

Industrial switchgear

Switchgear SIRIUS 3RA2711 function modules for IO-Link

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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Introduction

1.1 Responsibility of the user for system configuration and functionality

The function modules described here have been developed to carry out communication tasks as part of a plant or machine. The function modules for IO-Link are available for direct starting, reversing starting and star-delta starting.

Siemens AG, its regional offices, and associated companies (hereinafter referred to as "Siemens") cannot guarantee all the properties of an overall installation or machine that has not been designed by Siemens.

Nor can Siemens assume liability for recommendations that appear or are implied in the following description. No new guarantee, warranty, or liability claims beyond the scope of the Siemens general terms of supply are to be derived or inferred from the following description.

Note

Comply in each case with the valid national assembly regulations and standards when configuring the system.

1.2 Purpose of the manual

This manual describes the function modules for IO-Link. It provides overview information for integrating the function modules into the system environment and describes the hardware and software components of the modules.

The information in this manual enables you to commission the function modules for IO-Link.

1.3 Required basic knowledge

To understand these operating instructions you should have a general knowledge of automation engineering and low-voltage switchgear.

1.4 Scope of the manual

This manual is valid for the available function modules for IO-Link. It describes the components that are valid at the time of publication.

1.5 Siemens Industry Online Support

Information and Service

In Siemens Industry Online Support, you can obtain up-to-date information from our global support database quickly and simply. To accompany our products and systems, we offer a wealth of information and services that provide support in every phase of the lifecycle of your machine or plant – from planning and implementation, through commissioning, up to maintenance and modernization:

- Product support
- Application examples
- Services
- Forum
- mySupport

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

Product support

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

- **FAQs**
Our 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.
- **Characteristic curves**
For support in planning and configuring your system.
- **Product announcements**
The latest information and news concerning our products.
- **Downloads**
You can find here 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

With "mySupport", your personal workspace, you get the very best out of your Industry Online Support. Everything to enable you to find the right information every time.

The following functions are now available:

- **Personal messages**
Your personal mailbox for exchanging information and managing your contacts
- **Inquiries**
Use our online form for specific solution suggestions, or send your technical inquiry directly to a specialist in Technical Support
- **Notifications**
Make sure you always have the latest information - individually tailored to your needs
- **Filters**
Simple management and re-use of your filter settings from Product Support and the Technical Forum
- **Favorites / Tags**
Create your own knowledge database by assigning "Favorites" and "Tags" to documents – simply and efficiently
- **Entries last viewed**
Clear presentation of your last viewed entries
- **Documentation**
Configure your individual documentation from different manuals – quickly and without complications
- **Personal data**
Change personal data and contact information here
- **CAX data**
Simple access to thousands of items of CAX data such as 3D models, 2D dimension drawings, EPLAN macros and much more

1.6 Further documentation

To install and connect the contactors, you require the operating instructions of the contactors used.

The Appendix "References (Page 122)" has a list of the operating instructions.

You can find more information about Siemens IO-Link masters in the corresponding manuals for the electronic modules 4SI IO-Link and 4SI SIRIUS (IP20), as well as for ET 200eco PN (IP65).

The range of technical documentation for the various SIMATIC products and automation systems is available on the Internet (<http://www.siemens.com/simatic-tech-doku-portal>). This application example (<http://support.automation.siemens.com/WW/view/en/38006560>) describes how to read and write process data and parameterization data of IO-Link masters and IO-Link switching devices.

1.7 DataMatrix code

A DataMatrix code is lasered on the front of all units of the function modules for IO-Link, on the left on the basic module.

In the case of basic and coupling modules, there is a further DataMatrix code behind the labeling plate.

DataMatrix codes are standardized in ISO/IEC 16022. The DataMatrix codes on Siemens devices use ECC200 coding for powerful error correction.

The following device information is encoded in the front DataMatrix code as a bit stream:

- Article number
- Serial number (abbreviated)

This information is stored in the following format in the DataMatrix code:

1P	Article number	+	S
Data identifier	Net content	Separator	Serial number

The following device information is encoded in the front DataMatrix code behind the labeling plate as a bit stream:

- Article number
- Serial number
- Where appropriate, MAC address

This information is stored in the following format in the DataMatrix code:

1P	Article number	+	S
Data identifier	Net content	Separator	Serial number (+ 23S MAC address)

The following device information is encoded in the side rating plate as a bit stream:

- Article number
- Serial number
- Where appropriate, MAC address

This information is stored in the following format in the DataMatrix code:

1P	Article number	+	S
Data identifier	Net content	Separator	Serial number (+ 23S MAC address)

Note

The information content is displayed without spaces.

This machine-readable information simplifies and accelerates handling of the respective devices.

As well as fast access to the serial numbers of the respective devices for unique identification, the DataMatrix codes simplify communication with Siemens Technical Support.

1.8 Siemens Industry Online Support app

Siemens Industry Online Support app

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

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



Android



iOS

1.9 Recycling and disposal

The available function modules for IO-Link can be recycled, as they are low in pollutants. For environmentally-friendly recycling and disposal of your electronic waste, please contact a company certified for the disposal of electronic waste.

1.10 Support Request

After you have registered, you can use the Support Request form in the online support to send your question directly to Technical Support:

Support Request:	Internet (https://www.siemens.com/support-request)
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Standards

2.1 Standards

Applicable standards

The function modules comply with the following standards:

Table 2-1 Standards - function modules

Device standards	• IEC/EN 60947-1 "Low-voltage switchgear and controlgear: General rules" • IEC/EN 60947-4-1 "Contactors and motor-starters: Electromechanical contactors and motor-starters" • IEC/EN 60947-5-1 "Control circuit devices and switching elements: Electromechanical control circuit devices"; VDE 0660 "Low-voltage switchgear" • DIN EN 50042 "Terminal marking"
EMC standard ¹⁾	• IEC/EN 61000-6-2 "Generic standards - Immunity for industrial environments" • IEC/EN 61000-6-4 "Generic standards - Emission standard for industrial environments"
Resistance to extreme climates	• IEC 60721-3-3 "Classification of environmental conditions" The function modules are climate-proof according to IEC 60721-3.
Touch protection	• IEC/EN 60529 "Degrees of protection provided by enclosures" The function modules are safe to touch in accordance with IEC/EN 60529.

¹⁾ This is a device of Class A. When used in domestic areas, the device can cause radio interference. Users may have to take suitable measures.

Reference

SIRIUS components have been approved by a whole range of bodies for various sectors (e.g. shipbuilding). An up-to-date list of approvals appears in the appendix of the Catalog IC 10 - SIRIUS "Industrial Controls" (<http://www.siemens.com/sirius/catalogs>), and more information, as well as an option to download certificates, can be obtained on the Internet (<http://www.siemens.com/sirius/support>).

2.2 Requirements for switching high-efficiency motors

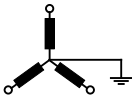
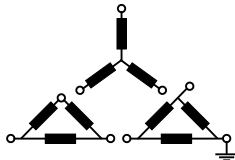
The increased requirements for protection devices and switchgear when switching high-efficiency motors are covered by the new utilization category AC-3e introduced in the IEC 60947-4-1 product standard.

The utilization category AC-3e takes into account the higher switch-on characteristic of efficiency-enhanced motors. This is reflected, for example, in a higher starting current when starting squirrel-cage motors.

All SIRIUS protection devices and switchgear that are subject to the IEC 60947-4-1 product standard meet the increased requirements in accordance with utilization category AC-3e and are suitable for use with high-efficiency motors.

2.3 Voltages

The specifications for 3-phase line supply according to IEC 60947-4-1 are valid for the following line system configurations:

Voltage specification U _e in the Equipment Manual	Line system configurations	
	Three-phase four-wire systems	Three-phase three-wire systems
		
[V]	[V]	[V]
230	--	230
400	230 / 400	400
440	260 / 440	440
500	--	500
690	400 / 690	690 (only from size S3)
1000	--	1000

-- not specified

2.4 Notes on the protection of device connections

The specifications for short-circuit protection (fuses, circuit breakers, or miniature circuit breakers) are available for the device connections of the main circuit and the auxiliary circuit. In order to ensure a holistic view for the protection of the device connections, the manufacturer is obliged to provide all relevant information for short-circuit protection and overcurrent protection.

If, for example, device connections for the control supply voltage, the supply voltage, or digital inputs/digital outputs are not connected to self-limiting current sources or energy sources, you can find the relevant information in the Equipment Manual or the technical data sheet.

IO-Link

You can find more information about communication via IO-Link, and about the valid standards for monitoring relays for IO-Link, on the Internet (<http://www.io-link.com/en>).

2.5 Approvals, test certificates, characteristics

You can find an overview of the certifications available for low-voltage controls and distribution products, test certificates and characteristics on the Internet (<http://www.siemens.com/sirius/approvals>).

You can find further information in the appendix of Catalog IC 10 "SIRIUS Industrial Controls" (<https://support.industry.siemens.com/cs/ww/en/view/109771990>).

Safety notes

3.1 Current information about operational safety

Important note for maintaining the operational safety of your system

Please take note of our latest information. Systems with safety-oriented characteristics are subject to special operational safety requirements on the part of the operator. The supplier is also obliged to comply with certain actions when monitoring the product. By subscribing to the appropriate newsletter, you will ensure that you are always up-to-date and able to make changes to your system, when necessary:

For this purpose, go to the page: SIEMENS newsletter (<http://www.siemens.com/sirius/newsletter>)

Click "Subscribe to newsletter".

Safety notices

NOTICE
Observe the ESD guidelines When handling and installing the devices, observe the ESD guidelines. Connection is only permitted when the power adapters have been deactivated (PELV power adapter in accordance with IEC EN 50178).

ESD guidelines

ESD components are destroyed by voltage and energy far below the limits of human perception. Voltages of this kind occur as soon as a device or an assembly is touched by a person who is not electrostatically discharged. ESD components which have been subject to such voltage are usually not recognized immediately as being defective, because the malfunction does not occur until after a longer period of operation.

NOTICE

Damage to the function module from electrostatic charging!

The function module contains components that are sensitive to electrostatic discharge. These modules will be destroyed or damaged by improper handling.

- You must discharge your body electrostatically immediately before touching an electronic component. To do this, touch a conductive, grounded object, e.g., a bare metal part of a switch cabinet or the water pipe.
- Always hold the component by the plastic enclosure.
- Electronic modules should not be brought into contact with electrically insulating materials such as plastic film, plastic parts, insulating table supports or clothing made of synthetic fibers.
- Always place electrostatic sensitive devices on conductive bases.
- Always store and transport electronic modules or components in ESD-safe conductive packaging, e.g. metallized plastic or metal containers. Leave the component in its packaging until installation.

Intended use



WARNING

Intended use

Can Cause Death, Serious Injury, or Property Damage.

The devices may only be used for the applications described in the catalog and the technical description, and only in conjunction with equipment or components from other manufacturers which have been approved or recommended by Siemens.

This product can function correctly and reliably only if it is transported, stored, assembled, and installed correctly, and operated and maintained as recommended.

