acknowledgment for "Read data set"	• Data set write-only
80 _H	A1 _H	Negative acknowledgment for "Write data set"	• Data set read-only
80 _H	A2 _H	Protocol error	• Layer 2 (fieldbus) • Device interface • Incorrect coordination
80 _H	A9 _H	This function is not supported.	• Acyclic communication is not equal to Read/Write data set.
Access to technology			
80 _H	B0 _H	Unknown data set number	• Data set number is not supported by the soft starter.
80 _H	B1 _H	Incorrect data set length when writing	• Data set length and specified data set length different
80 _H	B2 _H	Wrong slot number	• Incorrect slot number
80 _H	B3 _H	Inconsistent configuration	• Invalid parameter value pairings
80 _H	B4 _H	Incorrect data set length when reading	• Data set length and specified data set length different
80 _H	B6 _H	Communication partner has rejected data transfer.	• Incorrect operating mode • Data set is read-only • Parameters cannot be changed in ON state
80 _H	B7 _H	Invalid value range	• Incorrect value range
80 _H	B8 _H	Given parameter is invalid	• Incorrect parameter value
Device resources			

Error codes (bytes)		Error message	Cause
high	low		
80 _H	C2 _H	Temporary lack of resources in the device	- No free input buffer - The data set is currently being updated - The data set request is currently active on another interface
80 _H	C3 _H	Resource not available	Module not available

7.5 Disable or enable group error and group warning

With the parameters "Group error" and "Group warning" you determine whether interrupts (error interrupts and maintenance interrupts) are transmitted via PROFINET. In the factory setting, Group error and Group warning are enabled and alarms (error alarms and maintenance alarms) are transmitted

Setting options

You can disable or enable transmission of error interrupts (group error) and maintenance interrupts (group warning) via the bus connection in the following ways:

- Configuration software of the controller, e.g. STEP 7
- User program via data set 131 (Page 162)
- SIRIUS Soft Starter ES (TIA Portal) Premium / Professional via 3RW5 communication module
Brief overview: Window "Project Navigation" with current project under created Soft Starter > "Parameters" > Window "Work area" > "Communication module > Group error / Group warning"
- SIRIUS Soft Starter ES (TIA Portal) via local interface on the 3RW5 HMI High Feature
Brief overview: See SIRIUS Soft Starter ES (TIA Portal) Premium / Professional via 3RW5 communication module
- 3RW5 HMI High Feature (Page 80)

7.5.1 Disable or enable group error and group warning via 3RW5 HMI High Feature

Requirements

- Access protection to 3RW5 HMI High Feature is not active or has been removed.
- You are in the following menu:
 - 3RW5 HMI High Feature with firmware version earlier than V2.0:
"Parameters > Communication module > PROFINET / PROFINET HF > Group diagnostics"
 - 3RW5 HMI High Feature as of firmware version V2.0:
"Parameters > Communication module > Group diagnostics"
- You will find more information on operating the 3RW5 HMI High Feature in the Equipment Manual of the 3RW5 soft starter.

Procedure

1. Select the desired menu item.
 - "Group error"
 - "Group warning"
2. Select a parameter.
 - "Disable"
 - "Enable" (factory setting)
3. Confirm the parameter.

Result

You have disabled or enabled transmission of error interrupts (group error) and maintenance interrupts (group warning) via the bus connection.

7.6 Errors and remedial measures on the 3RW5 communication module

The following table describes possible errors and remedies for the 3RW5 communication module. Errors and remedies for the 3RW5 soft starter can be found in the Equipment Manual of the 3RW5 soft starter.

Error No. ¹⁾	Error	Cause	Remedy
303	Bus error	-	• Check the bus connection. • Check the bus parameters. • The error is acknowledged automatically once it has been rectified.

¹⁾ Visible on the display of the 3RW5 HMI Standard.

7.7 Messages about the mode

The following message bits in data set 92 of the 3RW5 soft starter (slot 2) (Page 168) clearly indicate which control source currently has control priority:

- Automatic mode (①)
- Automatic operation - input controlled (②)¹⁾
- Operating mode manual - bus (③)
- Manual operation bus - PC controlled (④)
- Manual operation bus - Webserver controlled (⑤)
- Operating mode manual - local (⑥)
- Manual operation local - input controlled (⑦)
- Manual operation local - HMI controlled (⑧)
- Manual operation local - PC controlled (⑨)
- Connection abort in manual mode (⑩)

Automatic		Manual								Control priority is with:
		Manual operation bus			Manual operation local					
①	② ¹⁾	③	④	⑤	⑥	⑦	⑧	⑨	⑩	
0	0	0	0	0	0	0	0	0	0	Message is not permitted.
1	0	0	0	0	0	0	0	0	0	PLC controls via fieldbus.
0	1	0	0	0	1	1	0	0	0	Control digital inputs. ²⁾
0	0	1	0	0	0	0	0	0	1	No control source.
0	0	1	1	0	0	0	0	0	0	PC controls via fieldbus.
0	0	1	0	1	0	0	0	0	0	Web server controls via fieldbus.
0	0	0	0	0	1	0	0	0	1	No control source.
0	0	0	0	0	1	1	0	0	0	Input IN or control digital inputs. ³⁾
0	0	0	0	0	1	0	1	0	0	HMI controls.
0	0	0	0	0	1	0	0	1	0	PC controls via local interface.

¹⁾ Supported by soft starter 3RW55 with firmware version V2.1 or higher and soft starter 3RW55 Failsafe with firmware version V1.1.0 or higher

²⁾ Combination of the message bits not possible for 3RW50, 3RW52, 3RW55 soft starters with firmware version earlier than V2.1 and 3RW55 Failsafe soft starters with firmware version V1.0.0. For soft starters 3RW55 from firmware version V2.1 and soft starters 3RW55 Failsafe with firmware version V1.1.0 or higher if the digital inputs have master control by activating the "Manual operation local - input controlled" bit in the process image output (PIQ). The PLC can fetch back control at any time.

³⁾ Combining the message bits is possible for 3RW50, 3RW52, 3RW55 and 3RW55 Failsafe soft starters. For soft starters 3RW55 from firmware version V2.1 and soft starters 3RW55 Failsafe with firmware version V1.1.0 or higher only if the input action "Operating mode manual - local" has been parameterized and activated.

For more information on setting the operating mode, see chapter Operating modes and master control function (Page 24).

Functions

8.1 PROFlenergy

PROFlenergy is a vendor-neutral profile defined by Profibus & Profinet International (PI). PROFlenergy lays the foundations for a universal system for flexible, short-term, and intelligent shutdown of individual consumers or whole production units.

Requirements

- 3RW5 PROFINET Standard communication module from firmware version V1.0.1 or 3RW5 PROFINET High Feature communication module
- 3RW50 and 3RW55 Failsafe soft starters from firmware version V1.0 or 3RW52 and 3RW55 soft starters from firmware version V2.0
- Basic knowledge of handling PROFlenergy and the PROFlenergy commands

Classification of the PROFlenergy commands

PROFlenergy (PE), for example, supports the following groups of commands:

- Command for querying the PROFlenergy functional scope (Page 84)
- Commands for the PROFlenergy energy saving function (Page 84)
The PE energy saving function supports the targeted switching off of loads during idle times.
- Commands for PROFlenergy measured value function (Page 88)
The PE measured value function supplies the measured values required for optimizing energy consumption.

Supported PROFlenergy commands

The 3RW5 soft starters support 2 groups of the PROFlenergy commands for the motor current. The 3RW5 PROFINET communication module transfers the PROFlenergy data set 0x80A0 to the 3RW5 soft starter. The commands contained in the data set trigger reactions in the 3RW5 soft starter and provide information on the status of the 3RW5 soft starter according to the PROFlenergy definition. You can evaluate and further process the commands in the user program.

Command ID	Command	Group	3RW			
			50 ¹⁾	52 ²⁾	55 ³⁾	55-F ⁴⁾
0x01 ⁶⁾	Start_Pause	PE energy saving function	-	-	x ⁵⁾	x
0x02 ⁶⁾	End_Pause	PE energy saving function	-	-	x ⁵⁾	x
0x03 ⁶⁾	Query_Modes	PE energy saving function	-	-	x ⁵⁾	x
0x04 ⁶⁾	PEM_Status	PE energy saving function	-	-	x ⁵⁾	x

8.1 PROFIenergy

Command ID	Command	Group	3RW			
			50 ¹⁾	52 ²⁾	55 ³⁾	55-F ⁴⁾
0x05	PE_Identify	PE functional scope	x	x	x	x
0x10	Query_Measurement	PE measured value function	x	x	x	x

¹⁾ Supported by SIRIUS 3RW50 soft starter

²⁾ Supported by SIRIUS 3RW52 soft starter from firmware version V2.0

³⁾ Supported by SIRIUS 3RW55 soft starter from firmware version V2.0

⁴⁾ Supported by SIRIUS 3RW55 Failsafe soft starter

⁵⁾ 3RW55 soft starter from firmware version V2.1

⁶⁾ When using a 3RW5 PROFINET High Feature communication module from firmware version V1.1

Additional information

You can find more information on PROFIenergy on the Internet by clicking on the following links:

- PROFIenergy - Siemens (<https://w3.siemens.com/mcms/topics/en/comdec/feldgeraeteentwicklung/profile-und-features/profienergy/Pages/profienergy.aspx>)
- PROFIenergy - PROFIBUS & PROFINET International (PI) (<https://www.profibus.com/technology/profienergy/>)

8.1.1 Command for the PE functional scope

Command

ID	Modifier	Command	Description
0x05	0x00	PE_Identify	Command for providing a list of supported PROFIenergy commands and functions.

Result

After receiving the command, the 3RW5 soft starter sends the requested information or an error message.

8.1.2 Commands for PE energy saving function

Commands

ID	Modifier	Command	Description
0x01	0x00	Start_Pause	Command for switching to energy saving mode (Page 86).
0x02	0x00	End_Pause	Command for switching to operating mode.

ID	Modifier	Command	Description
0x03	-	Query_Modes	-
	0x01	List_Energy_Saving_Modes	Command for providing a list of supported energy saving modes.
	0x02	Get_Mode	Command for supplying the parameter values with which the PE energy saving function works (Page 88).
0x04	0x00	PEM_Status	Command for providing the status of the current energy saving mode.

Result

After receiving the command, the 3RW5 soft starter sends the requested information, an error message, or switches to the appropriate mode. When the mode is changed, the 3RW55 or 3RW55 Failsafe soft starter triggers a PROFinenergy status interrupt (Page 72).

8.1.2.1 Energy saving mode and operating mode

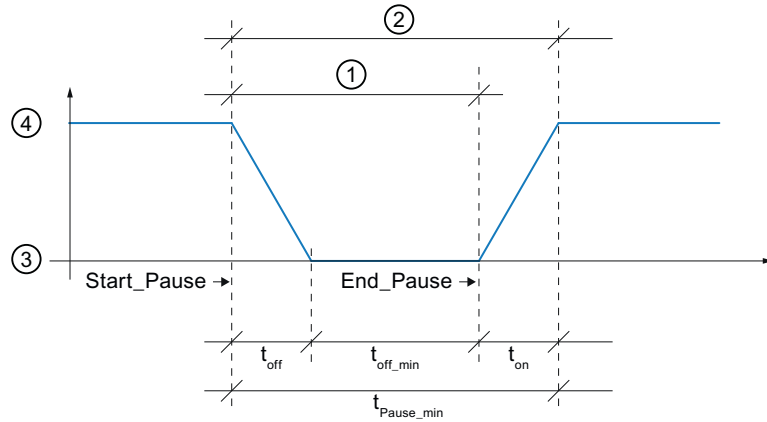
Modes

For data transmission, the 3RW5 soft starter distinguishes between two different states:

PE_Mode_ID = 255	Ready to operate (operating mode)
PE_Mode_ID = 01	Energy saving mode 1

Operating principle of the energy saving mode

The following graphic shows the principle of operation of commands, parameters and diagnostic messages:



- ① Message "Start pause pending" (46.6) in data set 92 from 3RW5 soft starter (slot 2) (Page 168)
- ② Message "Energy saving mode active" (46.7) in data set 92 from 3RW5 soft starter (slot 2) (Page 168)
- ③ Energy saving mode
- ④ Operating mode
- t_{off} "Time_to_Pause" parameter
- t_{off_min} "Time_min_length_of_stay" parameter
- t_{on} "Time_to_operate" parameter
- t_{Pause_min} "Time_min_Pause" parameter

8.1.2.2 Activating the energy saving function

After the "Start_Pause" command the 3RW5 soft starter checks the transmitted pause time (t_{Pause}). The switch to energy saving mode only takes effect when t_{Pause} is greater than the device-specific minimum pause time (t_{Pause_min}). If the pause time is shorter, the 3RW5 soft starter remains in operating mode and sends an error message.

To switch off the motor, the following cyclic and acyclic control data of the controller (bits in the process image output (PIQ)) are suppressed and overwritten with the value "0":

- "Motor CW"
- "Motor CCW"

The other bits of the PIQ (e.g. "Reset") remain active.

After expiry of the transmitted pause time (t_{Pause}), the 3RW5 soft starter remains in energy saving mode and does not automatically switch to operating mode.

Note

A pending error is not acknowledged by the switch to energy saving mode. The pending error is stored internally and can be read out.

Eliminate and acknowledge the error after exiting the energy saving mode.

Further information on the messages and a graphical representation of the parameters can be found in chapter Energy saving mode and operating mode (Page 85).

Automatic switchover to operating mode

The 3RW5 soft starter automatically switches to operating mode in the following situations:

- Restoring the factory settings
- Restart of the 3RW5 soft starter or the 3RW5 communication module

LED display

The 3RW5 soft starter indicates an active energy saving mode by means of the flashing "MT" LED (yellow).

You will find more information on the LED display in the Equipment Manual of the 3RW5 soft starter.

Entries in the logbook

The message "Energy saving mode active" is entered in the "Device" logbook as an incoming and outgoing event. If the energy saving function is disabled by a restart of the 3RW5 soft starter or the 3RW5 communication module, the message is only entered in the "Device" logbook when the device starts up.

For more information on the logbooks, refer to the Equipment Manual of the 3RW5 soft starter.

8.1.2.3 Interactions with the various operating modes

PROFlenergy is influenced by the operating modes (Page 24) as follows:

- The energy saving mode only works in the "Automatic" mode.
When the 3RW5 soft starter in the "Manual operation bus" or "Manual operation local" modes receives a command to switch to energy saving mode or operating mode, it will only switch to the corresponding mode after switching to "Automatic" mode.
- The "Manual operation bus" and "Manual operation local" modes are not influenced by PROFlenergy.
You can also switch to the "Manual operation bus" and "Manual operation local" operating modes and control the 3RW5 soft starter manually. When you switch back to "Automatic" mode, the 3RW5 soft starter will respond according to the last command.
- Cyclic and acyclic data transmission (e.g. process images, data records, diagnostics, alarms) to and from the 3RW5 soft starter are still possible.

8.1.2.4 "Get_Mode" command

With the "Get_Mode" command you read the following parameters:

Parameter	Description
Time_to_Pause (t_{off})	Time required for the 3RW5 soft starter to enter energy saving mode. If present and the 3RW5 soft starter was in the ON state, a parameterized deceleration ramp time is added. This time is as follows for 3RW5 soft starters: 200 ms + deceleration ramp time
Time_min_length_of_stay ($t_{\text{off_min}}$)	The minimum time that the 3RW5 soft starter will or should remain in energy saving mode. This time is as follows for 3RW5 soft starters: 0 ms
Time_to_operate (t_{on})	Time until the 3RW5 soft starter returns to operating mode. This time is as follows for 3RW5 soft starters: 0 ms
Time_min_Pause ($t_{\text{Pause_min}}$)	Device-specific minimum pause time. After a minimum pause time $t_{\text{Pause}} \geq t_{\text{Pause_min}}$ the 3RW5 soft starter switches to energy saving mode. $t_{\text{Pause_min}} = t_{\text{off}} + t_{\text{off_min}} + t_{\text{on}}$

A graphical representation of the parameters can be found in chapter Energy saving mode and operating mode (Page 85).

8.1.3 Commands for PE measured value function

Efficient energy management requires the provision of measured values for energy. The PROFlenergy specification offers various measured values from which to choose, each of which is assigned a measured value ID.

Commands

ID	Modifier	Command	Description
0x10	-	Query_Measurement	-
	0x01	Get_Measurement_List	Command for providing a list of supported PROFlenergy measured values.
	0x02	Get_Measurement_Values	Command for providing the supported PROFlenergy measured values.

Result

After receiving the command, the 3RW5 soft starter sends the requested information or an error message.

Measured values

The measured values are uniquely identified by IDs. Dependent on the 3RW5 soft starter, the following measured values are supported:

ID	Measured value	Unit	3RW			
			50 ¹⁾	52 ²⁾	55 ³⁾	55-F ⁴⁾
7	Phase current IL1 (rms)	A	x	x	x	x
8	Phase current IL2 (rms)	A	x	x	x	x
9	Phase current IL3 (rms)	A	x	x	x	x
33	Phase current average (rms)	A	x	x	x	x
34	Active power	W	-	-	x	x
200	Active energy import (total)	Wh	-	-	x	x

¹⁾ Supported by SIRIUS 3RW50 soft starter

²⁾ Supported by SIRIUS 3RW52 soft starter from firmware version V2.0

³⁾ Supported by SIRIUS 3RW55 soft starter from firmware version V2.0

⁴⁾ Supported by SIRIUS 3RW55 Failsafe soft starter

Accuracy of the specifications

The current values are transferred with the following tolerances:

- Accuracy Domain (unsigned8) = 0x03 → according to IEC 61557-12
- Accuracy Class (unsigned8) = 0x11 → 5%
- Range (Float32) = I_{e_max} (fixed value parameter)

It follows that the measured values are transferred with an accuracy of 5% relative to the maximum configurable rated operational current I_e .

8.1.4 Function blocks for SIMATIC S7

Application examples and the application descriptions "Saving energy with SIMATIC S7 - PROFlenergy with ET 200SP (TIA Portal)" and "Saving energy with SIMATIC S7 - PROFlenergy with ET 200S (STEP 7 V5.5)" for the use of the PROFlenergy functions can be found on the Internet using the following links:

- PROFlenergy - Saving energy with SIMATIC S7 and SIMATIC HMI (TIA Portal) (<https://support.industry.siemens.com/cs/ww/en/view/58235225>)
- PROFlenergy - Saving energy with SIMATIC S7 (STEP 7 V5.5) (<https://support.industry.siemens.com/cs/ww/en/view/41986454>)

You can also make use of the blocks from the application descriptions to implement PROFlenergy functions in conjunction with the 3RW5 soft starters.

Function blocks

SIEMENS provides the following function blocks for using PROFlenergy, for example:

- PE_START_END (FB 815)
With the function block FB 815 "PE_START_END" you can transfer the commands "Start_Pause" and "End_Pause" directly to the 3RW5 soft starter.
- PE_CMD (FB 816)
With the universal function block FB 816 "PE_CMD", for example, you can transfer the following additional commands of the PROFlenergy profile:
 - Query_Modes
 - PEM_Status
 - PE_Identify
 - Query_Measurement

8.2 NTP (time synchronization)

Requirements

- 3RW5 PROFINET High Feature communication module
- 3RW55 soft starter from firmware version V2.0 or 3RW55 Failsafe soft starter from firmware version V1.0

Time synchronization according to the NTP procedure

The 3RW55 and 3RW55 Failsafe soft starters have a capacitor-buffered real-time clock with an operation reserve of about 3 days. You can synchronize the real-time clock using the NTP procedure via the 3RW5 PROFINET High Feature communication module.

Network Time Protocol (NTP) is the implementation of a TCP/IP protocol for time synchronization in networks. The NTP procedure uses hierarchical time synchronization, in which an external

clock is used for synchronization. External clocks are, for example, SICLOCK TM or a PC in the network.

At programmed intervals, the 3RW5 PROFINET High Feature communication module sends time queries to the configured NTP server. The server's responses are used to synchronize the clock time of the capacitor-buffered clock in the 3RW5 soft starter. This ensures that a synchronized clock time is available shortly after the supply voltage (control supply voltage) is switched on.

Parameter

Parameter	Description
Update interval	Time interval in seconds at which synchronization of the time of day with the NTP server is performed. The parameter value "0" (factory setting) deactivates the time synchronization. • Factory setting: 0 • Setting values: 0, 10 s, 30 s, 1 min, 10 min, 30 min, 1 h, 24 h
Server IP address	IP address of the NTP server.

Note

UTC time

In the 3RW5 soft starter, the real-time clock runs in UTC (Universal Time Coordinated). This UTC time is synchronized by means of the NTP procedure.

By means of the "Time offset" parameter, the time actually displayed is adjusted to the time zone.

Note the information on setting the clock time in the Equipment Manual of the 3RW5 soft starter.

Setting options

You can parameterize the time-of-day synchronization in the following ways:

- SIRIUS Soft Starter ES (TIA Portal) Premium / Professional via 3RW5 communication module
Brief overview: Window "Project Navigation" with current project under created Soft Starter > "Commissioning" > Window "Working area" > "Soft Starter > Functions > Time"
- SIRIUS Soft Starter ES (TIA Portal) via local interface on the 3RW5 HMI High Feature
Brief overview: See SIRIUS Soft Starter ES (TIA Portal) Premium / Professional via 3RW5 communication module
- 3RW5 HMI High Feature
Menu: "Parameter > Communication module > NTP time synchronization"
You will find more information on operating the 3RW5 HMI High Feature in the Equipment Manual of the 3RW5 soft starter.

Alternative time setting

If an NTP server IP address has not been configured or a server was not found on the network, you can also set the time of day using the following options:

- SIRIUS Soft Starter ES (TIA Portal) Premium / Professional via 3RW5 communication module
Brief overview: Window "Project Navigation" with current project under created Soft Starter > "Commissioning" > Window "Working area" > "Soft Starter > Functions > Time"
- SIRIUS Soft Starter ES (TIA Portal) via local interface on the 3RW5 HMI High Feature
Brief overview: See SIRIUS Soft Starter ES (TIA Portal) Premium / Professional via 3RW5 communication module
- 3RW5 HMI High Feature
Menu: "Parameter > Soft starter > Date & Time"
You will find more information on operating the 3RW5 HMI High Feature in the Equipment Manual of the 3RW5 soft starter.

8.3 Web server

Requirement

- 3RW5 PROFINET High Feature communication module from firmware version V2.0
- Soft starter 3RW55 with firmware version V2.1.1 or higher or soft starter 3RW55 Failsafe with firmware version V1.1.0 or higher
- PC or programming device with web browser (Page 93)

Principle of operation

With the web server, the 3RW5 PROFINET High Feature communication module offers you the possibility to retrieve information from the 3RW55 and 3RW55 Failsafe soft starters from a PC or programming device using a web client. The 3RW5 PROFINET High Feature communication module provides all information and data in the form of web pages (html pages).

To be able to control 3RW55 or 3RW55 Failsafe soft starters via the web server (Page 96), you must be logged on (Page 98) with a user account ("Operator" or "Maintenance personnel" user role) via a secure https connection. For more information on user account management, refer to the 3RW55 and 3RW55 Failsafe Soft Starters Equipment Manual. All other functions are possible without login.

If you control the 3RW55 or 3RW55 Failsafe soft starter via the web server, the 3RW5 soft starter is in the operating mode "Manual operation bus - Webserver controlled" (Page 24).

Web pages

- Home
- Overview
- Faults and warnings
- Current status

- Logbook
- Measured values
- Statistic data
- Maximum pointer
- Control Panel

Further information on the contents can be found in chapter Contents of web pages (Page 100).

Languages

The websites are available in the following languages:

- German
- English
- French
- Spanish
- Italian
- Chinese
- Portuguese

You can switch the language without interrupting the connection to the 3RW5 communication module in the header of a web page (Page 100).

Number of web client connections

The 3RW5 PROFINET High Feature communication module supports at least 5 web client connections simultaneously. Each of the connections is monitored and controlled separately with regard to access rights. The controlling access is only possible for 1 web client connection.

8.3.1 Web browser

A web browser is required to access the web pages in the 3RW5 PROFINET High Feature communication module.

Requirement

The following web browser settings are required to access the information made available via the web:

- JavaScript is activated in the web browser.
- Cookies are allowed.
- When using a firewall: The corresponding port in the PC or programming device is released.
 - "http port 80/TCP"
 - "https port 443/TCP" (for protected connections)

Suitable web browsers

The following web browsers are, for example, suitable for communication with the 3RW5 soft starter:

- Microsoft Edge (recommended version: from 44.0)
- Mozilla Firefox (recommended version: from 74.0)
- Google Chrome (recommended version: from 80.0)

8.3.2 Establishing a connection to the web server

Requirements

- Web browser (Page 93)
- Activated web server (Page 94)
- Set IP address (Page 95)
- For secure https connection: valid certificate (Page 96)
- Information in chapter Operation without PN control (Page 135)

Procedure

1. In the web browser, call up the home page of the web server using the IP address set. The examples apply to the IP address 192.168.1.1:
 - For http connection: `http://192.168.1.1`
 - For secure https connection: `https://192.168.1.1`To read out or set the IP address, refer to chapter Setting IP parameters (Page 95).
2. To be able to control the 3RW55 or 3RW55 Failsafe soft starter via the web server on the "Control Panel" web page, (Page 96) log on with a user account ("Operator personnel" or "Maintenance personnel" user role) (Page 98). For all other functions (monitoring, diagnosis) no login is required.
For more information on user account management, refer to the 3RW55 and 3RW55 Failsafe Soft Starters Equipment Manual.

Result

You can call the web pages of the web server and control the 3RW55 or 3RW55 Failsafe soft starter after logging in via the web server.

8.3.3 Activating or deactivating the web server

To use the web server, the function must be enabled in the 3RW5 communication module. The web server function is deactivated in the factory setting.

Setting options

- 3RW5 HMI High Feature (firmware version V3.1 or higher)
Menu: "Parameter > Communication Module > Web Server"
You will find more information on operating the 3RW5 HMI High Feature in the Equipment Manual of the 3RW5 soft starter.
- Starting parameters for start-up of the automation system
- User program via data set 131 (Page 162)

Result

You have enabled or disabled access to the web server.

8.3.4 Setting IP parameters

A prerequisite for establishing a connection via the web is the setting of the IP parameters (Page 61) in the 3RW5 communication module.

Note

IP parameters of the PROFINET connection

If you have already set IP parameters in the 3RW5 communication module for the PROFINET connection, you can use these IP parameters and read them out via the setting options. A new setting is not necessary. If you change the set IP parameters, also take this change into account in a possible PROFINET connection to the PLC.

Setting options

- SIRIUS Soft Starter ES (TIA Portal) Premium / Professional via 3RW5 communication module
Brief overview: Window "Project Navigation" with current project under created Soft Starter > "Online & Diagnostics" > Window "Work area" > "PROFINET IO HF > Functions > Assign IP address"
Brief overview: Window "Project Navigation" with current project under created Soft Starter > "Device configuration" > Window "Work area" > Communication module "PROFINET IO HF" > Inspector window "PROFINET IO HF" > Tab "Properties" > Tab "General" > "PROFINET interface > Ethernet addresses > IP protocol"
- SIRIUS Soft Starter ES (TIA Portal) via local interface on the 3RW5 HMI High Feature
Brief overview: See SIRIUS Soft Starter ES (TIA Portal) Premium / Professional via 3RW5 communication module
- 3RW5 HMI High Feature
Menu: "Parameter > Communication module > PROFINET HF > IP address"
Menu: "Parameter > Communication module > PROFINET HF > Subnet mask"
Menu: "Parameter > Communication module > PROFINET HF > Router address"
You will find more information on operating the 3RW5 HMI High Feature in the Equipment Manual of the 3RW5 soft starter.

- The IP parameters of the IO device are assigned online (static IP parameters).
- The IP parameters are created and assigned by the IO controller (dynamic IP parameters).

Note the information in chapter IP parameters (Page 61).

Note

Keeping IP parameters of the web server

If the web server should always be accessible via the same IP address, static IP parameters are recommended.

Result

You have set the IP parameters and can establish a connection via the web.

8.3.5 Certificates

To access the web server via a secure https connection, the web browser requires a valid certificate from the web server. For certain changes (e.g. IP address or major changes in date and time) in the 3RW5 communication module or in the 3RW55 or 3RW55 Failsafe soft starter, the web server generates a CA certificate with a validity of 30 years for this purpose. If the web browser does not yet have a valid certificate, or an existing certificate is invalid or has expired, install a current certificate.

Requirements

The current clock time and date are stored in the 3RW55 or 3RW55 Failsafe soft starter (manually or with NTP (Page 90)).

Procedure

1. Click the "Download certificate" button on the "Home" page (Page 100).
2. Open and install the certificate.

8.3.6 Control via the web server

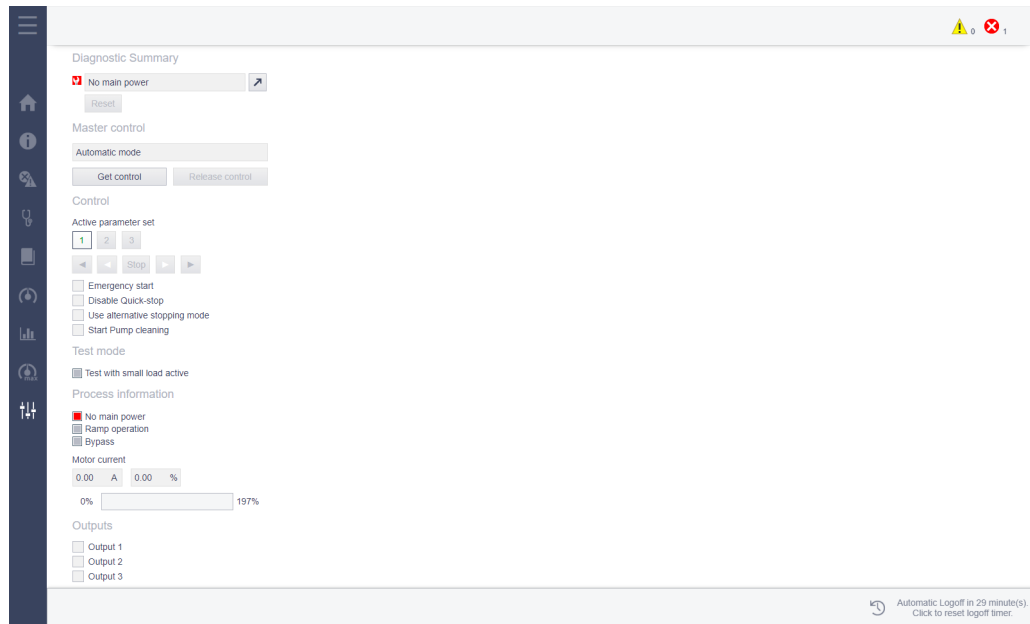
Requirement

- Logging on to the web server (Page 98)
- The current time and date are set in the 3RW55 or 3RW55 Failsafe soft starter.
- Secured https connection, e.g. <https://192.168.1.1>

Principle of operation

To be able to control 3RW55 or 3RW55 Failsafe soft starters via the web server on the "Control Panel" web page, you must be logged in (Page 98) with a user account ("Operator personnel" or "Maintenance personnel" user role) via a secure https connection. For more information on user account management, refer to the 3RW55 and 3RW55 Failsafe Soft Starters Equipment Manual. All other functions (monitoring, diagnosis) are possible without logging in.

