

Industrial Controls

Soft starters and solid-state switching devices SIRIUS 3RW5 PROFIBUS communication module

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.

Die 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://support.industry.siemens.com/My/ww/en/requests)
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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>)
- Manuals for the 3RW5 soft starter (<https://support.industry.siemens.com/cs/ww/en/ps/16212/man>)
- Equipment Manual for the 3RW5 PROFIBUS communication module (<https://support.industry.siemens.com/cs/ww/en/view/109753753>)
- Equipment Manual for the 3RW5 PROFINET communication modules (<https://support.industry.siemens.com/cs/ww/en/view/109753754>)
- 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 NET PROFIBUS Network Manual (<https://support.industry.siemens.com/cs/ww/en/view/35222591>)
- 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.profibus.com>)
- 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 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:

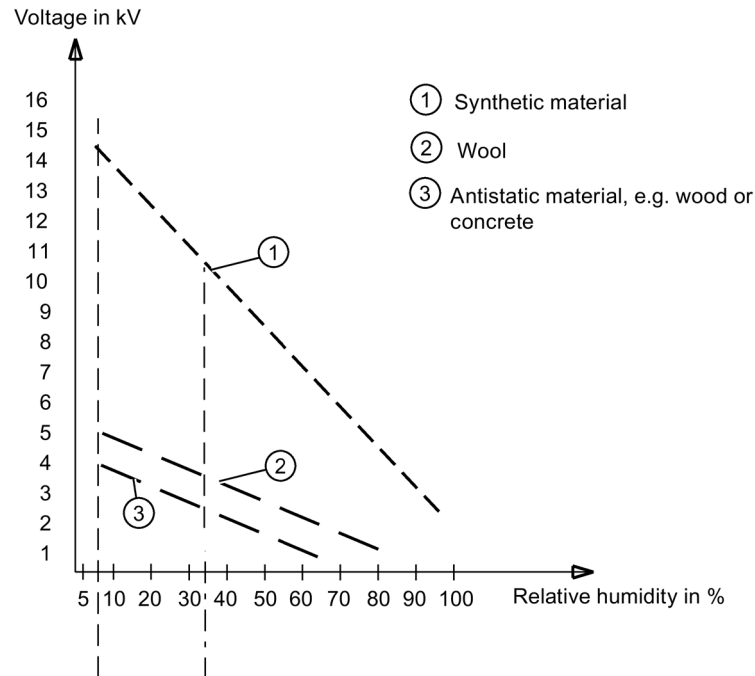


NOTICE
Electrostatic discharge ESD devices can be destroyed by voltages well below the threshold of human perception. These static voltages develop when you touch a component or electrical connection of a device without having drained the static charges present on your body. The damage caused to a device 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.

2.3 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: VDI guidelines (<http://www.vdi.de/43460.0.html>)

2.4 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 PROFIBUS communication module

The 3RW5 PROFIBUS 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 PROFIBUS 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 PROFIBUS communication module, firmware version V1.0.1 or higher

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 GSD file
- Parameterization software (optional), e.g. SIRIUS Soft Starter ES (TIA Portal) (Page 39)

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 39)

Note

Full functional scope

In order to be able to use 3RW5 soft starters without any difficulties and with their full range of functions, ensure that you have the latest firmware and software updates:

- 3RW5 soft starter, 3RW5 communication module, 3RW5 HMI High Feature
- HSP, GSD 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>).

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:

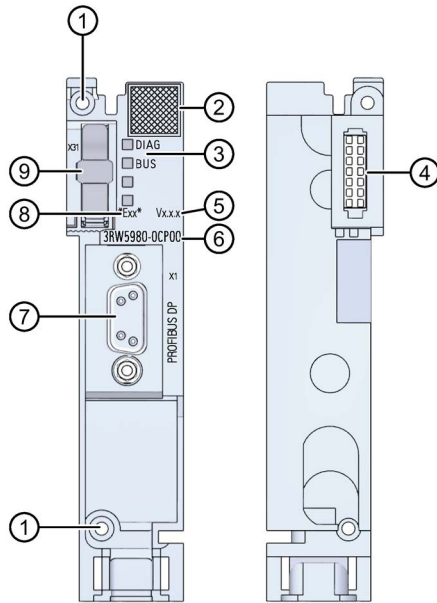
- Planning and configuring systems
- Installation
- Commissioning
- Service and maintenance

3.1 History

Release number	New features
03/2018	• Initial release
02/2019	• Revision of the manual
02/2020	• Revision of the manual • Supplementing the contents for the 3RW50 and 3RW55 Failsafe soft starters

3.2 Hardware configuration

3RW5 PROFIBUS communication module with article number 3RW5980-0CP00:



- 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 Article number
- ⑦ Fieldbus connection (9-pin SUB-D socket)
- ⑧ Product version
- ⑨ Plug-in connection to the 3RW5 soft starter with cover cap

3.3 Functions of the 3RW5 PROFIBUS communication module

PROFIBUS DP

PROFIBUS DP is an open bus system in accordance with the standard IEC 61784-1:2002 Ed1 CP 3/1 with the transmission protocol "DP" (distributed peripherals or I/Os). The "DP" is a high-speed protocol for cyclic data exchange between the controller and the distributed I/O systems.

Physically, PROFIBUS DP is an electrical network based on a shielded twisted-pair cable.

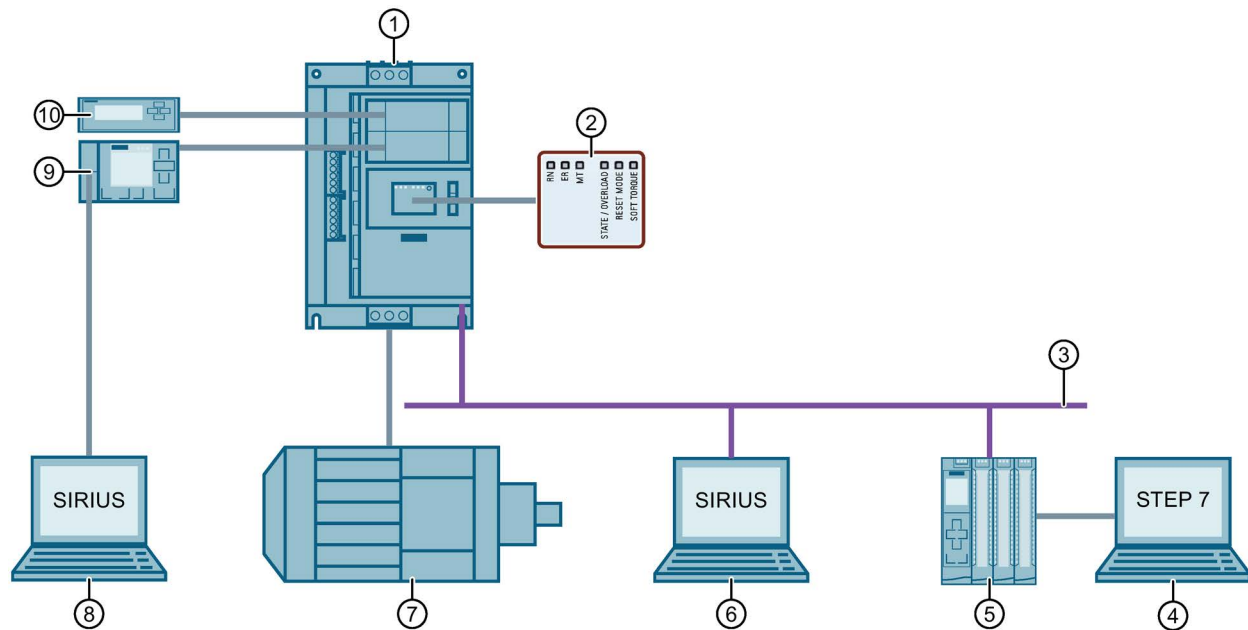
PROFIBUS DP has the following properties:

- Hierarchical master-slave principle
- Transfer rate up to max. 12 MBit/s

Functionality of the 3RW5 communication module

- DPV0 slave
- DPV1 slave
- S7V1 slave
- Operation in redundant controllers behind a Y-Link
- Diagnostic interrupt
- Removal and insertion interrupt (3RW5 HMI High Feature)

3.4 Access options for the 3RW5 soft starter



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

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

2) Dependent on the 3RW5 soft starter

3) Station address is adjustable.

Possible number of applications per access path

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

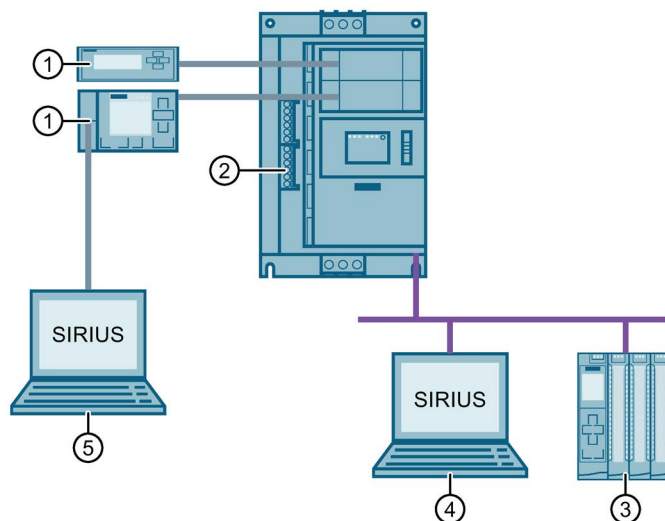
Access path	Number of applications
Programmable logic controller, e.g. SIMATIC S7-1500	1
SIRIUS Soft Starter ES (TIA Portal) Premium / Professional	4

3.5 Operating modes and master control function

3.5.1 Operating modes

Control source and master 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 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: PLC, operating mode: Automatic
- ④ Control source: SIRIUS Soft Starter ES (TIA Portal) Premium / Professional, operating mode: Manual bus mode
- ⑤ 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 - input controlled" mode

The "Automatic - input controlled" mode is available for 3RW55 soft starter as of firmware version V2.1 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 regain master 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", master control is with the SIRIUS Soft Starter ES (TIA Portal) Premium software.

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

Operating mode		Control source	Priority
Automatic	-	PLC	Lowest
	Input controlled ¹⁾	Digital inputs ²⁾	↓
Manual bus mode	-	Connection abort ³⁾	↓
	PC controlled	SIRIUS Soft Starter ES (TIA Portal) Premium / Professional	↓
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 controlled	3RW5 HMI	↓
	PC controlled	SIRIUS Soft Starter ES (TIA Portal)	Highest

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

²⁾ Not possible for 3RW50, 3RW52, 3RW55 soft starters with firmware version earlier than V2.1 and 3RW55 Failsafe. For the 3RW55 soft starter as of firmware version V2.1 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 regain master control at any time.

³⁾ Explanation in text below.

⁴⁾ Possible for 3RW50, 3RW52, 3RW55 and 3RW55 Failsafe soft starters. For 3RW55 soft starters as of firmware version V2.1, 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 starters behave 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 35).
- 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 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 45). 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 35).
- 3RW55 and 3RW55 Failsafe soft starters: The 3RW55 soft starter behaves in accordance with the parameter "Response to CPU/master stop" (Page 70).

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 for 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.

Requirements

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 the "Automatic" mode after the 3RW5 communication module has been installed in the soft starter 3RW52 with 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 35).

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 > 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 119), 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 > Master Control > Release Control"

Withdrawal of master control by other control sources

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

Operating mode "Manual - bus"

Fetching master control

SIRIUS Soft Starter ES (TIA Portal) Premium / Professional actively fetches master control from the "Automatic" mode or "Automatic - 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 master control from "Automatic - input controlled" mode

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

- 3RW55 soft starter from firmware version V2.1

This operating mode is not possible for the 3RW55 Failsafe soft starters with firmware version V1.0.

Relinquishing master 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 > Master Control > Release Control"

Withdrawal of master control by other control sources

Master control is withdrawn from the operating mode "manual - bus" by the operating mode "manual - 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 119).
- 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 - input controlled" modes

Fetching master 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 119).
- 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 master control.

Relinquishing master control

"Automatic" mode receives 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 119).
- 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 master 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 master control from "Automatic - input controlled" mode

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

- 3RW55 soft starter from firmware version V2.1

This operating mode is not possible for the 3RW55 Failsafe soft starters with firmware version V1.0.

-
- "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 master control

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

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

Relinquishing master 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 yielded 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 35) is set to "Permanent activation".

Withdrawal of master control by other control sources

In the event of a corresponding command in SIRIUS Soft Starter ES (TIA Portal) at the local interface on the 3RW5 HMI High Feature, the master control function 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 master 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"

Relinquishing master 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 > Master Control > Release Control"

3.5 Operating modes and master control function

In the following cases, the master control function is yielded 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 35) is set to "Permanent activation".

Withdrawal of master 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 102).

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 26).

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 9-pin SUB-D bus connectors (RS 485).



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. Use only one bus connector. If necessary, use bus connectors with two cable inputs.

Recommended bus connector

Article number	Description
6ES7972-0BB52-0XA0	SIMATIC DP, bus connector for PROFIBUS up to 12 Mbit/s, 90-degree angle cable outlet, insulation displacement technology Fast Connect, with PG socket 15.8 x 59 x 35.6 MM (WxHxD)
6ES7972-0BA52-0XA0	SIMATIC DP, bus connector for PROFIBUS up to 12 Mbit/s, 90-degree angle cable outlet, insulation displacement technology Fast Connect, without PG socket 15.8 x 59 x 35.6 MM (WxHxD)
6ES7972-0BB12-0XA0	SIMATIC DP, bus connector for PROFIBUS up to 12 Mbit/s, 90-degree angle cable outlet, 15.8x 64x 35.6mm (WxHxD), terminat. resist. with isolat. function, with PG socket
6ES7972-0BA12-0XA0	SIMATIC DP, bus connector for PROFIBUS up to 12 Mbit/s, 90-degree angle cable outlet, 15.8x 64x 35.6mm (WxHxD), terminat. resist. with isolat. function, without PG socket
6ES7972-0BB70-0XA0 ¹⁾	SIMATIC DP, bus connector for PROFIBUS up to 12 Mbit/s, 90-degree angle cable outlet, insulation displacement technology Fast Connect, with PG socket 15.8x 72.2x 36.4 mm (WxHxD)
6ES7972-0BA70-0XA0 ¹⁾	SIMATIC DP, bus connector for PROFIBUS up to 12 Mbit/s, 90-degree angle cable outlet, insulation displacement technology Fast Connect, without PG socket 15.8x 72.2x 36.4 mm (WxHxD)

¹⁾ Supported by SIRIUS 3RW5 PROFIBUS communication module, product version E02 or higher

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

SIRIUS Soft Starter ES (TIA Portal) can be downloaded on the 3RW5 topic page (<https://support.industry.siemens.com/cs/ww/en/view/109747404>) or via the following link (<https://support.industry.siemens.com/cs/ww/en/ps/24231/dl>).