Before you run any sample programs or programs that you have written yourself, make sure that running the plant cannot cause injury to anyone else or damage to the machine itself.

EU notice: Commissioning is absolutely prohibited until it has been ensured that the machine in which the component described here is to be installed fulfills the regulations/specifications of Machinery Directive 89/392/EEC.

See also

SIEMENS newsletter (<http://www.siemens.com/sirius/newsletter>)

3.2 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/cert>.

Product description

4.1 Properties

Function modules for IO-Link

Function modules for IO-Link are integrated in the higher-level control system via an IO-Link master. They are mounted on contactors with a communication link or contactor combinations with a communication link from the SIRIUS device family.

The function modules for IO-Link comply with the IO-Link communication specification V1.1.

The following contactors and contactor combinations are available for the function modules for IO-Link:

- For direct starting
- For reversing starting
- For star-delta starting

The function modules are divided into basic modules and coupling modules. Coupling modules are connected with the basic module or another coupling module via module connectors.

The process image of the function module outputs controls the starter. The process image of the inputs represents the status of the starter.

Operator panel

The starters are controlled with the operator panel in manual mode. The states of the device are also queried for up to 4 starters.

The operator panel is connected to the last available interface of a starter group via the 10-core connecting cable.

The voltage supply of the operator panel is provided with the 2 m long connecting cable.

Operation using the operator panel (Page 92)

Note

If communication between the IO-Link master and IO-Link device is interrupted, the IO-Link devices switch off connected loads for safety reasons.

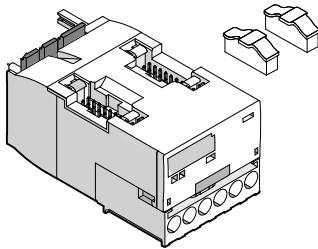
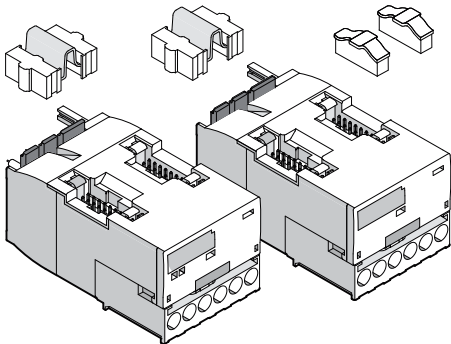
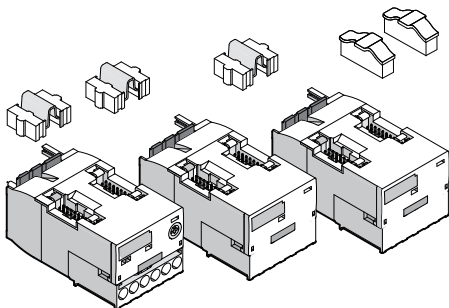
Manual operation is still possible with the operator panel.

4.2 Scope of supply

Function modules for IO-Link

The following components are included in the scope of supply of the function modules for IO-Link.

Table 4-1 Scope of supply of the function modules for IO-Link

Article number ¹⁾	Components supplied	Fig. ²⁾
3RA2711- . AA00	Function module for IO-Link, direct starting 1 x basic module for direct starting 1 x module connector 14-pin 2 x interface cover	
3RA2711- . BA00	Function modules for IO-Link, reversing starting: 1 x basic module, reversing starting 1 x coupling module, reversing starting 2 x module connectors 14-pin 2 x interface cover	
3RA2711- . CA00	Function modules for IO-Link, star-delta starting: 1 x basic module, star-delta starting 2 x coupling module, star-delta starting 3 x module connectors 14-pin 2 x interface cover	

¹⁾ Article number supplement for type of connection: 1 - with screw-type terminals, 2 - with spring-loaded terminals

²⁾ The table shows only the function modules with screw-type terminals.

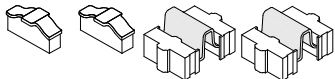
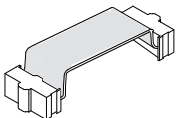
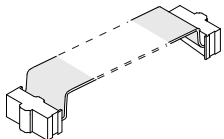
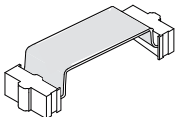
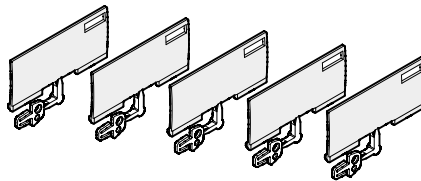
See also

Product combinations (Page 35)

Accessories

The components can also be ordered individually:

Table 4-2 Accessories

Article number	Components supplied	Image
3RA2711-OEE10	2 x module connector 14-pin, length 35 mm for connecting starters 2 x interface cover	
3RA2711-OEE17	Module connector 14-pin, length 60 mm for connecting starters and starter groups	
3RA2711-OEE06	Module connector 14-pin, length 90 mm for connecting starters and starter groups	
3RA2711-OEE18	Module connector 14-pin, length 130 mm for connecting starters and starter groups	
3RA2711-OEE07	Module connector 14-pin, length 260 mm for connecting starters and starter groups	
3RA2711-OEE08	Module connector 14-pin, length 335 mm for connecting starters and starter groups	
3RA2711-OEE16	Module connector 14-pin (only 10 pins occupied), length 90 mm for additional supply of auxiliary voltage	
3RA2910-0	5 x sealable cover	
3RA2711-OEE15	5 x interface cover	

Selecting the module connectors

Article number	Description	Application
3RA2711-0EE10	Module connector 14-pin, length 35 mm (2 x enclosed)	Connection between function modules on contactors of the same size, that is, 3RT201 - 3RT201 ²⁾ , 3RT202 - 3RT202 ²⁾ , 3RT203-3RT203 ¹⁾
3RA2711-0EE17	Module connector 14-pin, length 60 mm	Connection between function modules on contactors of the same size, that is, 3RT203-3RT203 ²⁾ , 3RT204-3RT204 ²⁾ and connection between function modules on contactors of different sizes, that is, 3RT201-3RT202 ¹⁾
3RA2711-0EE06	Module connector 14-pin, length 90 mm	Connection between function modules on contactors of different sizes, that is, 3RT201-3RT203 ²⁾ , 3RT202-3RT203 ¹⁾ , 3RT202-3RT204 ¹⁾ , 3RT203-3RT204 ²⁾
3RA2711-0EE18	Module connector 14-pin, length 130 mm	Connection between function modules on contactors of different sizes, that is, 3RT201-3RT203 ²⁾ , 3RT202-3RT204 ²⁾
3RA2711-0EE07	Module connector 14-pin, length 260 mm	Bypassing spaces 3RT201 to 3RT203
3RA2711-0EE08	Module connector 14-pin, length 335 mm	Bypassing spaces 3RT201 to 3RT204

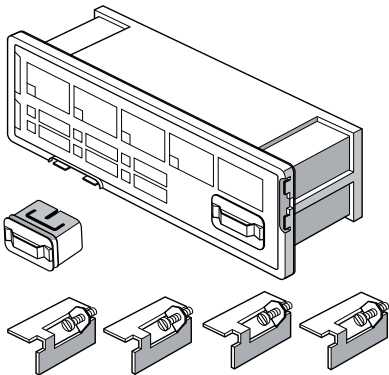
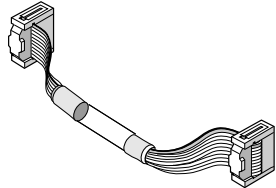
¹⁾ max. 1 auxiliary switch

²⁾ max. 2 auxiliary switches

Operator panel

An operator panel is offered as an additional accessory:

Table 4-3 Scope of supply of operator panel

Article number	Components supplied	Image
3RA6935-0A	Operator panel: 1 x enabling block 1 x interface cover operator panel 4 x mounting bracket	
3RA2711-0EE11	Connecting cable 10 to 14-pole, length 2 m (round) for operator panel	
3RA6936-0A	Enabling block	
3RA6936-...	5 x interface cover operator panel	

4.3 Technical data

4.3.1 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/16208/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.

The screenshot shows the Siemens Industry Online Support search interface. At the top, there is a search bar with the text 'Enter keyword...'. Below it, the 'Product' field contains the article number '3RV2026-4EA10' and is highlighted with a red box. To the right of the 'Product' field is a search icon. Below the 'Product' field is a 'Search product' button. To the right of the 'Product' field is the 'Entry type' dropdown menu, which is set to 'Technical data (1)' and is also highlighted with a red box. To the right of the 'Entry type' dropdown is a 'Date' field with 'From' and 'To' sub-fields. Below the search bar, the product details for '3RV2026-4EA10' are displayed. The details include 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 is a breadcrumb navigation bar with the links '> Product details > Technical data > CAX data'. The 'Technical data' link is highlighted with a red box.

4.3.2 Overview tables

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/10047525?tree=CatalogTree>).

Application planning

5.1 Product combinations

Assembly with individual components and pre-wired starters

The function modules for IO-Link are designed for the contactors (24 V DC) 3RT201, 3RT202, 3RT203 and 3RT204.

You can mount the function modules for IO-Link on contactors or contactor combinations of the SIRIUS device family:

- The basic modules on contactors for communication connection
- The coupling modules on standard contactors.

As an alternative to assembling individual components, pre-wired reversing contactor assemblies **without** function modules for IO-Link and pre-wired contactor assemblies for star-delta (wye-delta) start **with** function modules for IO-Link are available.

Requirements

You will need the following components to assemble a starter:

Table 5-1 Components for starters

Assembly for ...	Components
Direct start	Individual components • Contactor for communication connection (24 V DC) • Function module for IO-Link, direct start
Reversing start	Individual components • Contactor for communication connection (24 V DC): Direction of rotation 1 (clockwise) • Standard contactor (24 V DC): Direction of rotation 2 (counter-clockwise) • Wiring modules for reversing contactor assemblies • Function modules for IO-Link, reversing start Pre-wired reversing contactor assembly, comprising: • Reversing contactor assembly with communication connection (24 V DC) • Function modules for IO-Link, reversing start

Assembly for ...	Components
Star-delta (wye-delta) start	Individual components • Contactor for communication connection (24 V DC): Line contactor • 2 x standard contactor: Star-delta (wye-delta) contactor • Wiring modules for contactor assembly for star-delta (wye-delta) start • Function modules for IO-Link, star-delta (wye-delta) start
	Pre-wired contactor assembly for star-delta (wye-delta) start: • Contactor assembly for star-delta (wye-delta) start (comprising contactors, wiring modules and function modules)

Note**Assembly with individual components**

If you assemble contactor assemblies using individual components, the function modules for IO-Link handle control of the contactors. The wiring modules for connecting the main current paths are mounted in the usual way. The wiring modules for connecting the control current paths are not required.