If you control the 3RW5 soft starter via the web server, the 3RW5 soft starter is in the operating mode "Manual operation bus - Webserver controlled" (Page 24).



Connection abort

The connection between the web server and web client is monitored. If the web server has control, the 3RW55 or 3RW55 Failsafe soft starter reports a connection abort if the connection is interrupted for at least 10 seconds and stops the motor if it is switched on. The Web client connection is terminated automatically and the Web server is no longer in control. Connection aborts are, for example, an interrupted cable connection or closing the web browser.

Activity monitoring

The activity on the web server is monitored. If the web server has master control and over an adjustable period of time (default: 30 minutes) no activity is detected, the web client connection is automatically logged off. The connection termination means that control no longer lies with the Web server, and the 3RW55 or 3RW55 Failsafe soft starter stops the motor if it is switched on. The following activities are considered by the web server in terms of activity monitoring:

- Clicking on buttons in the following areas or web pages (Page 100):
 - Menu
 - Header
 - Alarm line
 - "Control Panel" web page
- Clicking the button "Automatic logout in ... minute(s). Click to reset the timer."
This button is visible in the footer of the web pages if you are logged on to the web server. You can set the timer to 30 min (default), or by the hour to 1 ... 10 hours.

8.3.6.1 Logging on to the web server

Requirements

- User account with the "Operator personnel" or "Maintenance personnel" user role
For more information on user account management, refer to the 3RW55 and 3RW55 Failsafe Soft Starters Equipment Manual. Functions for monitoring and diagnosis are possible without logon.
- Valid certificate (Page 96)
- Secured https connection, e.g. <https://192.168.1.1>

The screenshot displays the web interface for the SIEMENS SIRIUS 3RW5 Soft Starter. The top header bar includes the SIEMENS logo, the product name 'SIRIUS 3RW5 Soft Starter', and a user status indicator 'You are not logged in | English'. Below the header, a navigation sidebar on the left contains icons for home, information, search, and other functions. The main content area is titled 'User login' and features a form with fields for 'User name' and 'Password'. A 'Show password' checkbox and a 'Log on' button are also present. A status bar at the bottom of the main area shows a warning icon and a count of 1.

Procedure

1. Click on the "You are not logged in" button in the header of a web page.
A drop-down menu opens.
2. Click on the "Login" menu item in the drop-down menu.
You will automatically switch to the "User login" web page.
3. Enter the user name and password.
4. Click the "Login" button.

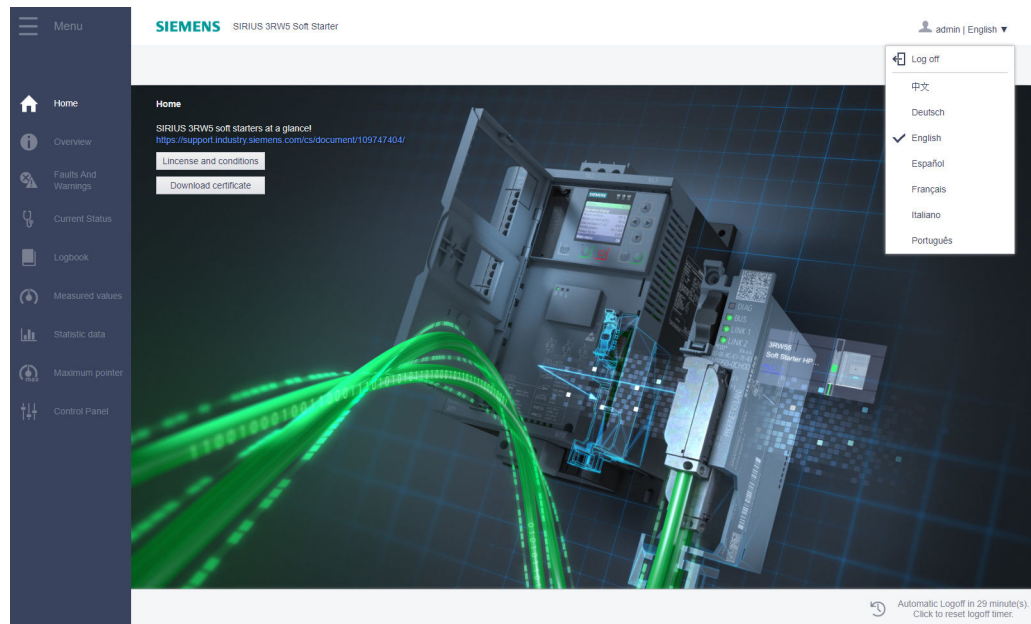
Result

You have logged on to the web server and your user name is now indicated in the header. You can control the 3RW55 or 3RW55 Failsafe soft starter via the web server on the "Control Panel" web page.

8.3.6.2 Logging off from the web server

Requirements

- Logging on to the web server (Page 98)



Procedure

1. Click on the button with your user name in the header of a web page.
A drop-down menu opens.
2. Click the "Logout" menu item in the drop-down menu.

Result

You have logged out of the web server and the header now indicates "You are not logged in". If the Web server has control, the termination of the connection ends it. The 3RW55 or 3RW55 Failsafe soft starter stops the motor if it is switched on.

Alternatively, you can be logged off by activity monitoring (Page 96).

8.3.7 Contents of web pages

Home

The "Home" web page provides a link to the 3RW5 topic page (<https://support.industry.siemens.com/cs/ww/en/view/109747404>) and the 2 following buttons:

- License and conditions: Opens a text file with license conditions for open source and third-party software.
- Download certificate (Page 96)

Menu

The menu is located on the left side. By clicking on an icon, you can switch to the corresponding web page.

Header

The header is the same for all web pages and shows the login status and the set language. By clicking the buttons, you can change the login status (Page 98) and language in a drop-down menu.

Alarm line

The alarm line is located below the header and shows the number of faults (red) and warnings (yellow). By clicking on one of the icons, you can switch to the "Faults and Warnings" web page.



Overview

The "Overview" web page shows the I&M data (device-related information) (Page 201).

SIEMENS SIRIUS 3RW5 Soft Starter admin | English

Overview

Soft Starter

Module

Parameters	Value
Short designation	3RW55 HP 3ph 13A
Article number	3RW5 513-1HA14
Hardware	00
Firmware	T02.01.01
Slot number	2

Module information

Parameters	Value
Plant designation	
Tag location	
Installation date	
Additional information	

Manufacturer information

Parameters	Value
Manufacturer	SIEMENS AG
Serial number	LO171001123456

HMI

Module

Automatic Logout in 29 minute(s). Click to reset logout timer.

Faults and Warnings

The "Faults and Warnings" web page shows faults and warnings of the 3RW5 soft starter, the 3RW5 HMI High Feature, and the 3RW5 PROFINET High Feature communication module.

SIEMENS SIRIUS 3RW5 Soft Starter admin | English

Faults And Warnings

Soft Starter

Group error Group warning

No main power

HMI

Communication module

Automatic Logout in 29 minute(s). Click to reset logout timer.

Current Status

The "Current Status" web page shows the device status of the 3RW5 soft starter, the 3RW5 HMI High Feature, and the 3RW5 PROFINET High Feature communication module.

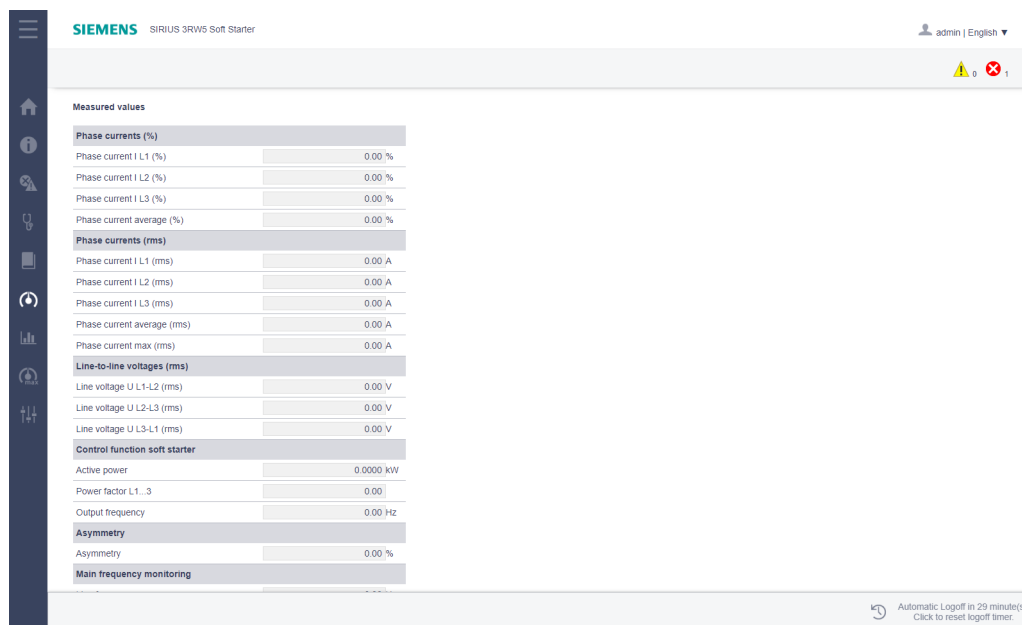
Logbook

The "Logbook" web page shows the logbooks. The logbooks are not updated automatically. To update the logbooks, click the update button. You can use the arrange buttons to arrange the logbooks differently. It is not possible to delete the logbooks.

Source	Message	Operating hours (ddd.hh:mm:ss)	Date (DD.MM.YYYY)	Time (hh:mm:ss)	Time qualifier	Identification number
Soft Starter	Automatic mode	187.18:08:49	30.04.2020	12:23:03	Time set	357
Soft Starter	No main power	187.18:08:40	30.04.2020	12:22:54	Time set	319
Soft Starter	Operating mode manual - bus	187.18:08:37	30.04.2020	12:22:51	Time set	358
Soft Starter	CPU/Master STOP	187.15:56:23	30.04.2020	10:10:34	Time set	356
Soft Starter	Bus error	187.15:56:13	30.04.2020	10:10:24	Time set	303
Soft Starter	Automatic mode	187.15:56:04	30.04.2020	10:10:15	Time set	357
Soft Starter	Logbook application - warnings deleted	187.15:56:04	30.04.2020	10:10:15	Time set	1555
Soft Starter	Bus error	187.15:15:01	29.04.2020	16:04:58	Time set	303
Soft Starter	CPU/Master STOP	187.15:15:01	29.04.2020	16:04:58	Time set	356
Soft Starter	Bus error	187.15:14:13	29.04.2020	16:04:10	Time set	303
Soft Starter	CPU/Master STOP	187.15:14:13	29.04.2020	16:04:10	Time set	356
Soft Starter	CPU/Master STOP	187.15:10:54	29.04.2020	16:00:52	Time set	356
Soft Starter	FW update successful	187.15:10:53	29.04.2020	16:00:50	Time set	376
Soft Starter	Automatic mode	187.15:10:53	29.04.2020	16:00:50	Time set	357
Soft Starter	Bus error	187.15:10:53	29.04.2020	16:00:50	Time set	303
Soft Starter	Operating mode manual - local	187.15:10:30	29.04.2020	16:00:27	Time set	359
Soft Starter	Connection abort in manual mode	187.15:10:30	29.04.2020	16:00:27	Time set	360
Soft Starter	CPU/Master STOP	187.15:07:41	29.04.2020	15:57:38	Time set	356
Soft Starter	CPU/Master STOP	187.15:06:06	29.04.2020	15:56:03	Time set	356
Soft Starter	Automatic mode	187.15:05:56	29.04.2020	15:55:53	Time set	357

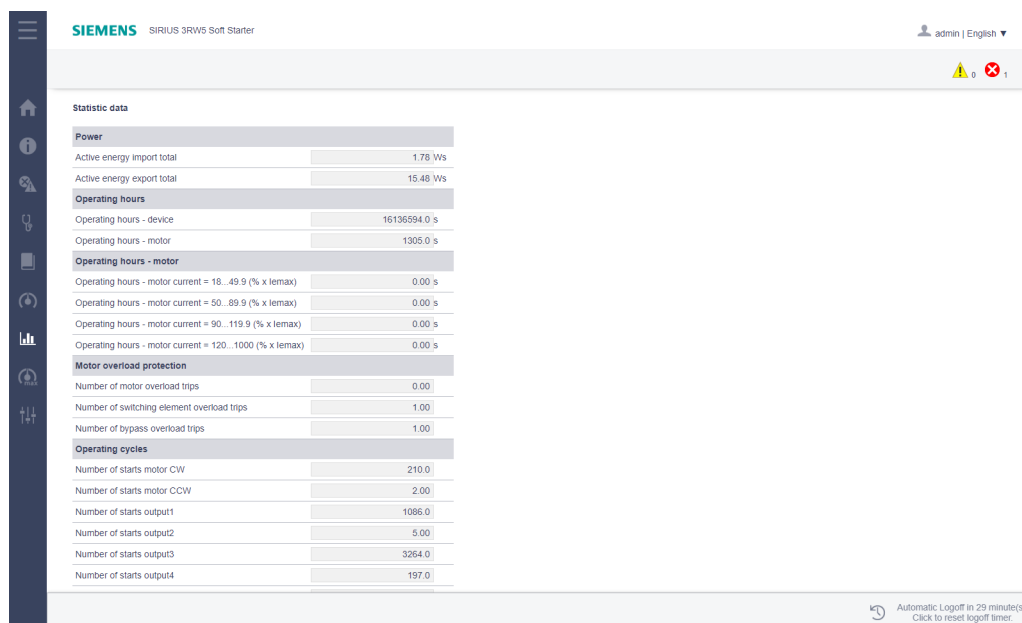
Measured values

The "Measured values" web page displays the measured values of the 3RW5 soft starter.



Statistic data

The "Statistic data" web page displays the statistic data of the 3RW5 soft starter.



Maximum pointer

The "Maximum pointer" web page shows the maximum pointers of the 3RW5 soft starter.

SIEMENS SIRIUS 3RW5 Soft Starter

admin | English

Maximum pointer

Operating hours	
Operating hours - device	4482:24:20 hhhh:mm:ss
Operating hours - motor	
Operating hours - motor current 18...49.9 (% x Ie)	00:00:08 hhhh:mm:ss
Operating hours - motor current 50...89.9 (% x Ie)	00:03:10 hhhh:mm:ss
Operating hours - motor current 90...119.9 (% x Ie)	00:00:14 hhhh:mm:ss
Operating hours - motor current 120...1000 (% x Ie)	00:00:49 hhhh:mm:ss
Motor overload protection	
Number of motor overload trips	0.00
Number of starts with ext. bypass	0.00
Main frequency monitoring	
Minimum line frequency	0.00 Hz
Maximum line frequency	102.0 Hz
Thermal switching element model	
Maximum switching element heating	29.00 %
Phase currents (%)	
Phase current I L1 min (%)	0.00 %
Phase current I L1 max (%)	78.13 %
Phase current I L2 min (%)	0.00 %
Phase current I L2 max (%)	84.98 %
Phase current I L3 min (%)	0.00 %
Phase current I L3 max (%)	71.88 %

Automatic Logout in 29 minute(s).
Click to reset logout timer.

Control Panel

The "Control Panel" web page provides information and buttons for controlling the 3RW5 soft starter. To be able to control the 3RW5 soft starter via the web server, log on with a user account (Page 98).

Diagnostic Summary

☒ No main power [↗](#)

Master control

Automatic mode

Control

Active parameter set

1 2 3

☐ Emergency start

☐ Disable Quick-stop

☐ Use alternative stopping mode

☐ Start Pump cleaning

Test mode

☒ Test with small load active

Process information

☒ No main power

☐ Ramp operation

☐ Bypass

Motor current

0.00 A 0.00 %

0%

Outputs

☐ Output 1

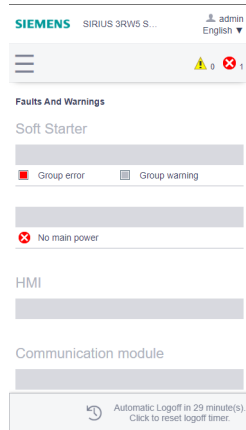
☐ Output 2

☐ Output 3

Automatic Logout in 29 minute(s).
Click to reset logout timer.

Example for display on mobile devices

In the display on mobile terminal devices, you can show and hide the menu using the button on the left in the alarm line. In the following example the menu is hidden.

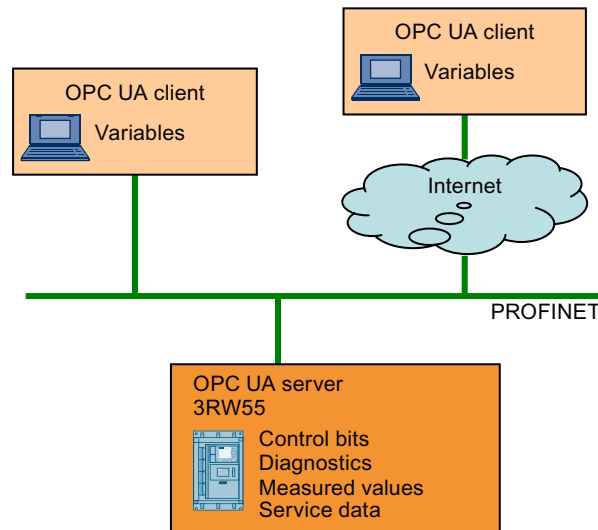


8.4 OPC UA server

Requirement

- 3RW5 PROFINET High Feature communication module from firmware version V2.0
- Soft starter 3RW55 with firmware version V2.1.1 or higher or soft starter 3RW55 Failsafe with firmware version V1.1.0 or higher
- OPC UA client
- Basic knowledge in handling OPC UA
- The current clock time and date are stored in the 3RW55 or 3RW55 Failsafe soft starter (manually or with NTP (Page 90)).

OPC UA



OPC UA offers the following features:

- Simple client-server principle: An OPC UA server provides a lot of information within a network. An OPC UA client retrieves this information.
- Use of open and non-platform-specific protocols for network communication.
- Integrated access control and security mechanisms at the protocol and application level.
- OPC UA and PROFINET can be used together. Both protocols use the same network infrastructure.
- Operating system independence: The OPC UA standard is platform-independent and uses an optimized, TCP-based binary protocol for high-performance applications. For example, OPC UA can be used on Windows, Linux, Mac OS X, a real-time operating system, or a mobile operating system (Android or iOS).
- OPC UA currently supports the following transport mechanisms and protocols:
 - Transfer of messages as binary stream directly via TCP/IP.
 - Transfer of messages with XML over TCP/IP and HTTP. This transport mechanism allows only slow transmissions and is therefore hardly ever used. The 3RW5 PROFINET High Feature communication module does not support this transport mechanism.

Binary data exchange is supported by every OPC UA application (specified by the OPC UA specification).

- The OPC Foundation has implemented the OPC UA standard in several programming languages: Stacks for .NET, ANSI C and Java are available, but the stacks for ANSI C and Java are no longer maintained. The OPC Foundation offers the .NET stack as well as sample programs as open source software (<https://github.com/opcfoundation>). Several companies offer Software Development Kits (SDK). These development packages contain the stacks of the OPC Foundation and other functions that facilitate the development of solutions. Advantage of using SDKs:
 - Support from the supplier
 - Tested software
 - Exhaustive documentation
 - Clear licensing terms (important for reselling solutions)

- Scalability
OPC UA can be used for devices of different performance classes:
 - Sensors
 - Embedded systems
 - Controllers
 - PC systems
 - Smartphones
 - Servers with MES or ERP applications.

The performance class of the devices is differentiated by profiles. Different OPC UA profiles offer the possibility to scale OPC UA both for very small and simple devices as well as for very powerful devices. An OPC UA profile describes functions and services that must be supported by the server and the client. In addition, further functions and services that are not required by the profile can be optionally provided.

Nano Embedded Device 2017 Server Profile

The "Nano Embedded Device 2017 Server Profile" from the OPC Foundation is available for the smallest devices with severely limited functionality. This profile corresponds functionally to the Core Server facet and defines the binary OPC UA TCP protocol as the required transport profile. The profile permits connections without UA security, no subscriptions, and no method calls. The support of diagnostic objects and variables is optional for this profile. Other profiles are based on the "Nano Embedded Device 2017 Server Profile", require more resources, and offer more functionality.

Micro Embedded Device 2017 Server Profile

This profile offers limited functionality, additional subscriptions/data monitoring, but no UA security and no method calls. The profile requires at least two parallel connections.

3RW5 PROFINET High Feature communication module

The 3RW5 PROFINET High Feature communication module supports the "Micro Embedded Device 2017 Server Profile" and additionally UA security.

- OPC UA uses security mechanisms at different levels:
 - Establishing secure connections between an OPC UA server and an OPC UA client is only possible if the client and server can log on using X.509-v3 certificates and mutually recognize each other's certificates (application-level security). Various security policies are possible, including an unsecured connection between server and client (security policy: "No Security").
 - For authorized access (authentication), a server can generally require the following information from the user: A user certificate, user name and password, no legitimation of the user.

The security mechanisms are optional and configurable.

Schema files used for OPC UA functionality

The OPC Foundation provides its users with schemas that manufacturers can use for server implementations.

The following schema files are used for the 3RW5 OPC UA server:

Schema	Description
https://opcfoundation.org/UA/schemas/1.04/UANodeSet.xsd	XML schema for NodeSet files
https://opcfoundation.org/UA/schemas/1.04/Opc.Ua.NodeSet2.xml	OPC UA ("CORE") Model of 2019-09-09
https://opcfoundation.org/UA/schemas/DI/1.2/Opc.Ua.Di.NodeSet2.xml	OPC UA for Devices ("DI") Model of 2019-05-01

Principle of operation

The OPC UA server integrated in the 3RW5 PROFINET High Feature communication module provides structured objects (variables) in an address space that the OPC UA client can access in read-only mode. Controlling access to the 3RW55 and 3RW55 Failsafe soft starters is not possible.

Maximum number of OPC UA client connections:	2
Maximum number of subscriptions (subscribable variables):	5 subscriptions are possible per OPC UA client connection. 100 objects can be monitored in each subscription. This allows up to 1000 objects to be monitored (2 x 5 x 100 = 1000).
Shortest update interval for subscriptions:	160 ms

Languages

The objects (variables) of the OPC UA server are only available in English.

Additional information

Further information about OPC UA can be found, for example, in the application descriptions "Programming of an OPC UA .NET client with C# for the SIMATIC NET OPC UA server" (<https://support.industry.siemens.com/cs/ww/en/view/42014088>) or "Creating OPC UA clients with .NET and Helper class" (<https://support.industry.siemens.com/cs/ww/en/view/109737901>) and on the website of the OPC UA Foundation (<https://opcfoundation.org/>).

8.4.1 Establishing a connection to the OPC UA server

An OPC UA client can access variables in the hierarchical namespace of the OPC UA server. The representation of the OPC UA variables depends on the OPC UA client used.

Note

Configuration of the connection in the OPC UA client

The functionality of an OPC UA client depends on the manufacturer. Information is available directly from the manufacturer of the OPC UA client that is to access the data of the OPC UA server via OPC UA.

Requirements

- Activated OPC UA server (Page 111)
- Set IP address (Page 112)
- Set security function (Page 113)
- Set OPC UA session time-out (Page 115)
- Information in chapter Operation without PN control (Page 135)

Procedure

1. In the OPC UA client, establish the connection to the OPC UA server using the URL (e.g. `opc.tcp://192.168.0.2:4840`).
Please note the information on the URL in chapters Setting IP parameters (Page 112) and Port (Page 112).
2. Depending on the OPC UA client, access the required variable, e.g. via a folder structure or by means of the NodeId.
An overview of the variables and the NodeIds can be found in chapter OPC UA variables (Page 116).

Result

You have established a connection to the OPC UA server and can access the variables of the OPC UA server.

8.4.2 Activating or deactivating an OPC UA server

To use the OPC UA server, the function must be activated in the 3RW5 communication module. The function of the OPC UA server is deactivated in the factory setting.

Setting options

- 3RW5 HMI High Feature (firmware version V3.1 or higher)
Menu: "Parameter > Communication Module > OPC UA server"
You will find more information on operating the 3RW5 HMI High Feature in the Equipment Manual of the 3RW5 soft starter.
- Starting parameters for start-up of the automation system
- User program via data set 131 (Page 162)

Result

You have activated or deactivated access to the OPC UA server.

8.4.3 Setting IP parameters

A prerequisite for establishing a connection via OPC UA is the setting of the IP parameters (Page 61) in the 3RW5 communication module.

Note

IP parameters of the PROFINET connection

If you have already set IP parameters in the 3RW5 communication module for the PROFINET connection, you can use these IP parameters and read them out via the setting options. A new setting is not necessary. If you change the set IP parameters, also take this change into account in a possible PROFINET connection to the PLC.

Setting options

You will find the setting options in chapter Setting IP parameters (Page 95).

Note the information in chapter IP parameters (Page 61).

Note

Keeping IP parameters of the OPC UA server

If the OPC UA server should always be accessible via the same IP address, static IP parameters are recommended.

URL of the OPC UA server

The URL of the OPC UA server depends on the IP address and the port (Page 112) set in the 3RW5 communication module and is made up as follows:

- Protocol identifier ("opc.tcp://")
- IP address
- Port

Example:

If the IP address 192.168.0.2 and port 4840 are set in the 3RW5 communication module, the OPC UA server has the following URL: `opc.tcp://192.168.0.2:4840`

Result

You have set the IP parameters and can establish a connection via OPC UA.

8.4.4 Port

A prerequisite for establishing a connection via OPC UA is the setting of the "Port" parameter in the 3RW5 communication module. The "Port" parameter is part of the URL of the OPC UA server (Page 112).

Setting options

- 3RW5 HMI High Feature (firmware version V3.1 or higher)
Menu: "Parameter > Communication Module > OPC UA server" (if OPC UA server is activated)
You will find more information on operating the 3RW5 HMI High Feature in the Equipment Manual of the 3RW5 soft starter.
- User program via data set 132 (Page 163)

Parameter

Parameter	Description
Port	• Factory setting: 4 840 • Adjustment range: 1 024 ... 49 151 • In steps of: 1

8.4.5 Setting security functions

The OPC UA server and OPC UA client authorize each other for data exchange by exchanging certificates. By default, the 3RW5 OPC UA server classifies every certificate of an OPC UA client as "trustworthy". You can additionally encrypt the data traffic.

Requirements

The current clock time and date are stored in the 3RW55 or 3RW55 Failsafe soft starter (manually or with NTP (Page 90)).

Note

Configuration of the OPC UA server

When configuring the OPC UA server, make sure that you only release security parameters that are compatible with the protection concept of your machine or plant.

Supported OPC UA services

- SecurityPolicy (encryption and hash procedure)
 - No Security
Use of the security profile "None" according to the OPC UA specification. This security profile does not provide any security mechanisms.
 - Basic128RSA15
Use of the security profile "Basic128RSA15" according to the OPC UA specification. Only use this security profile if you cannot use another security profile for compatibility reasons.
 - Basic256
Use of the security profile "Basic256" according to the OPC UA specification. Only use this security profile if you cannot use another security profile for compatibility reasons.
 - Basic256SHA256
Use of the security profile "Basic256SHA256" according to the OPC UA specification.
- MessageSecurityMode (security setting for messages)
 - No Security
Use of the security procedure "NONE" according to the OPC UA specification. This security procedure does not provide any security or safety mechanisms.
 - Sign
Use of the security procedure "SIGN" according to the OPC UA specification. The messages and data packets are signed but not encrypted.
 - Sign and encrypt
Use of the security procedure "SIGNANDENCRYPT" according to the OPC UA specification. The messages and data packets are signed and encrypted.

"Basic256SHA256 - sign and encrypt" is enabled in the factory setting of the 3RW5 PROFINET High Feature communication module.

Note**Unsecured connection between OPC UA client and OPC UA server**

If you enabled "No Security", any OPC UA client can connect to the OPC UA server regardless of other security parameters that have been set. Use the "No Security" setting for test purposes only. Set up a secure connection between the OPC UA client and OPC UA server for productive operation.

Setting options

- 3RW5 HMI High Feature (firmware version V3.1 or higher)
Menu: "Parameter > Communication Module > OPC UA server" (if OPC UA server is activated)
You will find more information on operating the 3RW5 HMI High Feature in the Equipment Manual of the 3RW5 soft starter.
- User program via data set 132 (Page 163)

Parameter

Parameter	Description	SecurityPolicy	MessageSecurity-Mode
No Security	- Disable (factory setting) - Enable	None	NONE
Basic128RSA15 - sign	- Disable (factory setting) - Enable	Basic128RSA15	SIGN
Basic128RSA15 - sign and encrypt	- Disable (factory setting) - Enable	Basic128RSA15	SIGNANDENCRYPT
Basic256 - sign	- Disable (factory setting) - Enable	Basic256	SIGN
Basic256 - sign and encrypt	- Disable (factory setting) - Enable	Basic256	SIGNANDENCRYPT
Basic256SHA256 - sign	- Disable (factory setting) - Enable	Basic256SHA256	SIGN
Basic256SHA256 - sign and encrypt	- Disable - Enable (factory setting)	Basic256SHA256	SIGNANDENCRYPT

8.4.6 OPC UA Session Time-Out

The parameter "OPC UA Session Time-Out" determines how long an OPC UA client connection remains open without activity. If the OPC UA client does not make a service request within this time interval, the OPC UA server terminates the OPC UA client connection.