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

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
Parameter setting	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
Parameter setting	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
Teleservice via MPI	-	x
Routing	-	x
Bulk engineering (group function)	-	x

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

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 42).
2. Mount the 3RW5 communication module (Page 44).

Result

You have mounted the 3RW5 communication module in the 3RW5 soft starter, which you can connect to the fieldbus (Page 56) 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.

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

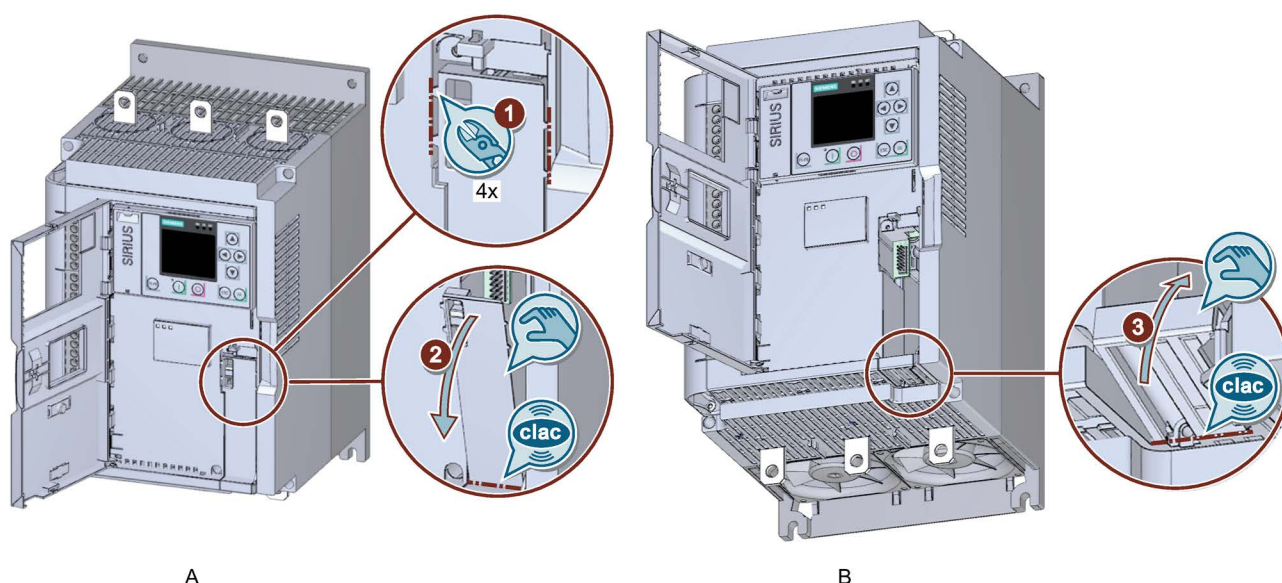


Illustration similar

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 44).

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 42)
- Screwdriver PH1

Note

A magnetic screwdriver simplifies assembly.

Procedure

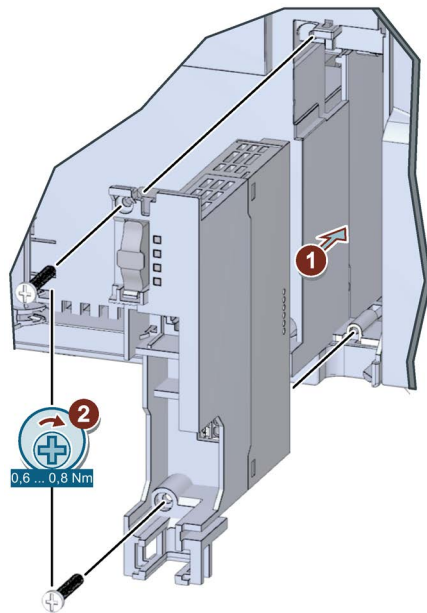


Illustration similar

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 56) 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 58)
- 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.

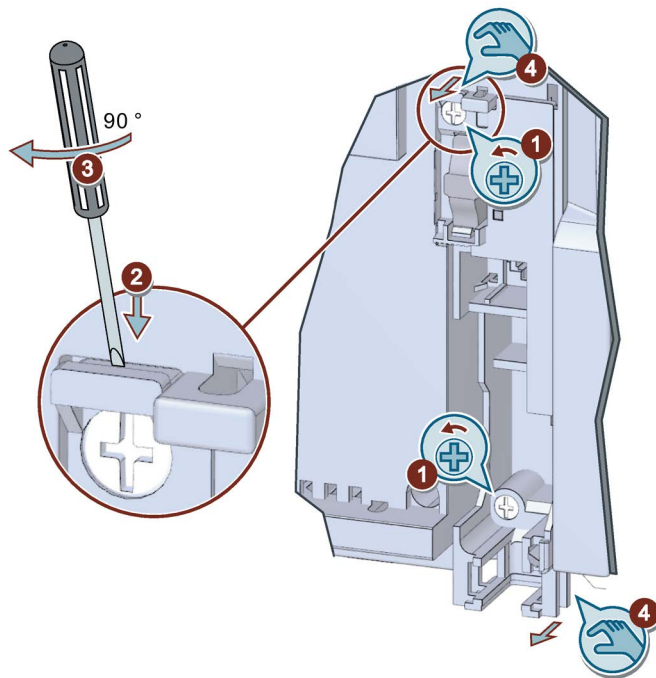


Illustration similar

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.
- 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 114). 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 40)

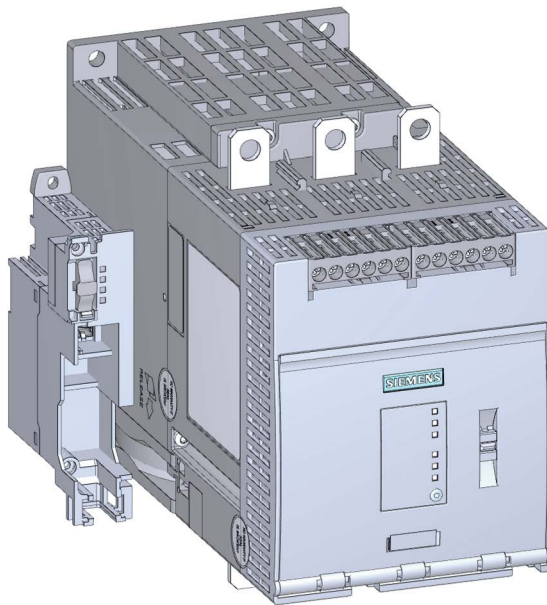


Illustration similar

Procedure

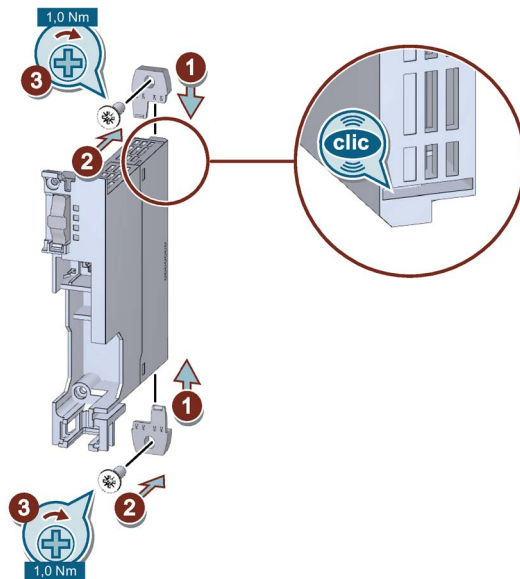


Illustration similar

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 51) and on the 3RW5 communication module (Page 52) and connect the 3RW50 soft starter to the fieldbus via the 3RW5 communication module (Page 56).

4.4 Removing the 3RW5 communication module from a level surface

Requirements

- 3RW50 soft starter
- Removed bus connector (Page 58)
- Removed COM connecting cable (Page 54)
- Screwdriver (depending on the drive of the screws)

Procedure

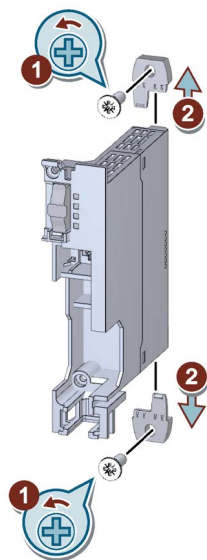


Illustration similar

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

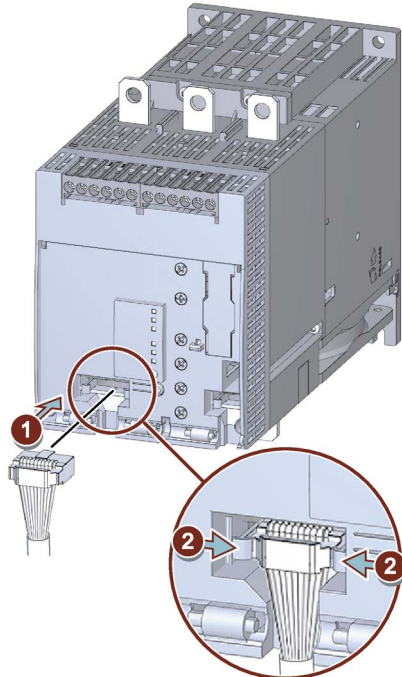


Illustration similar

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 52).

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

Requirements

- 3RW5 communication module mounted on a level surface (Page 47)
- 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 51)

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.

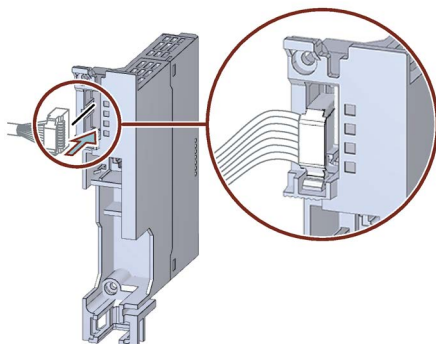


Illustration similar

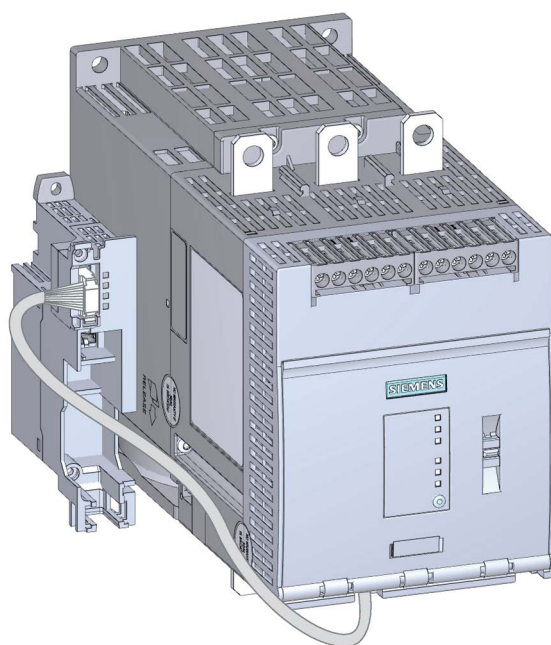


Illustration similar

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 56).

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

Requirements

- 3RW5 communication module mounted on a level surface (Page 47)
- Removed bus connector (fieldbus) (Page 58)
- 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

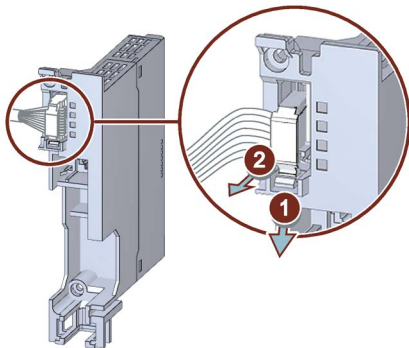


Illustration similar

1. Loosen 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 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 54)

Procedure

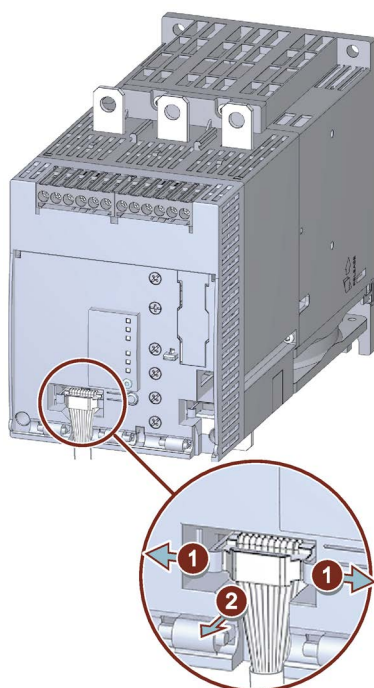


Illustration similar

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 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 communication module
- Bus connector (Page 37)
- Screwdriver (size depends on the bus connector)
- 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

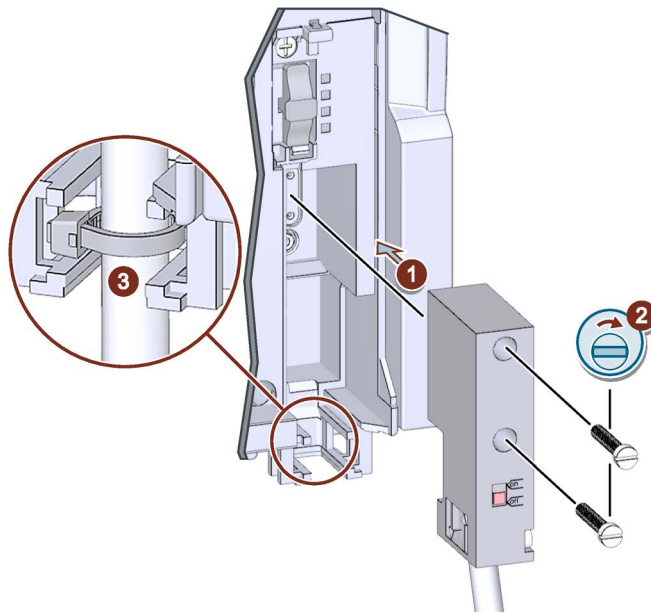


Illustration similar

1. Plug the bus connector of the cable into the socket of the 3RW5 communication module.
2. Secure the bus connector on the socket of the 3RW5 communication module with the fastening screws.
3. Secure the cable with a cable tie. With a bus connector with 2 cable inputs, secure both cables together in the relevant manner with a cable tie.