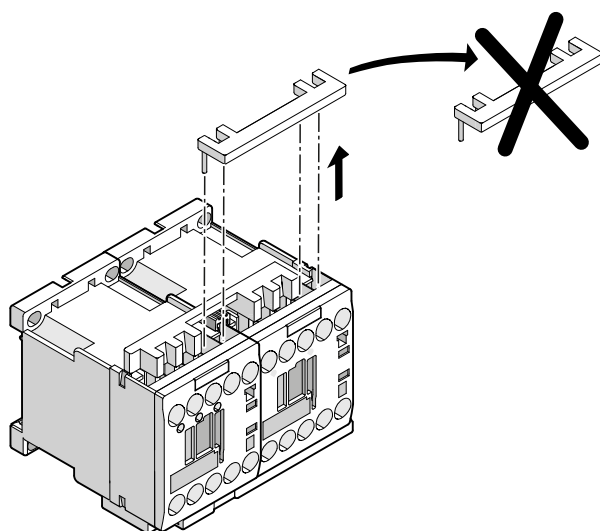


Figure 5-1 Removal of the wiring modules for connecting the control current paths on a reversing contactor assembly with 3RA231 screw-type connections

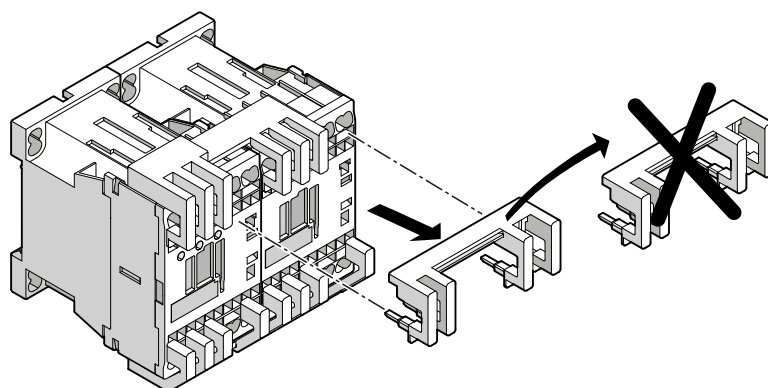


Figure 5-2 Removal of the wiring modules for connecting the control current paths on a reversing contactor assembly with 3RA231 spring-loaded connections

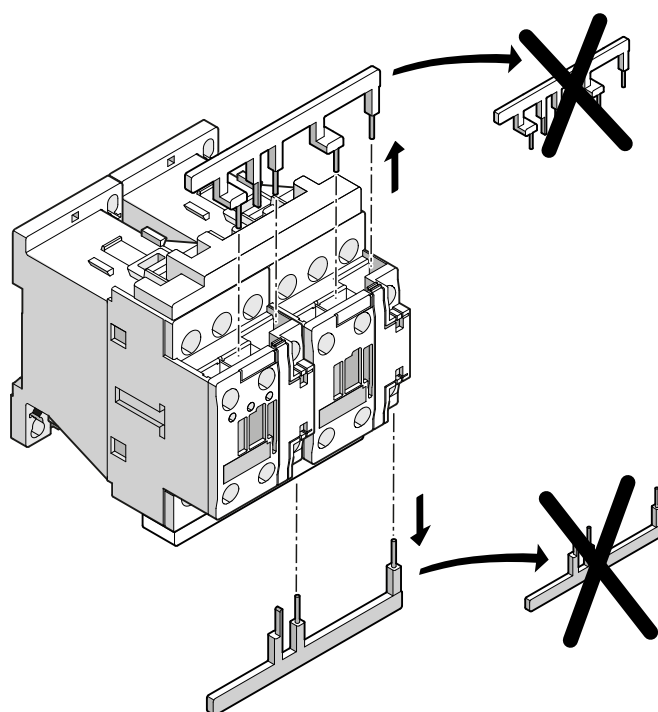


Figure 5-3 Removal of the wiring modules for connecting the control current paths on a reversing contactor assembly with 3RA232 screw-type connections

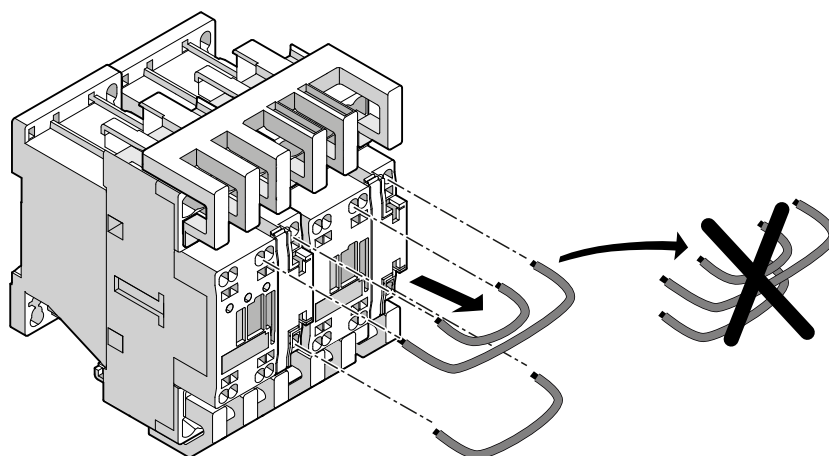


Figure 5-4 Removal of the wiring modules for connecting the control current paths on a reversing contactor assembly with 3RA232 spring-loaded connections

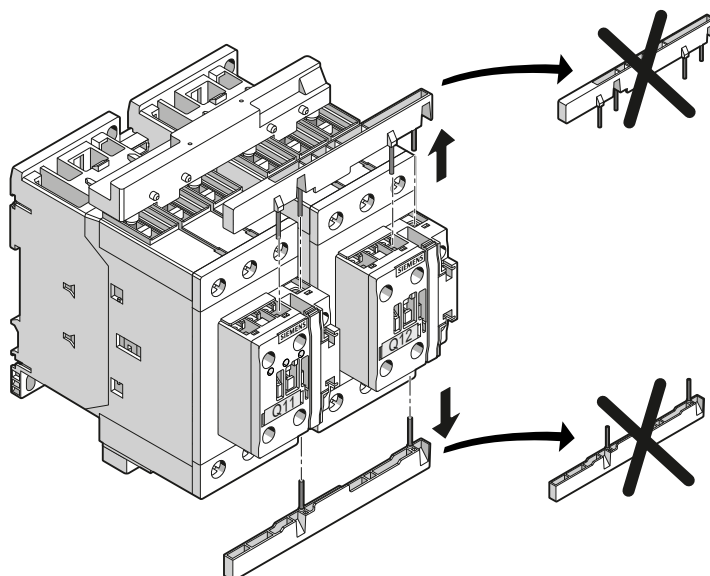


Figure 5-5 Removal of the wiring modules for connecting the control current paths on a reversing contactor assembly with 3RA233 screw-type connections

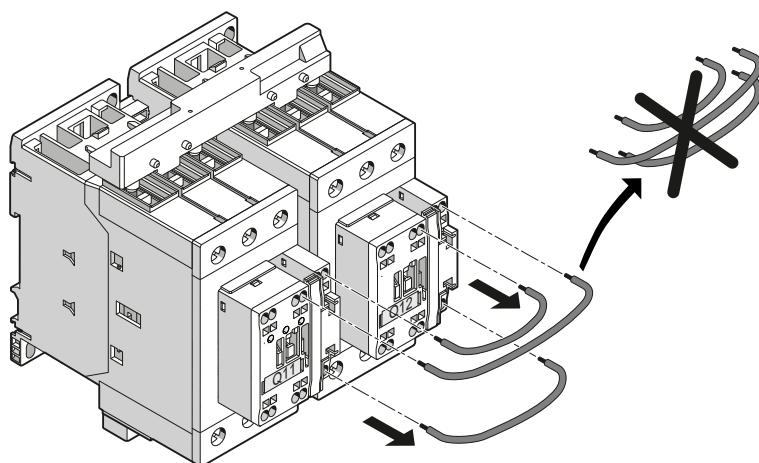


Figure 5-6 Removal of the wiring modules for connecting the control current paths on a reversing contactor assembly with 3RA233 spring-loaded connections

Note

Removal of the wiring modules

The procedure for removing the wiring modules on a 3RA234 reversing contactor assembly is identical.

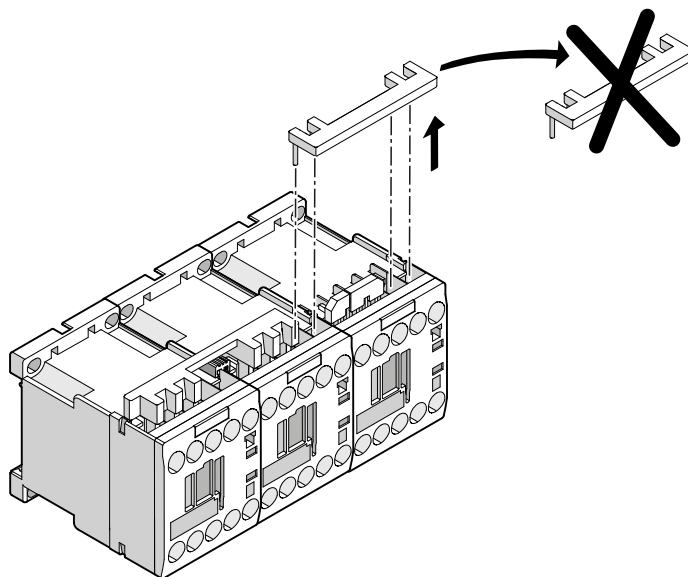


Figure 5-7 Removal of the wiring modules for connecting the control current paths on a contactor assembly for star-delta (wye-delta) start with 3RA241 screw-type connections

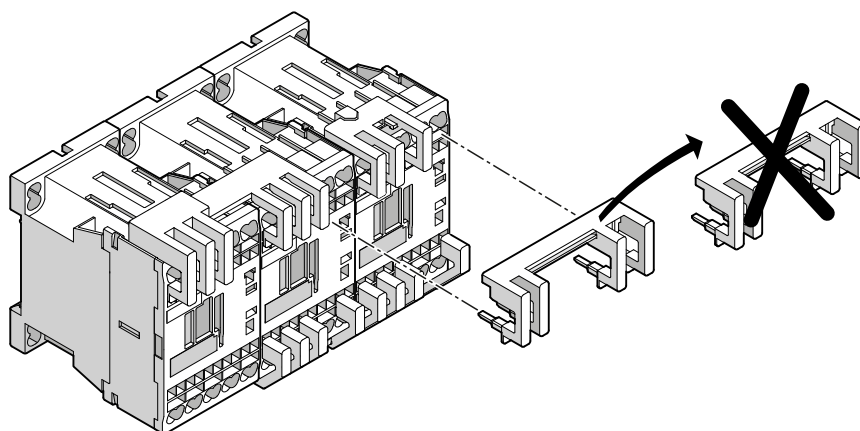


Figure 5-8 Removal of the wiring modules for connecting the control current paths on a contactor assembly for star-delta (wye-delta) start with 3RA241 spring-loaded connections