Setting options

- 3RW5 HMI High Feature (firmware version V3.1 or higher)
Menu: "Parameter > Communication Module > OPC UA server" (if the OPC UA server is activated)
You will find more information on operating the 3RW5 HMI High Feature in the Equipment Manual of the 3RW5 soft starter.
- User program via data set 132 (Page 163)

Parameter

Parameter	Description
OPC UA Session Time-Out	- Factory setting: 30 s - Adjustment range: 10 ... 600 s - In steps of: 1 ms

8.4.7 Addressing of nodes

Nodes are the basic elements of OPC UA and are comparable with objects from object-oriented programming. Nodes are used, for example, for user data (variables) or other metadata. Nodes are used to model an OPC UA address space that also contains a type model with type definitions.

Node ID (NodeId)

Nodes in the OPC UA address space are unambiguously defined by a NodeId (Node Identifier). The NodeId consists of the identifier ("identifier"), identifier type ("identifierType") and a namespace index ("namespaceIndex"). Namespaces are used to avoid name conflicts.

The OPC Foundation has defined a number of nodes that provide information about the respective OPC UA server. These nodes are located in the namespace of the OPC Foundation and have the index 0. Furthermore, the OPC Foundation has defined data and variable types.

Namespace

Besides the OPC Foundation namespace described above, the namespace for accessing 3RW5 data is of interest: All variables or methods of a 3RW5 OPC UA server are located in the namespace of the standard server interface "<http://siemens.com/opcua/2020/controlproducts/3rw55>". By default, this namespace has the index 6. Another namespace with index 2 is "<http://siemens.com/opcua/2020/controlproducts/siriussimple>".

Identifier

The 3RW5 OPC UA server uses numeric identifiers (IdentifierType = NUMERIC) to identify the nodes. These numeric identifiers allow OPC UA clients to access the corresponding OPC UA nodes (e.g. variables).

8.4.8 OPC UA variables

The 3RW5 OPC UA server supports the OPC UA specification "OPC 10000 100 - Part 100: Device Information Model". The information model contains the units for measured values and parameters.

Faults and warnings

In addition to the individual variables for diagnostics, there is a variable for faults and warnings. The description of the messages for faults and warnings are shown in separate tables.

Variables for NamespaceIndex = 6

Tag				NodeId. Identifier	Data format	Unit
Displayed name and level				i =		
1st	2nd	3rd	4th level			
SoftStarter3RW5				SoftStarter3RW5	1009	-
	Current Status			Current_Status	1019	-
	Braking			Braking	1026	-
	DC braking active			DC_braking_active_DIAG	1115	Bool
	Dynamic DC braking active			Dynamic_DC_braking_active_DIAG	1116	Bool
	Reversing DC braking active			Reversing_DC_braking_active_DIAG	1194	Bool
	Control			Control	1027	-
	Alternative stopping mode active			Alternative_stopping_mode_active_DIAG	1107	Bool
	Creep speed active			Creep_speed_active_DIAG	1113	Bool
	Current limiting active			Current_limiting_active_DIAG	1114	Bool
	Motor CCW			Motor_CCW_DIAG	1150	Bool
	Motor CW			Motor_CW_DIAG	1151	Bool
	Motor heating active			Motor_heating_active_DIAG	1152	Bool
	Operation / bypass active			Operation_/bypass_active_DIAG	1172	Bool
	Starting mode active			Starting_mode_active_DIAG	1200	Bool
	Stopping mode active			Stopping_mode_active_DIAG	1201	Bool
	Emergency mode			Emergency_mode	1028	-
	Emergency run active			Emergency_run_active_DIAG	1117	Bool
	Emergency run enabled			Emergency_run_enabled_DIAG	1118	Bool
	Emergency start active			Emergency_start_active_DIAG	1119	Bool
	Emergency start enabled			Emergency_start_enabled_DIAG	1120	Bool
	Energy Saving Functions			Energy_Saving_Functions	1029	-
	Energy saving mode active			Energy_saving_mode_active_DIAG	1121	Bool
	Start pause pending			Start_pause_pending_DIAG	1199	Bool
	Ex motor protection			Ex_motor_protection	1030	-
	Ex application active			Ex_application_active_DIAG	1122	Bool
	Ex release denied - wrong CRC			Ex_release_denied_wrong_CRC_DIAG	1123	Bool
	Firmware Update			Firmware_Update	1031	-
	FW update active			FW_update_active_DIAG	1125	Bool
	FW update rejected			FW_update_rejected_DIAG	1126	Bool
	FW update successful			FW_update_successful_DIAG	1127	Bool
	I/O monitoring			I/O_monitoring	1032	-

Tag				NodeId. Identifier	Data format	Unit	
Displayed name and level				Browse name	i =		
1st	2nd	3rd	4th level				
			Analog output overflow	Analog_output_overflow_DIAG	1108	Bool	-
			Analog output underflow	Analog_output_underflow_DIAG	1109	Bool	-
			Input 1	Input_1_DIAG	1128	Bool	-
			Input 2	Input_2_DIAG	1129	Bool	-
			Input 3	Input_3_DIAG	1130	Bool	-
			Input 4	Input_4_DIAG	1131	Bool	-
			Input control	Input_control_DIAG	1132	Bool	-
			Output 1 - Time active	Output_1___Time_active_DIAG	1173	Bool	-
			Output 1 active	Output_1_active_DIAG	1174	Bool	-
			Output 2 - Time active	Output_2___Time_active_DIAG	1175	Bool	-
			Output 2 active	Output_2_active_DIAG	1176	Bool	-
			Output 3 active	Output_3_active_DIAG	1177	Bool	-
			Output 4 - Time active	Output_4___Time_active_DIAG	1178	Bool	-
			Output 4 active	Output_4_active_DIAG	1179	Bool	-
			Quick-stop active	Quick_stop_active_DIAG	1190	Bool	-
		Logbook	Logbook	1033	-	-	
			Logbook application - errors deleted	Logbook_application___errors_deleted_DIAG	1136	Bool	-
			Logbook application - events deleted	Logbook_application___events_deleted_DIAG	1137	Bool	-
			Logbook application - warnings deleted	Logbook_application___warnings_deleted_DIAG	1138	Bool	-
			Logbook service - errors deleted	Logbook_service___errors_deleted_DIAG	1139	Bool	-
			Logbook service - events deleted	Logbook_service___events_deleted_DIAG	1140	Bool	-
		Main Energy Monitoring	Main_Energy_Monitoring	1034	-	-	
			Main power rotation left	Main_power_rotation_left_DIAG	1141	Bool	-
			Main power rotation right	Main_power_rotation_right_DIAG	1142	Bool	-
			Type of motor connection inside delta	Type_of_motor_connection_inside_delta_DIAG	1208	Bool	-
			Type of motor connection standard	Type_of_motor_connection_standard_DIAG	1209	Bool	-
			Type of motor connection unknown	Type_of_motor_connection_unknown_DIAG	1210	Bool	-
		Maintenance	Maintenance	1035	-	-	
		Missing initialization after maintenance	Missing_initialization_after_maintenance_DIAG	1149	Bool	-	
		Motor protection	Motor_protection	1036	-	-	

Tag				NodeId. Identifier	Data format	Unit	
Displayed name and level			Browse name	i =			
1st	2nd	3rd			4th level		
			Cooling time active	Cooling_time_active_DIAG	1112	Bool	-
			Switching element cooling time active	Switching_element_cooling_time_active_DIAG	1202	Bool	-
			Thermal motor model deactivated	Thermal_motor_model_deactivated_DIAG	1207	Bool	-
		Operating mode control		Operating_mode_control	1037	-	-
			Automatic mode	Automatic_mode_DIAG	1110	Bool	-
			Manual operation bus - PC controlled	Manual_operation_bus___PC_controlled_DIAG	1143	Bool	-
			Manual operation bus - Web server controlled	Manual_operation_bus___Web_server_controlled_DIAG	1144	Bool	-
			Manual operation local - HMI controlled	Manual_operation_local___HMI_controlled_DIAG	1145	Bool	-
			Manual operation local - input controlled	Manual_operation_local___input_controlled_DIAG	1146	Bool	-
			Manual operation local - PC controlled	Manual_operation_local___PC_controlled_DIAG	1147	Bool	-
			Operating mode manual - bus	Operating_mode_manual___bus_DIAG	1170	Bool	-
			Operating mode manual - local	Operating_mode_manual___local_DIAG	1171	Bool	-
		Operating state		Operating_state	1038	-	-
			Normal operation active	Normal_operation_active_DIAG	1153	Bool	-
			Ready (automatic)	Ready_(automatic)_DIAG	1191	Bool	-
			Ready to start for motor ON	Ready_to_start_for_motor_ON_DIAG	1192	Bool	-
			Test mode active	Test_mode_active_DIAG	1205	Bool	-
		Operating system functions		Operating_system_functions	1039	-	-
			Maximum pointer reset	Maximum_pointer_reset_DIAG	1148	Bool	-
		Parameterization		Parameterization	1040	-	-

Tag				Nodetd. Identifier	Data format	Unit	
Displayed name and level				Browse name	i =		
1s t	2n d	3r d	4th level				
	Automatic parameterization active			Automatic_parameterization_active_DIAG	1111	Bool	-
	Factory settings restored			Factory_settings_restored_DIAG	1124	Bool	-
	Parameter assignment active			Parameter_assignment_active_DIAG	1180	Bool	-
	Parameter set 1 active			Parameter_set_1_active_DIAG	1181	Bool	-
	Parameter set 2 active			Parameter_set_2_active_DIAG	1182	Bool	-
	Parameter set 3 active			Parameter_set_3_active_DIAG	1183	Bool	-
	Parameter set change not possible			Parameter_set_change_not_possible_DIAG	1184	Bool	-
	Parameters cannot be changed in ON state			Parameters_cannot_be_changed_in_ON_state_DIAG	1185	Bool	-
Parameters disable CPU/master active			Parameters_disable_CPU/master_active_DIAG	1186	Bool	-	
	Pump cleaning			Pump_cleaning	1041	-	-
	Pump cleaning active			Pump_cleaning_active_DIAG	1189	Bool	-
	Safety			Safety	1042	-	-
	Reset ON command required			Reset_ON_command_required_DIAG	1193	Bool	-
	Start condition fulfilled			Start_condition_fulfilled_DIAG	1197	Bool	-
	Start condition not fulfilled			Start_condition_not_fulfilled_DIAG	1198	Bool	-
	Self-test			Self_test	1043	-	-
	Self-test active			Self_test_active_DIAG	1195	Bool	-
	Switching frequency monitoring			Switching_frequency_monitoring	1044	-	-
	Switching frequency lock active			Switching_frequency_lock_active_DIAG	1203	Bool	-
	Switching frequency time running			Switching_frequency_time_running_DIAG	1204	Bool	-
	Test mode functions			Test_mode_functions	1045	-	-
	Simulation active			Simulation_active_DIAG	1196	Bool	-
	Test with small load active			Test_with_small_load_active_DIAG	1206	Bool	-
	DeviceManual			DeviceManual	1011	String	-
	DeviceRevision			DeviceRevision	1012	String	-
	Faults and Warnings			Faults_and_Warnings	1020	-	-

Tag				NodeId. Identifier	Data format	Unit	
Displayed name and level				Browse name			i =
1s t	2n d	3r d	4th level				
	Errors			Errors	1046	ByteString	-
	Warnings			Warnings	1047	See tables below	-
	Group error			Group_error_DIAG	1295	Boolean	-
	Group warning			Group_warning_DIAG	1296	Boolean	--
	Device error			Device_Error_DIAG	1297	Boolean	
	No main power			No_main_power_DIAG	1298	Boolean	-
	Electronics supply voltage too low			Electronics_supply_volt- age_too_low_DIAG	1299	boolean	-
	Safety-related shutoff			Safety_related_shutoff_DIAG	1300	boolean	-
	Thermal motor model overload			Thermal_motor_model_over- load_DIAG	1301	boolean	-
	Temperature sensor overload			Temperature_sensor_overload_DI- AG	1302	boolean	-
	Temperature sensor wire break			Temperature_sen- sor_wire_break_DIAG	1303	boolean	-
	Temperature sensor short-circuit			Temperature_sensor_short_cir- cuit_DIAG	1304	boolean	-
	Switching element overload			Contact_block_overload_DIAG	1305	boolean	-
	Bypass protective shutoff			Bypass_element_protective_shut- off_DIAG	1306	boolean	-
-	HardwareRevision			HardwareRevision	1013	String	-
	Identification			Identification	1014	-	-
	DeviceManual			DeviceManual	1011	String	-
	DeviceRevision			DeviceRevision	1012	String	-
	HardwareRevision			HardwareRevision	1013	String	-
	Manufacturer			Manufacturer	1015	Localized- Text	-
	Model			Model	1016	Localized- Text	-
	SerialNumber			SerialNumber	1017	String	-
	SoftwareRevision			SoftwareRevision	1018	String	-
	Manufacturer			Manufacturer	1015	Localized- Text	-
	Maximum pointer			Maximum_pointer	1021	-	-

Tag				Nodetd. Identifier	Data format	Unit	
Displayed name and level				Browse name	i =		
1st	2nd	3rd	4th level				
			Line voltage U L1-L2 max	Line_volt- age_U_L1_L2_max_MAXP	1049	Float	V
			Line voltage U L1-L2 min	Line_voltage_U_L1_L2_min_MAXP	1050	Float	V
			Line voltage U L2-L3 min	Line_voltage_U_L2_L3_min_MAXP	1051	Float	V
			Line voltage U L3-L1 max	Line_volt- age_U_L3_L1_max_MAXP	1052	Float	V
			Line voltage U L3-L1 min	Line_voltage_U_L3_L1_min_MAXP	1053	Float	V
			Line-to-line voltage U L2-L3 max	Line_to_line_volt- age_U_L2_L3_max_MAXP	1048	Float	V
			Maximum line frequency	Maximum_line_frequency_MAXP	1054	Float	Hz
			Maximum switching element heating	Maximum_switching_ele- ment_heating_MAXP	1055	UInt32	%
			Maximum trigger current (%)	Maximum_trigger_current_per- cent_MAXP	1056	Float	%
			Maximum trigger current (rms)	Maximum_trigger_cur- rent_rms_MAXP	1057	Float	A
			Minimum line frequency	Minimum_line_frequency_MAXP	1058	Float	Hz
			Number of motor overload trips	Number_of_motor_over- load_trips_MAXP	1059	UInt32	-
			Number of starts with ext. bypass	Number_of_starts_with_ext._by- pass_MAXP	1060	UInt32	-
			Operating hours - device	Operating_hours___device_MAXP	1061	UInt32	s
			Operating hours - motor current 120...1000 (% x Ie)	Operating_hours___motor_cur- rent_120...1000_(%_x_Ie)_MAXP	1065	UInt32	s
			Operating hours - motor current 18...49.9 (% x Ie)	Operating_hours___motor_cur- rent_18...49.9_(%_x_Ie)_MAXP	1062	UInt32	s
			Operating hours - motor current 50...89.9 (% x Ie)	Operating_hours___motor_cur- rent_50...89.9_(%_x_Ie)_MAXP	1063	UInt32	s
			Operating hours - motor current 90...119.9 (% x Ie)	Operating_hours___motor_cur- rent_90...119.9_(%_x_Ie)_MAXP	1064	UInt32	s
			Phase current I L1 max (%)	Phase_current_I_L1_max_per- cent_MAXP	1066	Float	%
			Phase current I L1 max (rms)	Phase_cur- rent_I_L1_max_rms_MAXP	1067	Float	A
			Phase current I L1 min (%)	Phase_current_I_L1_min_per- cent_MAXP	1068	Float	%
			Phase current I L1 min (rms)	Phase_cur- rent_I_L1_min_rms_MAXP	1069	Float	A
			Phase current I L2 max (%)	Phase_current_I_L2_max_per- cent_MAXP	1070	Float	%
			Phase current I L2 max (rms)	Phase_cur- rent_I_L2_max_rms_MAXP	1071	Float	A

Tag				NodeId. Identifier	Data format	Unit	
Displayed name and level			Browse name	i =			
1s t	2nd	3rd			4th level		
	Phase current I L2 min (%)			Phase_current_I_L2_min_percent_MAXP	1072	Float	%
	Phase current I L2 min (rms)			Phase_current_I_L2_min_rms_MAXP	1073	Float	A
	Phase current I L3 max (%)			Phase_current_I_L3_max_percent_MAXP	1074	Float	%
	Phase current I L3 max (rms)			Phase_current_I_L3_max_rms_MAXP	1075	Float	A
	Phase current I L3 min (%)			Phase_current_I_L3_min_percent_MAXP	1076	Float	%
	Phase current I L3 min (rms)			Phase_current_I_L3_min_rms_MAXP	1077	Float	A
	Starting current I L1 max (rms)			Starting_current_I_L1_max_rms_MAXP	1078	Float	A
	Starting current I L2 max (rms)			Starting_current_I_L2_max_rms_MAXP	1079	Float	A
	Starting current I L3 max (rms)			Starting_current_I_L3_max_rms_MAXP	1080	Float	A
	Starting current I max (rms)			Starting_current_I_max_rms_MAXP	1081	Float	A
	Measured values			Measured_values	1022	-	-

Tag				Nodetd. Identifier	Data format	Unit	
Displayed name and level			Browse name				
1s t	2n d	3r d		4th level	i =		
	Active power			Active_power_MESW	1082	Float	kW
	Asymmetry			Asymmetry_MESW	1083	UInt32	%
	Line frequency			Line_frequency_MESW	1084	Float	Hz
	Line voltage U L1-L2 (rms)			Line_volt- age_U_L1_L2_rms_MESW	1085	Float	V
	Line voltage U L2-L3 (rms)			Line_volt- age_U_L2_L3_rms_MESW	1086	Float	V
	Line voltage U L3-L1 (rms)			Line_volt- age_U_L3_L1_rms_MESW	1087	Float	V
	Motor temperature rise			Motor_temperature_rise_MESW	1088	UInt32	%
	Output frequency			Output_frequency_MESW	1089	Float	Hz
	Phase current average (%)			Phase_current_average_per- cent_MESW	1090	Float	%
	Phase current average (rms)			Phase_current_aver- age_rms_MESW	1091	Float	A
	Phase current I L1 (%)			Phase_current_I_L1_per- cent_MESW	1092	Float	%
	Phase current I L1 (rms)			Phase_current_I_L1_rms_MESW	1093	Float	A
	Phase current I L2 (%)			Phase_current_I_L2_per- cent_MESW	1094	Float	%
	Phase current I L2 (rms)			Phase_current_I_L2_rms_MESW	1095	Float	A
	Phase current I L3 (%)			Phase_current_I_L3_per- cent_MESW	1096	Float	%
	Phase current I L3 (rms)			Phase_current_I_L3_rms_MESW	1097	Float	A
	Phase current max (rms)			Phase_current_max_rms_MESW	1098	Float	A
	Power factor L1...3			Power_factor_L1...3_MESW	1099	Float	-
	Remaining motor cooling time			Remaining_motor_cool- ing_time_MESW	1100	Float	s
	Remaining switching element cooling time			Remaining_switching_ele- ment_cooling_time_MESW	1101	Float	s
	Remaining switching frequency monit. time			Remaining_switching_frequen- cy_monit._time_MESW	1102	UInt32	s
	Remaining time for motor overload protection			Remaining_time_for_motor_over- load_protection_MESW	1103	Float	s
	Switching element heating			Switching_element_heat- ing_MESW	1104	UInt32	%
	Model			Model	1016	Localized- Text	-
	ParameterSet			ParameterSet	1023	-	-

Tag				Nodetd. Identifier	Data format	Unit	
Displayed name and level				Browse name	i =		
1s t	2n d	3r d	4th level				
	Active energy export total			Active_energy_export_total_STAT	1105	Float	Wh
	Active energy import total			Active_energy_import_total_STAT	1106	Float	Wh
	Active power			Active_power_MESW	1082	Float	kW
	Alternative stopping mode active			Alternative_stopping_mode_active_DIAG	1107	Bool	-
	Analog output overflow			Analog_output_overflow_DIAG	1108	Bool	-
	Analog output underflow			Analog_output_underflow_DIAG	1109	Bool	-
	Asymmetry			Asymmetry_MESW	1083	UInt32	%
	Automatic mode			Automatic_mode_DIAG	1110	Bool	-
	Automatic parameterization active			Automatic_parameterization_active_DIAG	1111	Bool	-
	Cooling time active			Cooling_time_active_DIAG	1112	Bool	-
	Creep speed active			Creep_speed_active_DIAG	1113	Bool	-
	Current limiting active			Current_limiting_active_DIAG	1114	Bool	-
	DC braking active			DC_braking_active_DIAG	1115	Bool	-
	Dynamic DC braking active			Dynamic_DC_braking_active_DIAG	1116	Bool	-
	Emergency run active			Emergency_run_active_DIAG	1117	Bool	-
	Emergency run enabled			Emergency_run_enabled_DIAG	1118	Bool	-
	Emergency start active			Emergency_start_active_DIAG	1119	Bool	-
	Emergency start enabled			Emergency_start_enabled_DIAG	1120	Bool	-
	Energy saving mode active			Energy_saving_mode_active_DIAG	1121	Bool	-
	Errors			Errors	1046	ByteString See tables below	-
	Ex application active			Ex_application_active_DIAG	1122	Bool	-
	Ex release denied - wrong CRC			Ex_release_denied_wrong_CRC_DIAG	1123	Bool	-
	Factory settings restored			Factory_settings_restored_DIAG	1124	Bool	-
	FW update active			FW_update_active_DIAG	1125	Bool	-
	FW update rejected			FW_update_rejected_DIAG	1126	Bool	-
	FW update successful			FW_update_successful_DIAG	1127	Bool	-
	Input 1			Input_1_DIAG	1128	Bool	-
	Input 2			Input_2_DIAG	1129	Bool	-
	Input 3			Input_3_DIAG	1130	Bool	-
	Input 4			Input_4_DIAG	1131	Bool	-
	Input control			Input_control_DIAG	1132	Bool	-
	Last real starting time			Last_real_starting_time_STAT	1133	Float	s
	Last tripping current IA (%)			Last_tripping_current_IA_percent_STAT	1134	Float	%

Tag				Nodetd. Identifier	Data format	Unit	
Displayed name and level			Browse name	i =			
1s t	2n d	3r d			4th level		
			Last tripping current IA (rms)	Last_tripping_cur- rent_IA_rms_STAT	1135	Float	A
			Line frequency	Line_frequency_MESW	1084	Float	Hz
			Line voltage U L1-L2 (rms)	Line_volt- age_U_L1_L2_rms_MESW	1085	Float	V
			Line voltage U L1-L2 max	Line_volt- age_U_L1_L2_max_MAXP	1049	Float	V
			Line voltage U L1-L2 min	Line_voltage_U_L1_L2_min_MAXP	1050	Float	V
			Line voltage U L2-L3 (rms)	Line_volt- age_U_L2_L3_rms_MESW	1086	Float	V
			Line voltage U L2-L3 min	Line_voltage_U_L2_L3_min_MAXP	1051	Float	V
			Line voltage U L3-L1 (rms)	Line_volt- age_U_L3_L1_rms_MESW	1087	Float	V
			Line voltage U L3-L1 max	Line_volt- age_U_L3_L1_max_MAXP	1052	Float	V
			Line voltage U L3-L1 min	Line_voltage_U_L3_L1_min_MAXP	1053	Float	V
			Line-to-line voltage U L2-L3 max	Line_to_line_volt- age_U_L2_L3_max_MAXP	1048	Float	V
			Logbook application - errors deleted	Logbook_application___errors_de- leted_DIAG	1136	Bool	-
			Logbook application - events deleted	Logbook_applica- tion___events_deleted_DIAG	1137	Bool	-
			Logbook application - warnings deleted	Logbook_application___warn- ings_deleted_DIAG	1138	Bool	-
			Logbook service - errors deleted	Logbook_service___errors_de- leted_DIAG	1139	Bool	-
			Logbook service - events deleted	Logbook_service___events_de- leted_DIAG	1140	Bool	-
			Main power rotation left	Main_power_rotation_left_DIAG	1141	Bool	-
			Main power rotation right	Main_power_rotation_right_DIAG	1142	Bool	-
			Manual operation bus - PC controlled	Manual_operation_bus___PC_con- trolled_DIAG	1143	Bool	-
			Manual operation bus - Web server con- trolled	Manual_opera- tion_bus___Web_server_control- led_DIAG	1144	Bool	-
			Manual operation local - HMI controlled	Manual_operation_lo- cal___HMI_controlled_DIAG	1145	Bool	-
			Manual operation local - input control- led	Manual_operation_local___in- put_controlled_DIAG	1146	Bool	-
			Manual operation local - PC controlled	Manual_operation_lo- cal___PC_controlled_DIAG	1147	Bool	-
			Maximum line frequency	Maximum_line_frequency_MAXP	1054	Float	Hz
			Maximum pointer reset	Maximum_pointer_reset_DIAG	1148	Bool	-

Tag				NodeId. Identifier	Data format	Unit	
Displayed name and level				Browse name			i =
1st	2nd	3rd	4th level				
	Maximum switching element heating			Maximum_switching_element_heating_MAXP	1055	UInt32	%
	Maximum trigger current (%)			Maximum_trigger_current_percent_MAXP	1056	Float	%
	Maximum trigger current (rms)			Maximum_trigger_current_rms_MAXP	1057	Float	A
	Minimum line frequency			Minimum_line_frequency_MAXP	1058	Float	Hz
	Missing initialization after maintenance			Missing_initialization_after_maintenance_DIAG	1149	Bool	-
	Motor CCW			Motor_CCW_DIAG	1150	Bool	-
	Motor CW			Motor_CW_DIAG	1151	Bool	-
	Motor heating active			Motor_heating_active_DIAG	1152	Bool	-
	Motor temperature rise			Motor_temperature_rise_MESW	1088	UInt32	%
	Normal operation active			Normal_operation_active_DIAG	1153	Bool	-
	Number of braking stops			Number_of_braking_stops_STAT	1154	UInt32	-
	Number of bypass overload trips			Number_of_bypass_overload_trips_STAT	1155	UInt32	-
	Number of motor overload trips			Number_of_motor_overload_trips_MAXP	1059	UInt32	-
	Number of motor overload trips			Number_of_motor_overload_trips_STAT	1156	UInt32	-
	Number of starts motor CCW			Number_of_starts_motor_CCW_STAT	1157	UInt32	-
	Number of starts motor CW			Number_of_starts_motor_CW_STAT	1158	UInt32	-
	Number of starts output1			Number_of_starts_output1_STAT	1159	UInt32	-
	Number of starts output2			Number_of_starts_output2_STAT	1160	UInt32	-
	Number of starts output3			Number_of_starts_output3_STAT	1161	UInt32	-
	Number of starts output4			Number_of_starts_output4_STAT	1162	UInt32	-
	Number of starts with ext. bypass			Number_of_starts_with_ext_bypass_MAXP	1060	UInt32	-
	Number of switching element overload trips			Number_of_switching_element_overload_trips_STAT	1163	UInt32	-
	Operating hours - device			Operating_hours__device_MAXP	1061	UInt32	s
	Operating hours - device			Operating_hours__device_STAT	1164	UInt32	s
	Operating hours - motor			Operating_hours__motor_STAT	1165	UInt32	s
	Operating hours - motor current 120...1000 (% x Ie)			Operating_hours__motor_current_120...1000_(%_x_Ie)_MAXP	1065	UInt32	s
	Operating hours - motor current 18...49.9 (% x Ie)			Operating_hours__motor_current_18...49.9_(%_x_Ie)_MAXP	1062	UInt32	s
	Operating hours - motor current 50...89.9 (% x Ie)			Operating_hours__motor_current_50...89.9_(%_x_Ie)_MAXP	1063	UInt32	s

Tag				Nodetd. Identifier	Data format	Unit	
Displayed name and level			Browse name				
1s t	2n d	3r d		4th level	i =		
	Operating hours - motor current 90...119.9 (% x le)			Operating_hours__motor_cur- rent_90...119.9_(%_x_le)_MAXP	1064	UInt32	s
	Operating hours - motor current = 120...1000 (% x lemax)			Operating_hours__motor_cur- rent_=_120...1000_(%_x_le- max)_STAT	1169	UInt32	s
	Operating hours - motor current = 18...49.9 (% x lemax)			Operating_hours__motor_cur- rent_=_18...49.9_(%_x_le- max)_STAT	1166	UInt32	s
	Operating hours - motor current = 50...89.9 (% x lemax)			Operating_hours__motor_cur- rent_=_50...89.9_(%_x_le- max)_STAT	1167	UInt32	s
	Operating hours - motor current = 90...119.9 (% x lemax)			Operating_hours__motor_cur- rent_=_90...119.9_(%_x_le- max)_STAT	1168	UInt32	s
	Operating mode manual - bus			Operating_mode_man- ual__bus_DIAG	1170	Bool	-
	Operating mode manual - local			Operating_mode_manual__lo- cal_DIAG	1171	Bool	-
	Operation / bypass active			Operation_/_bypass_active_DIAG	1172	Bool	-
	Output 1 - Time active			Output_1__Time_active_DIAG	1173	Bool	-
	Output 1 active			Output_1_active_DIAG	1174	Bool	-
	Output 2 - Time active			Output_2__Time_active_DIAG	1175	Bool	-
	Output 2 active			Output_2_active_DIAG	1176	Bool	-
	Output 3 active			Output_3_active_DIAG	1177	Bool	-
	Output 4 - Time active			Output_4__Time_active_DIAG	1178	Bool	-
	Output 4 active			Output_4_active_DIAG	1179	Bool	-
	Output frequency			Output_frequency_MESW	1089	Float	Hz
	Parameter assignment active			Parameter_assignment_active_DI- AG	1180	Bool	-
	Parameter set 1 active			Parameter_set_1_active_DIAG	1181	Bool	-
	Parameter set 2 active			Parameter_set_2_active_DIAG	1182	Bool	-
	Parameter set 3 active			Parameter_set_3_active_DIAG	1183	Bool	-
	Parameter set change not possible			Parameter_set_change_not_possi- ble_DIAG	1184	Bool	-
	Parameters cannot be changed in ON state			Parameters_can- not_be_changed_in_ON_state_DI- AG	1185	Bool	-
	Parameters disable CPU/master active			Parameters_disable_CPU/ master_active_DIAG	1186	Bool	-
	Phase current average (%)			Phase_current_average_per- cent_MESW	1090	Float	%
	Phase current average (rms)			Phase_current_aver- age_rms_MESW	1091	Float	A