Note

Terminating resistor

Set the terminating resistor for the first and last device in the PROFIBUS DP segment.

Result

The 3RW5 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
- Screwdriver (size depends on the bus connector)

Procedure

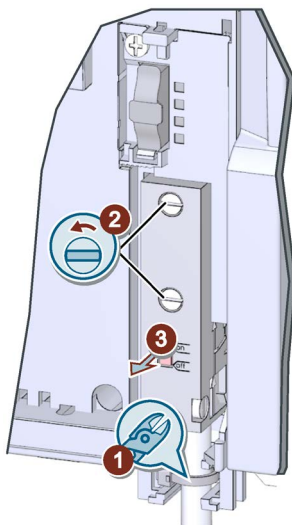


Illustration similar

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. Remove the fastening screws from the bus connector.
3. Pull the bus connector of the cable out of the socket of the 3RW5 communication module.

Result

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

Configuring

6.1 Configuring the 3RW5 Soft Starter in the PROFIBUS DP system

Requirements

- Mounted 3RW5 PROFIBUS 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.
- PROFIBUS DP system
 - Class 1 DP master (programmable logic controller, e.g. SIMATIC S7-1500)
 - Class 2 DP master (PC or programming device)
 - DP slave (3RW5 PROFIBUS communication module)
- Configuration software of the controller, e.g. STEP 7 with HSP or GSD file
- Parameterization software (optional), e.g. SIRIUS Soft Starter ES (TIA Portal) (Page 39)
- Fundamental knowledge in working with PROFIBUS, e.g. for the station address (Page 65)

Note

Full functional scope

In order to be able to use 3RW5 soft starters without any difficulties and with their full range of functions, ensure that you have the latest firmware and software updates:

- 3RW5 soft starter, 3RW5 communication module, 3RW5 HMI High Feature
- HSP, GSD 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>).

Procedure

1. Configure the 3RW5 soft starter in the PROFIBUS DP system.

The following procedures are possible, for example:

- Configuring 3RW5 soft starters without help from a 3RW5 HMI (Page 61)
- Configuring 3RW5 soft starters with the aid of a 3RW5 HMI (Page 63)

Note the information in chapter Configuring the 3RW5 Soft Starter (Page 61).

2. Parameterize the 3RW5 soft starter. In particular, note the information in chapter Operation on failure of the bus connection to the controller (Page 70). 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 PROFIBUS DP connection
- Configuration software of the controller on PC or programming device with PROFIBUS DP connection

Note

With the GSD file, you can set only values for parameter set 1 (PS 1) and parameters (e.g. input action) that are independent of the parameter set. For PS 2 and PS 3, the default values are used.

- User program via data sets (Page 125)

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 135). You will find the dependencies of the parameters in the Equipment Manual of the 3RW5 soft starter.

Result

The 3RW5 soft starter is linked into the PROFIBUS DP system as a DP slave and parameterized. You can program the controller and commission the 3RW5 soft starter in the PROFIBUS DP system.

6.2 Configuring the 3RW5 Soft Starter

The requirement for communication via PROFIBUS is the setting of the station address (Page 65) in the 3RW5 communication module.

Possible procedures for configuration can be found in chapters Configuring 3RW5 soft starters without help from a 3RW5 HMI (Page 61) and Configuring 3RW5 soft starters with the aid of a 3RW5 HMI (Page 63).

Note

Setting via the local interface and on the 3RW5 HMI

Setting the station address via the local interface and on the 3RW5 HMI is always possible, even if no PROFIBUS connection is available.

6.2.1 Configuring the 3RW5 Soft Starter in the PROFIBUS DP system

6.2.1.1 Configuring 3RW5 soft starters without help from a 3RW5 HMI

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 for this option.

Requirements

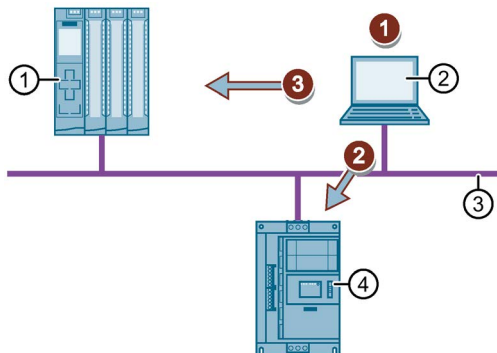
- Connection of the 3RW5 soft starter via PROFIBUS
- Switched on control supply voltage on the 3RW5 soft starter
- The configuration software of the controller supports the command for changing the station address.

Note

STEP 7 (TIA Portal)

If you use STEP 7 (TIA Portal), you require a 3RW5 HMI. Pay particular attention to chapter Configuring 3RW5 soft starters with the aid of a 3RW5 HMI (Page 63).

Procedure



- ① Programmable logic controller / DP master, e.g. SIMATIC S7-1500
- ② PC or programming device with configuration software of controller
- ③ PROFIBUS
- ④ SIRIUS 3RW5 soft starter / DP slave

① ... ③ : Steps to be taken in the procedure

1. Integrate the 3RW5 soft starter with the GSD file into the PROFIBUS DP system as the DP slave. (Page 69)

Note the information in chapter Station address (Page 65).

2. Change the station address of the DP slave in the configuration software of the controller and transfer the station address into the 3RW5 communication module.

Note the information in chapter Station address (Page 65).

3. Load the configuration into the DP master.

Result

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

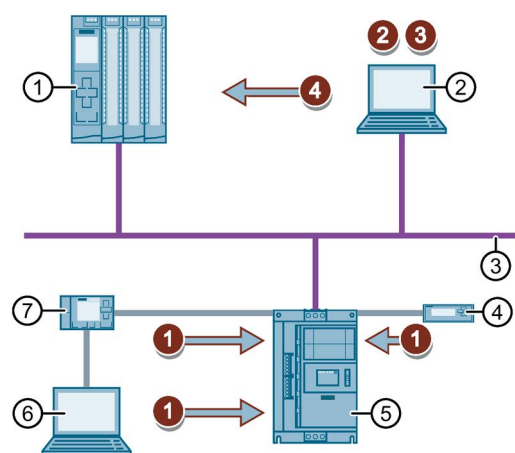
6.2.1.2 Configuring 3RW5 soft starters with the aid of a 3RW5 HMI

This section describes options for configuring the 3RW5 soft starter that requires a 3RW5 HMI.

Requirements

- Input device (3RW5 HMI, PC)
- Switched on control supply voltage on the 3RW5 soft starter

Procedure



- ① Programmable logic controller / DP master, 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 PROFIBUS
- ④ 3RW5 HMI Standard (accessories depend on 3RW5 soft starter)
- ⑤ SIRIUS 3RW5 soft starter / DP slave
- ⑥ PC with SIRIUS Soft Starter ES (TIA Portal)
- ⑦ 3RW5 HMI High Feature (accessories depend on 3RW5 soft starter)
- ① ... ④ : Steps to be taken in the procedure

1. Set a station address on the 3RW5 soft starter.

The following procedures are possible:

- Via SIRIUS Soft Starter ES (TIA Portal) over the local interface on the 3RW5 HMI High Feature

Brief overview: Window "Project Navigation" with current project under created Soft Starter > "Device configuration" > Window "Work area" > Communication module "PROFIBUS DP" > Inspector window "PROFIBUS DP" > Tab "Properties" > Tab "General" > "PROFIBUS address > Parameter > Address"

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).

- Via the 3RW5 HMI High Feature

Menu: "Parameter > Communication module > PROFIBUS DP > Station address"

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

- Via the standard 3RW5 HMI (Page 66)

Note the information in chapter Station address (Page 65).

2. Integrate the 3RW5 soft starter into the PROFIBUS DP system.

The following procedures are possible:

- Integrating 3RW5 soft starter via HSP in STEP 7 (TIA Portal) (Page 68)
- Integrating the 3RW5 Soft Starter with GSD file into the PROFIBUS DP system (Page 69)

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.

3. Enter the station address of the DP slave that is set on the 3RW5 soft starter in the configuration software of the controller.

Note the information in chapter Station address (Page 65).

4. Load the configuration into the DP master.

Result

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

6.2.1.3 Station address

Before the 3RW5 soft starter can be addressed as a DP slave by a DP master, it must have a station address. The station address of the 3RW5 soft starter must match the station address in the configuration so that the DP master can communicate.

Selection of the station address

Observe the following points when selecting the station address:

- 3RW5 soft starters are preset to station address 126 as the factory default. Set another station address during configuration.
- The station address can be set in a range from 1 to 125.

Assigning or setting station address

If you assign the station address to the 3RW5 soft starter online or set it directly on the 3RW5 soft starter, the station address is stored in the 3RW5 communication module. The 3RW5 soft starter is accessible via the assigned or set station address after a restart of the 3RW5 communication module and can be addressed by a DP master.

Note**STEP 7 (TIA Portal)**

If you use STEP 7 (TIA Portal), you require a 3RW5 HMI. Pay particular attention to chapter Configuring 3RW5 soft starters with the aid of a 3RW5 HMI (Page 63).

6.2.1.4 Setting station address via 3RW5 HMI Standard

Requirements

- 3RW50 or 3RW52 soft starter with 3RW5 HMI Standard
- Unlocked locking switch on the 3RW5 HMI Standard
- Control priority is with the 3RW5 HMI Standard
- Information in chapter Station address (Page 65).

Procedure

1. Select the menu item "PBADR".

The currently set station address is displayed. You will find more information on operating the 3RW5 HMI Standard in the Equipment Manual of the 3RW5 soft starter.

2. Hold down a navigation button until the ">" symbol appears before the currently set station address.

The ">" symbol denotes the processing status of the station address.

3. Press a navigation button.

The first position of the station address runs through the potential digits (0 ... 1).

4. Press a navigation button when the desired digit appears.

This sets the first digit of the station address. The second position of the station address runs through the potential digits (0 ... 9, depending on the first digit).

5. Press a navigation button when the desired digit appears.

This sets the second digit of the station address. The third position of the station address runs through the potential digits (0 ... 9, depending on the second digit).

6. Press a navigation button when the desired digit appears.

You have set the station address and are in the "PBADR" menu item. The ">" symbol to denote the processing state is grayed out.

Result

The set station address is saved in the 3RW5 communication module and the 3RW5 communication module restarts automatically. The 3RW5 soft starter is accessible via the set station address after the restart of the 3RW5 communication module and can be addressed by a DP master.

6.2.1.5 Baud rate

The baud rate of the PROFIBUS connection is set automatically. You can display the current baud rate via the following options.

- 3RW5 HMI High Feature

Menu: "Parameter > Communication module > PROFIBUS DP > Baud rate"

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 > "Device configuration" > Window "Work area" > Communication module "PROFIBUS DP" > Inspector window "PROFIBUS DP" > Tab "Properties" > Tab "General" > "PROFIBUS address > Parameter > Transmission speed"

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).

- 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

6.2.2 Integrating the 3RW5 Soft Starter into PROFIBUS DP 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 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. Select the required 3RW5 soft starter from the HW catalog by means of the article number.
3. Add the 3RW5 PROFIBUS communication module from the HW catalog.
4. Connect the 3RW5 PROFIBUS communication module of the 3RW5 soft starter to the PROFIBUS DP system or the controller.

Result

The 3RW5 soft starter is integrated into the PROFIBUS DP system as a DP slave in STEP 7 (TIA Portal).

You can also integrate the 3RW5 soft starter via the GSD file in STEP 7 (TIA Portal). (Page 69)

6.2.2.2 Integrating the 3RW5 Soft Starter with GSD file into the PROFIBUS DP system

Requirements

- Configuration software of the controller, e.g. STEP 7
- GSD file

The current PROFIBUS GSD file can be found on the 3RW5 topic page (<https://support.industry.siemens.com/cs/ww/en/view/109747404>).

Procedure

1. Install the GSD 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 PROFIBUS DP system.

Result

The 3RW5 soft starter is integrated into the PROFIBUS DP system as a DP slave 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 70)
- 3RW55 and 3RW55 Failsafe soft starters (Page 71)

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 35).
- 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 26).

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 45). 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 35).

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"

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).
- 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 145)

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

Parameter	Description
Parameters of CPU / master disabled	This parameter defines how the 3RW55 and 3RW55 Failsafe soft starters process the parameter values received from the controller. - 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 76)
- 3RW5 HMI High Feature

Menu: "Diagnostics > 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"

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).

- 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 78)
 - User program via data sets (Page 96)

Pay particular attention to chapter Structure of the slave diagnostics (Page 80).

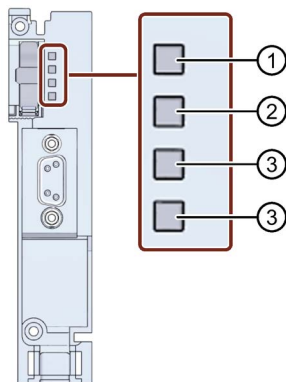
You will find faults and remedial measures for the 3RW5 communication module in chapter Errors and remedial measures on the 3RW5 communication module (Page 101).

7.1 LED display

7.1.1 Device LEDs on the 3RW5 PROFIBUS communication module

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 PROFIBUS communication module



- ① DIAG (red / green)
- ② BUS (red / green)
- ③ No function

7.1.2 Status and error displays

"DIAG" LED

State	Meaning
 Lights up green	Device exchanging data with the DP master
 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)
 Flashes green/red	The "node flash test" was activated.
 Off	No main power

"BUS" LED

State	Meaning
 Lights up green	Device performing data exchange.
 Lights up red	Bus error
 Flashes red	Configuring error
 Flashes green/red	The "node flash test" was activated.
 Off	- Device not performing data exchange (e.g. controller is in stop state). - No main power

7.2 Diagnostics via configuration software of the controller

When a certain fault occurs, the 3RW5 soft starter as an DP slave generates an interrupt and sends it to the DP master. 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. Independently of this, the diagnostic state of the DP slave is maintained in the identifier-related, device-related, and channel-related diagnostics.

After acknowledgment of the interrupt, a new interrupt is possible.

The 3RW5 communication module supports the following interrupts:

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

Note

Interrupt

If you operate the 3RW5 soft starter with a DPV0 master or as a DPV0 slave, no interrupts are generated. Prerequisite is operation as a DPV1 or S7V1 slave

7.2.1 Triggering of a diagnostics interrupt (error interrupt)

In the case of a coming or going event, with appropriate parameterization (Page 99), 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 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.