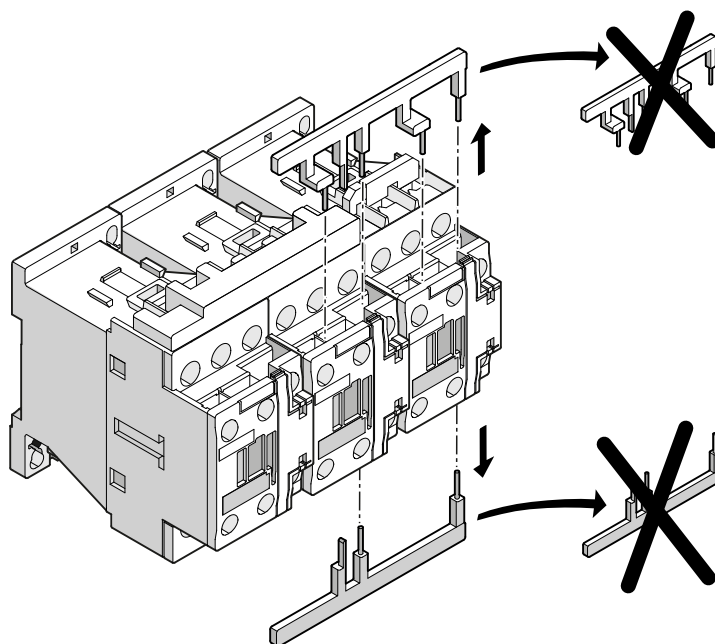


Figure 5-9 Removal of the wiring modules for connecting the control current paths on a contactor assembly for star-delta (wye-delta) start with 3RA242 screw-type connections

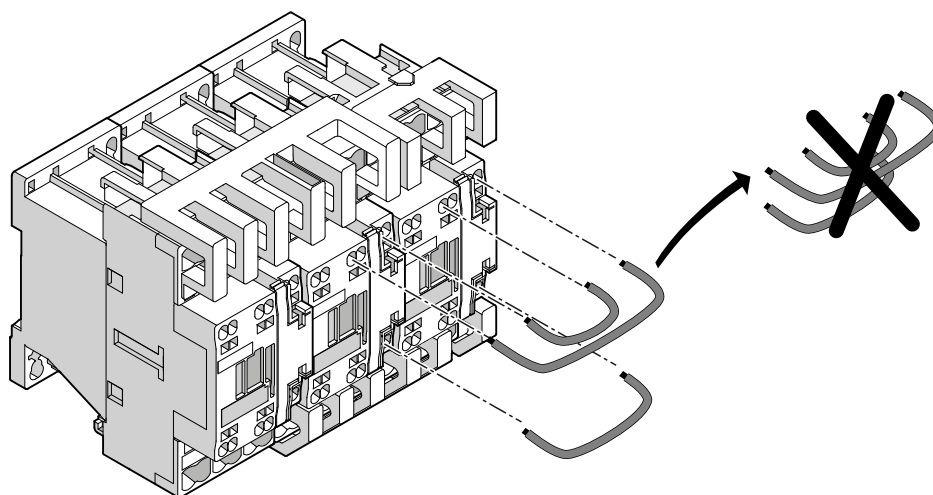


Figure 5-10 Removal of the wiring modules for connecting the control current paths on a contactor assembly for star-delta (wye-delta) start with 3RA242 spring-loaded connections

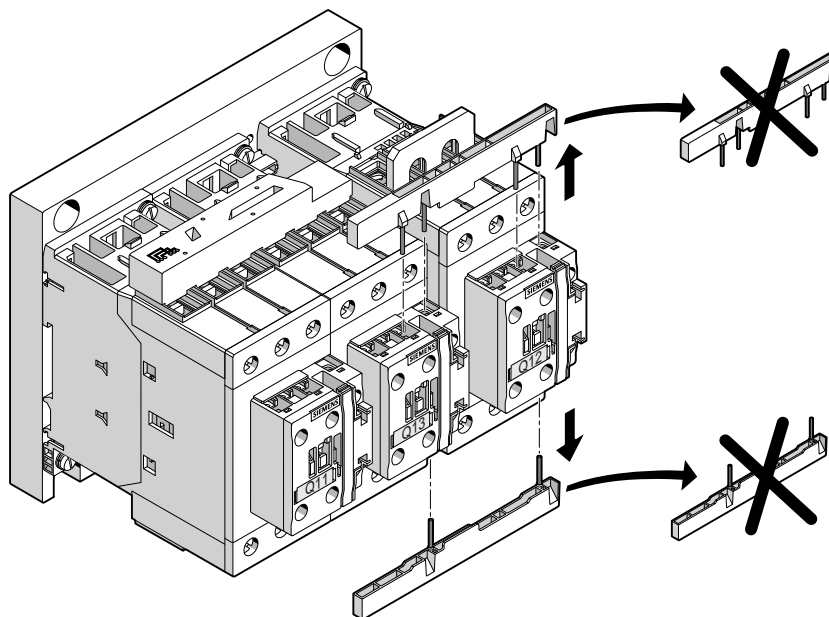


Figure 5-11 Removal of the wiring modules for connecting the control current paths on a contactor assembly for star-delta (wye-delta) start with 3RA243 screw-type connections

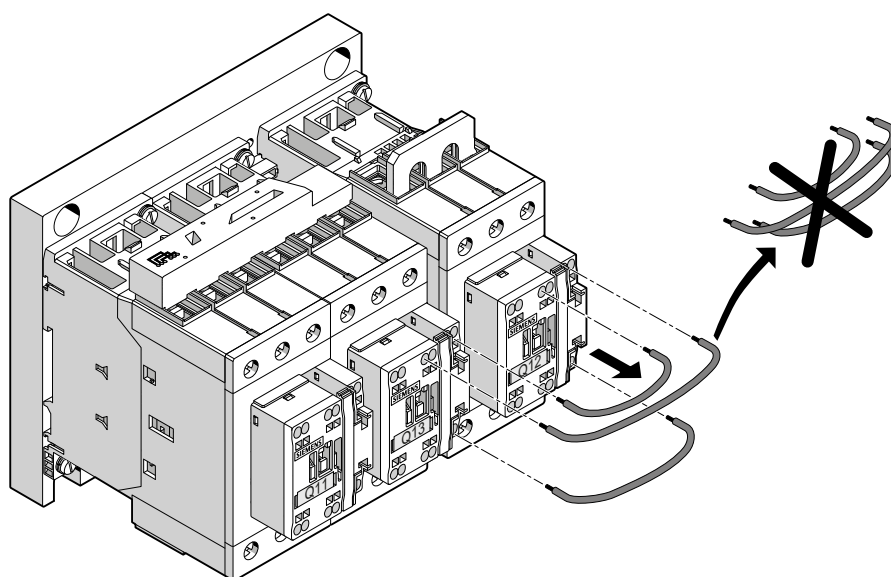


Figure 5-12 Removal of the wiring modules for connecting the control current paths on a contactor assembly for star-delta (wye-delta) start with 3RA243 spring-loaded connections

Note

Removal of the wiring modules

The procedure for removing the wiring modules on a 3RA244 contactor assembly for star-delta (wye-delta) start is identical.

Contactors for basic modules and coupling modules

Table 5-2 Approved contactors S00, S0, S2 and S3 for basic modules and coupling modules

For basic module	For coupling module	Power
Contactor for communication connection	Standard contactor	
Article No. *	Article number	
3RT2015- . BB4x-0CC0	3RT2015- . BB4x	3 kW/400 V, 24 V DC
3RT2016- . BB4x-0CC0	3RT2016- . BB4x	4 kW/400 V, 24 V DC
3RT2017- . BB4x-0CC0	3RT2017- . BB4x	5.5 kW/400 V, 24 V DC
3RT2018- . BB4x-0CC0	3RT2018- . BB4x	7.5 kW/400 V, 24 V DC
3RT2023- . BB40-0CC0	3RT2023- . BB40	4 kW/400 V, 24 V DC
3RT2024- . BB40-0CC0	3RT2024- . BB40	5.5 kW/400 V, 24 V DC
3RT2025- . BB40-0CC0	3RT2025- . BB40	7.5 kW/400 V, 24 V DC
3RT2026- . BB40-0CC0	3RT2026- . BB40	11 kW/400 V, 24 V DC
3RT2027- . BB40-0CC0	3RT2027- . BB40	15 kW/400 V, 24 V DC
3RT2028- . BB40-0CC0	3RT2028- . BB40	18.5 kW/400 V, 24 V DC
3RT2035- . NB30-0CC0	3RT2035- . NB30	18.5 kW/400 V, 20-33 V AC/DC

For basic module	For coupling module	Power
Contactor for communication connection	Standard contactor	
Article No. *	Article number	
3RT2036- . NB30-0CC0	3RT2036- . NB30	22 kW/400 V, 20-33 V AC/DC
3RT2037- . NB30-0CC0	3RT2037- . NB30	30 kW/400 V, 20-33 V AC/DC
3RT2038- . NB30-0CC0	3RT2038- . NB30	37 kW/400 V, 20-33 V AC/DC
3RT2045- . NB30-0CC0	3RT2045- . NB30	37 kW/400 V, 20-33 V AC/DC
3RT2046- . NB30-0CC0	3RT2046- . NB30	45 kW/400 V, 20-33 V AC/DC
3RT2047- . NB30-0CC0	3RT2047- . NB30	55 kW/400 V, 20-33 V AC/DC

* Article number supplement for type of connection:

- 1 - with screw-type terminals (3RT201, 3RT202, 3RT203, 3RT204)
- 2 - with spring-loaded terminals (3RT201, 3RT202)

• 3 - with screw-type terminals in the main circuit and spring-loaded terminals in the control circuit / coil connection (3RT203, 3RT204)

x article number supplement:

- 1 - integrated auxiliary contact 1 NO contact
- 2 - integrated auxiliary contact 1 NC contact

Pre-wired reversing contactor assembly

Table 5-3 Reversing contactor assemblies for communication connection, without function module for IO-Link

Article No. *	Power
3RA2315-8XE30- . BB4	3 kW/400 V, 24 V DC
3RA2316-8XE30- . BB4	4 kW/400 V, 24 V DC
3RA2317-8XE30- . BB4	5.5 kW/400 V, 24 V DC
3RA2318-8XE30- . BB4	7.5 kW/400 V, 24 V DC
3RA2324-8XE30- . BB4	5.5 kW/400 V, 24 V DC
3RA2325-8XE30- . BB4	7.5 kW/400 V, 24 V DC
3RA2326-8XE30- . BB4	11 kW/400 V, 24 V DC
3RA2327-8XE30- . BB4	15 kW/400 V, 24 V DC
3RA2328-8XE30- . BB4	18.5 kW/400 V, 24 V DC
3RA2335-8XE30-1NB3	18.5 kW/400 V, 20-33 V AC/DC
3RA2336-8XE30-1NB3	22 kW/400 V, 20-33 V AC/DC
3RA2337-8XE30-1NB3	30 kW/400 V, 20-33 V AC/DC
3RA2338-8XE30-1NB3	37 kW/400 V, 20-33 V AC/DC
3RA2345-8XE30-1NB3	37 kW/400 V, 20-33 V AC/DC

Article No. *	Power
3RA2346-8XE30-1NB3	45 kW/400 V, 20-33 V AC/DC
3RA2347-8XE30-1NB3	55 kW/400 V, 20-33 V AC/DC

* Article number supplement for type of connection:

- 1 - with screw-type terminals
- 2 - with spring-loaded terminals

Note

The pre-wired reversing contactor assemblies comprise contactors and wiring modules. The function modules must be ordered and mounted separately.