Tag				NodeId. Identifier	Data format	Unit	
Displayed name and level				Browse name			i =
1s t	2n d	3r d	4th level				
	Phase current I L1 (%)			Phase_current_I_L1_per- cent_MESW	1092	Float	%
	Phase current I L1 (rms)			Phase_current_I_L1_rms_MESW	1093	Float	A
	Phase current I L1 max (%)			Phase_current_I_L1_max_per- cent_MAXP	1066	Float	%
	Phase current I L1 max (rms)			Phase_cur- rent_I_L1_max_rms_MAXP	1067	Float	A
	Phase current I L1 min (%)			Phase_current_I_L1_min_per- cent_MAXP	1068	Float	%
	Phase current I L1 min (rms)			Phase_cur- rent_I_L1_min_rms_MAXP	1069	Float	A
	Phase current I L2 (%)			Phase_current_I_L2_per- cent_MESW	1094	Float	%
	Phase current I L2 (rms)			Phase_current_I_L2_rms_MESW	1095	Float	A
	Phase current I L2 max (%)			Phase_current_I_L2_max_per- cent_MAXP	1070	Float	%
	Phase current I L2 max (rms)			Phase_cur- rent_I_L2_max_rms_MAXP	1071	Float	A
	Phase current I L2 min (%)			Phase_current_I_L2_min_per- cent_MAXP	1072	Float	%
	Phase current I L2 min (rms)			Phase_cur- rent_I_L2_min_rms_MAXP	1073	Float	A
	Phase current I L3 (%)			Phase_current_I_L3_per- cent_MESW	1096	Float	%
	Phase current I L3 (rms)			Phase_current_I_L3_rms_MESW	1097	Float	A
	Phase current I L3 max (%)			Phase_current_I_L3_max_per- cent_MAXP	1074	Float	%
	Phase current I L3 max (rms)			Phase_cur- rent_I_L3_max_rms_MAXP	1075	Float	A
	Phase current I L3 min (%)			Phase_current_I_L3_min_per- cent_MAXP	1076	Float	%
	Phase current I L3 min (rms)			Phase_cur- rent_I_L3_min_rms_MAXP	1077	Float	A
	Phase current max (%)			Phase_current_max_percent_STAT	1187	Float	%
	Phase current max (rms)			Phase_current_max_rms_MESW	1098	Float	A
	Phase current max (rms)			Phase_current_max_rms_STAT	1188	Float	A
	Power factor L1...3			Power_factor_L1...3_MESW	1099	Float	-
	Pump cleaning active			Pump_cleaning_active_DIAG	1189	Bool	-
	Quick-stop active			Quick_stop_active_DIAG	1190	Bool	-
	Ready (automatic)			Ready_(automatic)_DIAG	1191	Bool	-
	Ready to start for motor ON			Ready_to_start_for_motor_ON_DI- AG	1192	Bool	-

Tag				Nodetd. Identifier	Data format	Unit	
Displayed name and level			Browse name				
1s t	2n d	3r d		4th level	i =		
	Remaining motor cooling time			Remaining_motor_cool- ing_time_MESW	1100	Float	s
	Remaining switching element cooling time			Remaining_switching_ele- ment_cooling_time_MESW	1101	Float	s
	Remaining switching frequency monit. time			Remaining_switching_frequen- cy_monit._time_MESW	1102	UInt32	s
	Remaining time for motor overload pro- tection			Remaining_time_for_motor_over- load_protection_MESW	1103	Float	s
	Reset ON command required			Reset_ON_command_required_DI- AG	1193	Bool	-
	Reversing DC braking active			Reversing_DC_braking_active_DI- AG	1194	Bool	-
	Self-test active			Self_test_active_DIAG	1195	Bool	-
	Simulation active			Simulation_active_DIAG	1196	Bool	-
	Start condition fulfilled			Start_condition_fulfilled_DIAG	1197	Bool	-
	Start condition not fulfilled			Start_condition_not_fulfilled_DIAG	1198	Bool	-
	Start pause pending			Start_pause_pending_DIAG	1199	Bool	-
	Starting current I L1 max (rms)			Starting_cur- rent_I_L1_max_rms_MAXP	1078	Float	A
	Starting current I L2 max (rms)			Starting_cur- rent_I_L2_max_rms_MAXP	1079	Float	A
	Starting current I L3 max (rms)			Starting_cur- rent_I_L3_max_rms_MAXP	1080	Float	A
	Starting current I max (rms)			Starting_cur- rent_I_max_rms_MAXP	1081	Float	A
	Starting mode active			Starting_mode_active_DIAG	1200	Bool	-
	Stopping mode active			Stopping_mode_active_DIAG	1201	Bool	-
	Switching element cooling time active			Switching_element_cool- ing_time_active_DIAG	1202	Bool	-
	Switching element heating			Switching_element_heat- ing_MESW	1104	UInt32	%
	Switching frequency lock active			Switching_frequency_lock_ac- tive_DIAG	1203	Bool	-
	Switching frequency time running			Switching_frequency_time_run- ning_DIAG	1204	Bool	-
	Test mode active			Test_mode_active_DIAG	1205	Bool	-
	Test with small load active			Test_with_small_load_active_DIAG	1206	Bool	-
	Thermal motor model deactivated			Thermal_motor_model_deactiva- ted_DIAG	1207	Bool	-
	Type of motor connection inside delta			Type_of_motor_connection_in- side_delta_DIAG	1208	Bool	-
Type of motor connection standard			Type_of_motor_connec- tion_standard_DIAG	1209	Bool	-	

Tag				NodeId. Identifier	Data format	Unit	
Displayed name and level				Browse name			i =
1st	2nd	3rd	4th level				
		Type of motor connection unknown		Type_of_motor_connection_unknown_DIAG	1210	Bool	-
		Warnings		Warnings	1047	ByteString See tables below	-
	PROFenergy			PROFenergy	1024	-	-
		Active energy import total		Active_Energy_Import_total	1211	Double	Wh
		Active power		Active_Power_total	1212	Float	kW
		Phase current average (rms)		Current_average_abc_rms	1213	Float	A
		Phase current I L1 (rms)		Current_a_rms	1214	Float	A
		Phase current I L2 (rms)		Current_b_rms	1215	Float	A
		Phase current I L3 (rms)		Current_c_rms	1216	Float	A
		Power factor L1...3		Power_factor_total	1217	Float	-
	RevisionCounter			RevisionCounter	1010	Int32	-
	SerialNumber			SerialNumber	1017	String	-
	SoftwareRevision			SoftwareRevision	1018	String	-
	Statistic data			Statistic_data	1025	-	-

Tag				NodeId. Identifier	Data format	Unit	
Displayed name and level			Browse name				
1st	2nd	3rd		4th level	i =		
	Active energy export total			Active_energy_export_total_STAT	1105	Float	Wh
	Active energy import total			Active_energy_import_total_STAT	1106	Float	Wh
	Last real starting time			Last_real_starting_time_STAT	1133	Float	s
	Last tripping current IA (%)			Last_tripping_current_IA_percent_STAT	1134	Float	%
	Last tripping current IA (rms)			Last_tripping_current_IA_rms_STAT	1135	Float	A
	Number of braking stops			Number_of_braking_stops_STAT	1154	UInt32	-
	Number of bypass overload trips			Number_of_bypass_overload_trips_STAT	1155	UInt32	-
	Number of motor overload trips			Number_of_motor_overload_trips_STAT	1156	UInt32	-
	Number of starts motor CCW			Number_of_starts_motor_CCW_STAT	1157	UInt32	-
	Number of starts motor CW			Number_of_starts_motor_CW_STAT	1158	UInt32	-
	Number of starts output1			Number_of_starts_output1_STAT	1159	UInt32	-
	Number of starts output2			Number_of_starts_output2_STAT	1160	UInt32	-
	Number of starts output3			Number_of_starts_output3_STAT	1161	UInt32	-
	Number of starts output4			Number_of_starts_output4_STAT	1162	UInt32	-
	Number of switching element overload trips			Number_of_switching_element_overload_trips_STAT	1163	UInt32	-
	Operating hours - device			Operating_hours__device_STAT	1164	UInt32	s
	Operating hours - motor			Operating_hours__motor_STAT	1165	UInt32	s
	Operating hours - motor current = 120...1000 (% x lemax)			Operating_hours__motor_current_=_120...1000_(%_x_lemax)_STAT	1169	UInt32	s
	Operating hours - motor current = 18...49.9 (% x lemax)			Operating_hours__motor_current_=_18...49.9_(%_x_lemax)_STAT	1166	UInt32	s
	Operating hours - motor current = 50...89.9 (% x lemax)			Operating_hours__motor_current_=_50...89.9_(%_x_lemax)_STAT	1167	UInt32	s
	Operating hours - motor current = 90...119.9 (% x lemax)			Operating_hours__motor_current_=_90...119.9_(%_x_lemax)_STAT	1168	UInt32	s
Phase current max (%)			Phase_current_max_percent_STAT	1187	Float	%	
Phase current max (rms)			Phase_current_max_rms_STAT	1188	Float	A	

Errors

Byte	Bit	Errors	Data format
0	0	Asymmetry limit error exceeded	Bool
	1	Asymmetry shutoff	Bool
	2	Bus error	Bool
	3	Bypass defective	Bool
	4	Bypass protective shutoff	Bool
	5	Switching element defective	Bool
	6	Switching element overload	Bool
	7	Current limit error undershot	Bool
1	0	Current limit error shutoff	Bool
	1	Current measuring range exceeded	Bool
	2	Device error	Bool
	3	Electronics supply voltage too low	Bool
	4	FW update faulty	Bool
	5	Ground fault limit error exceeded	Bool
	6	Current limit error exceeded	Bool
	7	Invalid parameter value	Bool
2	0	Loss of phase L1	Bool
	1	Loss of phase L2	Bool
	2	Loss of phase L3	Bool
	3	Main power for test not allowed	Bool
	4	Line voltage for test required	Bool
	5	Main power rotation faulty	Bool
	6	Missing load	Bool
	7	Switching frequency time not kept	Bool
3	0	Motor overload protection - shutoff	Bool
	1	No external start parameters received	Bool
	2	No main power	Bool
	3	Operating temperature too high	Bool
	4	Active power limit error exceeded	Bool
	5	Phase control failure	Bool
	6	Active power error limit shutoff	Bool
	7	Active power limit error undershot	Bool
4	0	Preset unequal actual configuration	Bool
	1	Error process image	Bool
	2	Safety-related shutoff	Bool
	3	Self-test error	Bool
	4	Switching element L1 failed	Bool
	5	Switching element L2 failed	Bool
	6	Switching element L3 failed	Bool
	7	Temperature sensor overload	Bool

Byte	Bit	Errors	Data format
5	0	Temperature sensor short-circuit	Bool
	1	Temperature sensor wire break	Bool
	2	Thermal motor model overload	Bool
	3	Motor connection wrong	Bool

Warnings

Byte	Bit	Warnings	Data format
0	0	2-phase control with defective thyristor active	Bool
	1	Asymmetry limit warning exceeded	Bool
	2	Check fan	Bool
	3	Connection abort in manual mode	Bool
	4	Switching element too hot for Start	Bool
	5	Current limit - maintenance demanded exceeded	Bool
	6	Current limit - maintenance demanded undershot	Bool
	7	Generator operation	Bool
1	0	Ground fault limit warning exceeded	Bool
	1	Main power rotation faulty	Bool
	2	Switching frequency time not kept	Bool
	3	Motor heating warning limit exceeded	Bool
	4	New Ex parameter values detected	Bool
	5	Active power limit - maintenance demanded exceeded	Bool
	6	Active power limit - maintenance demanded undershot	Bool
	7	Preset unequal actual configuration	Bool
2	0	Remaining time for tripping warning limit undershot	Bool
	1	Starting time limit - maintenance demanded exceeded	Bool
	2	Starting time limit - maintenance demanded undershot	Bool
	3	Temperature sensor overload	Bool
	4	Temperature sensor short-circuit	Bool
	5	Temperature sensor wire break	Bool

Variables for NamespaceIndex = 2

Tag				Nodeld. Identifier	Data format	Unit
Displayed name and level			Browse name			
1s t	2n d	3rd level			i =	
SIRIUS_Simple			SIRIUS_Simple	1	-	-
	Measured Values		MeasuredValues	4	-	-

Tag			NodeId. Identifier	Data format	Unit
Displayed name and level		Browse name			
1st	2nd	3rd level	i =		
		Active power	Active_Power_P	UInt32	W
		Asymmetry	Phase_Unbalance	Byte	%
		Motor temperature rise	Thermal_Memory	Byte	%
		Phase current I L1 (%)	Current_I_L1	UInt16	%
		Phase current I L2 (%)	Current_I_L2	UInt16	%
		Phase current I L3 (%)	Current_I_L3	UInt16	%
		Power factor L1...3	Cos_Phi	Byte	%
		Remaining motor cooling time	Cooling_Down_Period	UInt16	s
		Remaining time for motor overload protection	Time_to_Trip	UInt16	s
	Statistics		Statistics	-	-
		Active energy import total	Consumed_Energy	UInt32	kWh
		Last tripping current IA (%)	Last_Trip_Current	UInt16	%
		Number of motor overload trips	Number_of_Overload_Trips	UInt16	-
		Number of starts motor CCW	Int_Number_of_reverse_Starts	UInt32	-
		Number of starts motor CW	Int_Number_of_direct_Starts	UInt32	-
		Operating hours - device	Device_Operating_Hours	UInt32	s
		Operating hours - motor	Motor_Operating_Hours	UInt32	s
		Phase current max (%)	Max_Current_I_max	UInt16	%

8.5 Operation without PN control

The parameter "Operation without PN control" determines how the 3RW55 and 3RW55 Failsafe soft starters behave in relation to a PLC. The parameter is only relevant in connection with the use of the web server or OPC UA server.

Requirement

- 3RW5 PROFINET High Feature communication module from firmware version V2.0
- Soft starter 3RW55 with firmware version V2.1.1 or higher or soft starter 3RW55 Failsafe with firmware version V1.1.0 or higher

Setting options

- 3RW5 HMI High Feature (firmware version V3.1 or higher)
Menu: "Parameter > Communication Module > Web Server" (if web server is activated)
Menu: "Parameter > Communication Module > OPC UA server" (if OPC UA server is activated)
The parameter and setting in both menus are identical.
You will find more information on operating the 3RW5 HMI High Feature in the Equipment Manual of the 3RW5 soft starter.
- User program via data set 131 (Page 162)

Parameter

Parameter	Description
Operation without PN control	• No (factory setting) A PLC as control source ("Automatic" mode) is required. If the 3RW5 soft starter does not detect a bus start, an error is reported. • Yes A PLC as control source ("Automatic" mode) is not possible. Only connections with SIRIUS Soft Starter ES (TIA Portal) Premium / Professional, a web server and OPC UA server are possible via the 3RW5 PROFINET High Feature communication module.

8.6 System redundancy S2

Requirement

- 3RW5 PROFINET High Feature communication module with firmware V3.0 or higher

System redundancy S2

The PROFINET system redundancy S2 enables the setup of system-redundant plants. The goal of high availability automation systems is to reduce production downtime.

Reference

You can find more information on the Internet (<https://support.industry.siemens.com/cs/ww/en/view/109756450>).

8.7 Dynamic Reconfiguration (DR)

Requirement

- 3RW5 PROFINET High Feature communication module with firmware V3.0 or higher

Changes during operation

Changes during operation (Dynamic Reconfiguration) refer to the property, based on redundant communication connections, of being able to make changes to the system without having to restart devices or controllers and without affecting communication in the network. This applies to measures on or with compact devices as well as to modular devices or proxies.

Examples include changing a device configuration, replacing a device, adding or repairing components, or changing parameters.

Formerly this function was called Configuration in Run (CiR).

8.7 Dynamic Reconfiguration (DR)

Maintenance and service

9.1 Firmware update

During operation, it may be necessary to update the firmware, e.g. to extend the available functions. You update the firmware of the 3RW5 communication module with the help of firmware files. The retentive data is retained after the firmware has been updated.

Firmware updates and a history of the versions with the innovations are provided to you on the Internet.

Requirements

- Valid firmware update
You will find the latest firmware files on the 3RW5 topic page (<https://support.industry.siemens.com/cs/ww/en/view/109747404>).

9.1 Firmware update

Procedure

1. Make sure that the motor is switched off and you do not start the motor during the firmware update.
A control command for starting the motor is not supported during the firmware update. To ensure the quickest and most fault-free firmware update, it is recommended that you disconnect the main voltage (operating voltage) of the 3RW5 soft starter and set the CPU / PLC to STOP mode.

2. Perform the update of the device firmware.

The following procedures are recommended:

- Via SIRIUS Soft Starter ES (TIA Portal) Premium / Professional on the 3RW5 communication module
Brief overview: Window "Project Navigation" with current project under created Soft Starter > "Online & Diagnostics" > Window "Work area" > "PROFINET IO ST / PROFINET IO HF > Functions > Firmware update"
- Via the configuration software of the controller (e.g. STEP 7 with corresponding HSP) on the 3RW5 communication module

Further procedures are possible:

- With a micro SD card via the 3RW5 HMI High Feature (Page 141)
- Via SIRIUS Soft Starter ES (TIA Portal) over the local interface on the 3RW5 HMI High Feature
Brief overview: See SIRIUS Soft Starter ES (TIA Portal) Premium / Professional via 3RW5 communication module

Note

Firmware update of the 3RW5 PROFINET High Feature communication module

The firmware update of the 3RW5 PROFINET High Feature communication module via SIRIUS Soft Starter ES (TIA Portal) at the local interface or using a Micro SD card via the 3RW5 HMI High Feature can take a very long time (up to about 60 minutes).

Result

You have performed a firmware update for the 3RW5 communication module. The 3RW5 communication module restarts automatically.

9.1.1 Performing firmware update with micro SD card (3RW5 HMI High Feature)

Requirements

- Micro SD card with valid firmware file (*.upd)
You will find more information and requirements for supporting the micro SD card in the Equipment Manual of the 3RW5 soft starter.
- The valid firmware file is located in the root directory (topmost level).
- 3RW5 HMI High Feature
Menu "Micro SD card > FW update".

Procedure

Note**Access to micro SD card.**

Please note that the micro SD card is inserted in the 3RW5 HMI High Feature during updating of the firmware.

Premature removal of the micro SD card from the 3RW5 HMI High Feature is not permissible and will terminate updating of the firmware. Data could also be lost.

1. Select the folder of the 3RW5 communication module.
2. Select the firmware file of the 3RW5 communication module and confirm with the OK button. You can see the firmware update is being performed from the progress bar on the display. Following successful updating of the firmware, the 3RW5 communication module restarts automatically.
3. Check the new firmware version in the "Overview" menu.

Result

You have performed a firmware update for the 3RW5 communication module using the Micro SD card.

More information

You will find more information on operating the 3RW5 HMI High Feature in the Equipment Manual of the 3RW5 soft starter.

9.2 Replacing the 3RW5 communication module

Communication parameters are stored in the 3RW5 communication module and not automatically transferred into the replacement device.

Observe the following chapters on the communication parameters:

- Configuring the 3RW5 Soft Starter (Page 54)
- Disable or enable group error and group warning (Page 79)
- Data set 131: Parameter communication (slot 1) (Page 162)
- Data set 132: Parameter communication server (slot 1) (Page 163)

Note**Back up the communication parameters on micro SD card**

You can save the communication parameters on a Micro SD card via the 3RW5 HMI High Feature.

You will find more information about backing up the configuration data to a micro SD card and operating the 3RW5 HMI High Feature in the Equipment Manual of the soft starter 3RW55.

See also

Firmware update (Page 15)

Requirements**NOTICE****Damage to property due to electrical voltage**

Switch off the power to the 3RW5 soft starter before starting work (main and control supply voltage).

Procedure

1. Remove the bus connector (Page 51).
2. Remove the 3RW5 communication module.
 - 3RW50 soft starter: Remove the COM connecting cable from the 3RW5 communication module (Page 48) and remove the 3RW5 communication module on the level surface (Page 43).
 - 3RW52, 3RW55 and 3RW55 Failsafe soft starters: Remove the 3RW5 communication module in the 3RW5 soft starter (Page 40).
3. Mount the 3RW5 communication module.
 - 3RW50 soft starter: Mount the 3RW5 communication module on the level surface (Page 41) and connect the COM connecting cable to the 3RW5 communication module (Page 46).
 - 3RW52, 3RW55 and 3RW55 Failsafe soft starters: Mount the 3RW5 communication module in the 3RW5 soft starter (Page 39).
4. Connect the 3RW5 communication module to the bus connection (Page 50).

Result

You have replaced the 3RW5 communication module and can commission the 3RW5 soft starter in the bus connection.

Set the communication parameters anew. If you backed up the communication parameters to a micro SD card before replacement, you can transfer them from the micro SD card to the replacement device. Please note that other parameters are also transferred in addition to the communication parameters. For more information on the transferred parameters, refer to the Equipment Manual of the 3RW5 soft starter.

9.3 Restoring factory settings

Effects of the factory setting

The following devices can be reset to the factory setting:

- 3RW5 soft starter
 - The parameters of the 3RW5 soft starter are reset to the factory setting (depending on the 3RW5 soft starter).
 - User accounts are deleted (depending on the 3RW5 soft starter).
 - Parameters relevant to protection against explosion are deleted (depends on the 3RW5 soft starter).
- 3RW5 communication module
 - The parameters of the 3RW5 communication module are reset.
- 3RW5 HMI High Feature
 - The parameters of the 3RW5 HMI High Feature and the PIN for access protection are reset to the factory setting.
- All devices
 - The 3RW5 soft starter, the 3RW5 communication module, and the 3RW5 HMI High Feature are reset to the factory settings, as described above.

Requirements

The master control lies with the source of the command to restore the factory setting.

Procedure

1. Make sure that the motor is switched off and that you do not start the motor while restoring the factory settings.
To ensure the quickest and most fault-free restoration of the factory setting, it is recommended that you disconnect the main voltage (operating voltage) at the 3RW5 soft starter.
2. Restore the factory settings.
The following procedures are possible via the 3RW5 communication module:
 - Via the configuration software of controller (e.g. STEP 7) on the 3RW5 communication module. Only the communication parameters are reset here.
 - Via SIRIUS Soft Starter ES (TIA Portal) Premium / Professional on the 3RW5 communication module
Brief overview: Window "Project Navigation" with current project under created Soft Starter > "Commissioning" > Window "Work area" > "Soft Starter > Functions > Commands > Factory settings"
Brief overview: Window "Project Navigation" with current project under created Soft Starter > "Online & Diagnostics" > Window "Work area" > "PROFINET IO ST / PROFINET IO HF > Functions > Reset to factory settings"
 - Via data set 93 (Page 160) with the command "Factory settings"

Other possibilities for restoring the factory settings

Additional information on restoring the factory setting via the 3RW5 soft starter, via the 3RW5 HMI High Feature or via the SIRIUS Soft Starter ES (TIA Portal) on the local interface on the 3RW5 HMI High Feature can be found in the 3RW5 Soft Starter Equipment Manual.

Result

The factory setting of the selected device or all devices is restored.

Technical data

10.1 Technical data in Siemens Industry Online Support

Technical data sheet

You can also find the technical data of the product at Siemens Industry Online Support (<https://support.industry.siemens.com/cs/ww/en/ps/16212/td>).

1. Enter the full article number of the desired device in the "Product" field, and confirm with the Enter key.
2. Click the "Technical data" link.

Product tree

All

Product:

Entry type:

Date:

> Search product

3RV2035-4BA10
 CIRCUIT BREAKER, SCREW TYPE, 20 A
 CIRCUIT BREAKER SIZE S2, FOR MOTOR PROTECTION, CLASS 10, A-RELEASE 14...20A, N-RELEASE 20A, SCREW TERMINAL, STANDARD BREAKING CAPACITY

> Product details > **Technical data** > CAx data

Overview tables technical data

You will find overview tables with technical data in the "Product information" tab in our online ordering system (<https://mall.industry.siemens.com/mall/en/WW/Catalog/Products/10024029?tree=CatalogTree>).

Dimension drawings

11.1 CAX data

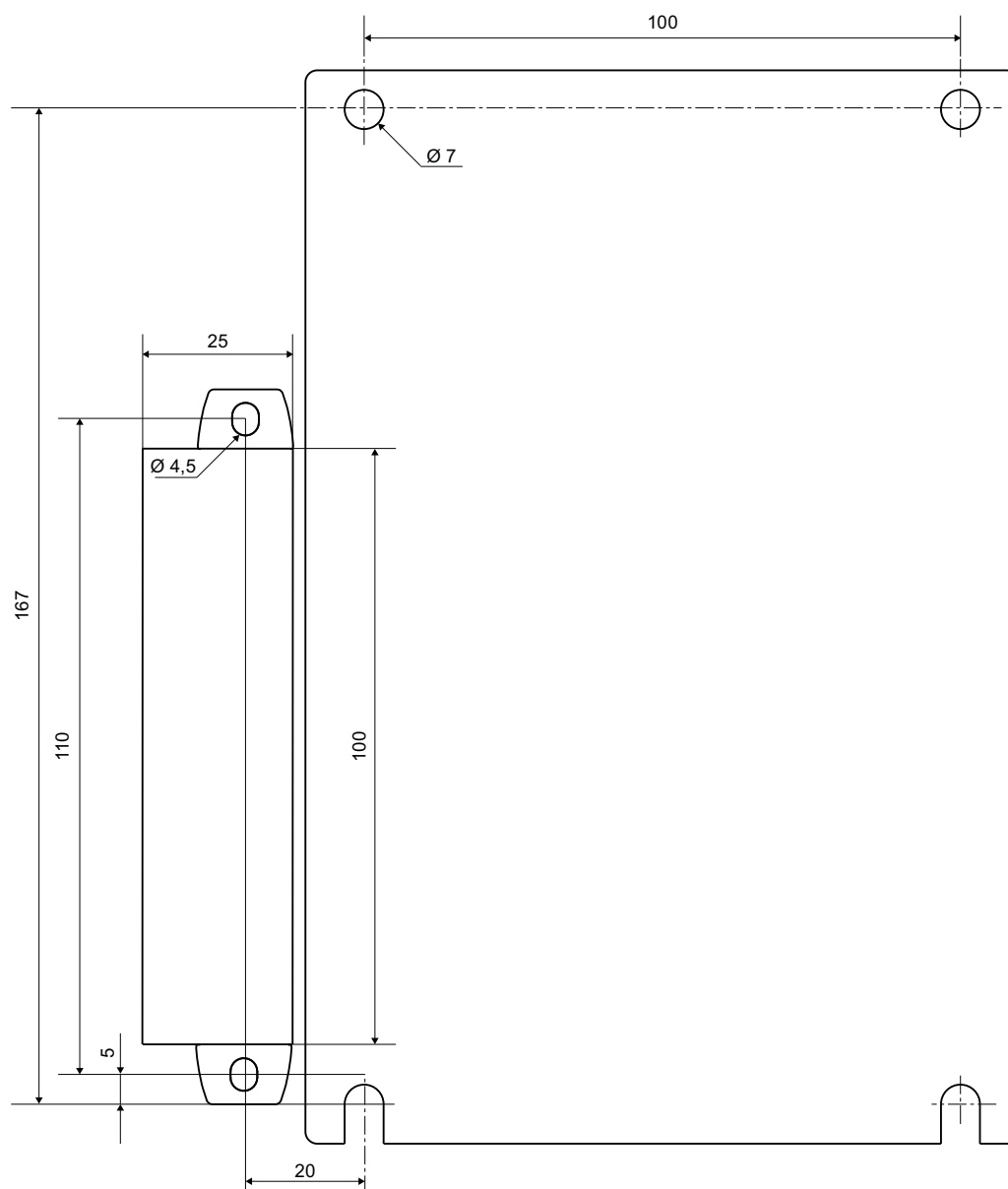
You can find the CAX data in the Siemens Industry Online Support (<https://support.industry.siemens.com/cs/ww/en/ps/16212/td>).

1. Enter the full article number of the desired device in the "Product" field, and confirm with the Enter key.
2. Click the "CAX data link.

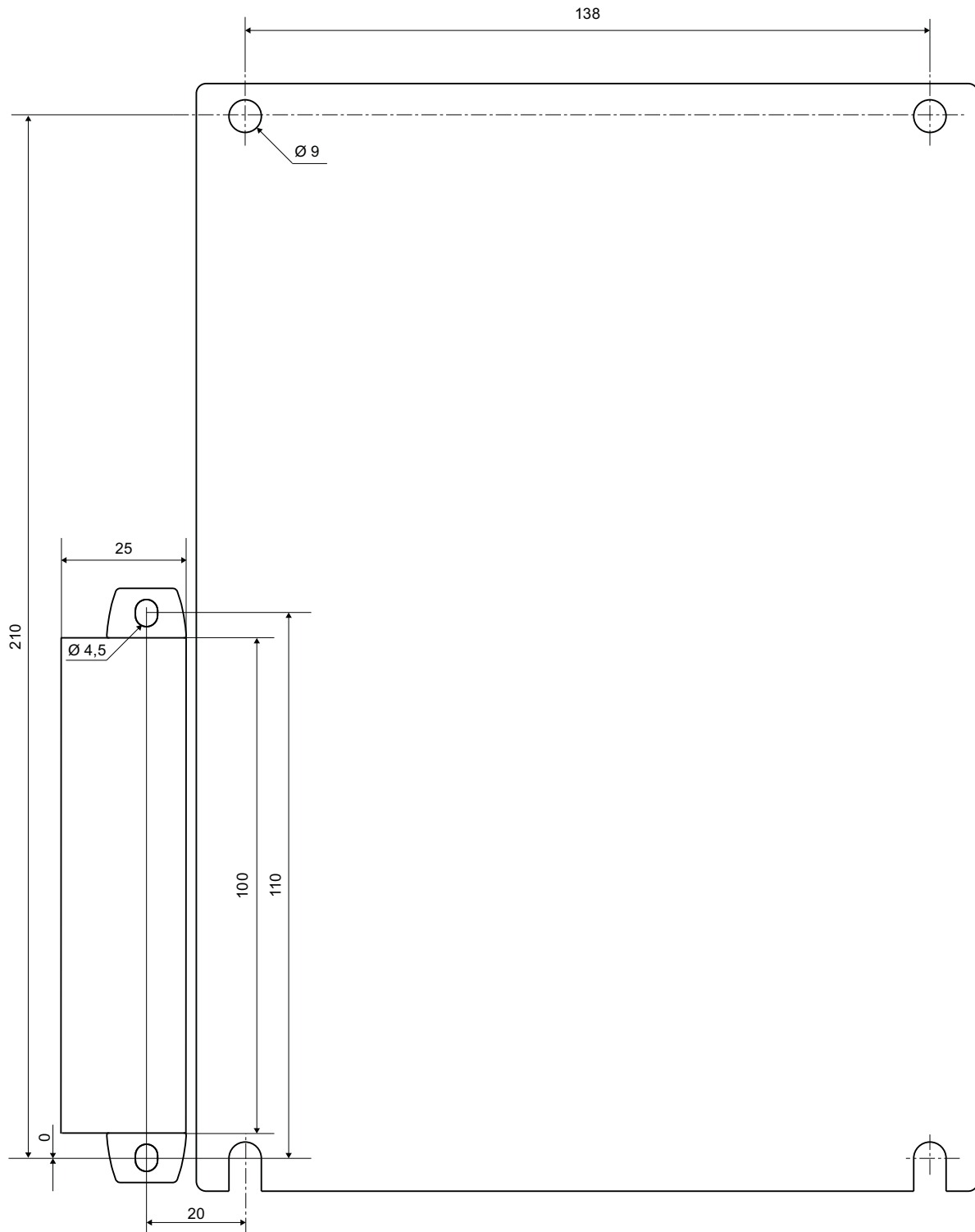
The screenshot shows the Siemens Industry Online Support search interface. At the top, there is a "Product tree" dropdown set to "All" and a search bar labeled "Enter keyword...". Below this, the search results are displayed. The "Product" field contains the article number "3RV2015-4BA10", which is highlighted with a red box. The "Entry type" dropdown is set to "Technical data (1)", also highlighted with a red box. The "Date" field has "From" and "To" input boxes. Below the search filters, there is a "Search product" button. The search results section shows a product image placeholder and the product name "3RV2015-4BA10" in red. Below the name, the technical specifications are listed: "CIRCUIT BREAKER, SCREW TYPE, 20 A CIRCUIT BREAKER SIZE S2, FOR MOTOR PROTECTION, CLASS 10, A-RELEASE 14...20A, N-RELEASE 20A, SCREW TERMINAL, STANDARD BREAKING CAPACITY". At the bottom of the results, there is a breadcrumb trail: "> Product details > Technical data > CAX data", where "CAX data" is highlighted with a red box.