7.2.3 Reading out the diagnostics information with STEP 7

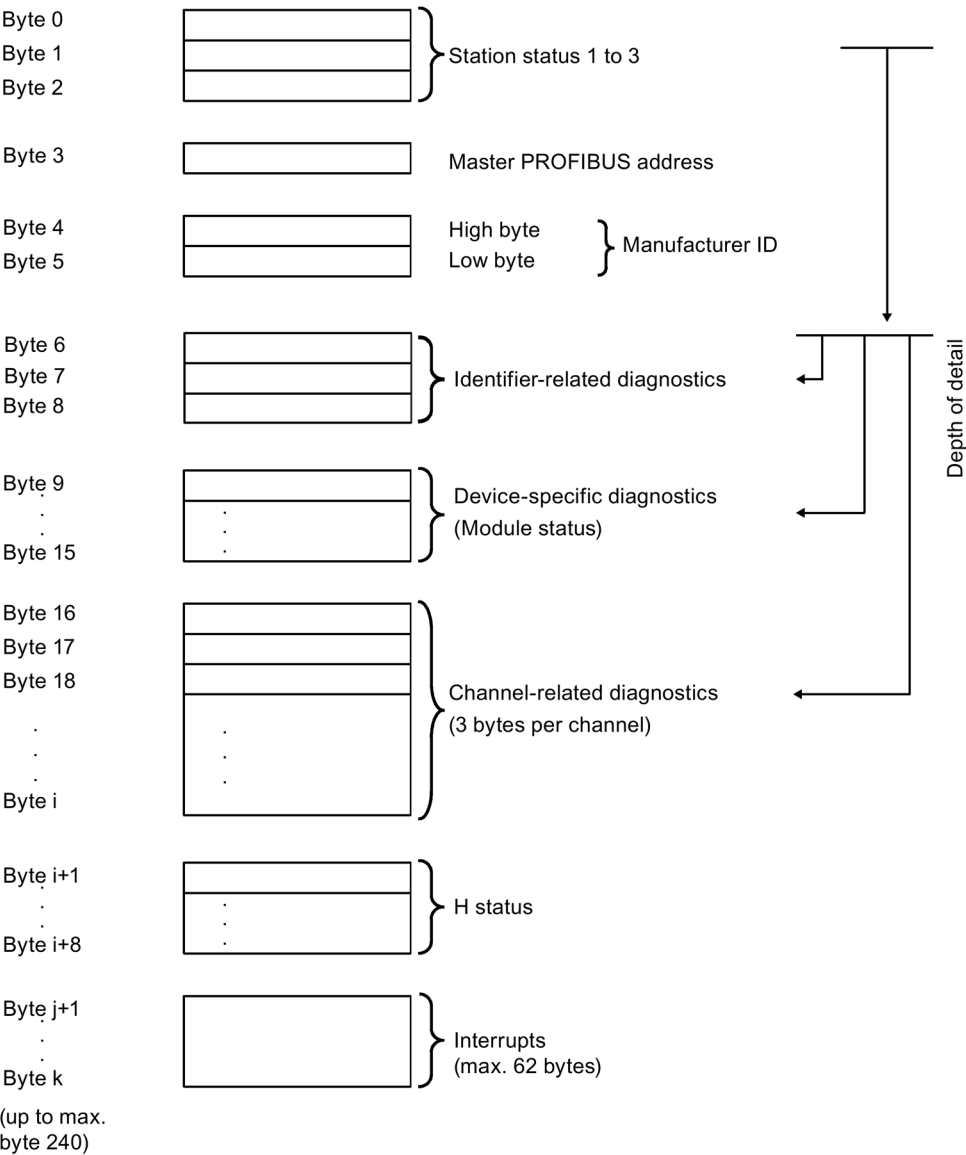
In an automation system with a SIMATIC S7 controller as the DP master, you can read out the diagnostics as follows (depending on the controller used):

- HW Config: Slave diagnostics as plain text on the STEP 7 user interface
- SFC 13 (DP_NRM_DG): Reading out slave diagnostics
- SFC 59 (RD_REC): Reading out data sets of the S7 diagnostics
- SFB 52 (RDREC): Reading data sets from the DP slave
- SFB 54 (RALRM): Receiving interrupts from the interrupt OBs

More information

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

7.3 Structure of the slave diagnostics



You will find more information on the variables i, j and k in the graphic in chapters Channel-related diagnostics (Page 85), H status (Page 87), and Interrupts (Page 88).

Note

The length of the diagnostics telegram varies between 6 and 240 bytes. The length of the diagnostics telegram last received can be seen in the RET_VAL parameter of SFC 13 in STEP 7.

7.3.1 Station status 1 to 3

Station states 1 to 3 provide an overview of the status of a DP slave.

Station status 1 (byte 0)

Bit	Meaning	Cause/remedy
0	1: The DP master cannot address the DP slave.	• Check the correct setting of the station address on the DP slave. • Check the connection of the PROFIBUS DP bus connector. • Check whether voltage is present at the DP slave. • Check correct setting of the RS 485 repeater.
1	1: The DP slave is not yet ready for the data transfer.	• The DP slave is still starting up. Wait until startup is completed.
2	1: The configuration data transferred from the DP master to the DP slave does not match the configuration of the DP slave.	• Check the input of the correct station type in the configuration software of the controller. • Check the correct configuration of the DP slave in the configuration software of the controller.
3	1: An external diagnosis exists (group diagnostics indication).	• Evaluate the following diagnoses: – Identifier-related diagnostics – Module status – Channel-related diagnostics As soon as all errors are remedied the bit 3 is reset. The bit is set again if a new diagnostic message appears in the bytes of the diagnostics described.
4	1: The function you requested is not supported by the DP slave.	• Check the configuration.
5	1: The DP master cannot interpret the response from the DP slave.	• Check the bus configuration.
6	1: The DP slave type does not match the software configuration.	• Check the input of the correct station type in the configuration software of the controller.
7	1: The DP slave has been parameterized by another DP master (not by the DP master that has access to the DP slave at the moment).	• You are currently accessing the DP slave with the programming device or another DP master. • The "Master PROFIBUS address" diagnostic byte contains the station address of the DP master that assigned parameters to the DP slave.

Station status 2 (byte 1)

Bit	Meaning	
0	1:	The DP slave must be parameterized again.
1	1:	There is a diagnostic message. The DP slave will not work until the fault is rectified (static diagnostic message).
2	1:	The bit is always "1" when the DP slave with this station address is configured.
3	1:	The watchdog of the DP slave is activated.
4	1:	The DP slave has received the "FREEZE" control command ¹⁾ .
5	1:	The DP slave has received the "SYNC" control command ¹⁾ .
6	0:	Bit is always "0".
7	1:	The DP slave is deactivated and decoupled from the current processing.

¹⁾ The bit is only updated if another diagnostics message also changes.

Station status 3 (byte 2)

Bit	Meaning	
0 to 6	0:	Bits are always "0".
7	1:	- More diagnostic messages are available to the DP slave than it can store. - The DP master cannot enter all the diagnostics messages sent by the DP slave in its diagnostics buffer (channel-specific diagnostics).

7.3.2 Master PROFIBUS address

The "master PROFIBUS address" diagnostics byte contains the station address of the DP master (DP master class 1), for which the following applies:

- DP master has parameterized the DP slave.
- DP master has read and write access to the DP slave.

The master PROFIBUS address is stored in byte 3 of the slave diagnostics.

7.3.3 Manufacturer ID

The manufacturer ID contains a code specifying the DP slave type.

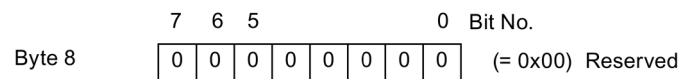
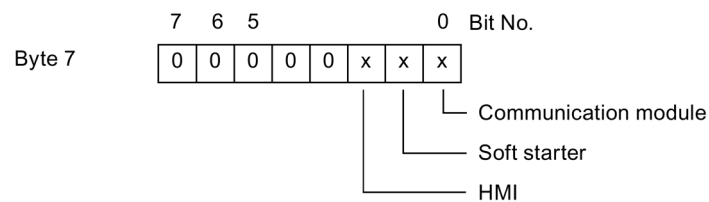
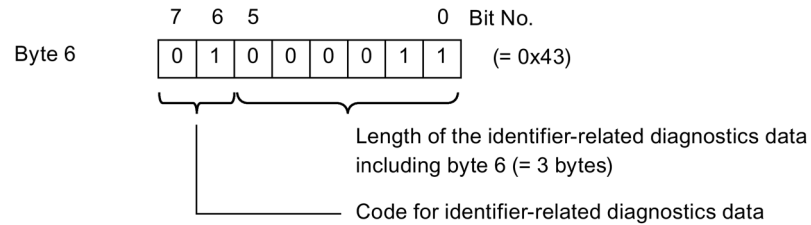
Structure of the manufacturer ID

Byte 4	Byte 5	Manufacturer ID for
81 _H (= 0x81)	CF _H (=0xCF)	SIRIUS Soft Starter 3RW5

7.3.4 Identifier-related diagnostics

Identifier-related diagnostic data indicates whether 3RW5 soft starters are faulty or not. Identifier-related diagnostics begins at byte 6 and is 3 bytes long.

Structure of identifier-related diagnostics



Meaning of x:

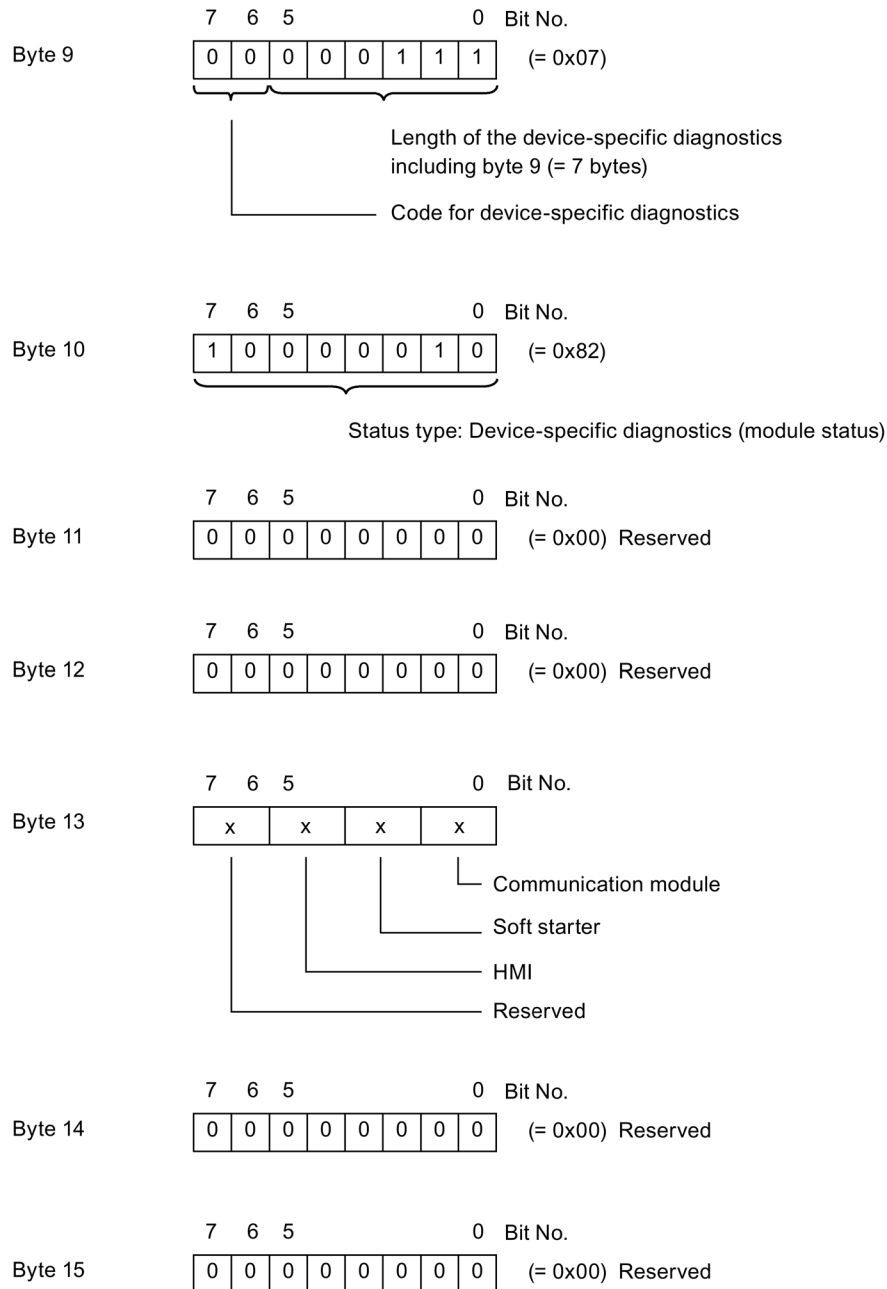
0: No diagnostics available

1: Diagnostics available

7.3.5 Device-specific diagnostics (module status)

The device-related diagnostics contains the status of the configured modules (in this case: 3RW5 Soft Starters) and provides details of the identifier-related diagnostics. The module status starts after the identifier-related diagnostics and consists of 7 bytes.