Pre-wired contactor assemblies for start-delta (wye-delta) start

Table 5-4 Contactor assemblies for star-delta (wye-delta) start for communication connection, with function module for IO-Link

Article No. *	Power
3RA2415-8XE31- . BB4	AC3, 5.5 kW / 400 V, 24 V DC
3RA2416-8XE31- . BB4	AC3, 7.5 kW/400 V, 24 V DC
3RA2417-8XE31- . BB4	AC3, 11 kW/400 V, 24 V DC
3RA2423-8XE32- . BB4	AC3, 11 kW/400 V, 24 V DC
3RA2425-8XE32- . BB4	AC3, 15/18.5 kW/400 V, 24 V DC
3RA2426-8XE32- . BB4	AC3, 22 kW/400 V, 24 V DC
3RA2434-8XH32-1NB3	AC3, 22/30 kW/400 V, 20-33 V AC/DC
3RA2435-8XH32-1NB3	AC3, 37 kW/400 V, 20-33 V AC/DC
3RA2436-8XH32-1NB3	AC3, 45 kW/400 V, 20-33 V AC/DC
3RA2437-8XH32-1NB3	AC3, 55 kW/400 V, 20-33 V AC/DC
3RA2445-8XH32-1NB3	AC3, 75 kW/400 V, 20-33 V AC/DC
3RA2446-8XH32-1NB3	AC3, 90 kW/400 V, 20-33 V AC/DC

* Article number supplement for type of connection:

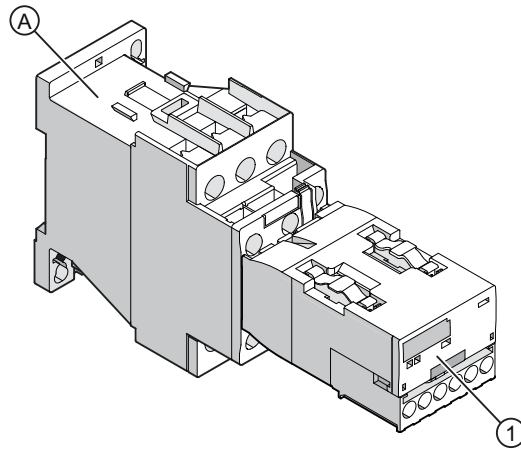
- 1 - with screw-type terminals
- 2 - with spring-loaded terminals

See also

Scope of supply (Page 30)

5.2 Assembly of function modules for IO-Link, direct starting

The figure below shows the assembly for direct starting.

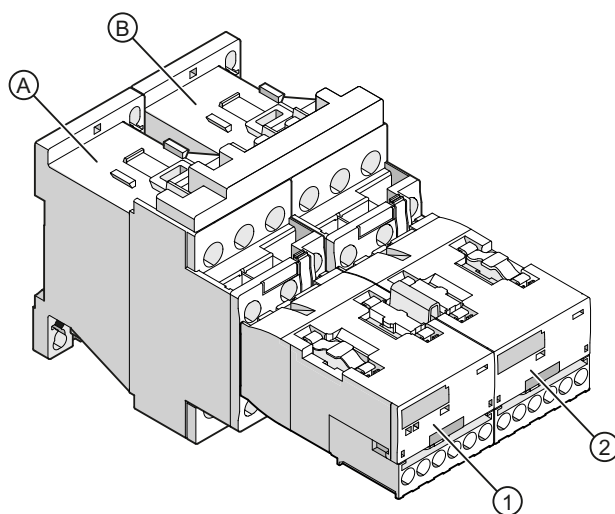


- ① IO function module for IO-Link, direct starting
- Ⓐ Contactor for communication connection

Figure 5-13 Assembly of function module for IO-Link, direct starting

5.3 Assembly of function module for IO-Link, reversing starting

The figure below shows the assembly for reversing starting.



- ① Basic module for IO-Link, reversing starting
- ② Coupling module, reversing starting
- (A) Contactor for communication connection for direction of rotation 1 (clockwise)
- (B) Standard contactor for direction of rotation 2 (counter-clockwise)

Figure 5-14 Assembly of function module for IO-Link, reversing starting

Note

No auxiliary wiring necessary!

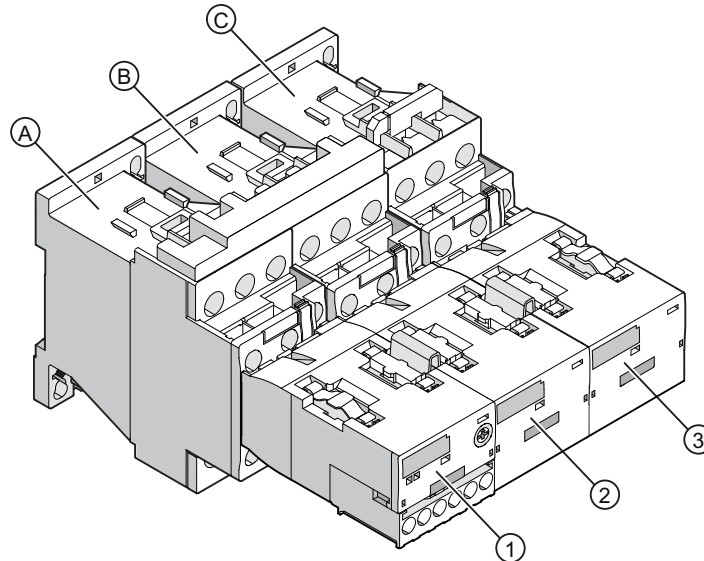
If you use the pre-wired reversing combination, you must dismantle the wiring modules for connecting the control conducting paths.

Reference

You can find information about the contactors in the operating instructions for the contactors and contactor combinations used. Appendix "References (Page 122)" has a list of the relevant operating instructions.

5.4 Assembly of function modules for IO-Link, star-delta starting

The figure below shows the assembly for star-delta starting.



- ① Basic module for IO-Link, star-delta starting
- ② Coupling module, star-delta starting
- ③ Coupling module, star-delta starting
- Ⓐ Contactor for communication connection (line contactor Q11)
- Ⓑ Standard contactor (delta contactor Q13)
- Ⓒ Standard contactor (star contactor Q12)

Figure 5-15 Assembly of function modules for IO-Link, star-delta starting

Note

No auxiliary wiring necessary!

If you use the pre-wired star-delta combination, you must dismantle the wiring modules for connecting the control conducting paths.

Reference

You can find information about the contactors in the operating instructions for the contactors and contactor combinations used. Appendix "References (Page 122)" has a list of the relevant operating instructions.

Configuring the IO-Link

6.1 Combinations

IO-Link master and IO-Link device combinations are shown in the following table.

IO-Link master...	IO-Link device...	
	... according to IO-Link communication specification V1.0	... according to IO-Link communication specification V1.1
...according to IO-Link communication specification V1.0	Operation according to specification V1.0	Operation according to specification V1.0
...according to IO-Link communication specification V1.1	Operation according to specification V1.0	Operation according to specification V1.1¹⁾

¹⁾ By selection of IODD V1.0.1, the device can be operated according to IO-Link communication specification V1.0.

Differences between IO-Link communication specifications V1.0 and V1.1

- Usable IO-Link telegram length (not relevant)
- Application-specific name: V1.0: 64 bytes max./V1.1: 32 bytes max.
- IO-Link device LED: V1.0: green/V1.1: Green blinking
- Device ID: V1.0: 0x00/V1.1: 0x01
- Parameter server functionality: V1.0: not available/V1.1: available

6.2 Configuring with STEP 7 and the S7-PCT Port Configuration Tool

6.2.1 Basic procedure and prerequisites

Procedure when configuring IO-Link master and IO-Link devices

Configuration takes place in two steps with STEP 7, V5.4 SP5 or STEP 7 TIA Portal, V12.0 or higher:

1. Configuring the IO-Link master in *HW Config*. You will find IO-Link master on the Internet (<http://www.siemens.com/industrymall>) under "Automation" > "Industrial communication" > "IO-Link" > "Master".
2. With the Port Configuration Tool *S7-PCT*, you configure the connected IO-Link devices.

Note

The block library for IO-Link (LIOLink) is available as download in the Siemens Industry Online Support (SIOS) via the following link: Library for IO-Link (LIOLink) (<https://support.industry.siemens.com/cs/ww/en/view/82981502>)

Note

An application example for using the device-specific blocks from the block library for IO-Link (LIOLink) can be found on the Internet (<https://support.industry.siemens.com/cs/ww/en/view/90529409>).

Requirements

- STEP 7 from V5.4 SP5 or STEP 7 TIA Portal from V12.0.
- The Port Configuration Tool *S7-PCT* is installed on the PG/PC.
You can either install *S7-PCT* together with or STEP 7 or you can download it from the Internet (<https://support.industry.siemens.com/cs/ww/en/view/32469496>).
- IO-Link IODD files (IO Device Description) are installed in the *S7-PCT hardware catalog*. You can download all current IODD files for the SIRIUS devices from the Internet (<http://support.automation.siemens.com/WW/view/de/29801139/133100>).
IODD files for V1.0 and V1.1 are available for the combination of an IO-Link master and an IO-Link device according to the IO-Link communication specification V1.1. You may need IODD files according to the IO-Link communication specification V1.0 when replacing devices in existing installations.
- The GSD files of the IO-Link masters are already installed in *STEP 7 HW Config*. You can download all current GSD files for the Siemens IO-Link masters from the Internet (<https://support.industry.siemens.com/cs/ww/en/ps/14288>).

6.2.2 Configuration

Configuring the IO-Link master in *HW Config*

1. Start the SIMATIC Manager (*STEP 7*) or the TIA Portal and configure the project as described in the *STEP 7* online help.
2. Select the IO-Link master in the hardware catalog of *HW Config*.
3. Drag and drop the IO-Link master from the hardware catalog to the hardware configuration.
4. Select the IO-Link master in the hardware configuration (*STEP 7 V5.x*) / device view (*STEP 7 TIA*).
5. Press the right mouse button and in the shortcut menu select "**Object Properties**" (*STEP 7 V5.x*) / "**Properties**" (*STEP 7 TIA*).
Result: The "**Properties**" window of the IO-Link master opens.
6. Check the settings of the addresses.
Every IO-Link master port needs a corresponding overall address range depending on the IO-Link device used.

Configuring the IO-Link device with the S7-PCT Port Configuration Tool

1. Select the configured IO-Link master.
2. Press the right mouse button and select "**Start device tool**" (*STEP 7 TIA*) / "**Configure IO-Link**" (*STEP 7 V5.x*) from the shortcut menu depending on the configuration tool used.
3. Select the IO-Link device in the component catalog of the S7-PCT Port Configuration Tool.
4. Drag the IO-Link device out of the component catalog to the required port of the IO-Link master.
5. Start by parameterizing the IO-Link device.
More information is available in the *S7-PCT* online help.