11.2 Drilling patterns for 3RW5 communication module on the 3RW50 soft starter

3RW5 communication module on the 3RW50 soft starter size S6



3RW5 communication module on the 3RW50 soft starter size S12



Circuit diagrams

12.1 CAx data

You can find the CAx data in the Siemens Industry Online Support (<https://support.industry.siemens.com/cs/ww/en/ps/16212/td>).

1. Enter the full article number of the desired device in the "Product" field, and confirm with the Enter key.
2. Click the "CAx data link.

The screenshot shows the Siemens Industry Online Support search interface. At the top, there is a "Product tree" dropdown set to "All" and a search bar labeled "Enter keyword...". Below this, the search results are displayed. The "Product" field contains "3RV2015-4BA10" with a magnifying glass icon and a close button. The "Entry type" dropdown is set to "Technical data (1)". The "Date" field has "From" and "To" input boxes. A "Search product" link is visible. The search results show a product image placeholder and the following text: "3RV2015-4BA10", "CIRCUIT BREAKER, SCREW TYPE, 20 A", "CIRCUIT BREAKER SIZE S2, FOR MOTOR PROTECTION, CLASS 10, A-RELEASE 14...20A, N-RELEASE 20A, SCREW TERMINAL, STANDARD BREAKING CAPACITY". At the bottom, there is a breadcrumb trail: "> Product details > Technical data > CAx data", where "CAx data" is highlighted with a red box.

Appendix

A.1 Content of the appendix

The appendix describes the structure and content of the soft starter 3RW5 data.

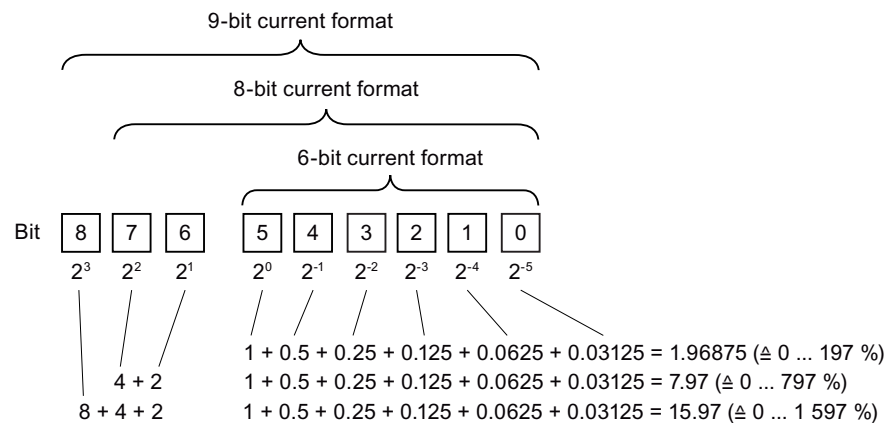
Information on the meaning of the contents can be found in the respective Equipment Manuals, see chapter Additional documentation (Page 9).

A.2 Data formats

A.2.1 Current values as percentages

Current values are coded as percentages in different current formats:

- 6-bit current format
- 8-bit current format
- 9-bit current format



Examples of current values

The following values are examples of current values expressed as percentages:

- Phase currents I L1, I L2, I L3 (8-bit current format)
- Last tripping current (9-bit current format)

A complete overview of all measured values can be found in chapter Data set 94: Measured values (Page 173).

A.2.2 Statistic data

Statistic data group together the operating states from the past that are relevant to the load.

Examples of statistic data

The following values are examples of statistic data:

- Operating hours
 - Motor operating hours
 - Operating hours of the device (3RW5 Soft Starter)
- Number of motor overload trips
- Number of starts motor CW
- Number of starts motor CCW

A complete overview of the statistic data can be found in chapter Data set 95: Statistic data (Page 174).

A.2.3 Maximum pointer

Maximum pointers are stored extreme values of measured values from the past and are used for preventive diagnostics. Maximum pointers are stored in the device and can be deleted at any time.

Examples of maximum pointers

The following values are examples of maximum pointers:

- Number of motor overload trips
- Minimum and maximum phase current I L1, I L2, I L3
- Minimum and maximum line voltages
- Minimum and maximum line frequency

A complete overview of the maximum pointers can be found in chapter Data set 96: Maximum pointer (Page 175).

A.3 Process data and process images

The basic functions of the 3RW5 soft starter are controlled and monitored in the process data in the process images.

The process images can be transferred as follows:

- Cyclically in the fieldbus protocol
- Acyclically using data sets

Process image input (PII) and process image output (PIQ)

The following process images are transferred:

- Process image input with 16 bytes
- Process image output with 4 bytes

Note

The tables for the process images describe only the supported process data. Inputs and outputs that are not listed are not assigned.

Process image input (PII)

Process data	Process image	3RW		
		50 ¹⁾	52 ²⁾	55 / 55-F ³⁾
DI 0.0	Ready (automatic)	x	x	x
DI 0.1	Motor On	x	x	x
DI 0.2	Group error	x	x	x
DI 0.3	Group warning	x	x	x
DI 0.4	Input 1	x	x	x
DI 0.5	Input 2	-	-	x
DI 0.6	Input 3	-	-	x
DI 0.7	Input 4	-	-	x
DI 1.0	Motor current lact-bit0	x	x	x
DI 1.1	Motor current lact-bit1	x	x	x
DI 1.2	Motor current lact-bit2	x	x	x
DI 1.3	Motor current lact-bit3	x	x	x
DI 1.4	Motor current lact-bit4	x	x	x
DI 1.5	Motor current lact-bit5	x	x	x
DI 1.6	Local manual mode	x	x	x
DI 1.7	Ramp operation	x	x	x
DI 2.0	Motor CW	x	x	x
DI 2.1	Motor CCW	-	-	x
DI 2.4	Starting mode active	x	x	x
DI 2.5	Operation / bypass active	x	x	x
DI 2.6	Stopping mode active	x	x	x
DI 2.7	Test mode active	x	x ⁴⁾	x
DI 3.0	Motor overload protection – shutoff	x	x	x
DI 3.1	Temperature sensor overload	x	x	x
DI 3.2	Switching element overload	x	x	x
DI 3.3	Cooling time active	x	x	x
DI 3.4	Device error	x	x	x
DI 3.5	Automatic parameterization active	-	-	x

Process data	Process image	3RW		
		50 ¹⁾	52 ²⁾	55 / 55-F ³⁾
DI 3.6	New EX parameter values detected	-	-	x ⁵⁾
AI 4 (Float32)	Measured value 1 ⁶⁾ (factory setting: Phase current I L1 (rms))	x	x	x
AI 8 (Float32)	Measured value 2 ⁶⁾ (factory setting: Phase current I L2 (rms))	x	x	x
AI 12 (Float32)	Measured value 3 ⁶⁾ (factory setting: Phase current I L3 (rms))	x	x	x

¹⁾ Supported by SIRIUS 3RW50 soft starter

²⁾ Supported by SIRIUS 3RW52 soft starter

³⁾ Supported by SIRIUS soft starter 3RW55 and 3RW55 Failsafe

⁴⁾ 3RW52 soft starter from firmware version V2.0

⁵⁾ 3RW55 soft starter from firmware version V2.0 or 3RW55 Failsafe soft starter from firmware version V1.0

⁶⁾ You can parameterize the measured values for the 3RW55 and 3RW55 Failsafe soft starters. You will find additional information in the Equipment Manual of the 3RW5 soft starter and in data set 135: Parameter cyclic process image. An overview of the measured values can be found in the following table.

Data format	Measured value	Unit	3RW			
			50 ¹⁾	52 ²⁾	55 ³⁾	55-F ⁴⁾
Float32	Phase current IL1 (rms)	A	x	x	x	x
Float32	Phase current IL2 (rms)	A	x	x	x	x
Float32	Phase current IL3 (rms)	A	x	x	x	x
Float32	Phase current average (rms)	A	-	-	x	x
Float32	Active energy import (total)	Wh	-	-	x	x
Float32	Active power	W	-	-	x	x
Float32	Power factor L1...3	-	-	-	x	x

¹⁾ Supported by SIRIUS 3RW50 soft starter

²⁾ Supported by SIRIUS 3RW52 soft starter

³⁾ Supported by SIRIUS 3RW55 soft starter

⁴⁾ Supported by SIRIUS 3RW55 Failsafe soft starter

Process image output (PIQ)

Process data	Process image	3RW		
		50 / 52 ¹⁾	55 ²⁾	55-F ³⁾
DQ 0.0	Motor CW	x	x	x
DQ 0.1	Motor CCW	-	x	x
DQ 0.3	Reset ⁴⁾	x	x	x
DQ 0.4	Emergency start	-	x ⁵⁾	x ⁵⁾
DQ 0.5	Self-test (user-test)	x	x	x
DQ 0.6	Creep speed	-	x	-
DQ 1.0	Output 1 ^{6), 7)}	-	x	x
DQ 1.1	Output 2 ^{6), 7)}	-	x	x

Process data	Process image	3RW		
		50 / 52 ¹⁾	55 ²⁾	55-F ³⁾
DQ 1.2	Parameter set bit 0 ⁸⁾	-	x	x
DQ 1.3	Parameter set bit 1 ⁸⁾	-	x	x
DQ 1.7	Disable Quick-stop	-	x	x
DQ 2.0	Output 3 ⁶⁾	-	x	-
DQ 2.3	Activate pump cleaning	-	x	x
DQ 3.0	Manual operation local - input controlled	x	x	x
DQ 3.1	Use alternative stopping mode	-	x	x
DQ 3.2	Motor standstill	-	x	-

¹⁾ Supported by SIRIUS 3RW50 and 3RW52 soft starters

²⁾ Supported by SIRIUS 3RW55 soft starter

³⁾ Supported by SIRIUS 3RW55 Failsafe soft starter

⁴⁾ In order to perform the reset reliably, the control command "Reset" must be present for at least 20 ms.

⁵⁾ Control data is relevant for EX applications

⁶⁾ You can assign the control data "Output 1", "Output 2" and "Output 3" to the digital outputs 1, 2 and 4 of the 3RW55 soft starter in any order via the digital output actions. You will find additional information in the Equipment Manual of the 3RW5 soft starter.

⁷⁾ You can assign the control data "Output 1" and "Output 2" to the digital outputs 1 and 2 of the 3RW55 Failsafe soft starter in any order via the digital output actions. You will find additional information in the Equipment Manual of the 3RW5 soft starter.

⁸⁾ Explanation in the following table

Additional information

The following table describes the assignment of the process images "Parameter set bit 0" and "Parameter set bit 1":

Parameter set	Parameter set bit 0	Parameter set bit 1
Process image error	1	1
Parameter set 1 (PS1)	0	0
Parameter set 2 (PS2)	1	0
Parameter set 3 (PS3)	0	1

A.4 Data sets

You can find an application example for reading and writing data sets with S7-1500 and HMI connection on the Internet (<https://support.industry.siemens.com/cs/ww/en/view/109772107>).

Data set		Length	3RW			
Number	Description		50 ¹⁾	52 ²⁾	55 ³⁾	55-F ⁴⁾
Commands						
93	Commands (Page 160)	10 byte	x	x	x	x

Data set		Length	3RW			
Number	Description		50 ¹⁾	52 ²⁾	55 ³⁾	55-F ⁴⁾
3RW5 communication module (slot 1)						
92	Communication module diagnostics (slot 1) (Page 161)	28 bytes	-	-	x ⁵⁾	x ⁵⁾
131	Parameter communication (slot 1) (Page 162)	16 bytes	x ⁶⁾	x ⁶⁾	x ⁶⁾	x ⁶⁾
132	Parameter communication server (slot 1) (Page 163)	120 bytes	-	-	x ^{10), 11)}	x ^{10), 12)}
3RW5 soft starter (slot 2)						
68	Process image output (PIQ) (Page 164)	14 bytes	x	x	x	x
69	Process image input (PII) (Page 166)	28 bytes	x	x	x	x
92	Soft starter diagnostics (slot 2) (Page 168)	94 bytes	x	x	x	x
94	Measured values (Page 173)	100 bytes	x	x	x	x
95	Statistic data (Page 174)	200 bytes	x	x ⁷⁾	x	x
96	Maximum pointer (Page 175)	126 bytes	x	x ⁷⁾	x	x
131, 141 and 151	Parameter basic functions - Set 1, 2, and 3 (Page 177)	200 bytes	x ⁸⁾	x ⁸⁾	x	x
132, 142 and 152	Parameter extended functions 1 - Set 1, 2, and 3 (Page 190)	200 bytes	-	-	x	x
133	Parameter extended functions 2 (Page 192)	200 bytes	x	x	x	x
134	Parameter Maintenance (Page 193)	200 bytes	-	-	x	x
135	Parameter cyclic process image (Page 194)	24 bytes	-	-	x	x
3RW5 HMI High Feature (slot 3)						
92	HMI diagnostics (slot 3) (Page 195)	28 bytes	x ⁹⁾	x ⁹⁾	x ⁹⁾	x ⁹⁾
131	HMI parameter (slot 3) (Page 196)	120 bytes	x ⁹⁾	x ⁹⁾	x ⁹⁾	x ⁹⁾
I&M data (Page 201)						
231	I&M0 - Device identification (Page 202)	64 bytes	x ^{6), 9)}	x ^{6), 9)}	x ^{6), 9)}	x ^{6), 9)}
232	I&M1 - Equipment identifier (Page 203)	64 bytes	x	x	x	x
233	I&M2 - Installation (Page 203)	64 bytes	x	x	x	x
234	I&M3 - Description (Page 204)	64 bytes	x	x	x	x

¹⁾ Supported by SIRIUS 3RW50 soft starter

²⁾ Supported by SIRIUS 3RW52 soft starter

³⁾ Supported by SIRIUS 3RW55 soft starter

⁴⁾ Supported by SIRIUS 3RW55 Failsafe soft starter

⁵⁾ Supported by SIRIUS 3RW5 PROFINET High Feature communication module

⁶⁾ Supported by SIRIUS 3RW5 PROFINET communication module

⁷⁾ 3RW52 soft starter from firmware version V2.0

⁸⁾ Data sets 141 and 151 are not supported

⁹⁾ Supported by 3RW5 HMI High Feature

¹⁰⁾ 3RW5 PROFINET High Feature communication module from firmware version V2.0

¹¹⁾ 3RW55 soft starter from firmware version V2.1.1

¹²⁾ Soft starter 3RW55 Failsafe with firmware version V1.1.0 or higher

A.4.1 Byte arrangement

When data longer than one byte are stored, the bytes are arranged as follows ("big endian"):

Byte arrangement		Data type
Byte 0	High byte	Double word
Byte 1	Low byte	
Byte 2	High byte	
Byte 3	Low byte	
Byte 0	High byte	Word
Byte 1	Low byte	
Byte 0	Byte 0	Byte
Byte 1	Byte 1	

A.4.2 Specifications

The following specifications apply in the data sets:

- Non-relevant (reserved) entries are not listed.
Fill these entries with "0" when writing.
- In data sets for parameters, codes are shown in square brackets "[...]". "[D^x]" describes the default coding.

Object number (Obj. No.)

The object number (Obj. No.) is used for unique identification of all parameters available in the 3RW5 soft starter. In the case of a parameterization error, the object number of the faulty parameter is displayed in data set 92 of the 3RW5 soft starter (slot 2) (Page 168) or in data set 92 of the 3RW5 HMI High Feature (slot 3) (Page 195) under "Faulty parameter number".

A.4.3 Commands

A.4.3.1 Data set 93: Commands

Only write (w) access to the command is possible.

Byte	Data format	Meaning	3RW		
			50 ¹⁾	52 ²⁾	55 / 55-F ³⁾
0	Unsigned8	Coordination [0x21] Write via acyclic bus channel – user program	x	x	x
2	Unsigned8	Slot number	x	x	x
4	Unsigned8	Number of commands	x	x	x
5	Unsigned8	Command 1	x	x	x
6	Unsigned8	Command 2 (optional)	x	x	x
7	Unsigned8	Command 3 (optional)	x	x	x
8	Unsigned8	Command 4 (optional)	x	x	x
9	Unsigned8	Command 5 (optional)	x	x	x

¹⁾ Supported by SIRIUS 3RW50 soft starter

²⁾ Supported by SIRIUS 3RW52 soft starter

³⁾ Supported by SIRIUS soft starter 3RW55 and 3RW55 Failsafe

The coding of the commands is described in the following table:

Code	Command	3RW5		
		50 / 52 ¹⁾	55 ²⁾	55-F ³⁾
0	No function	x	x	x
1	Reset	w	w	w
2	Enable Emergency start	-	w	w
3	Disable Emergency start	-	w	w
4	Automatic mode	w	w	w
5	Manual operation	w	w	w
6	Factory settings	w	w	w
7	Reset maximum pointer	w ⁴⁾	w	w
9	Restart	w	w	w
20	Delete logbook application - error	w	w	w
22	Delete logbook application - warning	-	w	w
24	Delete logbook application - events	-	w	w
42	Enable Emergency run	-	w ⁵⁾	-
43	Disable Emergency run	-	w ⁵⁾	-
44	Activate simulation	-	w ⁶⁾	-
45	Deactivate simulation	-	w ⁶⁾	-
46	Activate test with small load	w ⁴⁾	w	w
47	Deactivate test with small load	w ⁴⁾	w	w

Code	Command	3RW5		
		50 / 52 ¹⁾	55 ²⁾	55-F ³⁾
51	Normal operation	w ⁴⁾	w	w
52	Test mode	w ⁴⁾	w	w

¹⁾ Supported by SIRIUS 3RW50 and 3RW52 soft starters

²⁾ Supported by SIRIUS 3RW55 soft starter

³⁾ Supported by SIRIUS 3RW55 Failsafe soft starter

⁴⁾ 3RW50 soft starter from firmware version V1.0 or 3RW52 soft starter from firmware version V2.0

⁵⁾ 3RW55 soft starter from firmware version V2.1

⁶⁾ 3RW55 soft starter from firmware version V2.0

A.4.4 3RW5 communication module (slot 1)

A.4.4.1 Data set 92: Communication module diagnostics (slot 1)

Only read (r) access to the communication module diagnostics is possible. The data set 92 of the 3RW5 communication module (slot 1) is supported only by the 3RW5 PROFINET High Feature communication module.

Byte	Data format	Meaning	3RW		
			50 ¹⁾	52 ²⁾	55 / 55-F ³⁾
0	Unsigned8	Coordination	x	x	x
2	Unsigned8	Slot number	x	x	x
4	Unsigned16	Length of data structure	x	x	x
6	Unsigned16	Start position	x	x	x

¹⁾ Supported by SIRIUS 3RW50 soft starter

²⁾ Supported by SIRIUS 3RW52 soft starter

³⁾ Supported by SIRIUS soft starter 3RW55 and 3RW55 Failsafe

Byte	Bit	Data format	Communication module diagnostics	3RW5 PN HF ¹⁾
10	0	Bool	Bus error	r
	4	Bool	Operation without PN control	r
12	0	Bool	FW update rejected	r
	1	Bool	FW update active	r
	2	Bool	FW update successful	r
	3	Bool	FW update faulty	r
16	0	Bool	Webserver active	r ^{2), 3)}

Byte	Bit	Data format	Communication module diagnostics	3RW5 PN HF ¹⁾
20	0	Bool	OPC UA server active	r ²⁾ , 3)
	2	Bool	Invalid security settings	r ²⁾ , 3)
21 ... 27	-	-	Reserved	-

¹⁾ Supported by SIRIUS 3RW5 PROFINET High Feature communication module

²⁾ 3RW5 PROFINET High Feature communication module from firmware version V2.0

³⁾ Soft starter 3RW55 with firmware version V2.1.1 or higher or soft starter 3RW55 Failsafe with firmware version V1.1.0 or higher

A.4.4.2 Data set 131: Parameter communication (slot 1)

Read (r) and write (w) access to the parameter communication is possible.

Byte	Data format	Meaning	3RW		
			50 ¹⁾	52 ²⁾	55 / 55-F ³⁾
0	Unsigned8	Coordination [0x21] Write via acyclic bus channel – user program	x	x	x
2	Unsigned8	Slot number	x	x	x
4	Unsigned16	Length of data structure	x	x	x
6	Unsigned16	Start position	x	x	x

¹⁾ Supported by SIRIUS 3RW50 soft starter

²⁾ Supported by SIRIUS 3RW52 soft starter

³⁾ Supported by SIRIUS soft starter 3RW55 and 3RW55 Failsafe

Byte	Bit	Data format	Parameter	Range of values [encoding]	3RW5 PN	
					Std ¹⁾ [D ³⁾	HF ²⁾ [D ³⁾
10	1	Bool	Group error	[0 ... 1]	r/w [1]	r/w [1]
				[0] Disable [1] Enable		
	2	Bool	Group warning	[0 ... 1]	r/w [1]	r/w [1]
				[0] Disable [1] Enable		

Byte	Bit	Data format	Parameter	Range of values [encoding]	3RW5 PN	
					Std ¹⁾ [D ³⁾]	HF ²⁾ [D ³⁾]
11	1	Bool	Operation without PN control	[0 ... 1]	-	r/w ^{4), 5)} [0]
				[0] No [1] Yes		
	4	Bool	Web server	[0 ... 1]	-	r/w ^{4), 5)} [0]
				[0] Disable [1] Enable		
	5	Bool	OPC UA server	[0 ... 1]	-	r/w ^{4), 5)} [0]
				[0] Disable [1] Enable		
12 ... 15	-	-	Reserved	-	-	-

¹⁾ Supported by SIRIUS 3RW5 PROFINET Standard communication module

²⁾ Supported by SIRIUS 3RW5 PROFINET High Feature communication module

³⁾ Default encoding

⁴⁾ 3RW5 PROFINET High Feature communication module from firmware version V2.0

⁵⁾ Soft starter 3RW55 with firmware version V2.1.1 or higher or soft starter 3RW55 Failsafe with firmware version V1.1.0 or higher

A.4.4.3 Data set 132: Parameter communication server (slot 1)

Read (r) and write (w) access to the parameter communication servers is possible. Data set 132 of the 3RW5 communication module (slot 1) is only supported by the 3RW5 PROFINET High Feature communication module from firmware version V2.0.

Byte	Data format	Meaning	3RW		
			50 ¹⁾	52 ²⁾	55 / 55-F ³⁾
0	Unsigned8	Coordination [0x21] Write via acyclic bus channel – user program	x	x	x
2	Unsigned8	Slot number	x	x	x
4	Unsigned16	Length of data structure	x	x	x
6	Unsigned16	Start position	x	x	x

¹⁾ Supported by SIRIUS 3RW50 soft starter

²⁾ Supported by SIRIUS 3RW52 soft starter

³⁾ Supported by SIRIUS soft starter 3RW55 and 3RW55 Failsafe

Byte	Bit	Data format	Parameter	Range of values [encoding]	In steps of	3RW5 PN HF ^{1), 2)}
						[D ³⁾]
16	0	Unsigned32	Port	1 024 ... 49 151 [1 024 ... 49 151]	1	r/w [4 840]
20	0	Unsigned32	OPC UA Session Time-Out	10 ... 600 s [10000 ... 600000]	1 ms	r/w [30000]
48	0	Bool	No Security	[0 ... 1]	-	r/w [0]
				[0] Disable [1] Enable		
	1	Bool	Basic128RSA15 - sign	[0 ... 1]	-	r/w [0]
				[0] Disable [1] Enable		
	2	Bool	Basic128RSA15 - sign and encrypt	[0 ... 1]	-	r/w [0]
				[0] Disable [1] Enable		
	3	Bool	Basic256 - sign	[0 ... 1]	-	r/w [0]
				[0] Disable [1] Enable		
	4	Bool	Basic256 - sign and encrypt	[0 ... 1]	-	r/w [0]
				[0] Disable [1] Enable		
	5	Bool	Basic256SHA256 - sign	[0 ... 1]	-	r/w [0]
				[0] Disable [1] Enable		
	6	Bool	Basic256SHA256 - sign and encrypt	[0 ... 1]	-	r/w [1]
				[0] Disable [1] Enable		
49 ... 119	-	-	Reserved	-	-	-

¹⁾ Supported by PROFINET High Feature communication module SIRIUS 3RW5 from firmware version V2.0

²⁾ Soft starter 3RW55 with firmware version V2.1.1 or higher or soft starter 3RW55 Failsafe with firmware version V1.1.0 or higher

³⁾ Default encoding

A.4.5 3RW5 soft starter (slot 2)

A.4.5.1 Data set 68: Process image output (PIQ)

Read (r) and write (w) access to the process image output (PIQ) is possible.

Note

Note that data set 68 is overwritten by the cyclic process image in "Automatic" mode.

Byte	Data format	Meaning	3RW		
			50 ¹⁾	52 ²⁾	55 / 55-F ³⁾
0	Unsigned8	Coordination [0x21] Write via acyclic bus channel – user program	x	x	x
2	0x02	Slot number	x	x	x
4	Unsigned16	Length of data structure	x	x	x
6	Unsigned16	Start position	x	x	x

¹⁾ Supported by SIRIUS 3RW50 soft starter

²⁾ Supported by SIRIUS 3RW52 soft starter

³⁾ Supported by SIRIUS soft starter 3RW55 and 3RW55 Failsafe

Byte	Bit	Data format	Process image	3RW		
				50 / 52 ¹⁾	55 ²⁾	55-F ³⁾
10	0	Bool	Motor CW	r/w	r/w	r/w
	1	Bool	Motor CCW	-	r/w	r/w
	3	Bool	Reset	r/w	r/w	r/w
	4	Bool	Emergency start	-	r/w ⁴⁾	r/w ⁴⁾
	5	Bool	Self-test (user-test)	r/w	r/w	r/w
	6	Bool	Creep speed	-	r/w	-
11	0	Bool	Output 1 ^{5), 6)}	-	r/w	r/w
	1	Bool	Output 2 ^{5), 6)}	-	r/w	r/w
	2	Bool	Parameter set bit 0 ⁷⁾	-	r/w	r/w
	3	Bool	Parameter set bit 1 ⁷⁾	-	r/w	r/w
	7	Bool	Disable quick-stop	-	r/w	r/w
12	0	Bool	Output 3 ⁵⁾	-	r/w	-
	3	Bool	Activate pump cleaning	-	r/w	r/w
13	0	Bool	Manual operation local - input controlled	r/w	r/w	r/w
	1	Bool	Use alternative stopping mode	-	r/w	r/w
	2	Bool	Motor standstill	-	r/w	-

¹⁾ Supported by SIRIUS 3RW50 and 3RW52 soft starters

²⁾ Supported by SIRIUS 3RW55 soft starter

³⁾ Supported by SIRIUS 3RW55 Failsafe soft starter

⁴⁾ Control data is relevant for EX applications

⁵⁾ You can assign the control data "Output 1", "Output 2" and "Output 3" to the digital outputs 1, 2 and 4 of the 3RW55 soft starter in any order via the digital output actions. You will find more information in the Equipment Manual of the 3RW5 soft starter.

⁶⁾ You can assign the control data "Output 1" and "Output 2" to the digital outputs 1 and 2 of the 3RW55 Failsafe soft starter in any order via the digital output actions. You will find more information in the Equipment Manual of the 3RW5 soft starter.

⁷⁾ Explanation in the following table

Note

In "Automatic" mode, the PLC specifies the process image of the outputs. In this case, reading of data set 68 returns the process image of the outputs as transmitted by the PLC.

Additional information

The following table describes the assignment of the process images "Parameter set bit 0" and "Parameter set bit 1":

Parameter set	Parameter set bit 0	Parameter set bit 1
Process image error	1	1
Parameter set 1 (PS1)	0	0
Parameter set 2 (PS2)	1	0
Parameter set 3 (PS3)	0	1

A.4.5.2 Data set 69: Process image input (PII)

Only read (r) access to the process image inputs (PII) is possible.