Structure of the module status



Meaning of x:

00_B: Module OK, valid user data

01_B: Module error, invalid user data

10_B: Incorrect module, invalid user data

11_B: No module or failure of the module, invalid user data

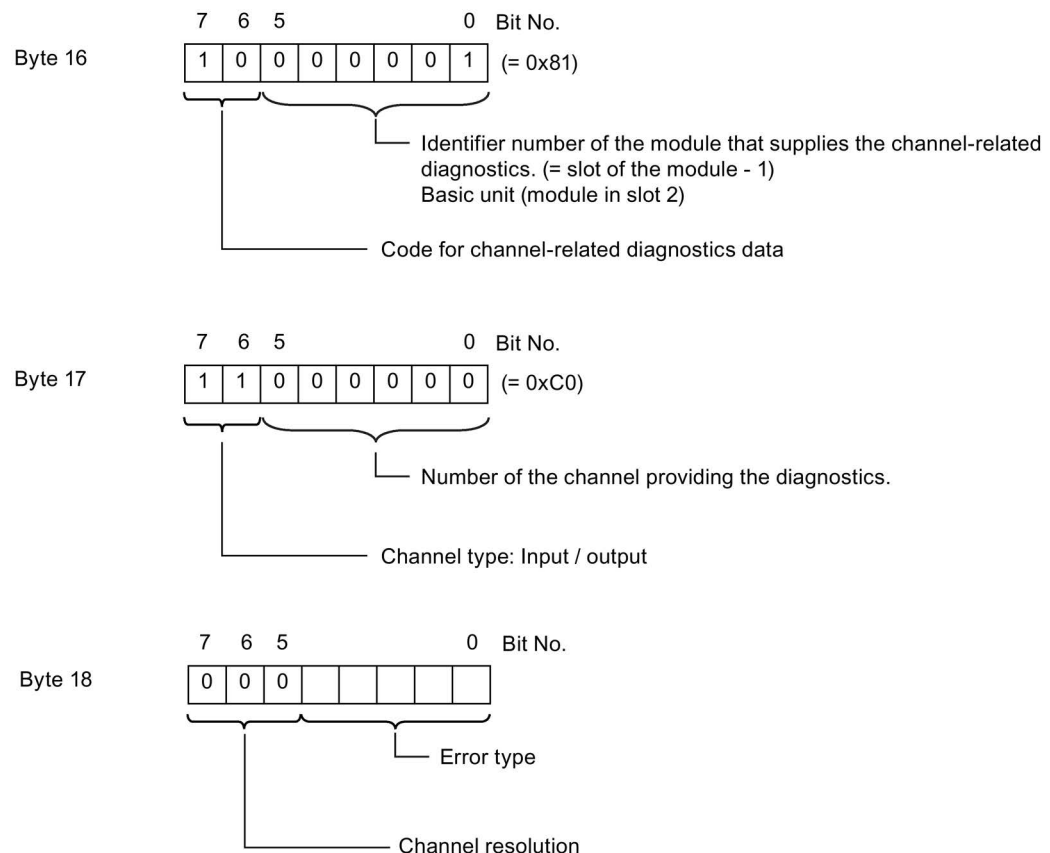
7.3.6 Channel-related diagnostics

Channel-related diagnostics provides information about channel faults in modules (in this case: 3RW5 soft starters) again and provides details of the identifier-related diagnostics. The channel-related diagnostics starts after device-related diagnostics (module status).

Channel-related diagnostics does not affect the module status.

The maximum number of channel-related diagnostic messages depends on whether an H status and an interrupt are present. The slave diagnostics includes up to 240 bytes. If the slave diagnostics contains an H status and an interrupt with 62 bytes, up to 51 channel-related diagnostics messages are possible (see also station status 3, bit 7).

Structure of the channel-related diagnostics



A channel-related diagnostic message is always 3 bytes long. Depending on the number of channel-related diagnostic messages, the channel-related diagnostics can have different lengths. Using the variable *i* (byte *i*), the last byte of the channel-related diagnostics is explained.

You will find an overview of the error types in chapter Error types (Page 86).

7.3.7 Error types

The diagnostics interrupt is signaled on channel 0.

Error type		
Fault No.	Error	Binary code
F1	Short circuit	00001
F4	Overload	00100
F5	Overtemperature	00101
F6	Open circuit	00110
F7	Upper limit exceeded	00111
F8	Lower limit exceeded	01000
F9	Error	01001
F16	Parameterization error	10000
F17	Sensor or load voltage missing	10001
F24	Disconnection	11000
F25	Safety-related tripping	11001
F26	External fault	11010
F27	Unclear error	11011

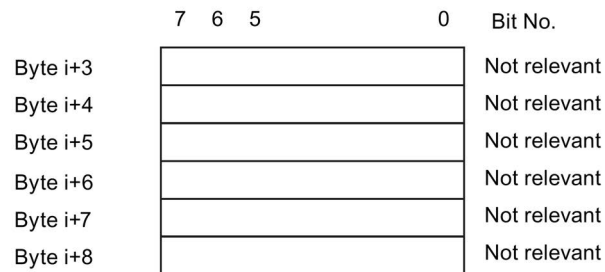
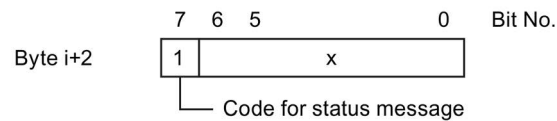
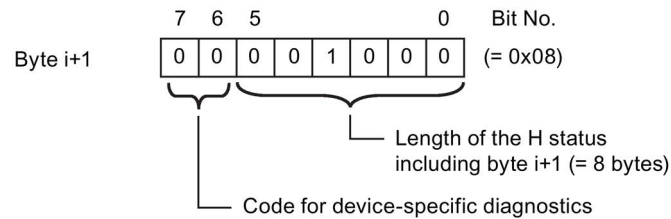
Depending on the 3RW5 soft starter, the error types can be assigned to the errors in chapter Channel error types (Page 93).

7.3.8 H status

The 3RW5 soft starter provides the H status in the diagnostic telegram only for operation behind a Y-Link when a DP master changes into a DP master. This H status can be passed over during the evaluation of the diagnostics frame. The H status starts after the channel-related diagnostics and occupies 8 bytes.

Structure of the H status

Using the variable i, the last byte of the channel-related diagnostics (Page 85) (byte i) is explained.



Meaning of x:

0x1E: Parameterization status (switchover by the DP master)

0x1F: H status

7.3.9 Interrupts

The interrupt section of the slave diagnostics provides information on the type of interrupt and what triggered it. The interrupt section starts after the H status or the channel-related diagnostics (only in DPV1 operation) and occupies up to 62 bytes. For each diagnostic telegram, only one interrupt is possible.

Interrupt types

The 3RW5 communication module supports the following interrupts:

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

Structure of the interrupt section

Depending on the interrupt type, the interrupt comprises the following parts:

- General interrupt section (Page 89)
- Data from data set 1 (for diagnostic interrupts only)

The data from data set 1 comprise the following sections:

- Diagnostic data from data set 0 (Page 90)
- Module-specific diagnostic data (Page 91)
- Channel error entries (Page 92)

Reading out data sets 0 and 1

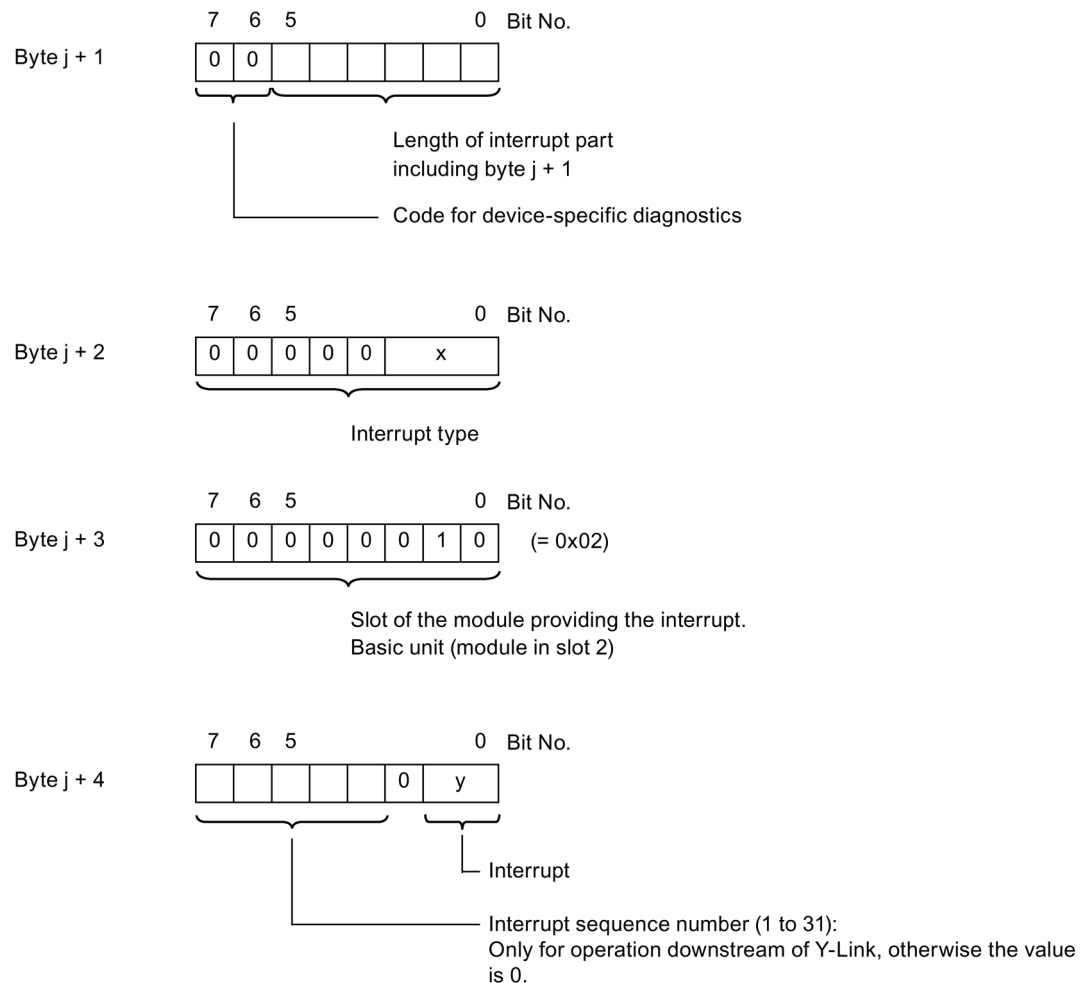
You can read out data sets 0 and 1 via SFC 59 "RD_REC" or SFB 52 "RDREC".

7.3.9.1 General interrupt section

The general interrupt section occupies 4 bytes.

Structure of the general interrupt section

Using the variable j , depending on whether it is present or not, the last byte of the H status (Page 87) ($j = i + 8$) or the channel-related diagnostics (Page 85) ($j = i$) is explained.



Meaning of x:

001_B: Diagnostic interrupt

011_B: Removal interrupt

100_B: Insertion interrupt

Meaning of y:

Diagnostic interrupt:

01_B: At least one error is present

10_B: Cleared error

11_B: Cleared with further diagnostics

Removal and insertion interrupt:

Removed module

Correct module inserted

Incorrect module inserted

7.3.9.2 Diagnostic data about the state

The diagnostic data about the state are contained in data sets 0 and 1 and include 4 bytes.

Structure of the diagnostic data about the state

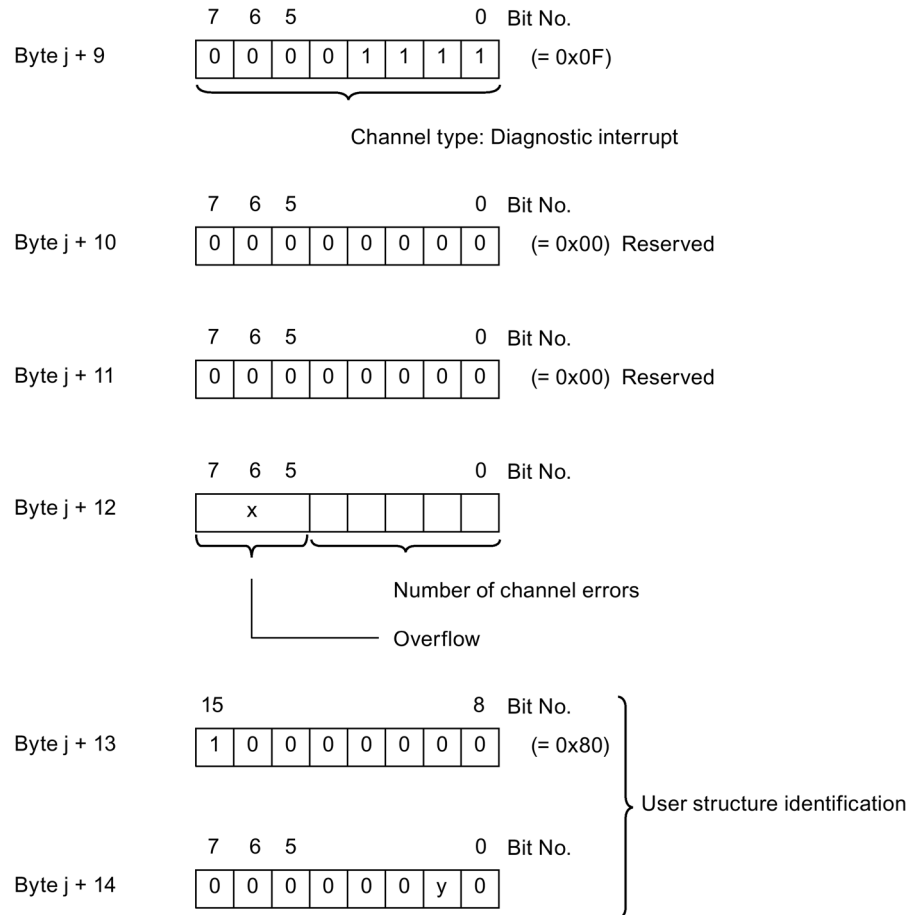
	7	6	5				0	Bit No.	
Byte j + 5	0	0	0	0	1	1	0	1	(= 0x0D)
	7	6	5				0	Bit No.	
Byte j + 6	0	0	0	1	0	0	1	1	(= 0x13)
	7	6	5				0	Bit No.	
Byte j + 7	0	0	0	0	0	0	0	0	(= 0x00) Reserved
	7	6	5				0	Bit No.	
Byte j + 8	0	0	0	0	0	0	0	0	(= 0x00) Reserved

7.3.9.3 Module-specific diagnostic data

The module-specific diagnostic data are contained in data set 1 and include 6 bytes.

Diagnostic interrupts can contain up to 8°channel errors. If data set 1 contains more than 8 channel fault entries, this circumstance is signaled in the "overflow".