6.3 Configuring with the S7-PCT port configuration tool (stand-alone)

6.3.1 Application

Configuration is always done with the S7-PCT Port Configuration Tool whenever no SIMATIC CPU is available and a SIMATIC IO-Link master is being used.

6.3.2 Basic procedure and prerequisites

Basic procedure when configuring IO-Link master and IO-Link devices with the S7-PCT Port Configuration Tool (stand-alone)

1. You configure the connected IO-Link devices with the *S7-PCT* Port Configuration Tool.

Requirements

- The *S7-PCT* Port Configuration Tool is installed on the PG/PC. You can either install *S7-PCT* together with STEP 7 V5.4 SP5 or higher or STEP 7 TIA Portal V12.0 or higher, or you can download it from the Internet (<https://support.industry.siemens.com/cs/ww/en/view/32469496>).
- IO-Link IODD files (IO Device Description) are installed in the *S7-PCT* hardware catalog. All current IODD files of the SIRIUS devices are available on the Internet (<http://support.automation.siemens.com/WW/view/de/29801139/133100>). IODD files for V1.0 and V1.1 are available for the combination of an IO-Link master and an IO-Link device according to the IO-Link communication specification V1.1. You may need IODD files according to the communication specification V1.0 when replacing devices in existing installations.

Note

Configuring with *S7-PCT* stand-alone is not possible for the CPU versions of the ET 200.

6.3.3 Configuration

Configuring the IO-Link device with the S7-PCT Port Configuration Tool

1. Start the *S7-PCT* Port Configuration Tool.
2. Create a new project or open an existing project as described in the online help.
3. Double-click to select a bus category (PROFIBUS DP / PROFINET IO).
4. Double-click to select an IO-Link master.
5. Select the IO-Link device in the component catalog of the *S7-PCT* Port Configuration Tool.

6.3 Configuring with the S7-PCT port configuration tool (stand-alone)

6. Drag the IO-Link device out of the component catalog to the required port of the IO-Link master.
7. Load the configuration into the IO-Link master before parameterizing the IO-Link device.
8. Start by parameterizing the IO-Link device.
More information is available in the *S7-PCT* online help.

Note

To be able to access the IO-Link master or an IO-Link device online, communication between the ET 200 and the higher-level controller must be active (BF LED on ET 200 interface module is off).

6.4 Block library for IO-Link (LIOLink)

The current block library for IO-Link (LIOLink) can be used for STEP 7 TIA Portal V16 and higher. For older STEP 7 versions, the article contains an archive download of an earlier version. The function block library for IO-Link (LIOLink) provides blocks and PLC data types to enable communication between the SIMATIC controller and IO-Link master or IO-Link device.

All blocks of the library are compatible with the SIMATIC S7-1200 / 1500 controller and mostly also with the SIMATIC S7-300 / 400 controller.

Basic blocks

The library contains the following blocks, among others:

- The LIOLink_Device block enables the reading and writing of acyclic data of an IO-Link device via the S7 program
- The LIOLink_Master block enables the backup (Backup) and restore (Restore) of device parameters and device settings of an IO-Link master via the S7 program (master exchange without engineering tool)

Device-specific blocks for simple communication with IO-Link devices

The library for IO-Link is available as download in the Siemens Industry Online Support (SIOS) via the following link:

Library for IO-Link (LIOLink) (<https://support.industry.siemens.com/cs/ww/en/view/82981502>)

Note

An application example for using the device-specific blocks for IO-Link can be found on the Internet (<https://support.industry.siemens.com/cs/ww/en/view/90529409>).

6.5 Replacing an IO-Link device

6.5.1 Introduction

To replace 3RA27 modules, the devices must be isolated from communication and disconnected from the power supply. The complete group of load feeders becomes inactive. After removal of the connections between the load feeders, the applicable module can then be replaced. After the connections have been restored and communication has been resumed, the parameterization can be restored according to the respective IO-Link communication specification:

- IO-Link communication specification V1.0: concerning the LIOLink_Device function block.
- IO-Link communication specification V1.1: via automatic parameterization under the ET 200SP

6.5.2 Replacing an IO-Link device according to the IO-Link communication specification V1.0

6.5.2.1 Procedure

Parameter data and configuration data specially optimized by the user for a specific application are stored in an IO-Link-Device. This data deviates in many cases from the default values stored in the IO-Link-Device.

In the event of replacement of an IO-Link-Device (referred to below as a "module"), the optimized data must be transferred to the new module because the parameters are stored only in the IO-Link device itself.

Data can be transferred via two channels:

- Module replacement with PG/PC
- Module replacement without PG/PC

6.5.2.2 Procedure with PG/PC

In the event of a replacement, a PG/PC is available with the SIMATIC project of the plant.

With the data stored in the SIMATIC project, and the *S7-PCT* port configuration tool, you transfer the parameters belonging to the replaced IO-Link-Device to the new IO-Link-Device.

6.5.2.3 Procedure without PG/PC

Requirements

- Implement the LIOLink_Device function block in the S7 program.
You can download the LIOLink_Device function block and the description from the Internet (<https://support.industry.siemens.com/cs/ww/en/view/82981502>).

On completion of commissioning, a PG/PC with the project is no longer available. For backing up and restoring the parameter data and configuration data from or to a module, the LIOLink_Device function block is available for the SIMATIC S7 controllers.

With this function block, you back up all relevant data records of a module after commissioning, in a data block (DB), for example. In the event of a replacement, you write the relevant data from the data block to the replaced module with the LIOLink_Device function block.

Refer to the Appendix "Data sets (Page 110)" for data records to be backed up in the case of a module.

Procedure

1. Install the block library for IO-Link (<https://support.industry.siemens.com/cs/ww/en/view/82981502>).
2. Use the LIOLink_Device function block as described in the documentation.
3. An application example for using the device-specific blocks from the block library for IO-Link (LIOLink) can be found on the Internet (<https://support.industry.siemens.com/cs/ww/en/view/90529409>).

Note

An IO-Link device is a module that communicates with the IO-Link master via its communication connection. With the special cases "SIRIUS 3RA64/65 compact starter" and "SIRIUS 3RA2711 function modules", where group formations of up to four starters are possible, the above information refers to the replacement of the first load feeder. Replacement of load feeders 2 to 4 of a group of four does not require any supplementary measures.

6.5.3 Replacing an IO-Link device according to the IO-Link communication specification V1.1

Automatic saving of parameter data

If IO-Link masters and IO-Link devices according to the IO-Link Kommunikations-Spezifikation V1.1 are available, the "parameter server" function can be used to automatically back up parameter data.

When devices are replaced, this parameter data is written back to the new IO-Link device automatically on system startup.

**WARNING**

**Risk of uncontrolled motor start-up
can cause death, serious injury, or property damage.**

The preset configuration of a starter group is saved by the starter connected to the IO-Link master via the removable terminal.

Make sure that the correct preset configuration is electronically stored in the new starter after the starters have been replaced.

Parameters

Parameters

The following parameters can be set:

- Type of starter
- Starter available
- Operation at Preset <> Actual Operation
- Operator panel available
- Parameter (write) access inhibition (parameters for IO-Link devices according to IO-Link communication specification V1.1)
- Data storage inhibition (parameters for IO-Link devices according to IO-Link communication specification V1.1)

The "Parameter (write) access inhibition" and "Data storage inhibition" parameters can be set in the **"Port Configuration Tool S7-PCT"** V3.0 or higher.



WARNING

**Risk of uncontrolled motor start-up
can cause death, serious injury, or property damage.**

The preset configuration of a starter group is saved by the starter connected to the IO-Link master via the removable terminal.

Make sure that the correct preset configuration is electronically stored in the new starter after the starters have been replaced.

7.1 Parameters for starters 1 to 4

7.1.1 "Starter type" parameter

"Type of starter" parameter

The "type of starter" parameter determines whether a starter or an empty slot is assigned to a module. The table below shows the values for the "type of starter" parameter.

Table 7-1 "Type of starter" parameter

Value	Type of starter	Default setting
1	Any	Any
110	Direct starter DS	—
120	Reversing starter RS	—
130	Star-delta starter YD	—

7.1.2 "Starter available" parameter

"Starter available" parameter

The "starter available" parameter enables removal of individual starters from the configuration. This is especially useful when existing configurations are re-used but individual modules are not implemented.

The table below shows the parameter values.

Table 7-2 "Starter available" parameter

Value	Description	Default setting
0	Starter available: No	—
1	Starter available: Yes	Yes ¹⁾

¹⁾ 4 starters are configured in the function module as delivered from the factory. If fewer starters are present, this must be configured.

Please note that the "starter available" parameter affects the PRESET-ACTUAL comparison. If you parameterize 3 or fewer starters in a starter group, the PRESET-ACTUAL comparison automatically becomes active.

Practical implementation

The IO-Link master is connected to the first function module that is actually available for the IO-Link of a group.

The operator panel is connected to the last function module that is actually available for IO-Link.

If there are gaps in the configuration because a function module is missing, they can be bridged with a long 14-pin module connector.

- 90 mm (3RA2711-0EE06)
- 260 mm (3RA2711-0EE07)
- 335 mm (3RA2711-0EE08)

View

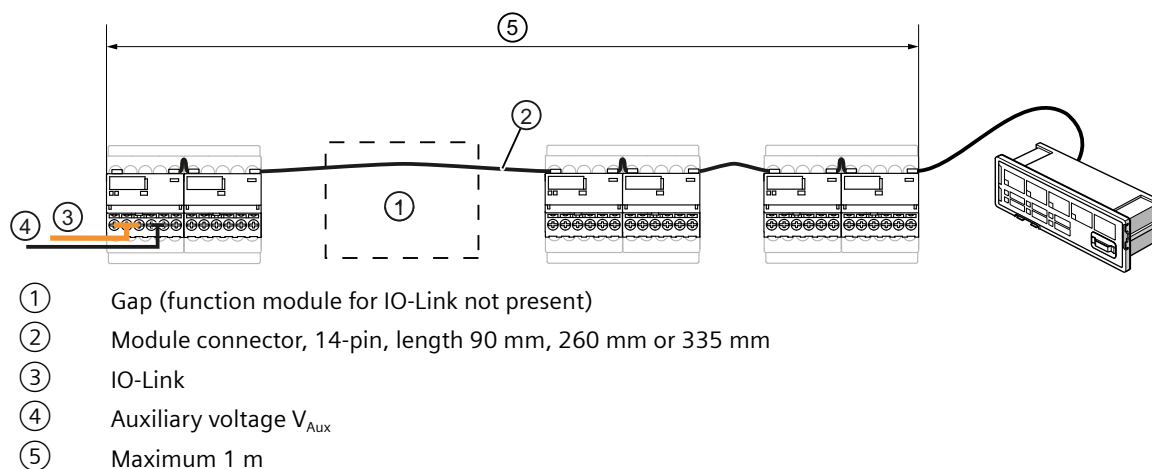


Figure 7-1 Configuration with parameter "Starter available" = no

Exception

2 consecutive empty slots for 2 star-delta starters are not allowed.