Byte	Data format	Meaning	3RW		
			50 ¹⁾	52 ²⁾	55 / 55-F ³⁾
0	Unsigned8	Coordination	x	x	x
2	Unsigned8	Slot number	x	x	x
4	Unsigned16	Length of data structure	x	x	x
6	Unsigned16	Start position	x	x	x

¹⁾ Supported by SIRIUS 3RW50 soft starter

²⁾ Supported by SIRIUS 3RW52 soft starter

³⁾ Supported by SIRIUS soft starter 3RW55 and 3RW55 Failsafe

Byte	Bit	Data format	Process image	3RW		
				50 ¹⁾	52 ²⁾	55 / 55-F ³⁾
12	0	Bool	Ready (automatic)	r	r	r
	1	Bool	Motor On	r	r	r
	2	Bool	Group error	r	r	r
	3	Bool	Group warning	r	r	r
	4	Bool	Input 1	r	r	r
	5	Bool	Input 2	-	-	r
	6	Bool	Input 3	-	-	r
	7	Bool	Input 4	-	-	r

Byte	Bit	Data format	Process image	3RW		
				50 ¹⁾	52 ²⁾	55 / 55-F ³⁾
13	0	Bool	Motor current lact-bit0	r	r	r
	1	Bool	Motor current lact-bit1	r	r	r
	2	Bool	Motor current lact-bit2	r	r	r
	3	Bool	Motor current lact-bit3	r	r	r
	4	Bool	Motor current lact-bit4	r	r	r
	5	Bool	Motor current lact-bit5	r	r	r
	6	Bool	Local manual mode	r	r	r
	7	Bool	Ramp operation	r	r	r
14	0	Bool	Motor CW	r	r	r
	1	Bool	Motor CCW	-	-	r
	4	Bool	Starting mode active	r	r	r
	5	Bool	Operation / bypass active	r	r	r
	6	Bool	Stopping mode active	r	r	r
	7	Bool	Test mode active	r	r ⁴⁾	r
15	0	Bool	Motor overload protection – shutoff	r	r	r
	1	Bool	Temperature sensor overload	r	r	r
	2	Bool	Switching element overload	r	r	r
	3	Bool	Cooling time active	r	r	r
	4	Bool	Device error	r	r	r
	5	Bool	Automatic parameterization active	-	-	r
	6	Bool	New EX parameter values detected	-	-	r ⁵⁾
16	0	Float32	Measured value 1 ⁶⁾ (factory setting: Phase current I L1 (rms))	r	r	r
20	0	Float32	Measured value 2 ⁶⁾ (factory setting: Phase current I L2 (rms))	r	r	r
24	0	Float32	Measured value 3 ⁶⁾ (factory setting: Phase current I L3 (rms))	r	r	r

¹⁾ Supported by SIRIUS 3RW50 soft starter

²⁾ Supported by SIRIUS 3RW52 soft starter

³⁾ Supported by SIRIUS soft starter 3RW55 and 3RW55 Failsafe

⁴⁾ 3RW52 soft starter from firmware version V2.0

⁵⁾ 3RW55 soft starter from firmware version V2.0 or 3RW55 Failsafe soft starter from firmware version V1.0

⁶⁾ You can parameterize the measured values for the 3RW55 and 3RW55 Failsafe soft starters. You will find more information in the Equipment Manual of the 3RW5 soft starter and in data set 135: Parameter cyclic process image. An overview of the measured values can be found in the following table.

Data format	Measured value	Unit	3RW			
			50 ¹⁾	52 ²⁾	55 ³⁾	55-F ⁴⁾
Float32	Phase current IL1 (rms)	A	x	x	x	x
Float32	Phase current IL2 (rms)	A	x	x	x	x
Float32	Phase current IL3 (rms)	A	x	x	x	x
Float32	Phase current average (rms)	A	-	-	x	x
Float32	Active energy import (total)	Wh	-	-	x	x

Data format	Measured value	Unit	3RW			
			50 ¹⁾	52 ²⁾	55 ³⁾	55-F ⁴⁾
Float32	Active power	W	-	-	x	x
Float32	Power factor L1...3	-	-	-	x	x

¹⁾ Supported by SIRIUS 3RW50 soft starter

²⁾ Supported by SIRIUS 3RW52 soft starter

³⁾ Supported by SIRIUS 3RW55 soft starter

⁴⁾ Supported by SIRIUS 3RW55 Failsafe soft starter

A.4.5.3 Data set 92: Soft starter diagnostics (slot 2)

Only read (r) access to the soft starter diagnostics is possible.

You will find more information on fault types in Chapter Interrupt types (Page 73).

Note

Alarm type of the soft starter diagnosis

In the Soft Starter Diagnosis, diagnostic messages may be present twice. In this case the alarm type (Page 73) determines which bit is activated.

Byte	Data format	Meaning	3RW		
			50 ¹⁾	52 ²⁾	55 / 55-F ³⁾
0	Unsigned8	Coordination	x	x	x
2	Unsigned8	Slot number	x	x	x
4	Unsigned16	Length of data structure	x	x	x
6	Unsigned16	Start position	x	x	x

¹⁾ Supported by SIRIUS 3RW50 soft starter

²⁾ Supported by SIRIUS 3RW52 soft starter

³⁾ Supported by SIRIUS soft starter 3RW55 and 3RW55 Failsafe

Byte	Bit	Data format	Soft starter diagnostics	Error types		3RW			
				F ⁵⁾	+ F ⁶⁾	50 ¹⁾	52 ²⁾	55 ³⁾	55-F ⁴⁾
10	0	Bool	Ready (automatic)	-	-	r	r	r	r
	1	Bool	Motor CW	-	-	r	r	r	r
	2	Bool	Motor CCW	-	-	-	-	r	r
	3	Bool	Switching element overload	0x1083	x	r	r	r	r
	4	Bool	Switching element defective	0x1082	x	r	r	r	r
	5	Bool	Emergency start active	-	-	-	-	r	r
	6	Bool	Group error	-	-	r	r	r	r
	7	Bool	Group warning	-	-	r	r	r	r

Byte	Bit	Data format	Soft starter diagnostics	Error types		3RW			
				F ⁵⁾	+ F ⁶⁾	50 ¹⁾	52 ²⁾	55 ³⁾	55-F ⁴⁾
11	1	Bool	No main power	0x010A	x	r	r	r	r
	3	Bool	Starting mode active	-	-	r	r	r	r
	4	Bool	Stopping mode active	-	-	r	r	r	r
	6	Bool	Electrical braking active	-	-	-	-	r	-
	7	Bool	Creep speed active	-	-	-	-	r	-
12	0	Bool	Temperature sensor overload	0x1024	x	r	r	r	r
	1	Bool	Temperature sensor wire break	0x1026	x	r	r	r	r
	2	Bool	Temperature sensor short-circuit	0x1025	x	r	r	r	r
	3	Bool	Thermal motor model overload	0x1022	x	r	r	r	r
	4	Bool	Motor overload protection - shutoff	0x1046	-	r	r	r	r
	5	Bool	Idle time active	-	-	-	-	r	r
	6	Bool	Cooling time active	-	-	r	r	r	r
	7	Bool	Safety-related shutoff	0x0019	x	-	-	-	r
13	3	Bool	Current limiting active	-	-	r	r	r	r
	6	Bool	Generator operation	0x1011	-	-	-	r	r
	7	Bool	Input control	-	-	r	r	r	r
14	0	Bool	Asymmetry limit error exceeded	0x1021	-	-	-	r	r
	1	Bool	Asymmetry shutoff	0x1046	-	-	-	r	r
	2	Bool	Current limit error exceeded	0x1040	-	-	-	r	r
	3	Bool	Current limit error undershot	0x1041	-	-	-	r	r
	4	Bool	Current limit error shutoff	0x1046	-	-	-	r	r
15	0	Bool	Input 1	-	-	r	r	r	r
	1	Bool	Input 2	-	-	-	-	r	r
	2	Bool	Input 3	-	-	-	-	r	r
	3	Bool	Input 4	-	-	-	-	r	r
16	0	Bool	Ground fault limit error exceeded	0x1027	-	-	-	r	r
	2	Bool	Quick-stop active	-	-	-	-	r	r
	6	Bool	Maximum pointer reset	-	-	r	r ⁷⁾	r	r
	7	Bool	Electronics supply voltage too low	0x1084	x	r	r	r	r
17	0	Bool	Bus error	-	-	r	r	r	r
	1	Bool	CPU/Master STOP	-	-	r	r	r	r
	2	Bool	Automatic mode	-	-	r	r	r	r
	3	Bool	Operating mode manual	-	-	r	r	r	r
	4	Bool	Operating mode manual - local	-	-	r	r	r	r
	6	Bool	Connection abort in manual mode	0x1098	-	r	r	r	r
	7	Bool	Error process image	0x1096	x	-	-	r	r
18	0	Bool	Parameter assignment active	-	-	-	-	r	r
	1	Bool	Invalid parameter value	0x1095	x	-	-	r	r
	2	Bool	Parameters cannot be changed in ON state	-	-	-	-	r	r
	3	Bool	Parameters disable CPU/master active	-	-	-	-	r	r
	4	Bool	No external start parameters received	0x1033	-	-	-	r	r

Byte	Bit	Data format	Soft starter diagnostics	Error types		3RW			
				F ⁵⁾	+ F ⁶⁾	50 ¹⁾	52 ²⁾	55 ³⁾	55-F ⁴⁾
19	0	Bool	Self-test active	-	-	-	-	r	r
	2	Bool	Self-test error	0x1080	-	r	r	r	r
	3	Bool	Factory settings restored	-	-	r	r	r	r
20	0	Unsigned16	Faulty parameter number ⁸⁾	-	-	-	-	r	r
22	3	Bool	Preset unequal actual configuration	0x1094	-	r	r	r	r
	5	Bool	Temperature sensor overload	0x1024	-	-	-	r	r
	6	Bool	Temperature sensor wire break	0x1026	-	-	-	r	r
	7	Bool	Temperature sensor short-circuit	0x1025	-	-	-	r	r
23	0	Bool	Parameter set 1 active	-	-	-	-	r	r
	1	Bool	Parameter set 2 active	-	-	-	-	r	r
	2	Bool	Parameter set 3 active	-	-	-	-	r	r
	4	Bool	Parameter set change not possible	-	-	-	-	r	r
	6	Bool	Preset unequal actual configuration	0x1094	-	-	-	r	r
	7	Bool	Motor connection wrong	0x1092	x	-	-	r	r
24	2	Bool	Motor heating active	-	-	-	-	r	-
	3	Bool	DC braking active	-	-	-	-	r	-
	4	Bool	Dynamic DC braking active	-	-	-	-	r	-
	5	Bool	Type of motor connection standard	-	-	r	r	r	r
	6	Bool	Type of motor connection inside delta	-	-	-	r	r	r
	7	Bool	Type of motor connection unknown	-	-	r	r	r	r
25	0	Bool	Missing load	0x1000	x	r	r	r	r
	2	Bool	Loss of phase L1	0x1097	x	r	r	r	r
	3	Bool	Loss of phase L2	0x1097	x	r	r	r	r
	4	Bool	Loss of phase L3	0x1097	x	r	r	r	r
	5	Bool	Main power rotation right	-	-	r	r	r	r
	6	Bool	Main power rotation left	-	-	r	r	r	r
27	0	Bool	Output 1 active	-	-	r	r	r	r
	1	Bool	Output 2 active	-	-	r	r	r	r
	2	Bool	Output 3 active	-	-	r	r	r	r
	3	Bool	Output 4 active	-	-	-	-	r	r
	4	Bool	Output 1 - Time active	-	-	-	-	r	r
	5	Bool	Output 2 - Time active	-	-	-	-	r	r
	7	Bool	Output 4 - Time active	-	-	-	-	r	-
29	1	Bool	Ready to start for motor ON	-	-	r	r	r	r
	3	Bool	Bypass defective	0x1081	x	r	r	r	r
	4	Bool	Bypass protective shutoff	0x1085	x	r	r	r	r
	5	Bool	Switching element L1 failed	0x1082	x	r	r	r	r
	6	Bool	Switching element L2 failed	0x1082	x	-	r	r	r
	7	Bool	Switching element L3 failed	0x1082	x	r	r	r	r
30	0	Bool	Thermal motor model deactivated	-	-	r	r	r	r
	3	Bool	Phase control failure	0x1012	x	r	r	r	r

Byte	Bit	Data format	Soft starter diagnostics	Error types		3RW			
				F ⁵⁾	+ F ⁶⁾	50 ¹⁾	52 ²⁾	55 ³⁾	55-F ⁴⁾
31	0	Bool	Switching element cooling time active	-	-	r	r	r	r
	1	Bool	Switching element too hot for Start	0x1083	-	r	r	r	r
	2	Bool	Current measuring range exceeded	0x0007	x	r	r	r	r
32	0	Bool	Automatic mode	-	-	r	r	r	r
	1	Bool	Operating mode manual	-	-	r	r	r	r
	2	Bool	Manual operation bus - PC controlled	-	-	r	r	r	r
	3	Bool	Operating mode manual - local	-	-	r	r	r	r
	4	Bool	Manual operation local - input controlled	-	-	r	r	r	r
	5	Bool	Manual operation local - HMI controlled	-	-	r	r	r	r
	6	Bool	Manual operation local - PC controlled	-	-	r	r	r	r
33	0	Bool	Manual operation bus - Webserver controlled	-	-	-	-	r ¹²⁾	r ¹¹⁾
	3	Bool	Automatic operation - input controlled	-	-	-	-	r ¹⁰⁾	r ¹¹⁾
35	0	Bool	Device error	-	-	r	r	r	r
38	0	Bool	FW update rejected	-	-	r	r	r	r
	1	Bool	FW update active	-	-	r	r	r	r
	2	Bool	FW update successful	-	-	r	r	r	r
	3	Bool	FW update faulty	0x011B	-	r	r	r	r
39	7	Bool	Operation / bypass active	-	-	r	r	r	r
46	6	Bool	Start pause pending	-	-	-	-	r ¹⁰⁾	r
	7	Bool	Energy saving mode active	-	-	-	-	r ¹⁰⁾	r
52	6	Bool	Normal operation active	-	-	r	r ⁷⁾	r	r
53	3	Bool	Test mode active	-	-	r	r ⁷⁾	r	r
59	0	Bool	Start condition not fulfilled	-	-	-	-	-	r
	1	Bool	Start condition fulfilled	-	-	-	-	-	r
	2	Bool	Reset ON command required	-	-	-	-	-	r
60	0	Bool	EX application active	-	-	-	-	r ⁹⁾	r
	2	Bool	New Ex parameter values detected	0x1036	-	-	-	r ⁹⁾	r
	5	Bool	Ex release denied - wrong CRC	-	-	-	-	r ⁹⁾	r
62	2	Bool	Remaining time for tripping warning limit under-shot	0x1089	-	-	-	r	r
	3	Bool	Motor heating warning limit exceeded	0x1022	-	r	r	r	r
	4	Bool	Current limit - maintenance demanded exceeded	0x1040	-	-	-	r	r
	5	Bool	Current limit - maintenance demanded under-shot	0x1041	-	-	-	r	r
	6	Bool	Asymmetry limit warning exceeded	0x1021	-	-	-	r	r
	7	Bool	Ground fault limit warning exceeded	0x1027	-	-	-	r	r
65	0	Bool	Pump cleaning active	-	-	-	-	r	r
66	5	Bool	Analog output underflow	-	-	-	-	r	r
67	5	Bool	Analog output overflow	-	-	-	-	r	r
70	0	Bool	Missing initialization after maintenance	-	-	r	r	r	r

Byte	Bit	Data format	Soft starter diagnostics	Error types		3RW				
				F ⁵⁾	+ F ⁶⁾	50 ¹⁾	52 ²⁾	55 ³⁾	55-F ⁴⁾	
71	0	Bool	Switching frequency time running	-	-	-	-	r	r	
	1	Bool	Switching frequency time not kept	0x1057	-	-	-	r	r	
	3	Bool	Switching frequency time not kept	0x1057	-	-	-	r	r	
	7	Bool	Switching frequency lock active	-	-	-	-	r	r	
72	2	Bool	Emergency start enabled	-	-	-	-	r	r	
	4	Bool	Emergency run enabled	-	-	-	-	r ¹⁰⁾	-	
	5	Bool	Emergency run active	-	-	-	-	r ¹⁰⁾	-	
73	0	Bool	2-phase control with defective thyristor active	0x1013	-	-	-	r ¹⁰⁾	-	
	1	Bool	Alternative stopping mode active	-	-	-	-	r	r	
74	0	Bool	Reversing DC braking active	-	-	-	-	r ⁹⁾	-	
75	0	Bool	Main power rotation faulty	0x510E	x	-	-	r	r	
	3	Bool	Main power rotation faulty	0x510E	-	-	-	r	r	
77	5	Bool	Check fan	0x510A	-	r	r	r	r	
83	2	Bool	Active power limit - maintenance demanded exceeded	0x1042	-	-	-	r	r	
	3	Bool	Active power limit - maintenance demanded undershot	0x1043	-	-	-	r	r	
	4	Bool	Active power limit error exceeded	0x1042	-	-	-	r	r	
	5	Bool	Active power limit error undershot	0x1043	-	-	-	r	r	
	6	Bool	Active power limit error shutoff	0x1046	-	-	-	r	r	
87	0	Bool	Main power for test not allowed	0x100A	x	-	-	r	-	
	1	Bool	Line voltage for test required	0x010A	x	r	r ⁷⁾	r	r	
	4	Bool	Simulation active	-	-	-	-	r ⁹⁾	-	
	5	Bool	Test with small load active	-	-	r	r ⁷⁾	r	r	
90	0	Bool	Operating temperature too high	0x9005	-	r	r	r	r	
91	0	Bool	Automatic parameterization active	-	-	-	-	r	r	
92	2	Bool	Starting time limit - maintenance demanded exceeded	0x1034	-	-	-	r	r	
	3	Bool	Starting time limit - maintenance demanded undershot	0x1035	-	-	-	r	r	
93	0	Bool	Logbook application - error deleted	-	-	r	r	r	r	
	2	Bool	Logbook application - warnings deleted	-	-	-	-	r	r	
	4	Bool	Logbook application - events deleted	-	-	-	-	r	r	
	5	Bool	Logbook service - errors deleted	-	-	-	-	r	r	
	7	Bool	Logbook service - events deleted	-	-	-	-	r	r	

¹⁾ Supported by SIRIUS 3RW50 soft starter

²⁾ Supported by SIRIUS 3RW52 soft starter

³⁾ Supported by SIRIUS 3RW55 soft starter

⁴⁾ Supported by SIRIUS 3RW55 Failsafe soft starter

⁵⁾ Error type

⁶⁾ Error type 0x1046 is additionally set

⁷⁾ 3RW52 soft starter from firmware version V2.0

- 8) Object number of the faulty parameter from data sets 131, 141, 151, 132, 142, 152, 133, 134 or 135
 9) 3RW55 soft starter from firmware version V2.0
 10) 3RW55 soft starter from firmware version V2.1
 11) Soft starter 3RW55 Failsafe with firmware version V1.1.0 or higher
 12) 3RW55 soft starter from firmware version V2.1.1

A.4.5.4 Data set 94: Measured values

Only read (r) access to the measured values is possible.

Byte	Data format	Meaning	3RW		
			50 ¹⁾	52 ²⁾	55 / 55-F ³⁾
0	Unsigned8	Coordination	x	x	x
2	Unsigned8	Slot number	x	x	x
4	Unsigned16	Length of data structure	x	x	x
6	Unsigned16	Start position	x	x	x

- 1) Supported by SIRIUS 3RW50 soft starter
 2) Supported by SIRIUS 3RW52 soft starter
 3) Supported by SIRIUS soft starter 3RW55 and 3RW55 Failsafe

Byte	Data format	Measured value	Value range	Incre- ment	3RW	
					50 / 52 ¹⁾	55 / 55-F ²⁾
12	Unsigned8	Phase current I L1 (%)	0 ... 796.9 %	3.125 %	r	r
13	Unsigned8	Phase current I L2 (%)	0 ... 796.9 %	3.125 %	r	r
14	Unsigned8	Phase current I L3 (%)	0 ... 796.9 %	3.125 %	r	r
16	Unsigned16	Remaining motor cooling time	0 ... 1 800 s	0.1 s	r	r
19	Unsigned8	Asymmetry	0 ... 100 %	1 %	-	r
20	Unsigned16	Motor temperature rise	0 ... 1000 %	1 %	r	r
28	Unsigned8	Output frequency	0 ... 100 Hz	0.5 Hz	-	r
32	Unsigned8	Line frequency	0 ... 100 Hz	0.5 Hz	-	r
34	Unsigned16	Line-to-line voltage U L1-L2 (rms)	0 ... 1 500 V	0.1 V	-	r
36	Unsigned16	Line-to-line voltage U L2-L3 (rms)	0 ... 1 500 V	0.1 V	-	r
38	Unsigned16	Line-to-line voltage U L3-L1 (rms)	0 ... 1 500 V	0.1 V	-	r
40	Signed32	Phase current I L1 (rms)	-20 000 ... 20 000 A	0.01 A	r	r
44	Signed32	Phase current I L2 (rms)	-20 000 ... 20 000 A	0.01 A	r	r
48	Signed32	Phase current I L3 (rms)	-20 000 ... 20 000 A	0.01 A	r	r
55	Unsigned8	Switching element heating	0 ... 250 %	1 %	r	r
56	Unsigned16	Remaining switching element cooling time	0 ... 1 800 s	0.1 s	r	r
58	Unsigned16	Remaining time for motor overload protection	0 ... 6 500 s	0.1 s	-	r
60	Signed32	Active power	-2 147.483 ... 2 147.483 kW	0.0001 kW	-	r
66	Unsigned8	Power factor L1...3	0 ... 1	0.01	-	r

Byte	Data format	Measured value	Value range	Increment	3RW	
					50 / 52 ¹⁾	55 / 55-F ²⁾
74	Unsigned16	Remaining switching frequency monitoring time	0 ... 65 535 s	1 s	-	r
76	Unsigned8	Phase current average (%)	0 ... 796.9 %	3.125 %	r	r
80	Signed32	Phase current average (rms)	-20 000 ... 20 000 A	0.01 A	r	r
84	Signed32	Maximum phase current (rms)	-20 000 ... 20 000 A	0.01 A	-	r
88 ... 99	-	Reserved	-	-	-	-

¹⁾ Supported by SIRIUS 3RW50 and 3RW52 soft starters

²⁾ Supported by SIRIUS 3RW55 and 3RW55 Failsafe soft starters

A.4.5.5 Data set 95: Statistic data

Only read (r) access to the statistic data is possible.

Byte	Data format	Meaning	3RW		
			50 ¹⁾	52 ²⁾	55 / 55-F ³⁾
0	Unsigned8	Coordination	x	x	x
2	Unsigned8	Slot number	x	x	x
4	Unsigned16	Length of data structure	x	x	x
6	Unsigned16	Start position	x	x	x

¹⁾ Supported by SIRIUS 3RW50 soft starter

²⁾ Supported by SIRIUS 3RW52 soft starter

³⁾ Supported by SIRIUS soft starter 3RW55 and 3RW55 Failsafe

Byte	Data format	Statistic data	Value range	Increment	3RW	
					50 / 52 ¹⁾	55 / 55-F ²⁾
12	Unsigned8	Phase current max (%)	0 ... 796.9 %	3.125 %	r	r
14	Unsigned16	Last tripping current IA (%)	0 ... 1 000 %	3.125 %	r	r
16	Unsigned32	Operating hours - device	0 ... 4 294 967 295 s	1 s	r	r
20	Unsigned32	Number of starts motor CW	0 ... 4 294 967 295	1	r	r
24	Unsigned32	Number of starts motor CCW	0 ... 4 294 967 295	1	-	r
28	Unsigned16	Number of motor overload trips	0 ... 65 535	1	r	r
32	Signed32	Maximum phase current (rms)	-20 000 ... 20 000 A	0.01 A	r	r
36	Signed32	Last tripping current IA (rms)	-20 000 ... 20 000 A	0.01 A	r	r
40	Unsigned32	Operating hours - motor	0 ... 4 294 967 295 s	1 s	r	r
44	Unsigned32	Operating hours - motor current = 18 ... 49.9% x I _{max}	0 ... 4 294 967 295 s	1 s	r	r
48	Unsigned32	Operating hours - motor current = 50 ... 89.9% x I _{max}	0 ... 4 294 967 295 s	1 s	r	r

Byte	Data format	Statistic data	Value range	Increment	3RW	
					50 / 52 ¹⁾	55 / 55-F ²⁾
52	Unsigned32	Operating hours - motor current = 90 ... 119.9% x I _{max}	0 ... 4 294 967 295 s	1 s	r	r
56	Unsigned32	Operating hours - motor current = 120 ... 1000% x I _{max}	0 ... 4 294 967 295 s	1 s	r	r
62	Unsigned16	Number of switching element overload trips	0 ... 65 535	1	r	r
64	Unsigned16	Number of bypass overload trips	0 ... 65 535	1	r	r
72	Unsigned32	Number of electrical braking stops	0 ... 4 294 967 295	1	-	r
76	Unsigned32	Number of starts output 1	0 ... 4 294 967 295	1	-	r
80	Unsigned32	Number of starts output 2	0 ... 4 294 967 295	1	-	r
84	Unsigned32	Number of starts output 3	0 ... 4 294 967 295	1	-	r
88	Unsigned32	Number of starts output 4	0 ... 4 294 967 295	1	-	r
128	Float32	Active energy import (total)	0 ... 4 294 967 295 Wh	1 Wh	-	r
136	Float32	Active energy export (total)	0 ... 4 294 967 295 Wh	1 Wh	-	r
144	Unsigned16	Last real starting time	0 ... 1 000 s	0.1 s	-	r
146 ... 199	-	Reserved	-	-	-	-

¹⁾ Supported by SIRIUS 3RW50 soft starter from firmware version V1.0 and 3RW52 from firmware version V2.0

²⁾ Supported by SIRIUS 3RW55 and 3RW55 Failsafe soft starters

A.4.5.6 Data set 96: Maximum pointer

Only read (r) access to the maximum pointer is possible.

Byte	Data format	Meaning	3RW		
			50 ¹⁾	52 ²⁾	55 / 55-F ³⁾
0	Unsigned8	Coordination	x	x	x
2	Unsigned8	Slot number	x	x	x
4	Unsigned16	Length of data structure	x	x	x
6	Unsigned16	Start position	x	x	x

¹⁾ Supported by SIRIUS 3RW50 soft starter

²⁾ Supported by SIRIUS 3RW52 soft starter

³⁾ Supported by SIRIUS soft starter 3RW55 and 3RW55 Failsafe

Byte	Data format	Maximum pointer	Value range	Increment	3RW	
					50 / 52 ¹⁾	55 / 55-F ²⁾
12	Unsigned8	Minimum phase current I L1 (%)	0 ... 796.9 %	3.125 %	r	r
13	Unsigned8	Phase current I L2 min (%)	0 ... 796.9 %	3.125 %	r	r
14	Unsigned8	Phase current I L3 min (%)	0 ... 796.9 %	3.125 %	r	r

Byte	Data format	Maximum pointer	Value range	Increment	3RW	
					50 / 52 ¹⁾	55 / 55-F ²⁾
16	Unsigned8	Maximum phase current I L1 (%)	0 ... 796.9 %	3.125 %	r	r
17	Unsigned8	Phase current I L2 max (%)	0 ... 796.9 %	3.125 %	r	r
18	Unsigned8	Phase current I L3 max (%)	0 ... 796.9 %	3.125 %	r	r
20	Unsigned16	Maximum trigger current	0 ... 1 000 %	3.125 %	r	r
22	Unsigned16	Number of motor overload trips	0 ... 65 535	1	r	r
24	Signed32	Maximum trigger current	-20 000 ... 20 000 A	0.01 A	r	r
28	Signed32	Minimum phase current I L1 (rms)	-20 000 ... 20 000 A	0.01 A	r	r
32	Signed32	Phase current I L2 min (rms)	-20 000 ... 20 000 A	0.01 A	r	r
36	Signed32	Phase current I L3 min (rms)	-20 000 ... 20 000 A	0.01 A	r	r
40	Signed32	Maximum phase current I L1 (rms)	-20 000 ... 20 000 A	0.01 A	r	r
44	Signed32	Phase current I L2 max (rms)	-20 000 ... 20 000 A	0.01 A	r	r
48	Signed32	Phase current I L3 max (rms)	-20 000 ... 20 000 A	0.01 A	r	r
52	Unsigned16	Line-to-line voltage U L1-L2 min	0 ... 1 500 V	0.1 V	-	r
54	Unsigned16	Line-to-line voltage U L2-L3 min	0 ... 1 500 V	0.1 V	-	r
56	Unsigned16	Line-to-line voltage U L3-L1 min	0 ... 1 500 V	0.1 V	-	r
58	Unsigned16	Line-to-line voltage U L1-L2 max	0 ... 1 500 V	0.1 V	-	r
60	Unsigned16	Line-to-line voltage U L2-L3 max	0 ... 1 500 V	0.1 V	-	r
62	Unsigned16	Line-to-line voltage U L3-L1 max	0 ... 1 500 V	0.1 V	-	r
69	Unsigned8	Maximum switching element heating	0 ... 250 %	1 %	r	r
70	Unsigned8	Minimum line frequency	0 ... 100 Hz	0.5 Hz	-	r
71	Unsigned8	Maximum line frequency	0 ... 100 Hz	0.5 Hz	-	r
72	Unsigned32	Operating hours - motor current = 18 ... 49.9% x I _{le}	0 ... 4 294 967 295 s	1 s	r	r
76	Unsigned32	Operating hours - motor current = 50 ... 89.9% x I _{le}	0 ... 4 294 967 295 s	1 s	r	r
80	Unsigned32	Operating hours - motor current = 90 ... 119.9% x I _{le}	0 ... 4 294 967 295 s	1 s	r	r
84	Unsigned32	Operating hours - motor current = 120 ... 1000% x I _{le}	0 ... 4 294 967 295 s	1 s	r	r
88	Unsigned32	Operating hours - device	0 ... 4 294 967 295 s	1 s	r	r
96	Signed32	Starting current I max (rms)	-20 000 ... 20 000 A	0.01 A	r	r
100	Signed32	Starting current I L1 max (rms)	-20 000 ... 20 000 A	0.01 A	r	r
104	Signed32	Starting current I L2 max (rms)	-20 000 ... 20 000 A	0.01 A	r	r
108	Signed32	Starting current I L3 max (rms)	-20 000 ... 20 000 A	0.01 A	r	r
112	Unsigned16	Number of starts with ext. bypass	0 ... 65 535	1	r	r ^{3), 4)}
114 ... 125	-	Reserved	-	-	-	-

¹⁾ Supported by SIRIUS 3RW50 soft starter from firmware version V1.0 and 3RW52 from firmware version V2.0

²⁾ Supported by SIRIUS 3RW55 and 3RW55 Failsafe soft starters

³⁾ 3RW55 soft starter from firmware version V2.0

⁴⁾ Not supported by SIRIUS 3RW55 Failsafe soft starter

A.4.5.7 Data sets 131, 141, and 151: Parameter basic functions - Set 1, 2, and 3

Read (r) and write (w) access to the parameter basic functions is possible.

- Data set 131: Parameter set 1
- Data set 141: Parameter set 2
- Data set 151: Parameter set 3

The data sets 141 and 151 are not supported by the 3RW50 and 3RW52 soft starters. Parameters independent of the parameter set are only present in data set 131 and can only be modified in this set.