Structure of the module-specific diagnostics



Meaning of x:

000_B: 0 to 8 channel errors present

111_B: More than 8 channel errors present

Meaning of y:

0_B: Channel diagnostics

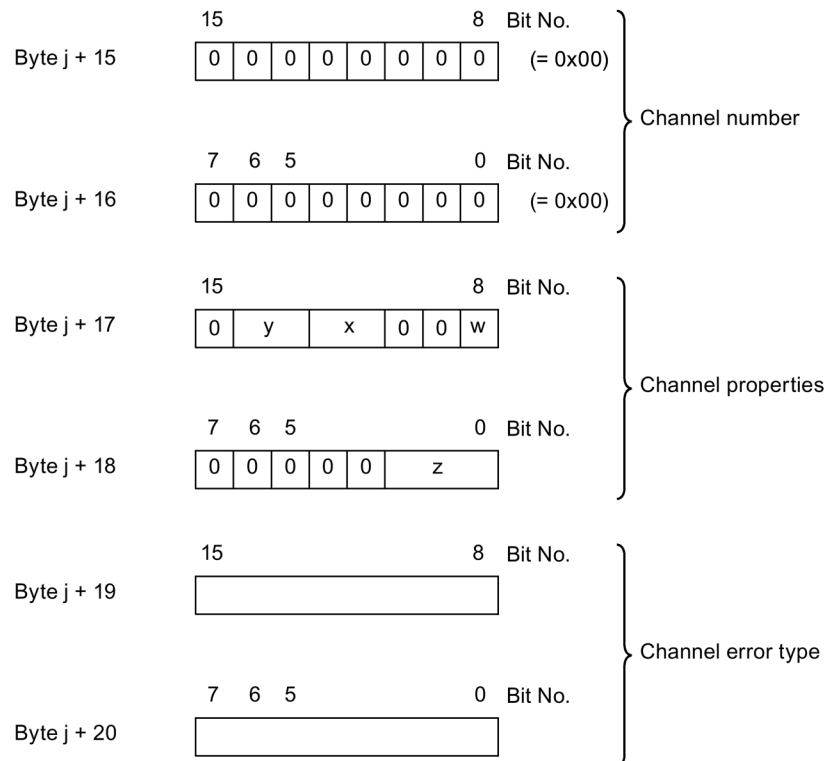
1_B: Extended channel diagnostics

7.3.9.4 Channel error entries

The data of the channel error entries comprise 6 bytes per channel error. Up to 8°channel errors can be transmitted in a diagnostic interrupt. Using the variable k, the last byte of the channel error entries is represented in chapter Structure of the slave diagnostics (Page 80).

You will find the channel error types in chapter Channel error types (Page 93).

Structure of the channel error entries



Meaning of w:

- 0_B: Channel
- 1_B: Channel group

Meaning of x:

- 00_B: Channel error-free
- 01_B: Arising diagnostics
- 10_B: Cleared diagnostics
- 11_B: Cleared diagnostics and further diagnoses are pending on this channel

Meaning of y:

-
- Input channel
- Output channel
- Input/output channel

Meaning of z:

- | | |
|-----------------------------------|--------------------------------|
| 000 _B : Free data type | 100 _B : Byte |
| 001 _B : Bit | 101 _B : Word |
| 010 _B : 2 bit | 110 _B : Double word |
| 011 _B : 4 bit | |

7.3.9.5 Channel error types

Depending on the 3RW5 soft starter, the following errors are assigned to Error types (Page 86) and Channel error types (Page 92). You will find information on remedial measures and acknowledgment of errors in the Equipment Manual of the 3RW5 soft starter.

Information on which errors are supported by the 3RW5 soft starter can also be found in data set 92 of the 3RW5 soft starter (slot 2) (Page 135).

Error type	Channel error type	Error	Cause	Byte.Bit ¹⁾
F9	0x0007 0x1046 ²⁾	Upper limit exceeded	- With sensors: The measured value has exceeded the range limits. - With actuators: The output value has exceeded an upper limit.	31.2
F25	0x0019 0x1046 ²⁾	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.	12.7
F17	0x010A 0x1046 ²⁾	No main power	- The power switch or the power supply is not correctly connected. - No current.	11.1 87.1
F9	0x011B	Invalid/inconsistent firmware present	The firmware is incomplete and/or the firmware expansions are incomplete or incompatible.	38.3
F17	0x1000 0x1046 ²⁾	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.	25.0
F17	0x100A 0x1046 ²⁾	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.	87.0
F27	0x1012 0x1046 ²⁾	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.	30.3

7.3 Structure of the slave diagnostics

Error type	Channel error type	Error	Cause	Byte.Bit ¹⁾
F7	0x1021	Asymmetry	A limit value for asymmetry has been exceeded. Asymmetry can cause an overload. - Loss of phase. - Fault in the motor windings.	14.0
F4	0x1022 0x1046 ²⁾	Therm. motor model overload	- The motor feeder has been overloaded. - The motor temperature rise has exceeded a limit.	12.3
F4	0x1024 0x1046 ²⁾	Temperature sensor overload	The temperature of the motor is too high.	12.0
F1	0x1025 0x1046 ²⁾	Temperature sensor short circuit	A short circuit has occurred in the temperature sensor cable.	12.2
F6	0x1026 0x1046 ²⁾	Temperature sensor wire break	A wire has broken in the sensor cable of the temperature sensor.	12.1
F7	0x1027	Ground fault	The ground-fault monitoring has responded. An impermissibly high residual current is flowing.	16.0
F16	0x1033	No start-up data received	Data necessary for device start-up are missing.	18.4
F7	0x1040	Threshold I exceeded	The current has exceeded a limit.	14.2
F8	0x1041	Threshold I undershot	The current has undershot a limit.	14.3
F7	0x1042	Threshold P exceeded	The active power of the motor has exceeded a limit value.	83.4
F8	0x1043	Threshold P undershot	The active power of the motor has undershot a limit value.	83.5
F24	0x1046	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 ³⁾ 14.1 ³⁾ 14.4 ³⁾ 83.6 ³⁾
F24	0x1057 0x1046 ²⁾	Number of starting operations exceeded	The permissible number of starting operations in the monitoring period has been exceeded.	71.1
F9	0x1080	Device error	Irrecoverable error detected following self-diagnostics (self-test, contactor contacts, switching element, etc.).	19.2
F9	0x1081 0x1046 ²⁾	Bypass defective	- Bypass defective - The error can also be generated by successive, brief interruptions of the control supply voltage.	29.3
F9	0x1082 0x1046 ²⁾	Power semiconductor defective	- Power semiconductor defective - The fault is also generated if the defective switching element (bypass or power semiconductor) cannot be accurately identified.	10.4 29.5 29.6 29.7
F5	0x1083 0x1046 ²⁾	Switching element overload	Switching element (switching contact, power semiconductor) too hot.	10.3
F17	0x1084 0x1046 ²⁾	Electronics supply voltage too low	The supply voltage is below the permissible value.	16.7

Error type	Channel error type	Error	Cause	Byte.Bit ¹⁾
F4	0x1085 0x1046 ²⁾	Bypass overload	An excessively high current has occurred in bypass mode.	29.4
F26	0x1092 0x1046 ²⁾	Type of motor connection unknown or incorrect	The type of motor connection was not recognized or deviates from the configuration.	23.7
F24	0x1094	Incorrect module slot or faulty configuration	Real and configured slot of the module are different.	22.3
F16	0x1095 0x1046 ²⁾	Parameter error	The module is not or is incorrectly parameterized or changes to parameter settings are rejected in the current operating state.	18.1
F26	0x1096 0x1046 ²⁾	Process image error	The process image output (PIQ) contains invalid control bit combinations (e.g. control bits for clockwise and counter-clockwise set simultaneously).	17.7
F17	0x1097 0x1046 ²⁾	Loss of phase	The main energy monitoring system has detected a loss of phase.	25.2 25.3 25.4
F17	0x510E 0x1046 ²⁾	Error in the phase sequence	The phase sequence is not correct.	75.0
F24	0x9005	Electronic component overload	The temperature in the components has exceeded the highest permissible limit.	90.0

- ¹⁾ The specified bits in data set 92 of the 3RW5 soft starter (slot 2) are assigned to the channel error types. If several bits are assigned to one channel error type you can read out a more accurate diagnosis via the data set.
- ²⁾ Channel error type 0x1046 is additionally set.
- ³⁾ For these bits only the channel error type 0x1046 is set.

7.4 Diagnostics via data sets

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 135).

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 164).

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 140).

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 141).

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 143).

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"

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).

- "Reset maximum pointer" command via data set 93 (Page 127)

7.5 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 PROFIBUS DP Layer 2. Further information can be found in the corresponding manuals for the PROFIBUS DP 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.	• DPV1 service 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	Invalid parameter	• Invalid parameter value

7.5 Error codes for negative data set acknowledgement

Error codes (bytes)		Error message	Cause
high	low		
Device resources			
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

7.6 Disable or enable group errors

With the parameter "Group error", you determine whether interrupts (error interrupts) are transmitted via PROFIBUS. Group errors are released in the factory settings and alarms (error alarms) are transferred.

Setting options

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

- Configuration software of the controller, e.g. STEP 7
- User program via data set 131 (Page 129)
- 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"

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).

- 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 100)

7.6.1 Disable or enable group error via High Feature 3RW5 HMI

Requirements

- Access protection to 3RW5 HMI High Feature is not active or has been removed.
- They are in the following menu:
 - 3RW5 HMI High Feature with firmware version earlier than V2.0:
"Parameters > Communication module > PROFIBUS DP > 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 menu item "Group error".
2. Select a parameter.
 - "Disable"
 - "Enable" (factory setting)
3. Confirm the parameter.

Result

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

7.7 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.

7.8 Messages about the mode

The following message bits in data set 92 of the 3RW5 soft starter (slot 2) (Page 135) 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)
- Operating mode manual - local (⑤)
- Manual operation local - input controlled (⑥)
- Manual operation local - HMI controlled (⑦)
- Manual operation local - PC controlled (⑧)
- Connection abort in manual mode (⑨)

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

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

²⁾ For 3RW50, 3RW52, 3RW55 soft starters with firmware version earlier than V2.1 and 3RW55 Failsafe it is not possible to combine the message bits. For the 3RW55 soft starter as of firmware version V2.1 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 regain master control at any time.

³⁾ Combining the message bits is possible for 3RW50, 3RW52, 3RW55 and 3RW55 Failsafe soft starters. For 3RW55 soft starters as of firmware version V2.1, 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 26).

Maintenance and service

8.1 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>).

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 of the 3RW5 soft starter and set the CPU / PLC to STOP state.

2. Perform the update of the device firmware.

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" > "PROFIBUS DP > Functions > Firmware update"

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).

- Via the configuration software of the controller (e.g. STEP 7 with corresponding HSP) on the 3RW5 communication module
- With a micro SD card via the 3RW5 HMI High Feature (Page 105)
- 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

Result

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

8.1.1 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.

8.2 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 61)
- Disable or enable group errors (Page 99)
- Data set 131: Parameter communication (slot 1) (Page 129)

Note

Back up the communication parameters on micro SD card

Depending on the 3RW5 soft starter, you can back up the communication parameters to 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 3RW5 soft starter.

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 58).
2. Remove the 3RW5 communication module.
 - 3RW50 soft starter: Remove the COM connecting cable from the 3RW5 communication module (Page 54) and remove the 3RW5 communication module on the level surface (Page 49).
 - 3RW52, 3RW55 and 3RW55 Failsafe soft starters: Remove the 3RW5 communication module in the 3RW5 soft starter (Page 45).
3. Mount the 3RW5 communication module.
 - 3RW50 soft starter: Mount the 3RW5 communication module on the level surface (Page 47) and connect the COM connecting cable to the 3RW5 communication module (Page 52).
 - 3RW52, 3RW55 and 3RW55 Failsafe soft starters: Mount the 3RW5 communication module in the 3RW5 soft starter (Page 44).
4. Connect the 3RW5 communication module to the bus connection (Page 56).

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.

8.3 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 control priority 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 at the 3RW5 soft starter.

2. Restore the factory settings.

The following procedures are possible via the 3RW5 communication module:

- 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"

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).

- Via data set 93 (Page 127) with the command "Factory settings"

Other possibilities of restoring the factory setting

More 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

9.1 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 Enter keyword...

Product: 3RW2031-4BA10

Entry type: Technical data (1)