7.1.3 Parameter "Operation at Preset <> Actual Operation"

Parameter "Operation at Preset <> Actual Operation"

The "Operation at Preset <> Actual Operation" parameter determines whether or not the types of starter of the ACTUAL configuration are to be compared with those of the PRESET configuration.

7.1 Parameters for starters 1 to 4

The table below shows the parameter values.

Table 7-3 Parameter "Operation at Preset <> Actual Operation"

Value	Description	Default setting
0	Operation at Preset <> Actual Operation: blocking	blocking
1	Operation at Preset <> Actual Operation: enabling	—

You can find more information on the data sets in the annex under "Data sets (Page 110)".

7.2 Parameters for the operator panel

7.2.1 "Operator panel available" parameter

With the "Operator panel available" parameter, you determine whether or not an operator panel is available for operating the IO-Link device.

In conjunction with the "Operation at Preset <> Actual Configuration" parameter, operation of the IO-Link device with or without operator panel can be configured (see Section "Parameter "Operation at Preset <> Actual Operation" (Page 63)").

Use of the operator panel is above all useful if manual intervention in an application is an indispensable requirement for operating the plant, or to enable manual intervention in an emergency.

The table below shows the values for the "Operator panel available" parameter.

Table 7-4 "Operator panel available" parameter

Value	Description	Default setting
0	Operator panel available: No	—
1	Operator panel available: Yes	Yes

The "Operator panel available" parameter can only be modified via IO-Link. It cannot be adjusted at the device.

7.2.2 Parameter "Operation at Preset <> Actual Operation"

The "Operation at Preset <> Actual Configuration" parameter sets the severity level of the test for the "Operator panel available" parameter.

The table below shows the values for the "Operation at Preset <> Actual Configuration" parameter.

Table 7-5 "Operation at Preset <> Actual Configuration" parameter

Value	Description	Default setting
0	Operation at Preset <> Actual Configuration: Disable	—
1	Operation at Preset <> Actual Configuration: Enable	Enable

If the value of the "Operation at Preset <> Actual Configuration" parameter is set to "Enable", the IO-Link device can be operated via IO-Link regardless of whether an operator panel is connected or not.

7.2 Parameters for the operator panel

If the value of the "Operation at Preset <> Actual Configuration" parameter is set to "Disable", the IO-Link device can only be operated if the setting of the "Operator panel available" parameter is precisely fulfilled. If the setting of the "Operator panel available" parameter is not fulfilled, the diagnostics message "Preset <> Actual Configuration" is output by the controller.

The following table shows the effects of the sample parameter values set:

Table 7-6 Parameter setting - example of operation with operator panel

Set parameter values	Practical implementation		
	Operator panel available	Operator panel not available	Operator panel is disconnected during operation
"Operator panel available" = "yes" and "Operation at Preset <> Actual Configuration" = "Disable"	Operation of the IO-Link device possible.	Operation of the IO-Link device not possible. → Fault message "Preset <> Actual Configuration"	The IO-Link device switches off. Further operation of the device not possible. → Fault message "Preset <> Actual Configuration"
"Operator panel available" = "no" and "Operation at Preset <> Actual Configuration" = "Disable"	The IO-Link device switches off. Further operation of the device not possible. → Fault message "Preset <> Actual Configuration"	Operation of the IO-Link device possible.	The group error (SF) is reset automatically. Operation of the IO-Link device possible.
"Operator panel available" = "yes" and "Operation at Preset <> Actual Configuration" = "Enable"	Operation of the IO-Link device possible.	Operation of the IO-Link device possible.	Operation of the IO-Link device possible.
"Operator panel available" = "no" and "Operation at Preset <> Actual Configuration" = "Enable"	Operation of the IO-Link device possible.	Operation of the IO-Link device possible.	Operation of the IO-Link device possible.

The "Operation at Preset <> Actual Configuration" parameter can only be modified via IO-Link. It cannot be adjusted at the device.

Note

Parameter assignment for "Operation at Preset <> Actual Configuration" refers only to the connectable operator panel.

By contrast, the diagnostics message "Preset <> Actual Configuration" can have different causes:

- The condition of the "Operator panel available" parameter is not fulfilled.
- The combination of different motor starters of one group on an IO-Link channel does not correspond to the parameterization.

7.3 Parameters for IO-Link devices (according to IO-Link communication specification V1.1)

7.3.1 "Parameter (write) access inhibition" parameter

"Parameter (write) access inhibition" parameter

With the "Parameter (write) access inhibition" parameter, you define whether or not all write and read access parameters can be accessed.

The table below shows the parameter values.

Table 7-7 "Parameter (write) access inhibition" parameter

Value	Description	Default setting
0	"Parameter (write) access inhibition" parameter: unlocked	Yes
1	"Parameter (write) access inhibition" parameter: locked	—

7.3.2 "Data storage inhibition" parameter

"Data storage inhibition" parameter

With the "Data storage inhibition" parameter, you define whether or not the mechanism for data storage is inhibited.

The table below shows the parameter values.

Table 7-8 "Data storage inhibition" parameter

Value	Description	Default setting
0	Data storage inhibition: unlocked	Yes
1	Data storage inhibition: locked	—

Process image

8.1 Process image input (PII)

The process input image contains the most important status information of the function modules for IO-Link (direct starting, reversing starting and star-delta starting).

Table 8-1 PII - status information

Module	DI (2 bytes)	PII
1	DI0.0	1: Ready (automatic)
	DI0.1	1: Motor on
	DI0.2	1: Group fault
	DI0.3	1: Group warning
2	DI0.4	1: Ready (automatic)
	DI0.5	1: Motor on
	DI0.6	1: Group fault
	DI0.7	1: Group warning
3	DI1.0	1: Ready (automatic)
	DI1.1	1: Motor on
	DI1.2	1: Group fault
	DI1.3	1: Group warning
4	DI1.4	1: Ready (automatic)
	DI1.5	1: Motor on
	DI1.6	1: Group fault
	DI1.7	1: Group warning

8.2 Process image output (PIQ)

The process output image contains the control commands for the function modules for IO-Link (direct starting, reversing starting and star-delta starting).

Table 8-2 PIQ - Control commands

Module	DO (2 bytes)	PIQ
1	DO0.0	1: Motor direction of rotation 1 (clockwise)
	DO0.1	1: Motor direction of rotation 2 (counter-clockwise) - for reversing start only
	DO0.2	1: Reserved
	DO0.3	1: Reserved
2	DO0.4	1: Motor direction of rotation 1 (clockwise)
	DO0.5	1: Motor direction of rotation 2 (counter-clockwise) - for reversing start only
	DO0.6	1: Reserved
	DO0.7	1: Reserved
3	DO1.0	1: Motor direction of rotation 1 (clockwise)
	DO1.1	1: Motor direction of rotation 2 (counter-clockwise) - for reversing start only
	DO1.2	1: Reserved
	DO1.3	1: Reserved
4	DO1.4	1: Motor direction of rotation 1 (clockwise)
	DO1.5	1: Motor direction of rotation 2 (counter-clockwise) - for reversing start only
	DO1.6	1: Reserved
	DO1.7	1: Reserved

Installing

9.1 Installing function modules for IO-Link

The following instruction describes how you mount the function modules for IO-Link on the contactors and connect them to each other.

Minimum clearances and mounting position

The minimum clearances and the mounting position are set dependent upon the type of mounting.

You can find more information on minimum clearances in the "SIRIUS - SIRIUS 3RT Contactors/ Contactor assemblies" (<http://support.automation.siemens.com/WW/view/en/60306557>) manual.

Mounting a function module for IO-Link on a contactor

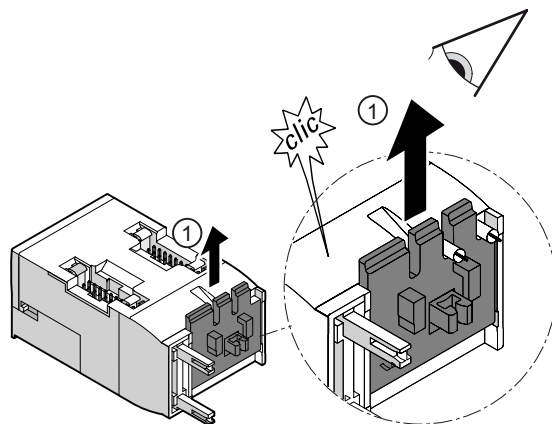


! DANGER

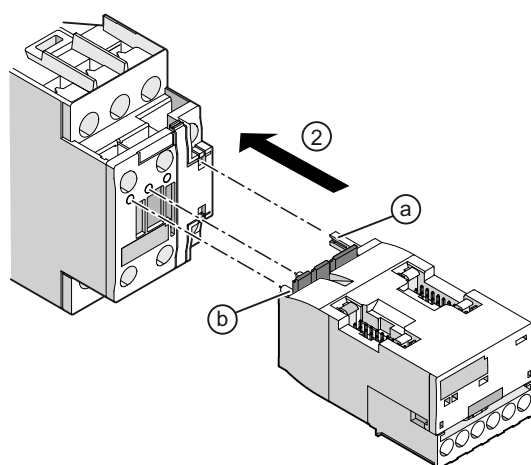
Hazardous voltage!

Will cause death or serious injury.

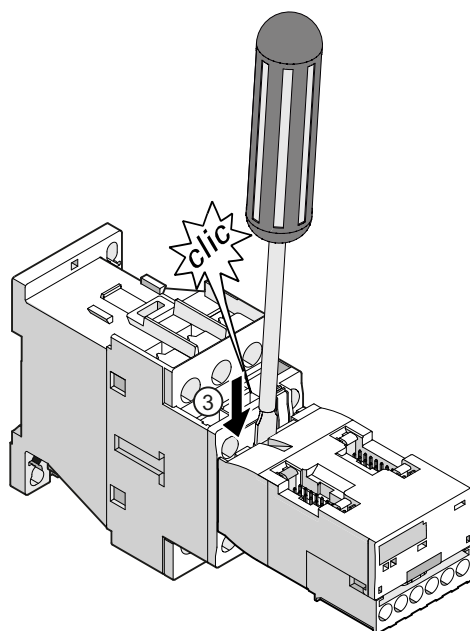
Turn off and lock out power before working on this equipment.



- ① Check that the locking slide is engaged in the topmost position.



- ② Set the basic module/coupling module for IO-Link onto the contactor from the front. For this purpose, insert the contacts (a) into the openings on the contactor. When mounting the basic modules for IO-Link, simultaneously insert the contacts (b) into the openings on the contactor.



- ③ Push the locking slide down with a screwdriver until it engages.