Byte	Data format	Meaning	3RW		
			50 ¹⁾	52 ²⁾	55 / 55-F ³⁾
0	Unsigned8	Coordination [0x21] Write via acyclic bus channel – user program	x	x	x
2	Unsigned8	Slot number	x	x	x
4	Unsigned16	Length of data structure	x	x	x
6	Unsigned16	Start position	x	x	x

¹⁾ Supported by SIRIUS 3RW50 soft starter

²⁾ Supported by SIRIUS 3RW52 soft starter

³⁾ Supported by SIRIUS soft starter 3RW55 and 3RW55 Failsafe

Object No.	Byte	Bit	Data format	Parameters	Value range [encoding]	Increment	3RW	
							50 / 52 ¹⁾ [D ³⁾]	55 / 55-F ²⁾ [D ³⁾]
130	12	0	Unsigned32	Rated operational current I _e	-	0.01 A	r	r/w ⁴⁾
				SIRIUS 3RW50 soft starter, basic performance, 2-phase controlled, motor overload protection	28.6 ... 987 A [2 860 ... 98 700]	0.01 A	[98 700] ⁵⁾	-
				SIRIUS 3RW52 soft starter, general performance, 3-phase controlled, motor overload protection	5.5 ... 987 A [550 ... 98 700]	0.01 A	[98 700] ⁶⁾	-
				SIRIUS 3RW55 soft starter, high performance, ____ A, 3-phase controlled, motor overload protection, torque control (rated operating current of the 3RW55 soft starter in the table) or SIRIUS 3RW55 soft starter, failsafe, high performance, ____ A, 3-phase controlled, motor overload protection, torque control (rated operating current of the 3RW55 soft starter Failsafe in the table)				
				Motor connection type: Automatic detection				
				13 A	2.5 ... 22.5 A [250 ... 2 250]	0.01 A	-	[440]
				18 A	3.5 ... 31.1 A [350 ... 3 110]	0.01 A	-	[610]
				25 A	5 ... 43.3 A [500 ... 4 330]	0.01 A	-	[870]
				32 A	6.5 ... 55.4 A [650 ... 5 540]	0.01 A	-	[1 130]
				38 A	7.5 ... 65.8 A [750 ... 6 580]	0.01 A	-	[1 300]
				25 A / 560 V ⁷⁾	5 ... 43.3 A [500 ... 4 330]	0.01 A	-	[870]
				25 A / 690 V ⁸⁾	5 ... 43.3 A [500 ... 4 330]	0.01 A	-	[870]
				47 A	10 ... 81.4 A [1 000 ... 8 140]	0.01 A	-	[1 740]
				63 A	13 ... 109 A [1 300 ... 10 900]	0.01 A	-	[2 260]
				77 A	16 ... 133 A [1 600 ... 13 300]	0.01 A	-	[2 780]
				93 A	19 ... 161 A [1 900 ... 16 100]	0.01 A	-	[3 300]
				113 A	23 ... 195 A [2 300 ... 19 500]	0.01 A	-	[3 990]
				143 A	29 ... 247 A [2 900 ... 24 700]	0.01 A	-	[5 030]

Object No.	Byte	Bit	Data format	Parameters	Value range [encoding]	Increment	3RW	
							50 / 52 ¹⁾ [D ³⁾]	55 / 55-F ²⁾ [D ³⁾]
				171 A	34 ... 296 A [3 400 ... 29 600]	0.01 A	-	[5 890]
				210 A	42 ... 363 A [4 200 ... 36 300]	0.01 A	-	[7 280]
				250 A	50 ... 433 A [5 000 ... 43 300]	0.01 A	-	[8 670]
				315 A	63 ... 545 A [6 300 ... 54 500]	0.01 A	-	[10 920]
				370 A	74 ... 640 A [7 400 ... 64 000]	0.01 A	-	[12 820]
				470 A	94 ... 814 A [9 400 ... 81 400]	0.01 A	-	[16 290]
				570 A	114 ... 987 A [11 400 ... 98 700]	0.01 A	-	[19 750]
				630 A ⁸⁾	126 ... 1 091 A [12 600 ... 109 100]	0.01 A	-	[21 830]
				720 A ⁸⁾	144 ... 1 247 A [14 400 ... 124 700]	0.01 A	-	[24 950]
				840 A ⁸⁾	168 ... 1 454 A [16 800 ... 145 400]	0.01 A	-	[29 100]
				1 100 A ⁸⁾	220 ... 1 905 A [22 000 ... 190 500]	0.01 A	-	[38 110]
				1 280 A ⁸⁾	256 ... 2 217 A [25 600 ... 221 700]	0.01 A	-	[44 350]
				Motor connection type: Standard				
				13 A	2.5 ... 13 A [250 ... 1 300]	0.01 A	-	[440]
				18 A	3.5 ... 18 A [350 ... 1 800]	0.01 A	-	[610]
				25 A	5 ... 25 A [500 ... 2 500]	0.01 A	-	[870]
				32 A	6.5 ... 32 A [650 ... 3 200]	0.01 A	-	[1 130]
				38 A	7.5 ... 38 A [750 ... 3 800]	0.01 A	-	[1 300]
				25 A / 560 V ⁷⁾	5 ... 25 A [500 ... 2 500]	0.01 A	-	[870]
				25 A / 690 V ⁸⁾	5 ... 25 A [500 ... 2 500]	0.01 A	-	[870]
				47 A	10 ... 47 A [1 000 ... 4 700]	0.01 A	-	[1 740]
				63 A	13 ... 63 A [1 300 ... 6 300]	0.01 A	-	[2 260]
				77 A	16 ... 77 A [1 600 ... 7 700]	0.01 A	-	[2 780]

Object No.	Byte	Bit	Data format	Parameters	Value range [encoding]	Increment	3RW	
							50 / 52 ¹⁾ [D ³⁾]	55 / 55-F ²⁾ [D ³⁾]
				93 A	19 ... 93 A [1 900 ... 9 300]	0.01 A	-	[3 300]
				113 A	23 ... 113 A [2 300 ... 11 300]	0.01 A	-	[3 990]
				143 A	29 ... 143 A [2 900 ... 14 300]	0.01 A	-	[5 030]
				171 A	34 ... 171 A [3 400 ... 17 100]	0.01 A	-	[5 890]
				210 A	42 ... 210 A [4 200 ... 21 000]	0.01 A	-	[7 280]
				250 A	50 ... 250 A [5 000 ... 25 000]	0.01 A	-	[8 670]
				315 A	63 ... 315 A [6 300 ... 31 500]	0.01 A	-	[10 920]
				370 A	74 ... 370 A [7 400 ... 37 000]	0.01 A	-	[12 820]
				470 A	94 ... 470 A [9 400 ... 47 000]	0.01 A	-	[16 290]
				570 A	114 ... 570 A [11 400 ... 57 000]	0.01 A	-	[19 750]
				630 A ⁸⁾	126 ... 630 A [12 600 ... 63 000]	0.01 A	-	[21 830]
				720 A ⁸⁾	144 ... 720 A [14 400 ... 72 000]	0.01 A	-	[24 950]
				840 A ⁸⁾	168 ... 840 A [16 800 ... 84 000]	0.01 A	-	[29 100]
				1 100 A ⁸⁾	220 ... 1 100 A [22 000 ... 110 000]	0.01 A	-	[38 110]
				1 280 A ⁸⁾	256 ... 1 280 A [25 600 ... 128 000]	0.01 A	-	[44 350]
				Motor connection type: Inside delta				
				13 A	4.4 ... 22.5 A [440 ... 2 250]	0.01 A	-	[770]
				18 A	6.1 ... 31.1 A [610 ... 3 110]	0.01 A	-	[1 060]
				25 A	8.7 ... 43.3 A [870 ... 4 330]	0.01 A	-	[1 510]
				32 A	11.3 ... 55.4 A [1 130 ... 5 540]	0.01 A	-	[1 960]
				38 A	13 ... 65.8 A [1 300 ... 6 580]	0.01 A	-	[2 260]
				25 A / 560 V ⁷⁾	8.7 ... 43.3 A [870 ... 4 330]	0.01 A	-	[1 510]
				25 A / 690 V ⁸⁾	8.7 ... 43.3 A [870 ... 4 330]	0.01 A	-	[1 510]

Object No.	Byte	Bit	Data format	Parameters	Value range [encoding]	Increment	3RW	
							50 / 52 ¹⁾ [D ³⁾]	55 / 55-F ²⁾ [D ³⁾]
				47 A	17.4 ... 81.4 A [1 740 ... 8 140]	0.01 A	-	[3 020]
				63 A	22.6 ... 109 A [2 260 ... 10 900]	0.01 A	-	[3 920]
				77 A	27.8 ... 133 A [2 780 ... 13 300]	0.01 A	-	[4 820]
				93 A	33 ... 161 A [3 300 ... 16 100]	0.01 A	-	[5 720]
				113 A	39.9 ... 195 A [3 990 ... 19 500]	0.01 A	-	[6 920]
				143 A	50.3 ... 247 A [5 030 ... 24 700]	0.01 A	-	[8 720]
				171 A	58.9 ... 296 A [5 890 ... 29 600]	0.01 A	-	[10 210]
				210 A	72.8 ... 363 A [7 280 ... 36 300]	0.01 A	-	[12 610]
				250 A	86.7 ... 433 A [8 670 ... 43 300]	0.01 A	-	[15 020]
				315 A	110 ... 545 A [11 000 ... 54 500]	0.01 A	-	[19 060]
				370 A	129 ... 640 A [12 900 ... 64 000]	0.01 A	-	[22 350]
				470 A	163 ... 814 A [16 300 ... 81 400]	0.01 A	-	[28 240]
				570 A	198 ... 987 A [19 800 ... 98 700]	0.01 A	-	[34 300]
				630 A ⁸⁾	219 ... 1 091 A [21 900 ... 109 100]	0.01 A	-	[37 940]
				720 A ⁸⁾	250 ... 1 247 A [25 000 ... 124 700]	0.01 A	-	[43 310]
				840 A ⁸⁾	291 ... 1 454 A [29 100 ... 145 400]	0.01 A	-	[50 410]
				1 100 A ⁸⁾	382 ... 1 905 A [38 200 ... 190 500]	0.01 A	-	[66 170]
				1 280 A ⁸⁾	444 ... 2 217 A [44 400 ... 221 700]	0.01 A	-	[76 910]
4	16	1	Bool	Non volatile tripping status ⁹⁾	[0 ... 1]	-	-	r/w ⁴⁾ [1]
					[0] No			
					[1] Yes			

Object No.	Byte	Bit	Data format	Parameters	Value range [encoding]	Increment	3RW	
							50 / 52 ¹⁾ [D ³⁾]	55 / 55-F ²⁾ [D ³⁾]
5	18	0	Bit2	Response to overload thermal motor model ⁹⁾	[0 ... 1] [0] Turn off without restart [1] Turn off with restart	-	r [0]	r/w ⁴⁾ [0]
232		4	Bit4	Response to faulty main power ⁹⁾	[1 ... 2] [1] Group error only at ON command [2] Warn	-	-	r/w [1]
6	19	0	Bit4	Tripping class	[0 ... 15] [0] CLASS 10E [1] CLASS 20E [2] CLASS 30E ^{5), 6)} [3] CLASS 10A [15] CLASS OFF	-	r 50: [0] 52: [3]	r/w ⁴⁾ [0]
7	20	0	Unsigned8	Recovery time ⁹⁾	60 ... 1 800 s [2 ... 60]	30 s	-	r/w ⁴⁾ [10]
10	24	0	Bit2	Response to overload temperature sensor ⁹⁾	[0 ... 2] [0] Turn off without restart [1] Turn off with restart [2] Warn ^{5), 6)}	-	r [0]	r/w ⁴⁾ [0]
9		2	Bit4	Temperature sensor ⁹⁾	[0 ... 2] [0] Deactivated [1] Thermoclick [2] PTC type A	-	-	r/w ⁴⁾ [0]
140	33	2	Bit2	Response to overload switching element ⁹⁾	[0 ... 1] [0] Turn off without restart [1] Turn off with restart	-	r [0]	r/w [0]
21	34	0	Bit4	Asymmetry limit error ⁹⁾	10 ... 60 % [2 ... 12] [0] Deactivated	5 %	-	r/w [6]
47	45	0	Unsigned8	DC braking torque	20 ... 100 % [4 ... 20]	5 %	-	r/w ⁸⁾ [10]
40	48	0	Unsigned8	Starting voltage	20 ... 100 % [4 ... 20]	5 %	r [6]	r/w [6]

Object No.	Byte	Bit	Data format	Parameters	Value range [encoding]	Increment	3RW	
							50 / 52 ¹⁾ [D ³⁾	55 / 55-F ²⁾ [D ³⁾
167	51	0	Bit4	Starting mode	[0 ... 6] [0] Direct ^{5), 6)} [1] Voltage ramp ^{5), 6)} [2] Torque control ^{5), 6)} [3] Motor heating ^{5), 6), 8)} [5] Voltage ramp + Current limiting [6] Torque control + Current limiting ^{5), 6)}	-	r [5]	r/w ⁴⁾ [5]
168		4	Bit4	Stopping mode	[0 ... 6] [0] Coasting down [1] Voltage ramp [2] Torque control ^{5), 6)} [3] Pump stopping mode ^{5), 6)} [4] DC braking ^{5), 6), 8)} [5] Dynamic DC braking ^{5), 6), 8)} [6] Reversing DC braking ^{5), 6), 8), 10)}	-	r [1]	r/w ⁴⁾ [0]

Object No.	Byte	Bit	Data format	Parameters	Value range [encoding]	Increment	3RW	
							50 / 52 ¹⁾ [D ³⁾]	55 / 55-F ²⁾ [D ³⁾]
35	52	0	Bit32	Substitute value	-	-	-	[0]
	52	0	Bool	Substitute value: Motor CW ⁹⁾	[0 ... 1]	-	-	r/w [0]
		1	Bool	Substitute value: Motor CCW ⁹⁾	[0 ... 1]	-	-	r/w [0]
		3	Bool	Substitute value: Reset ⁹⁾	[0 ... 1]	-	-	r/w [0]
		4	Bool	Substitute value: Emergency start ⁹⁾	[0 ... 1]	-	-	r/w [0]
		6	Bool	Substitute value: Creep speed ⁹⁾	[0 ... 1]	-	-	r/w ⁸⁾ [0]
	53	0	Bool	Substitute value: Output 1 ⁹⁾	[0 ... 1]	-	-	r/w [0]
		1	Bool	Substitute value: Output 2 ⁹⁾	[0 ... 1]	-	-	r/w [0]
		2	Bool	Substitute value: Parameter set bit 0 ⁹⁾	[0 ... 1]	-	-	r/w [0]
		3	Bool	Substitute value: Parameter set bit 1 ⁹⁾	[0 ... 1]	-	-	r/w [0]
		7	Bool	Substitute value: Disable Quick-stop ⁹⁾	[0 ... 1]	-	-	r/w [0]
	54	0	Bool	Substitute value: Output 3 ⁹⁾	[0 ... 1]	-	-	r/w ⁸⁾ [0]
		3	Bool	Substitute value: Activate pump cleaning ⁹⁾	[0 ... 1]	-	-	r/w [0]
	55	0	Bool	Substitute value: Manual operation local - input controlled ⁹⁾	[0 ... 1]	-	-	r/w [0]
		1	Bool	Substitute value: Use alternative stopping mode ⁹⁾	[0 ... 1]	-	-	r/w [0]
		2	Bool	Substitute value: Motor standstill ⁹⁾	[0 ... 1]	-	-	r/w [0]
34	56	7	Bool	Response to CPU/Master Stop ⁹⁾	[0 ... 1]	-	-	r/w [0]
					[0] Switch substitute value [1] Keep last value			
228	72	4	Bit4	Motor connection type ⁹⁾	[0 ... 2]	-	-	r/w ⁴⁾ [0]
					[0] Automatic detection [1] Standard [2] Inside_delta			
2234	73	0	Bit4	Permissible main power rotation ⁹⁾	[0 ... 2]	-	-	r/w [0]
					[0] Any [1] Clockwise [2] Counter-clockw.			

Object No.	Byte	Bit	Data format	Parameters	Value range [encoding]	Increment	3RW	
							50 / 52 ¹⁾ [D ³⁾]	55 / 55-F ²⁾ [D ³⁾]
194	76	0	Unsigned8	Input 1-Action ⁹⁾	[0 ... 45] [0] No action [6] Manual operation local [7] Emergency start [10] Creep speed ⁸⁾ [11] Quick-stop [12] Reset [16] Motor CW with PS1 [17] Motor CCW with PS1 [18] Motor CW with PS2 [19] Motor CCW with PS2 [20] Motor CW with PS3 [21] Motor CCW with PS3 [43] Motor standstill ⁸⁾ [44] Use alternative stopping mode [45] Activate pump cleaning	-	-	r/w ⁴⁾ [16]
195	77	0	Unsigned8	Input 2-Action ⁹⁾	(see Input 1-Action)	-	-	r/w ⁴⁾ [0]
196	78	0	Unsigned8	Input 3-Action ⁹⁾	(see Input 1-Action)	-	-	r/w ⁴⁾ [0]
197	79	0	Unsigned8	Input 4-Action ⁹⁾	(see Input 1-Action)	-	-	r/w ⁴⁾ [12]

Object No.	Byte	Bit	Data format	Parameters	Value range [encoding]	Increment	3RW	
							50 / 52 ¹⁾ [D ³⁾]	55 / 55-F ²⁾ [D ³⁾]
163	96	0	Unsigned8	Output 1-Action ⁹⁾	[0 ... 201]	-	r [14]	r/w [13]
					[0] No action ^{5), 6)} [1] Control source PIQ-DQ-1.0 output 1 ^{5), 6)} [2] Control source PIQ-DQ-1.1 output 2 ^{5), 6)} [6] Control source input 1 ^{5), 6)} [7] Control source input 2 ^{5), 6)} [8] Control source input 3 ^{5), 6)} [9] Control source input 4 ^{5), 6)} [10] Start-up ^{5), 6)} [11] Operation / bypass ^{5), 6)} [12] Run-down ^{5), 6)} [13] On time motor (RUN) [14] Control command motor ON [16] DC brake contactor ^{5), 6), 8)} [18] Device on ^{5), 6)} [19] Operation / Run-down ^{5), 6)} [29] External bypass ^{5), 6), 8), 10)} [31] Group warning ^{5), 6)} [32] Group error ^{5), 6)} [33] Bus error ^{5), 6)} [34] Device error ^{5), 6)} [38] Ready for motor ON ^{5), 6)} [41] Generator operation ^{5), 6)} [42] Pump cleaning active ^{5), 6)} [43] Alternative stopping mode active ^{5), 6)} [44] CM - maintenance demanded ^{5), 6)} [45] CM - error ^{5), 6)} [180] Control source PIQ-DQ-2.0 output 3 ^{5), 6), 8)} [200] Reversing contactor right ^{5), 6)} [201] Reversing contactor left ^{5), 6)}			
164	97	0	Unsigned8	Output 2-Action ⁹⁾	(see Output 1-Action)	-	-	r/w [0]

Object No.	Byte	Bit	Data format	Parameters	Value range [encoding]	Increment	3RW	
							50 / 52 ¹⁾ [D ³⁾]	55 / 55-F ²⁾ [D ³⁾]
166	99	0	Unsigned8	Output 4-Action ⁹⁾	(see Output 1-Action)	-	-	r/w ⁸⁾ [0]
159	100	0	Unsigned16	Output 1 - ON delay ⁹⁾	0 ... 6 500 s [0 ... 65 000]	0.1 s	-	r/w [0]
160	102	0	Unsigned16	Output 2 - ON delay ⁹⁾	0 ... 6 500 s [0 ... 65 000]	0.1 s	-	r/w [0]
162	106	0	Unsigned16	Output 4 - ON delay ⁹⁾	0 ... 6 500 s [0 ... 65 000]	0.1 s	-	r/w ⁸⁾ [0]
2326	109	4	Bit4	Alternative stopping mode ⁹⁾	[0 ... 6] [0] Coasting down [1] Voltage ramp [2] Torque control [3] Pump stopping mode [4] DC braking ⁸⁾ [5] Dynamic DC braking ⁸⁾ [6] Reversing DC braking ^{8), 10)}	-	-	r/w ⁴⁾ [0]
116	112	0	Unsigned8	Breakaway time	0 ... 2 s [0 ... 200]	0.01 s	-	r/w [0]
117	113	0	Unsigned8	Breakaway voltage	40 ... 100 % [8 ... 20]	5 %	-	r/w [8]
169	114	0	Unsigned16	Maximum starting time	0 ... 1 000 s [0 ... 10 000]	0.1 s	-	r/w [0]
170	116	0	Unsigned16	Ramp-up time	0 ... 360 s [0 ... 3 600]	0.1 s	r [100]	r/w [100]
171	118	0	Unsigned16	Stopping time	0 ... 360 s [0 ... 3 600]	0.1 s	r [0]	r/w [100]
172	120	0	Unsigned8	Starting torque	10 ... 100 % [2 ... 20]	5 %	-	r/w [2]
118	121	0	Unsigned8	Limiting torque	20 ... 200 % [4 ... 40]	5 %	-	r/w [30]
173	122	0	Unsigned8	Stopping torque	10 ... 100 % [2 ... 20]	5 %	-	r/w [2]
119	125	0	Unsigned8	Motor heating power	1 ... 100 % [1 ... 100]	1 %	-	r/w ⁸⁾ [20]
178	130	0	Unsigned8	Dynamic braking torque	20 ... 100 % [4 ... 20]	5 %	-	r/w ⁸⁾ [10]
43	131	0	Unsigned8	Creep speed factor right	3 ... 21 [3 ... 21]	1	-	r/w ⁸⁾ [7]
198	132	0	Unsigned8	Creep speed factor left	3 ... 21 [3 ... 21]	1	-	r/w ⁸⁾ [7]
44	133	0	Unsigned8	Creep speed torque right	20 ... 100 % [4 ... 20]	5 %	-	r/w ⁸⁾ [10]
199	134	0	Unsigned8	Creep speed torque left	20 ... 100 % [4 ... 20]	5 %	-	r/w ⁸⁾ [10]

Object No.	Byte	Bit	Data format	Parameters	Value range [encoding]	Increment	3RW	
							50 / 52 ¹⁾ [D ³⁾]	55 / 55-F ²⁾ [D ³⁾]
2209	140	0	Bit4	Ex application ⁹⁾	[0 ... 3]	-	-	r/w ^{4), 10)} [0]
					[0] No [1] Yes, with complete motor protection [2] Yes, with thermal motor model [3] Yes, with PTC temperature protection			
2327	142	0	Unsigned16	Alternative stopping time ⁹⁾	0 ... 360 s [0 ... 3 600]	0.1 s	-	r/w [100]
235	144	0	Unsigned16	Current limiting value	125 ... 800 % [125 ... 800]	1 %	r [400]	r/w [400]
2212	146	0	Unsigned8	Service factor	1 ... 1.15 [100 ... 115]	0.01	-	r/w ⁴⁾ [100]
2210	148	0	Unsigned8	Motor heating warning limit ⁹⁾	0 ... 99 % [0 ... 99]	1 %	-	r/w [0]
					[0] Deactivated			
2211	150	0	Unsigned16	Remaining time for tripping warning limit ⁹⁾	0 ... 500 s [0 ... 500]	1 s	-	r/w [0]
					[0] Deactivated			
2218	157	0	Bit4	Asymmetry limit warning ⁹⁾	10 ... 60 % [2 ... 12]	5 %	-	r/w [0]
					[0] Deactivated			
2220	158	0	Unsigned8	Ground fault limit warning ⁹⁾	10 ... 95 % [2 ... 19]	5 %	-	r/w [0]
					[0] Deactivated			
2359	160	0	Unsigned16	DC braking delay ⁹⁾	0 ... 360 s [0 ... 3 600]	0.1 s	-	r/w ^{8), 10)} [0]
2360	162	0	Unsigned16	Alternative DC braking delay ⁹⁾	0 ... 360 s [0 ... 3 600]	0.1 s	-	r/w ^{8), 10)} [0]
2294	168	0	Unsigned8	Ground fault limit error ⁹⁾	10 ... 95 % [2 ... 19]	5 %	-	r/w [4]
					[0] Deactivated			
2329	169	0	Unsigned8	Alternative stopping torque ⁹⁾	10 ... 100 % [2 ... 20]	5 %	-	r/w [2]
2333	170	0	Unsigned16	Output 1 - OFF delay ⁹⁾	0 ... 6 500 s [0 ... 65 000]	0.1 s	-	r/w [0]
2334	172	0	Unsigned16	Output 2 - OFF delay ⁹⁾	0 ... 6 500 s [0 ... 65 000]	0.1 s	-	r/w [0]
2336	176	0	Unsigned16	Output 4 - OFF delay ⁹⁾	0 ... 6 500 s [0 ... 65 000]	0.1 s	-	r/w ⁸⁾ [0]
2352	184	0	Unsigned16	Current limiting value - maximum	125 ... 800 % [125 ... 800]	1 %	-	r/w [400]

Object No.	Byte	Bit	Data format	Parameters	Value range [encoding]	Increment	3RW	
							50 / 52 ¹⁾ [D ³⁾]	55 / 55-F ²⁾ [D ³⁾]
2295	190	0	Bit4	Bypass operation mode ⁹⁾	[1 ... 4]	-	r ^{6), 11)} [1]	r/w ^{4), 8), 10)} [1]
					[1] Internal bypass [2] External bypass without current measurement [4] No bypass			
2310	191	0	Bit4	Parameters of CPU/master disabled ⁹⁾	[1 ... 3]	-	-	r/w [1]
					[1] Deactivate [2] Activate [3] Activate for start-up parameters only			
2311	192	0	Bit4	Soft torque ⁹⁾	[0 ... 1]	-	r [0]	-
					[0] Deactivate [1] Activate			
2313	193	0	Bit4	Automatic parameterization	[0 ... 2]	-	-	r/w [0]
					[0] Off [1] ON - with preset starting time [2] ON - with preset starting time and current limit			
2315	194	0	Unsigned16	Preset starting time	0 ... 360 s [0 ... 3 600]	0.1 s	-	r/w [100]
2332	196	0	Unsigned8	Alternative dynamic braking torque ⁹⁾	20 ... 100 % [4 ... 20]	5 %	-	r/w ⁸⁾ [10]
2331	197	0	Unsigned8	Alternative DC braking torque ⁹⁾	20 ... 100 % [4 ... 20]	5 %	-	r/w ⁸⁾ [10]
-	198 ... 199	0	-	Reserved	-	-	-	-

¹⁾ Supported by SIRIUS 3RW50 and 3RW52 soft starters

²⁾ Supported by SIRIUS 3RW55 and 3RW55 Failsafe soft starters

³⁾ Default encoding

⁴⁾ Parameter is relevant for EX applications

⁵⁾ Not supported by SIRIUS 3RW52 soft starter

⁶⁾ Not supported by SIRIUS 3RW50 soft starter

⁷⁾ Not supported by SIRIUS 3RW55 soft starter

⁸⁾ Not supported by SIRIUS 3RW55 Failsafe soft starter

⁹⁾ Parameter is only available in data set 131

¹⁰⁾ 3RW55 soft starter from firmware version V2.0 or 3RW55 Failsafe soft starter from firmware version V1.0

¹¹⁾ 3RW52 soft starter from firmware version V2.0

Dependencies

During parameterization, it is possible to select impossible combinations of interdependent values. The diagnosis "Invalid parameter value" is then indicated in data set 92 of the 3RW5 soft starter (slot 2) (Page 168). You will find the dependencies of the parameters in the Equipment Manual of the 3RW5 soft starter.

A.4.5.8 Data sets 132, 142, and 152: Parameter extended functions 1 - Set 1, 2, and 3

Read (r) and write (w) access to the parameter extended functions 1 is possible.

- Data set 132: Parameter set 1
- Data set 142: Parameter set 2
- Data set 152: Parameter set 3

The data sets 132, 142 and 152 are not supported by the 3RW50 and 3RW52 soft starters. Parameters independent of the parameter set are only present in data set 132 and can only be modified in this set.