Date: From To

> Search product

3RW2031-4BA10
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

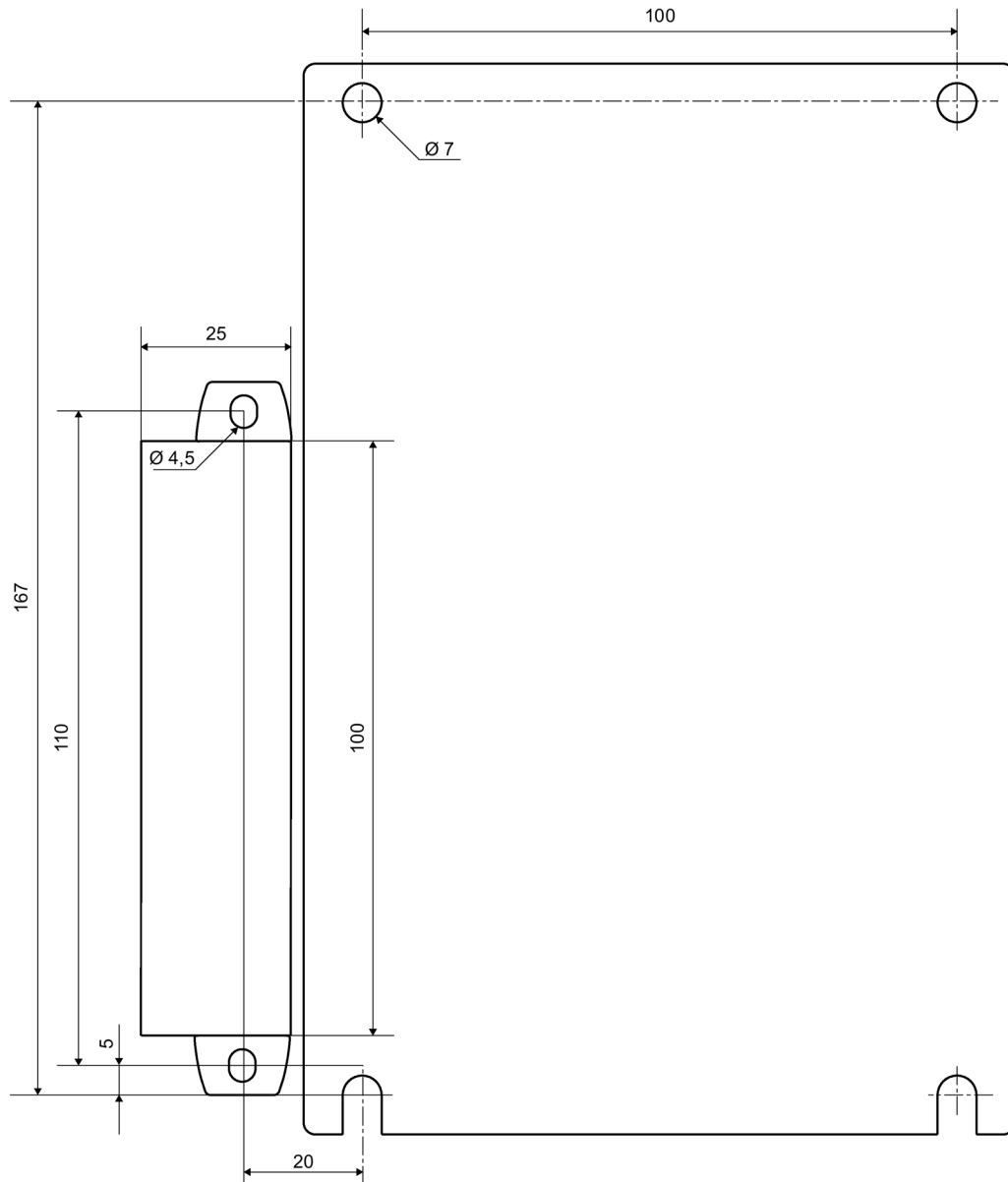
10.1 CAX data

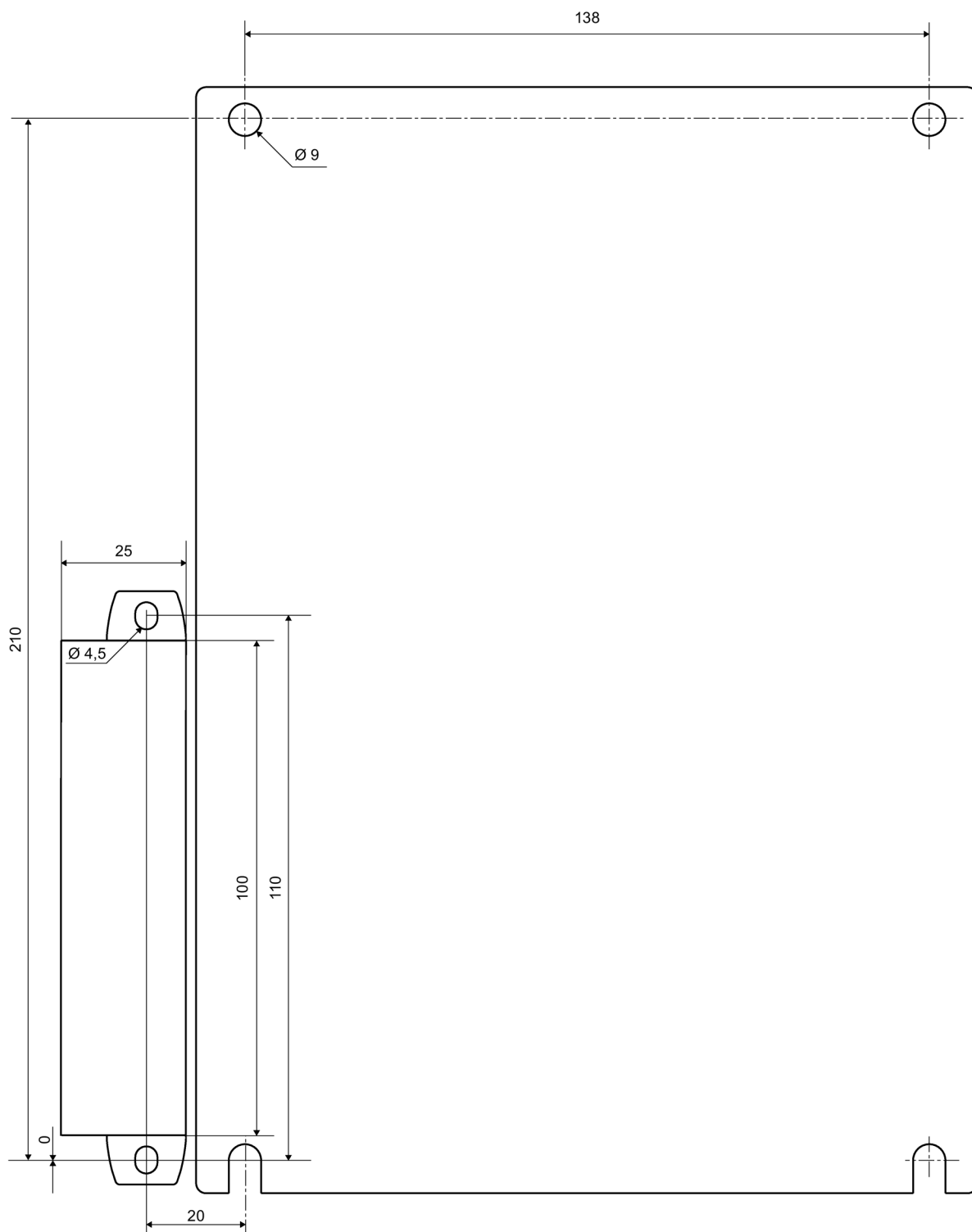
You can find the CAX data in the Siemens Industry Online Support (<https://support.industry.siemens.com/cs/ww/en/ps/16212/td>).

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 "3RW2015-4BA10". The "Entry type" dropdown is set to "Technical data (1)". The "Date" field has "From" and "To" input boxes. Below the search filters, there is a "Search product" button. The search results show a product card for "3RW2015-4BA10" with a description: "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 product card, there are navigation links: "> Product details", "> Technical data", and "> CAX data". The "CAX data" link is highlighted with a red box.

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



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

Circuit diagrams

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 "3RW2031-4BA10". The "Entry type" dropdown is set to "Technical data (1)". The "Date" field has "From" and "To" input boxes. A "Search product" button is visible. The search results show a product entry for "3RW2031-4BA10" with a description: "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". Below the description, there are navigation links: "> Product details", "> Technical data", and "> CAx data". The "CAx data" link is highlighted with a red box.

Appendix

A.1 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

Process data	Process image	3RW		
		50 ¹⁾	52 ²⁾	55 / 55-F ³⁾
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
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
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":

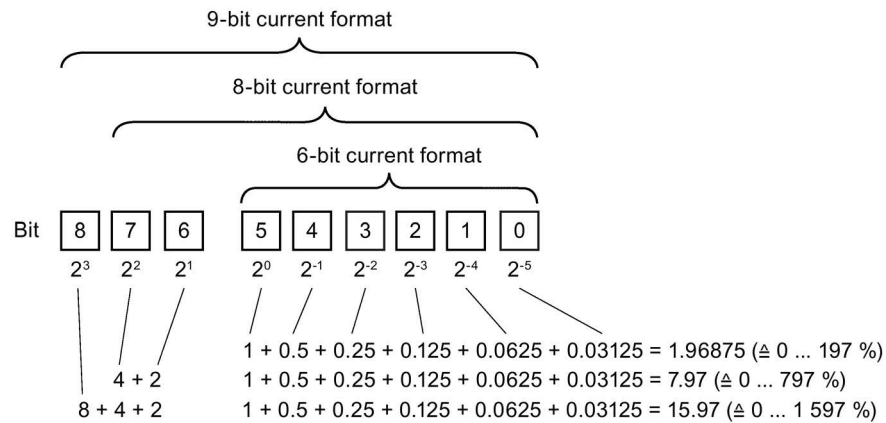
Parameter set	Parameter set bit 0	Parameter set bit 1
Process image error	1	1
Parameter set 1 (PS1)	0	0
Parameter set 2 (PS2)	1	0
Parameter set 3 (PS3)	0	1

A.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)

You will find a complete overview of all measured values in chapter Data set 94: Measured values (Page 140).

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

You will find a complete overview of the statistic data in chapter Data set 95: Statistic data (Page 141).

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-to-line voltages
- Minimum and maximum line frequency

You will find a complete overview of the maximum pointers in chapter Data set 96: Maximum pointer (Page 143).

A.3 Data sets

Data set		Length	3RW			
Number	Description		50 ¹⁾	52 ²⁾	55 ³⁾	55-F ⁴⁾
Commands						
93	Commands (Page 127)	10 byte	x	x	x	x
3RW5 communication module (slot 1)						
131	Parameter communication (slot 1) (Page 129)	16 bytes	x ⁵⁾	x ⁵⁾	x ⁵⁾	x ⁵⁾
3RW5 soft starter (slot 2)						
68	Process image output (PIQ) (Page 130)	14 bytes	x	x	x	x
69	Process image input (PII) (Page 133)	28 bytes	x	x	x	x
92	Soft starter diagnostics (slot 2) (Page 135)	95 bytes	x	x	x	x
94	Measured values (Page 140)	100 bytes	x	x	x	x
95	Statistic data (Page 141)	200 bytes	x	x ⁶⁾	x	x
96	Maximum pointer (Page 143)	126 bytes	x	x ⁶⁾	x	x
131, 141 and 151	Parameter basic functions - Set 1, 2, and 3 (Page 145)	200 bytes	x ⁷⁾	x ⁷⁾	x	x
132, 142 and 152	Parameter extended functions 1 - Set 1, 2, and 3 (Page 157)	200 bytes	-	-	x	x
133	Parameter extended functions 2 (Page 160)	200 bytes	x	x	x	x
134	Parameter Maintenance (Page 162)	200 bytes	-	-	x	x
135	Parameter cyclic process image (Page 163)	24 bytes	-	-	x	x
3RW5 HMI High Feature (slot 3)						
92	HMI diagnostics (slot 3) (Page 164)	28 bytes	x ⁸⁾	x ⁸⁾	x ⁸⁾	x ⁸⁾
131	HMI parameter (slot 3) (Page 166)	120 bytes	x ⁸⁾	x ⁸⁾	x ⁸⁾	x ⁸⁾
I&M data (Page 170)						
231	I&M0 - Device identification (Page 171)	64 bytes	x ^{5), 8)}	x ^{5), 8)}	x ^{5), 8)}	x ^{5), 8)}
232	I&M1 - Equipment identifier (Page 172)	64 bytes	x	x	x	x
233	I&M2 - Installation (Page 173)	64 bytes	x	x	x	x
234	I&M3 - Description (Page 174)	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 PROFIBUS communication module
- 6) 3RW52 soft starter from firmware version V2.0
- 7) Data sets 141 and 151 are not supported
- 8) Supported by 3RW5 HMI High Feature

A.3.1 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.3.2 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 135) or in data set 92 of the 3RW5 HMI High Feature (slot 3) (Page 164) under "Faulty parameter number".

A.3.3 Commands

A.3.3.1 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
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.3.4 3RW5 communication module (slot 1)

A.3.4.1 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	Parameters	Value range [encoding]	3RW5 PB ¹⁾ [D ²⁾]
10	1	Bool	Group error	[0 ... 1] [0] Disable [1] Enable	r/w [1]
11 ... 15	-	-	Reserved	-	-

1) Supported by SIRIUS 3RW5 PROFIBUS communication module

2) Default encoding

A.3.5 3RW5 soft starter (slot 2)

A.3.5.1 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.3.5.2 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
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

Byte	Bit	Data format	Process image	3RW		
				50 ¹⁾	52 ²⁾	55 / 55-F ³⁾
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
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.3.5.3 Data set 92: Soft starter diagnostics (slot 2)

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

For more information about the types of errors, see chapters Error types (Page 86) and Channel error types (Page 93).

Note

Channel fault type of the Soft Starter Diagnosis

In the Soft Starter Diagnosis, diagnostic messages may be present twice. In this case, the channel fault type (Page 93) defines which bit will be 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⁾	+ F ⁷⁾	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	F5	0x1083	x	r	r	r	r
	4	Bool	Switching element defective	F9	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
11	1	Bool	No main power	F17	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	-

Byte	Bit	Data format	Soft starter diagnostics	Error types			3RW			
				F ⁵⁾	F ⁶⁾	+ F ⁷⁾	50 ¹⁾	52 ²⁾	55 ³⁾	55-F ⁴⁾
12	0	Bool	Temperature sensor overload	F4	0x1024	x	r	r	r	r
	1	Bool	Temperature sensor wire break	F6	0x1026	x	r	r	r	r
	2	Bool	Temperature sensor short-circuit	F1	0x1025	x	r	r	r	r
	3	Bool	Motor overload protection – shutoff	F4	0x1022	x	r	r	r	r
	4	Bool	Motor overload protection - shutoff	F24	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	F25	0x0019	x	-	-	-	r
13	3	Bool	Current limiting active	-	-	-	r	r	r	r
	6	Bool	Generator operation	-	-	-	-	-	r	r
	7	Bool	Input control	-	-	-	r	r	r	r
14	0	Bool	Asymmetry limit - error exceeded	F7	0x1021	-	-	-	r	r
	1	Bool	Asymmetry trip	F24	0x1046	-	-	-	r	r
	2	Bool	Current limit error exceeded	F7	0x1040	-	-	-	r	r
	3	Bool	Current limit error undershot	F8	0x1041	-	-	-	r	r
	4	Bool	Current limit error trip	F24	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	F7	0x1027	-	-	-	r	r
	2	Bool	Quick stop active	-	-	-	-	-	r	r
	6	Bool	Maximum pointer reset	-	-	-	r	r ⁸⁾	r	r
	7	Bool	Electronics supply voltage too low	F17	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	Manual bus mode	-	-	-	r	r	r	r
	4	Bool	Local manual mode	-	-	-	r	r	r	r
	6	Bool	Connection abort in manual mode	-	-	-	r	r	r	r
	7	Bool	Process image error	F26	0x1096	x	-	-	r	r
18	0	Bool	Parameter assignment active	-	-	-	-	-	r	r
	1	Bool	InvalidParameter	F16	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	F16	0x1033	-	-	-	r	r
19	0	Bool	Self-test active	-	-	-	-	-	r	r
	2	Bool	Error during self-test	F9	0x1080	-	r	r	r	r
	3	Bool	Factory settings restored	-	-	-	r	r	r	r
20	0	Unsigned16	Faulty parameter number ⁹⁾	-	-	-	-	-	r	r