Byte	Data format	Meaning	3RW55 / 55-F ¹⁾
0	Unsigned8	Coordination [0x21] Write via acyclic bus channel – user program	x
2	Unsigned8	Slot number	x
4	Unsigned16	Length of data structure	x
6	Unsigned16	Start position	x

¹⁾ Supported by SIRIUS soft starters 3RW55 and 3RW55 Failsafe

Object No.	Byte	Bit	Data format	Parameters	Value range [encoding]	Increment	3RW55 / 55-F ¹⁾ [D ³⁾]
104	14	0	Unsigned16	Rated operating speed	500 ... 3 600 rpm [500 ... 3 600]	1 rpm	r/w [1 500]
113	24	0	Unsigned16	Rated torque	0 ... 10 000 Nm [0 ... 10 000]	1 Nm	r/w [0]
2236	66	0	Unsigned8	Switching frequency monitoring mode ²⁾	[0 ... 2] [0] Deactivated [1] ON - ON [2] OFF - ON	-	r/w [0]
2237	67	0	Unsigned8	Maximum number of starts ²⁾	2 ... 255 [2 ... 255]	1	r/w [2]
2238	68	0	Unsigned16	Switching frequency monitoring time t1 ²⁾	0 ... 65 535 s [0 ... 65 535]	1 s	r/w [0]
2239	70	0	Unsigned16	Switching frequency monitoring time t2 ²⁾	0 ... 65 535 s [0 ... 65 535]	1 s	r/w [0]

Object No.	Byte	Bit	Data format	Parameters	Value range [encoding]	Increment	3RW55 / 55-F ¹⁾ [D ³⁾]
2240	72	0	Unsigned8	Response to ON-command during active monitoring time ²⁾	[0 ... 3] [0] Turn off without restart [1] Turn off with restart [2] Warning without lock-out [3] Warning with lock-out	-	r/w [3]
2242	75	0	Bit4	Emergency start ²⁾	[0 ... 1] [0] Disable [1] manually enable/disable	-	r/w ⁴⁾ [1]
2243	76	0	Bit4	Emergency run ²⁾	[0 ... 2] [0] Disable [1] Manually enable/disable [2] Enable	-	r/w ^{4), 5), 6)} [0]
2251	82	0	Unsigned16	Active power upper limit error	0 ... 400 % [0 ... 400]	1 %	r/w [0]
2252	84	0	Unsigned16	Active power upper limit - maintenance demanded	0 ... 400 % [0 ... 400]	1 %	r/w [0]
2254	88	0	Unsigned8	Active power lower limit error	0 ... 100 % [0 ... 100]	1 %	r/w [0]
2255	89	0	Unsigned8	Active power lower limit - maintenance demanded	0 ... 100 % [0 ... 100]	1 %	r/w [0]
2260	96	0	Bit4	Response to P upper fault limit violation ²⁾	[0 ... 1] [0] Do not turn off [1] Turn off	-	r/w [0]
2297		4	Bit4	Response to fault P lower limit violation ²⁾	[0 ... 1] [0] Do not turn off [1] Turn off	-	r/w [0]
2250	104	0	Unsigned32	Active power reference value	0 ... 2 000 000 W [0 ... 2 000 000]	1 W	r/w [0]
2317	154	0	Unsigned16	Starting time upper limit - maintenance demanded	0 ... 400 % [0 ... 400]	1 %	r/w [0]
2320	159	0	Unsigned8	Starting time lower limit - maintenance demanded	0 ... 100 % [0 ... 100]	1 %	r/w [0]
2337	172	0	Unsigned16	Current upper limit error	50 ... 400 % [50 ... 400] [0] Deactivated	1 %	r/w [0]
2338	174	0	Unsigned16	Current upper limit - maintenance demanded	50 ... 400 % [50 ... 400] [0] Deactivated	1 %	r/w [0]
2340	178	0	Unsigned8	Current lower limit error	19 ... 100 % [19 ... 100] [0] Deactivated	1 %	r/w [0]

Object No.	Byte	Bit	Data format	Parameters	Value range [encoding]	Increment	3RW55 / 55-F ¹⁾ [D ³⁾]
2341	179	0	Unsigned8	Current lower limit - maintenance demanded	19 ... 100 % [19 ... 100] [0] Deactivated	1 %	r/w [0]
14	186	0	Bit4	Response to le upper fault limit violation ²⁾	[0 ... 1] [0] Do not turn off [1] Turn off	-	r/w [0]
2296		4	Bit4	Response to le lower limit fault violation ²⁾	[0 ... 1] [0] Do not turn off [1] Turn off	-	r/w [0]
-	187 ... 199	-	-	Reserved	-	-	-

¹⁾ Supported by SIRIUS soft starters 3RW55 and 3RW55 Failsafe

²⁾ Parameter is only in data set 132

³⁾ Default encoding

⁴⁾ Parameter is relevant for EX applications

⁵⁾ 3RW55 soft starter from firmware version V2.1

⁶⁾ Not supported by SIRIUS 3RW55 Failsafe soft starter

A.4.5.9 Data set 133: Parameter extended functions 2

Read (r) and write (w) access to the parameter extended functions 2 is possible.

Byte	Data format	Meaning	3RW		
			50 ¹⁾	52 ²⁾	55 / 55-F ³⁾
0	Unsigned8	Coordination [0x21] Write via acyclic bus channel – user program	x	x	x
2	Unsigned8	Slot number	x	x	x
4	Unsigned16	Length of data structure	x	x	x
6	Unsigned16	Start position	x	x	x

¹⁾ Supported by SIRIUS 3RW50 soft starter

²⁾ Supported by SIRIUS 3RW52 soft starter

³⁾ Supported by SIRIUS soft starter 3RW55 and 3RW55 Failsafe

Object No.	Byte	Bit	Data format	Parameters	Value range [encoding]	Increment	3RW	
							50 / 52 ¹⁾ [D ³⁾]	55 / 55-F ²⁾ [D ³⁾]
2222	40	0	Unsigned8	Analog output - signal type	[0 ... 3] [0] Deactivated [2] 4-20mA [3] 0-10V	-	r/w [2]	r/w [0]

Object No.	Byte	Bit	Data format	Parameters	Value range [encoding]	Increment	3RW	
							50 / 52 ¹⁾ [D ³⁾]	55 / 55-F ²⁾ [D ³⁾]
2223	42	0	Unsigned16	Analog output - measured value	[0 ...632] [0] Deactivated [502] Motor temperature rise [504] Phase current I L1 (%) [505] Phase current I L2 (%) [506] Phase current I L3 (%) [510] Line voltage U L1-L2 (rms) [511] Line voltage U L2-L3 (rms) [512] Line voltage U L3-L1 (rms) [513] Phase current I L1 (rms) [514] Phase current I L2 (rms) [515] Phase current I L3 (rms) [518] Switching element heating [521] Active power [523] Power factor L1...3 [528] Phase current average (%) [530] Phase current average (rms) [632] Active energy import total	-	-	r/w [0]
2224	46	0	Unsigned32	Analog output - range start value	0 ... 4 294 967 294 [0 ... 4 294 967 294]	1	r/w [0]	r/w [0]
2225	50	0	Unsigned32	Analog output - range end value	0 ... 4 294 967 295 [0 ... 4 294 967 295]	1	r/w [96]	r/w [27 648]
-	54 ... 199	-	-	Reserved	-	-	-	-

¹⁾ Supported by SIRIUS 3RW50 and 3RW52 soft starters

²⁾ Supported by SIRIUS 3RW55 and 3RW55 Failsafe soft starters

³⁾ Default encoding

A.4.5.10 Data set 134: Parameter Maintenance

Read (r) and write (w) access to the parameter Maintenance is possible. Data set 134 is not supported by the 3RW50 and 3RW52 soft starters.

Byte	Data format	Meaning	3RW55 / 55-F ¹⁾
0	Unsigned8	Coordination [0x21] Write via acyclic bus channel – user program	x
2	Unsigned8	Slot number	x

Byte	Data format	Meaning	3RW55 / 55-F ¹⁾
4	Unsigned16	Length of data structure	x
6	Unsigned16	Start position	x

¹⁾ Supported by SIRIUS soft starters 3RW55 and 3RW55 Failsafe

Object No.	Byte	Bit	Data format	Parameters	Value range [encoding]	Increment	3RW55 / 55-F ¹⁾ [D ²⁾]
2344	60	0	Bit4	Pump cleaning - mode	[0 ... 1] [0] Deactivated [1] Manual	-	r/w [0]
2345	60	4	Bit4	Pump cleaning - start/stop parameters	[1 ... 5] [1] Parameter set 1 [2] Parameter set 2 [3] Parameter set 3 [5] Operating parameters	-	r/w [5]
2346	61	0	Unsigned8	Pump cleaning - time	1 ... 30 s [1 ... 30]	1 s	r/w [20]
2347	62	0	Unsigned8	Pump cleaning - cycles	1 ... 10 [1 ... 10]	1	r/w [3]
2353	80	0	Bit4	Sensorless motor stand-still detection	[0 ... 1] [0] Disable [1] Enable	-	r/w ^{3), 4)} [1]
-	81 ... 199	-	-	Reserved	-	-	-

¹⁾ Supported by SIRIUS soft starters 3RW55 and 3RW55 Failsafe

²⁾ Default encoding

³⁾ 3RW55 soft starter from firmware version V2.0

⁴⁾ Not supported by SIRIUS 3RW55 Failsafe soft starter

A.4.5.11 Data set 135: Parameter cyclic process image

Read (r) and write (w) access is possible to the parameter cyclic process image. Data set 135 is not supported by the 3RW50 and 3RW52 soft starters.

Byte	Data format	Meaning	3RW55 / 55-F ¹⁾
0	Unsigned8	Coordination [0x21] Write via acyclic bus channel – user program	x
2	Unsigned8	Slot number	x
4	Unsigned16	Length of data structure	x
6	Unsigned16	Start position	x

¹⁾ Supported by SIRIUS soft starters 3RW55 and 3RW55 Failsafe

Object No.	Byte	Bit	Data format	Parameters	Value range [encoding]	3RW55 / 55-F ¹⁾ [D ²⁾]
2002	16	0	Unsigned16	Measured value 1	[20 000 ... 20 006] [20 000] Phase current I L1 (rms) [20 001] Phase current I L2 (rms) [20 002] Phase current I L3 (rms) [20 003] Phase current average (rms) [20 004] Active energy import total [20 005] Active power [20 006] Power factor L1...3	r/w [20 000]
2003	18	0	Unsigned16	Measured value 2	(see Measured value 1)	r/w [20 001]
2004	20	0	Unsigned16	Measured value 3	(see Measured value 1)	r/w [20 002]
-	22 ... 23	-	-	Reserved	-	-

1) Supported by SIRIUS soft starters 3RW55 and 3RW55 Failsafe

2) Default encoding

A.4.6 3RW5 HMI High Feature (slot 3)

A.4.6.1 Data set 92: HMI diagnostics (slot 3)

Only read (r) access to the HMI diagnostics is possible.

Byte	Data format	Meaning	3RW		
			50 ¹⁾	52 ²⁾	55 / 55-F ³⁾
0	Unsigned8	Coordination	x	x	x
2	Unsigned8	Slot number	x	x	x
4	Unsigned16	Length of data structure	x	x	x
6	Unsigned16	Start position	x	x	x

1) Supported by SIRIUS 3RW50 soft starter

2) Supported by SIRIUS 3RW52 soft starter

3) Supported by SIRIUS soft starter 3RW55 and 3RW55 Failsafe

Byte	Bit	Data format	HMI diagnostics	3RW5 HMI HF ¹⁾
10	0	Bool	HMI Fault	r
	1	Bool	Run	r
11	0	Bool	Factory settings restored	r

Byte	Bit	Data format	HMI diagnostics	3RW5 HMI HF ¹⁾
12	0	Bool	FW update rejected	r
	1	Bool	FW update active	r
	2	Bool	FW update successful	r
	3	Bool	FWUpdateUnsuccessful	r
	4	Bool	FWUpdateInvalidSignature	r
13	0	Bool	Self-test active	r
	2	Bool	Error during self-test	r
14	0	Bool	Device assigned	r
	4	Bool	HMI not configured	r
18	0	Bool	Micro SD card active	r
	1	Bool	Micro SD card access error	r
	2	Bool	Micro SD card plugged	r
	3	Bool	Micro SD card write-protected	r
19	0	Bool	LIActive	r
20	0	Bool	InvalidParameter	r
22	3	Bool	User account set up	r
23	0	Bool	No device answer	r
24	0	Bool	Write Error	r
25	0	Bool	Loading language rejected ²⁾	r
	1	Bool	Loading language active ²⁾	r
	2	Bool	Loading language successful ²⁾	r
	3	Bool	Loading language unsuccessful ²⁾	r
	4	Bool	Invalid signature 'Load additional language' ²⁾	r
26	0	Unsigned16	Faulty parameter number ³⁾	r

¹⁾ Supported by 3RW5 HMI High Feature

²⁾ 3RW5 HMI High Feature firmware version V3.0 or higher

³⁾ 3RW5 HMI High Feature firmware version V2.0 or higher

A.4.6.2 Data set 131: HMI parameter (slot 3)

Read (r) and write (w) access to the HMI parameters is possible.

Byte	Data format	Meaning	3RW		
			50 ¹⁾	52 ²⁾	55 / 55-F ³⁾
0	Unsigned8	Coordination [0x21] Write via acyclic bus channel – user program	x	x	x
2	Unsigned8	Slot number	x	x	x

Byte	Data format	Meaning	3RW		
			50 ¹⁾	52 ²⁾	55 / 55-F ³⁾
4	Unsigned16	Length of data structure	x	x	x
6	Unsigned16	Start position	x	x	x

¹⁾ Supported by SIRIUS 3RW50 soft starter

²⁾ Supported by SIRIUS 3RW52 soft starter

³⁾ Supported by SIRIUS soft starter 3RW55 and 3RW55 Failsafe

Object No.	Byte	Bit	Data format	Parameters	Value range [encoding]	Increment	3RW5 HMI HF ¹⁾	
							50 / 52 [D ²⁾]	55 / 55-F [D ³⁾]
72	12	0	Unsigned16	Measured value 1	[501 ... 65 534] [501] Remaining motor cooling time [502] Motor temperature rise [503] Asymmetry ⁴⁾ [504] Phase current I L1 (%) [505] Phase current I L2 (%) [506] Phase current I L3 (%) [508] Output frequency ⁴⁾ [509] Line frequency ⁴⁾ [510] Line voltage U L1-L2 (rms) ⁴⁾ [511] Line voltage U L2-L3 (rms) ⁴⁾ [512] Line voltage U L3-L1 (rms) ⁴⁾ [513] Phase current I L1 (rms) [514] Phase current I L2 (rms) [515] Phase current I L3 (rms) [518] Switching element heating [519] Remaining switching element cooling time [520] Remaining time for motor overload protection ⁴⁾ [521] Active power ⁴⁾ [523] Power factor L1...3 ⁴⁾ [526] Remaining switching frequency monit. time ⁴⁾ [528] Phase current average (%) [530] Phase current average (rms) [531] Phase current max (rms) ⁴⁾ [65 534] No operation	-	r/w [528]	r/w [528]
	14	0	Unsigned16	Measured value 2	(see Measured value 1)	-	r/w [530]	r/w [530]
	16	0	Unsigned16	Measured value 3	(see Measured value 1)	-	r/w [513]	r/w [510]
	18	0	Unsigned16	Measured value 4	(see Measured value 1)	-	r/w [514]	r/w [521]
	20	0	Unsigned16	Measured value 5	(see Measured value 1)	-	r/w [515]	r/w [523]

Object No.	Byte	Bit	Data format	Parameters	Value range [encoding]	Increment	3RW5 HMI HF ¹⁾	
							50 / 52 [D ²⁾]	55 / 55-F [D ³⁾]
73	32	0	Unsigned16	F1	[172] Local/Remote	-	r [172]	r [172]
	34	0	Unsigned16	F2	[171] Reset	-	r [171]	r [171]
	36	0	Unsigned16	F3	[171 ... 65 534] [171] Reset [172] Local/Remote [173] Emergency start [174] Creep speed [175] Save parameter settings to micro SD card [176] Save logbooks to micro SD card [177] Emergency run [178] Quick-stop [179] Alternative stopping mode [180] Select parameter set [181] Activate pump cleaning [182] Motor CW [183] Motor CW - creep speed [184] Motor CCW [185] Motor CCW - creep speed [65 534] No function	-	-	r/w [65 534]
	38	0	Unsigned16	F4	(see F3)	-	-	r/w [65 534]
	40	0	Unsigned16	F5	(see F3)	-	-	r/w [65 534]
	42	0	Unsigned16	F6	(see F3)	-	-	r/w [65 534]
	44	0	Unsigned16	F7	(see F3)	-	-	r/w [65 534]
	46	0	Unsigned16	F8	(see F3)	-	-	r/w [65 534]
	48	0	Unsigned16	F9	(see F3)	-	-	r/w [65 534]

Object No.	Byte	Bit	Data format	Parameters	Value range [encoding]	Increment	3RW5 HMI HF ¹⁾	
							50 / 52 [D ²⁾]	55 / 55-F [D ³⁾]
-	82	0	Unsigned16	Start button Functions 1	[1 ... 65 534] [1] Motor CW [2] Motor CCW [3] Motor CW - creep speed [4] Motor CCW - creep speed [65 534] No start type selected	-	r [1]	r/w [1]
	84	0	Unsigned16	Start button Functions 2	(see Start button Functions 1)	-	-	r/w [65 534]
	86	0	Unsigned16	Start button Functions 3	(see Start button Functions 1)	-	-	r/w [65 534]
	88	0	Unsigned16	Start button Functions 4	(see Start button Functions 1)	-	-	r/w [65 534]
78	100	0	Unsigned8	Language	[0 ... 254] [0] English [1] German [2] French [3] Spanish [4] Italian [5] Chinese [6] Portuguese [254] Additional language ⁵⁾	-	r/w [0]	r/w [0]
83	106	0	Unsigned16	Timer Lighting Dark	1 ... 60 min [1 ... 60] [0] Deactivated	1 min	r/w [5]	r/w [5]
84	108	0	Unsigned8	Date format	[1 ... 3] [1] MMDDYY [2] DDMMYY [3] YYMMDD	-	r/w [1]	r/w [1]
85	109	2	Unsigned8	Time format	[1 ... 2] [1] Time format: 12h [2] Time format: 24h	-	r/w [1]	r/w [1]
86	110	0	Unsigned8	Messages to show	-	-	-	-
		1	Bool	Error	[0 ... 1] [0] Disable [1] Enable	-	r/w [1]	r/w [1]
		3	Bool	Warnings	[0 ... 1] [0] Disable [1] Enable	-	r/w [1]	r/w [1]
94	112	0	Bool	Display time	[0 ... 1] [0] Disable [1] Enable	-	r/w [0]	r/w [0]

Object No.	Byte	Bit	Data format	Parameters	Value range [encoding]	Increment	3RW5 HMI HF ¹⁾	
							50 / 52 [D ²⁾]	55 / 55-F [D ³⁾]
89	113	0	Bit2	Trace Mode ⁶⁾	[0 ... 2]	-	r [0]	r [0]
					[0] Do not save automatically [1] Save automatically [2] Save automatically and delete older traces			
90	114	0	Unsigned16	Maximum Number Traces ⁶⁾	1 ... 255 [1 ... 255]	1	r [1]	r [1]
87	116	0	Bool	Do Control After Log Off	[0 ... 1]	-	r/w [0]	r/w [0]
					[0] Stop motor and give back control [1] Continue with motor control			
-	117 ... 119	-	-	Reserved	-	-	-	-

- 1) Supported by 3RW5 HMI High Feature
2) Default encoding for 3RW5 HMI High Feature on the SIRIUS 3RW50 or 3RW52 soft starter
3) Default encoding for 3RW5 HMI High Feature on the SIRIUS 3RW55 or 3RW55 Failsafe soft starter
4) Not supported by SIRIUS 3RW50 and 3RW52 soft starter
5) 3RW5 HMI High Feature firmware version V3.0 or higher
6) 3RW5 HMI High Feature firmware version V3.1 or higher

A.4.7 I&M data

The 3RW5 PROFINET communication modules, the 3RW5 soft starters and the 3RW5 HMI High Feature support the following I&M data:

I&M data			3RW5		
Number	Name	Comment	PN ¹⁾	50 / 52 / 55 / 55-F ²⁾	HMI HF ³⁾
I&M0	Device identification	This is stored in the device on initialization.	x	x	x
I&M1	Equipment identifier	These are entered in the engineering system.	-	x	-
I&M2	Installation		-	x	-
I&M3	Description		-	x	-

- 1) Supported by SIRIUS 3RW5 PROFINET communication module
2) Supported by SIRIUS 3RW50, 3RW52, 3RW55 und 3RW55 Failsafe soft starters
3) Supported by 3RW5 HMI High Feature

Note**I&M data**

I&M0 data is assigned for all of the devices (3RW5 communication module, 3RW5 soft starter and 3RW5 HMI High Feature) and can be read out. Only the proxy for the "Station" (Slot 0) has adjustable and readable I&M1, I&M2 and I&M3 data. The "Station" comprises the following devices:

- 3RW5 communication module (slot 1)
- 3RW5 soft starter (slot 2)
- 3RW5 HMI High Feature (slot 3)

Note**Access to I&M data**

With PROFINET, the I&M data can also be accessed via data sets 0xAFF0 to 0xAFF3 (PNO).

A.4.7.1 Data set 231: I&M0 - Device identification

Only read access (r) is possible to the device identification (I&M0).

Byte	Data length	Content
0	10 byte	I&M header

Byte	Data length	Content	Meaning	Access
10	2 bytes	MANUFACTURER_ID	42 = Manufacturer ID SIEMENS	r
12	20 bytes	ORDER_ID	Article number	r
32	16 bytes	SERIAL_NUMBER	Serial number	r
48	2 bytes	HARDWARE_REVISION	Product version	r
50	4 bytes	SOFTWARE_REVISION	Firmware version	r
54	2 bytes	REV_COUNTER	Provides information about the parameterized changes on the device.	r
56	2 bytes	PROFILE_ID	Gives information about the profile supported by the device and the line of products belonging to the device.	r
58	2 bytes	PROFILE_SPECIFIC_TYPE	Used to supplement the object "PROFILE_ID" and contains further information on the profile.	r
60	2 bytes	IM_VERSION	Provides information about the version of the identification data (0x0101 = Version 1.1).	r
62	2 bytes	IM_SUPPORTED	Provides information about the available identification data (Index 2 to 4).	r

A.4.7.2 Data set 232: I&M1 - Equipment identifier

Read (r) and write (w) access to the (I&M1) equipment identifier is possible.

Note

Validity of the write access

The 3RW5 soft starter checks the validity of the write access. The ASCII characters 0x20 - 0x7E are accepted. If the 3RW5 soft starter does not accept the data of the write access, the 3RW5 communication module responds with a negative acknowledgment.

Byte	Data format	Meaning
0 ... 9	-	I&M header
0	Unsigned8	Coordination [0x21] Write via acyclic bus channel – user program
1 ... 9	-	Transfer the value 0x00 for writing the data set for bytes 1 ... 9.

Byte	Data length	Content	Meaning	Access
10	32 bytes	TAG_FUNCTION	Plant identifier Fill unused positions with blanks (0x20).	r/w
42	22 bytes	TAG_LOCATION	Location designation Fill unused positions with blanks (0x20).	r/w

A.4.7.3 Data set 233: I&M2 - Installation

Read (r) and write (w) access to the (I&M2) installation is possible.

Note

Validity of the write access

The 3RW5 soft starter checks the validity of the write access. The accepted display formats are "YYYY-MM-DD" (year-month-day) and "YYYY-MM-DD HH:MM" (year-month-day hour:minute). If the 3RW5 soft starter does not accept the data of the write access, the 3RW5 communication module responds with a negative acknowledgment.

- YYYY (year): 0001 - 9999
- MM (month): 01 - 12
- DD (day): 01 - 31 (depending on month)
- HH (hour): 00 - 23
- MM (minute): 00 - 59

Byte	Data format	Meaning
0 ... 9	-	I&M header
0	Unsigned8	Coordination [0x21] Write via acyclic bus channel – user program
1 ... 9	-	Transfer the value 0x00 for writing the data set for bytes 1 ... 9.

Byte	Data length	Content	Meaning	Access
10	16 bytes	INSTALLATION_DATE	Installation date Fill unused positions with blanks (0x20).	r/w
26	38 bytes	RESERVED	-	r

A.4.7.4 Data set 234: I&M3 - Description

Read (r) and write (w) access to the (I&M3) description is possible.

Note

Validity of the write access

The 3RW5 soft starter checks the validity of the write access. The ASCII characters 0x20 - 0x7E are accepted. If the 3RW5 soft starter does not accept the data of the write access, the 3RW5 communication module responds with a negative acknowledgment.

Byte	Data format	Meaning
0 ... 9	-	I&M header
0	Unsigned8	Coordination [0x21] Write via acyclic bus channel – user program
1 ... 9	-	Transfer the value 0x00 for writing the data set for bytes 1 ... 9.

Byte	Data length	Content	Meaning	Access
10	54 bytes	DESCRIPTOR	Individual additional information and explanations. Fill unused positions with blanks (0x20). If the DESCRIPTOR is described, the content is shown on the 3RW5 HMI High Feature in the upper left corner of the display. If the text is too long for the display, it will be truncated at the end.	r/w

Glossary

Configuration

Configuration is the systematic arrangement, setting, and networking of the individual 3RW5 soft starters within the device or network view.

Configuring

This section refers to the configuration and parameterization of 3RW5 soft starters.

Device name

Before an IO device can be addressed by an IO controller, the IO device must have a device name because the IP address is permanently assigned to the device name.

In the case of PROFINET, this method was chosen because names are easier to handle than complex IP addresses. Assignment of a device name for a specific IO device can be compared to setting the PROFIBUS address on a DP slave. An IO device does not have a device name when it is delivered. It can only be addressed by an IO controller once a device name has been assigned to it, e.g. for transmission of the configuration data during startup or for exchanging useful data in cyclic operation.

Diagnostics

Data that is transferred from the 3RW5 soft starter and indicates the current operating state.

DR (Dynamic Reconfiguration)

Changes during operation (Dynamic Reconfiguration) refer to the property, based on redundant communication connections, of being able to make changes to the system without having to restart devices or controllers and without affecting communication in the network.

Fieldbus

Industrial communication system that connects a large number of field devices such as probes (sensors), final controlling elements, and drives (actuators) to a control device.

GSDML

The GSDML language is defined by the GSDML scheme. A GSDML scheme contains validity rules that allow you to check the syntax of a GSD file, for example. Manufacturers of IO devices can obtain GSDML schemes (in the form of scheme files) from PROFIBUS International.

GSDML file

The properties of a PROFINET device are described in a GSD (General Station Description or device master data) file. You can link a PROFINET device into an automation system via the GSD file. The GSD file contains all information required for configuration.

In the case of PROFINET IO, the GSD file is in XML format and will therefore be referred to as a GSDML file in this documentation. The structure of the GSDML file conforms to ISO 15734, the worldwide standard for device descriptions.

H-Sync forwarding

H-Sync forwarding allows a PROFINET device with MRP to forward synchronization data (synchronization frames) of a redundant S7-1500R system only within the PROFINET ring.

I&M data

Identification and maintenance data.

Information stored in a module that helps you to check the plant configuration, to locate hardware modifications in a plant, or to remedy faults in a plant. I&M data enable modules to be uniquely identified online.

IP address

To enable a PROFINET device to be addressed as a node on Industrial Ethernet, the PROFINET device requires an IP address that is unique within the network. The IP address is made up of 4 decimal numbers with a range of values from 0 through 255. The decimal numbers are separated by a decimal point.

The IP address is made up as follows:

- Address of the (sub)net
- Address of the station (host or network node)

IRT (Isochronous Real-Time Communication)

Synchronized transmission method for the cyclic exchange of IRT data between PROFINET devices. A reserved bandwidth within the send clock is available for the IRT data. The reserved bandwidth guarantees that the IRT data can be transmitted unaffected by other, high network loads (e.g. TCP/IP communication or additional real-time communication) in reserved, time-synchronized intervals.

LLDP

LLDP (Link Layer Discovery Protocol) is a protocol that allows the next neighbor to be detected. LLDP enables a device to send information about itself and receive information from neighboring devices.

MAC address

The MAC address is a globally unique device identification and is assigned to each PROFINET device during production. The PROFINET device can be accessed via the MAC address via LAN. The MAC address is 6 bytes long and has the following structure:

- 3 bytes for the manufacturer ID
- 3 bytes for the device identifier (consecutive number)

The 3RW5 PROFINET communication modules have 2 or 3 MAC addresses:

- 3RW5 PROFINET Standard communication module: 1 MAC address for the PROFINET interface, 1 port MAC address
- 3RW5 PROFINET High Feature communication module: 1 MAC address for the PROFINET interface, 2 Port MAC addresses

The MAC address for the PROFINET interface X1 is legibly lasered onto the front of the device, e.g.: 08-00-06-6B-80-C0. In an automation system, this MAC address for the 3RW5 communication module is displayed in STEP 7 (TIA Portal) under "Accessible devices".

The port MAC addresses (Port X1 P1 and Port X1 P2) are required for LLDP, for example.

Media redundancy

The 3RW5 PROFINET High Feature communication module supports media redundancy according to the Media Redundancy Protocol (MRP). This function is configured using the engineering tool of the automation system, e.g. with STEP 7 HW Config.

With the Media Redundancy Protocol (MRP) you can implement redundant PROFINET communication via a ring topology without additional Ethernet switches.

Messages

Data that is transferred from the 3RW5 soft starter and indicates the current operating state.

MRPD (Media Redundancy with Planned Duplication)

If one device or line in the ring fails, all other devices continue to be supplied with IO data without interruption. MRPD is based on IRT and MRP. In order to have as few interruptions as possible in the event of a failure, the PROFINET devices participating in the ring send their data in both directions. Since the devices receive this data at both ring ports, the ring reconfiguration time is eliminated.

NTP (time synchronization)

The Network Time Protocol (NTP) is a standard for synchronizing clocks in computer systems over packet-based communication networks. NTP was specially developed to provide reliable time data on networks with a variable package runtime.

OPC

In the past, OPC was a collection of software interfaces for data exchange between PC applications and process devices. These software interfaces were defined according to the rules of Microsoft COM (Component Object Model) and can therefore be easily integrated on Microsoft operating systems. COM or DCOM (Distributed COM) provides the functionality of interprocess communication and organizes information exchange between applications, including across computer boundaries (DCOM).

OPC client

An OPC client (COM client) can therefore exchange information with an OPC server (COM server) using mechanisms of the Microsoft operating system.

OPC server

The OPC server provides process information of a device at its interface. The OPC client connects to the server and can access the data offered.

OPC UA

To resolve the restrictions in practice and to meet the additional requirements, the OPC Foundation has defined a new platform with the name OPC Unified Architecture, which provides a standardized basis for exchanging information between components and systems. OPC UA will also be available as an IEC 62541 standard and will thus form the basis for other international standards.

Parameterization

Parameterization is the definition of parameters using the parameterization software.

PII/PIQ

Process image input/process image output

PROFenergy

PROFenergy is a profile for energy management in production plants and is based on the PROFINET communication protocol. PROFenergy controls the power consumption of automation equipment used in production via a PROFINET network.

PROFINET

PROFINET (Process Field Network) is the open Industrial Ethernet standard of Profibus & Profinet International (PI) for automation.

Within the framework of Totally Integrated Automation (TIA), PROFINET is a consistent continuation of:

- PROFIBUS DP, the established fieldbus
- Industrial Ethernet, the communication bus for the cell level

Experiences from both systems have been and are being integrated in PROFINET.

PROFINET IO controller

Device via which the connected IO devices are addressed. The IO controller exchanges input and output signals with assigned field devices. The IO controller is often the controller on which the automation program runs.

PROFINET IO device

Distributed field device assigned to one of the IO controllers.

Reading data

Data are transferred from the 3RW5 soft starter.

In STEP 7, you can read data sets by calling the SFB 52 "RD_REC".

Receive data

Data that are transferred to the 3RW5 soft starter.

Simple Network Management Protocol (SNMP)

Network protocol for monitoring and controlling network elements (e.g. switches).

SIRIUS Soft Starter ES (TIA Portal)

SIRIUS Soft Starter ES (TIA Portal) is the central software for commissioning, operating, and diagnostics of the SIRIUS 3RW5 soft starter series.

STEP 7

The basic STEP 7 software is the standard tool for the SIMATIC S7, SIMATIC C7 and SIMATIC WinAC automation systems.

System redundancy S2

The PROFINET system redundancy S2 enables the setup of system-redundant plants. The goal of high availability automation systems is to reduce production downtime.

Writing data

Data are transferred to the 3RW5 soft starter.

In STEP 7, you can read data sets by calling SFB 53 "WR_REC".

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