Byte	Bit	Data format	Soft starter diagnostics	Error types			3RW			
				F ⁵⁾	F ⁶⁾	+ F ⁷⁾	50 ¹⁾	52 ²⁾	55 ³⁾	55-F ⁴⁾
22	3	Bool	Preset unequal actual configuration	F24	0x1094	-	r	r	r	r
	5	Bool	Temperature sensor overload	-	-	-	-	-	r	r
	6	Bool	Temperature sensor wire break	-	-	-	-	-	r	r
	7	Bool	Temperature sensor short-circuit	-	-	-	-	-	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	-	-	-	-	-	r	r
	7	Bool	Type of motor connection wrong	F26	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	Inside-delta motor connection	-	-	-	-	r	r	r
	7	Bool	Motor connection type unknown	-	-	-	r	r	r	r
25	0	Bool	Missing load	F17	0x1000	x	r	r	r	r
	2	Bool	Loss of phase L1	F17	0x1097	x	r	r	r	r
	3	Bool	Loss of phase L2	F17	0x1097	x	r	r	r	r
	4	Bool	Loss of phase L3	F17	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	F9	0x1081	x	r	r	r	r
	4	Bool	Bypass protective shutoff	F4	0x1085	x	r	r	r	r
	5	Bool	Switching element L1 failed	F9	0x1082	x	r	r	r	r
	6	Bool	Switching element L2 failed	F9	0x1082	x	-	r	r	r
	7	Bool	Switching element L3 failed	F9	0x1082	x	r	r	r	r
30	0	Bool	Thermal motor model deactivated	-	-	-	r	r	r	r
	3	Bool	Phase control failure	F27	0x1012	x	r	r	r	r
31	0	Bool	Switching element cooling time active	-	-	-	r	r	r	r
	1	Bool	Switching element too hot for Start	-	-	-	r	r	r	r
	2	Bool	Current measuring range exceeded	F9	0x0007	x	r	r	r	r

Byte	Bit	Data format	Soft starter diagnostics	Error types			3RW			
				F ⁵⁾	F ⁶⁾	+ F ⁷⁾	50 ¹⁾	52 ²⁾	55 ³⁾	55-F ⁴⁾
32	0	Bool	Automatic mode	-	-	-	r	r	r	r
	1	Bool	Manual bus mode	-	-	-	r	r	r	r
	2	Bool	Manual operation bus - PC controlled	-	-	-	r	r	r	r
	3	Bool	Local manual mode	-	-	-	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	3	Bool	Automatic operation - input controlled	-	-	-	-	-	r ¹¹⁾	r
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	F9	0x011B	-	r	r	r	r
39	7	Bool	Operation / bypass active	-	-	-	r	r	r	r
52	6	Bool	Normal operation active	-	-	-	r	r ⁸⁾	r	r
53	3	Bool	Test mode active	-	-	-	r	r ⁸⁾	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 ¹⁰⁾	r
	2	Bool	New EX parameter values detected	-	-	-	-	-	r ¹⁰⁾	r
	5	Bool	Ex release denied - wrong CRC	-	-	-	-	-	r ¹⁰⁾	r
62	2	Bool	Remaining time for tripping warning limit undershot	-	-	-	-	-	r	r
	3	Bool	Motor heating warning limit exceeded	-	-	-	r	r	r	r
	4	Bool	Current limit - maintenance demanded exceeded	-	-	-	-	-	r	r
	5	Bool	Current limit - maintenance demanded undershot	-	-	-	-	-	r	r
	6	Bool	Asymmetry limit warning exceeded	-	-	-	-	-	r	r
	7	Bool	Ground fault limit warning exceeded	-	-	-	-	-	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
71	0	Bool	Switching frequency time running	-	-	-	-	-	r	r
	1	Bool	Switching frequency time not kept	F24	0x1057	-	-	-	r	r
	3	Bool	Switching frequency time not kept	-	-	-	-	-	r	r
	7	Bool	Switching frequency lock active	-	-	-	-	-	r	r
72	2	Bool	Emergency start enabled	-	-	-	-	-	r	r
	4	Bool	Emergency run enabled	-	-	-	-	-	r ¹¹⁾	-
	5	Bool	Emergency run active	-	-	-	-	-	r ¹¹⁾	-

Byte	Bit	Data format	Soft starter diagnostics	Error types			3RW			
				F ⁵⁾	F ⁶⁾	+ F ⁷⁾	50 ¹⁾	52 ²⁾	55 ³⁾	55-F ⁴⁾
73	0	Bool	2-phase control with defective thyristor active	-	-	-	-	-	r ¹¹⁾	-
	1	Bool	Alternative stopping mode active	-	-	-	-	-	r	r
74	0	Bool	Reversing DC braking active	-	-	-	-	-	r ¹⁰⁾	-
75	0	Bool	Main power rotation faulty	F17	0x510E	x	-	-	r	r
	3	Bool	Main power rotation faulty	-	-	-	-	-	r	r
77	5	Bool	Check fan	-	-	-	r	r	r	r
83	2	Bool	Active power limit - maintenance demanded exceeded	-	-	-	-	-	r	r
	3	Bool	Active power limit - maintenance demanded undershot	-	-	-	-	-	r	r
	4	Bool	Active power error limit exceeded	F7	0x1042	-	-	-	r	r
	5	Bool	Active power error limit undershot	F8	0x1043	-	-	-	r	r
	6	Bool	Active power limit error shutoff	F24	0x1046	-	-	-	r	r
87	0	Bool	Main power for test not allowed	F17	0x100A	x	-	-	r	-
	1	Bool	Supply voltage required for test	F17	0x010A	x	r	r ⁸⁾	r	r
	4	Bool	Simulation active	-	-	-	-	-	r ¹⁰⁾	-
	5	Bool	Test with small load active	-	-	-	r	r ⁸⁾	r	r
90	0	Bool	Operating temperature too high	F24	0x9005	-	r	r	r	r
91	0	Bool	Automatic parameterization active	-	-	-	-	-	r	r
92	2	Bool	Starting time limit - maintenance demanded exceeded	-	-	-	-	-	r	r
	3	Bool	Starting time limit - maintenance demanded undershot	-	-	-	-	-	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 - event deleted	-	-	-	-	-	r	r
	5	Bool	Logbook service - error deleted	-	-	-	-	-	r	r
	7	Bool	Logbook service - event deleted	-	-	-	-	-	r	r
94	-	-	Reserved	-	-	-	-	-	-	-

- 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 F No.
- 6) Channel error type
- 7) Channel error type 0x1046 is additionally set
- 8) 3RW52 soft starter from firmware version V2.0
- 9) Object number of the faulty parameter from data sets 131, 141, 151, 132, 142, 152, 133, 134 or 135
- 10) 3RW55 soft starter from firmware version V2.0
- 11) 3RW55 soft starter from firmware version V2.1

A.3.5.4 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	Increment	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
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.3.5.5 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 I _A (%)	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 I _A (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 _{emax}	0 ... 4 294 967 295 s	1 s	r	r
48	Unsigned32	Operating hours - motor current = 50 ... 89.9% x I _{emax}	0 ... 4 294 967 295 s	1 s	r	r
52	Unsigned32	Operating hours - motor current = 90 ... 119.9% x I _{emax}	0 ... 4 294 967 295 s	1 s	r	r
56	Unsigned32	Operating hours - motor current = 120 ... 1000% x I _{emax}	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.3.5.6 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
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

Byte	Data format	Maximum pointer	Value range	Increment	3RW	
					50 / 52 ¹⁾	55 / 55-F ²⁾
72	Unsigned32	Operating hours - motor current = 18 ... 49.9% x I _e	0 ... 4 294 967 295 s	1 s	r	r
76	Unsigned32	Operating hours - motor current = 50 ... 89.9% x I _e	0 ... 4 294 967 295 s	1 s	r	r
80	Unsigned32	Operating hours - motor current = 90 ... 119.9% x I _e	0 ... 4 294 967 295 s	1 s	r	r
84	Unsigned32	Operating hours - motor current = 120 ... 1000% x I _e	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.3.5.7 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)				

Object No.	Byte	Bit	Data format	Parameters	Value range [encoding]	Increment	3RW	
							50 / 52 ¹⁾ [D ³⁾]	55 / 55-F ²⁾ [D ³⁾]
				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]
				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]

Object No.	Byte	Bit	Data format	Parameters	Value range [encoding]	Increment	3RW	
							50 / 52 ¹⁾ [D ³⁾]	55 / 55-F ²⁾ [D ³⁾]
				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]
				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]

Object No.	Byte	Bit	Data format	Parameters	Value range [encoding]	Increment	3RW	
							50 / 52 ¹⁾ [D ³⁾]	55 / 55-F ²⁾ [D ³⁾]
				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]
				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]

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	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] [0] No [1] Yes	-	-	r/w ⁴⁾ [1]
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]

Object No.	Byte	Bit	Data format	Parameters	Value range [encoding]	Increment	3RW	
							50 / 52 ¹⁾ [D ³⁾]	55 / 55-F ²⁾ [D ³⁾]
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]
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			

Object No.	Byte	Bit	Data format	Parameters	Value range [encoding]	Increment	3RW	
							50 / 52 ¹⁾ [D ³⁾]	55 / 55-F ²⁾ [D ³⁾]
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.			
194	76	0	Unsigned8	Input 1-Action ⁹⁾	[0 ... 45]	-	-	r/w ⁴⁾ [16]
					[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			
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] [0] No action ^{5), 6)} [1] Control source PIQ-DQ-1.0 output ^{15), 6)} [2] Control source PIQ-DQ-1.1 output ^{25), 6)} [6] Control source input ^{15), 6)} [7] Control source input ^{25), 6)} [8] Control source input ^{35), 6)} [9] Control source input ^{45), 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 ^{35), 6), 8)} [200] Reversing contactor right ^{5), 6)} [201] Reversing contactor left ^{5), 6)}	-	r [14]	r/w [13]
164	97	0	Unsigned8	Output 2-Action ⁹⁾	(see Output 1-Action)	-	-	r/w [0]
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]

Object No.	Byte	Bit	Data format	Parameters	Value range [encoding]	Increment	3RW	
							50 / 52 ¹⁾ [D ³⁾]	55 / 55-F ²⁾ [D ³⁾]
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]
2209	140	0	Bit4	Ex application ⁹⁾	[0 ... 3] [0] No [1] Yes, with complete motor protection [2] Yes, with thermal motor model [3] Yes, with PTC temperature protection	-	-	r/w ^{4), 10)} [0]

Object No.	Byte	Bit	Data format	Parameters	Value range [encoding]	Increment	3RW	
							50 / 52 ¹⁾ [D ³⁾]	55 / 55-F ²⁾ [D ³⁾]
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]
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				

Object No.	Byte	Bit	Data format	Parameters	Value range [encoding]	Increment	3RW	
							50 / 52 ¹⁾ [D ³⁾]	55 / 55-F ²⁾ [D ³⁾]
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 135). You will find the dependencies of the parameters in the Equipment Manual of the 3RW5 soft starter.

A.3.5.8 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]
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]

Object No.	Byte	Bit	Data format	Parameters	Value range [encoding]	Increment	3RW55 / 55-F ¹⁾ [D ³⁾]
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]
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 Ie upper fault limit violation ²⁾	[0 ... 1] [0] Do not turn off [1] Turn off	-	r/w [0]
2296		4	Bit4	Response to Ie 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.3.5.9 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]
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.3.5.10 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
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 standstill 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.3.5.11 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.3.6 3RW5 HMI High Feature (slot 3)**A.3.6.1 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	HMIFault	r
	1	Bool	Run	r
11	0	Bool	Factory settings restored	r
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.3.6.2 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
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]

Object No.	Byte	Bit	Data format	Parameters	Value range [encoding]	Increment	3RW5 HMI HF ¹⁾	
							50 / 52 [D ²⁾]	55 / 55-F [D ³⁾]
	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]
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	r
					[0] Do not save automatically [1] Save automatically [2] Save automatically and delete older traces		[0]	[0]
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	r/w
					[0] Stop motor and give back control [1] Continue with motor control		[0]	[0]
-	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.3.7 I&M data

The 3RW5 PROFIBUS communication module, the 3RW5 soft starters and the 3RW5 HMI High Feature support the following I&M data:

I&M data			3RW5		
Number	Name	Comment	PB 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 PROFIBUS 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 PROFIBUS, the I&M data can also be accessed via data set 255.

A.3.7.1 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.3.7.2 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.3.7.3 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.3.7.4 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

Class 1 master

Active station on PROFIBUS DP. It is characteristically used for cyclic data exchange with other stations. Typical Class 1 masters include PLCs with a PROFIBUS DP connection.

Class 2 master

Optional station on PROFIBUS DP. PC / PG are typical class 2 masters.

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.

Diagnostics

Data that is transferred from the 3RW5 soft starter and indicates the current operating status.

DP master

Cyclic send data is exchanged in a PROFIBUS DP system between the DP master and the DP slave once in every DP cycle. The DP master sends the cyclic receive data to the 3RW5 soft starter. In response, the 3RW5 soft starter sends the cyclic send data to the DP master.

DP slave

Slave operating on PROFIBUS with the PROFIBUS DP protocol.

DPV1 slave

DP slave that enables acyclic data exchange of parameter, diagnostic, receive and test data.

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.

GSD file

Information on the input and output range, as well as the consistency of the cyclically transmitted data is defined in the GSD file (General Station Description or device master data), tested with the configuration telegram from the device and, if appropriate, declared to be valid. The GSD file is used for integrating the device into any DP standard master system (automation system).

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.

Master

PROFIBUS DP is based on a master-slave architecture. Telegrams are sent by the master to the addressed station (slave) and responded to by the slave.

Messages

Data that is transferred from the 3RW5 soft starter and indicates the current operating status.

Parameterization

Parameterization is the definition of parameters using the parameterization software.

PII/PIQ

Process image input/process image output

PROFIBUS

PROFIBUS stands for "process fieldbus". PROFIBUS is a manufacturer-independent standard to network the field devices (e.g. PLCs, actuators, final controlling elements and sensors). PROFIBUS is compatible with protocols such as DP (decentralized peripherals), FMS (fieldbus message specification) and PA (process automation).

Reading data

Data are transferred from the 3RW5 soft starter.

In STEP 7, you can read the data sets as follows:

- S7 master: By calling SFC 59
- S7-DPV1 master: by calling SFB 52 "RD_REC" or SFC 59

Receive data

Data that are transferred to the 3RW5 soft starter.

S7 slave

The S7 slave is a slave that is fully integrated into STEP 7 and supports the S7 model (diagnostic interrupts).

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.

Slave

PROFIBUS DP is based on a master-slave architecture. Telegrams are sent by the master to the addressed station (slave) and responded to by the slave.

STEP 7

The basic STEP 7 software is the standard tool for the SIMATIC S7, SIMATIC C7 and SIMATIC WinAC automation systems.

Writing data

Data are transferred to the 3RW5 soft starter.

In STEP 7, you can write the data sets as follows: by calling SFB 53 "WR_REC".

- S7 master: by calling up SFC 58
- S7-DPV1 master: by calling SFB 53 "WR_REC" or SFC 58

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