Mounting function modules for IO-Link, reversing start/star-delta (wye-delta) start

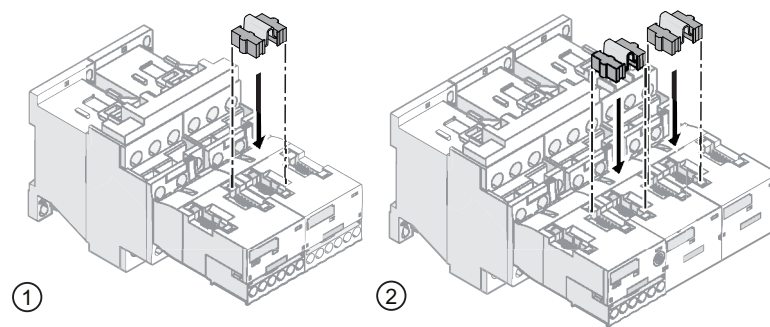
When installing the modules for reversing starting or star-delta starting, connect the coupling module via module connectors with the basic module or the further coupling module.

Note

Mounting function modules onto 3RT2.4 contactors

When mounting function modules onto 3RT2.4 contactors use the 14-pin 3RA2711-0EE17 module connector.

The figure below shows which modules you must connect with each other via module connectors.



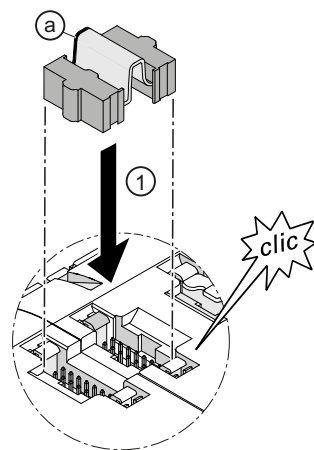
①

②

① Function module for IO-Link, reversing starting: Basic module and coupling module

② Function modules for IO-Link, star-delta starting: Basic module and 2 coupling modules

Plugging in module connectors



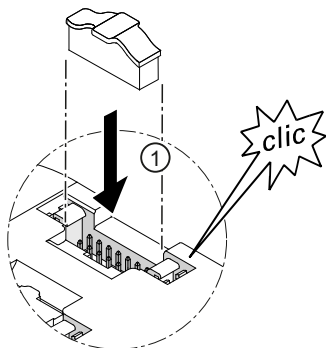
①

Insert the coded module connector into the slot in the correct position from above until the module connector engages in the locking mechanism.

The colored conductor (a) must point towards the contactor.

Inserting the interface covers

Use the interface covers to close unused interfaces. This prevents damage or contamination to the interfaces.



- ① Insert the interface cover into the slot from above until it engages in the locking mechanism.

Reference

You can find information about mounting the contactors in the operating instructions for the contactors used. You will find a list of all the operating instructions in the Appendix "References" (Page 122).

9.2 Connecting IO-Link starters

IO-Link master with 4 starters

Up to 4 starter combinations can be connected to one IO-Link master. For this purpose, connect the first starter combination directly to the IO-Link master. The 3 other starter combinations are connected to each other using the module connectors. The 14-pin module connector is available with a length of 35 mm, 90 mm, 260 mm and 335 mm.

The diagram below provides an example of starter combination connections.

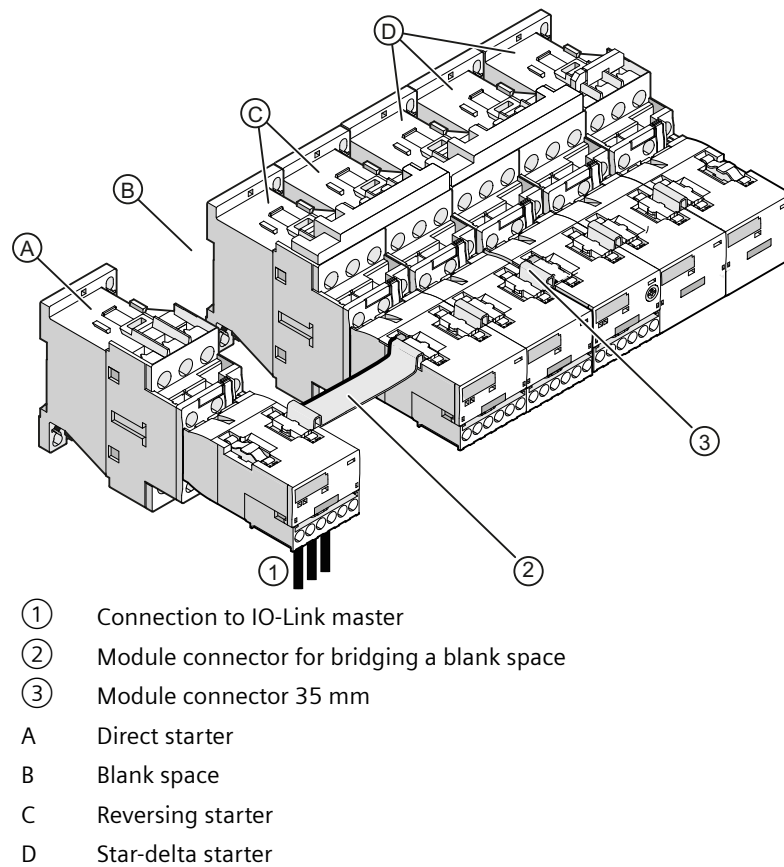
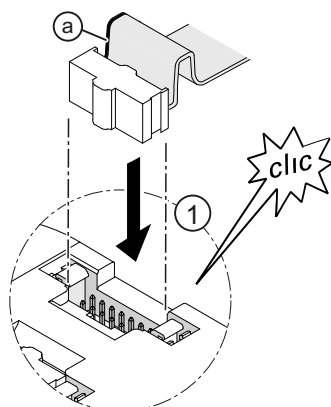


Figure 9-1 Connecting starters

Plugging in module connectors



- ① Insert the coded module connector into the slot in the correct position from above until the module connector engages in the locking mechanism.
The colored conductor (a) must point towards the contactor.

Inserting the interface covers

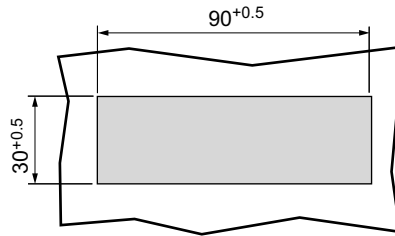
Use the interface covers to close unused interfaces. This prevents damage or contamination to the interfaces.

9.3 Mounting an operator panel

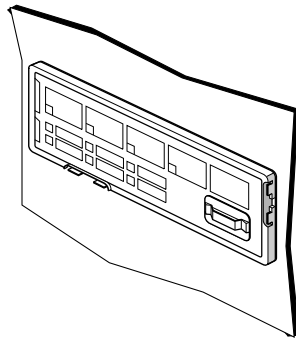
The operator panel is designed for use in the front panels of motor control centers, for example, or in control cabinet doors.

For information on using the operator panel, please refer to Section "Operation using the operator panel (Page 92)".

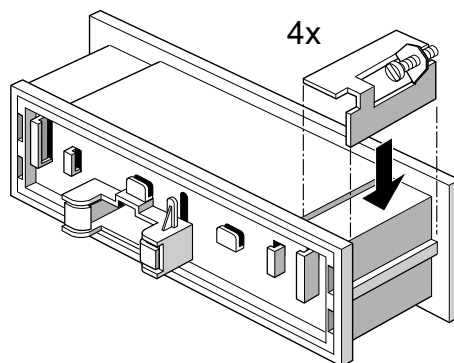
Installing



- ① Make a cutout in the front panel, for example, or in the control cabinet door.



- ② Insert the operator panel in the cutout.



- ③ Snap the four mounting brackets onto the operator panel.
- ④ Lock the operator panel in position by tightening the four screws on the securing brackets.

NOTICE
Tightness and correct functionality of the operator panel
In order to guarantee the IP54 tightness and correct functionality of the operator panel, ensure that the tightening torque of the screws selected is not excessive when tightening the enclosed screws.

9.4 Removing function modules for IO-Link

Requirements



DANGER

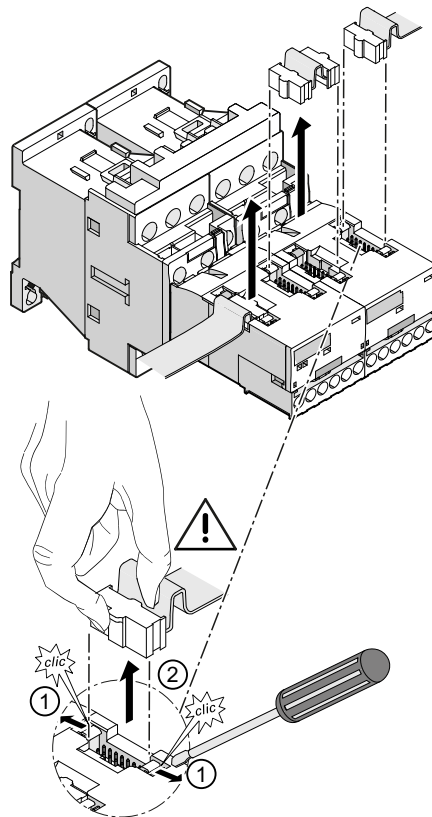
Hazardous voltage!

Will cause death or serious injury.

Turn off and lock out power before working on this equipment.

Separating the modules

Before you remove the modules from the contactors, you have to remove the module connectors.

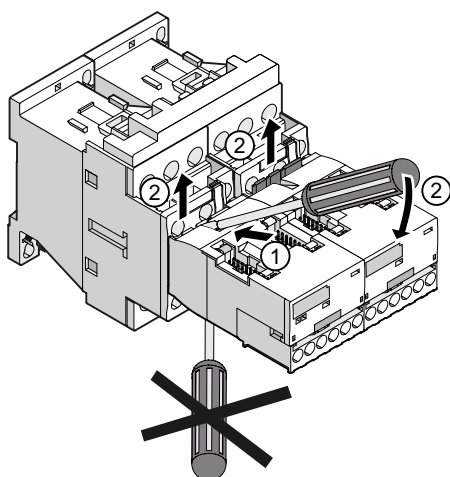


- ① Use a screwdriver to release the locking mechanisms.
- ② Remove the module connector from the slot by lifting it up and out.

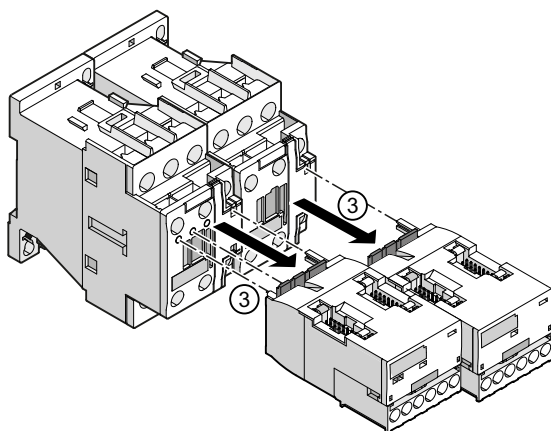
Removing the modules

NOTICE**Damage to the function module from improper handling!**

The function module is destroyed or damaged if unlocked from below.



- ① Press the screwdriver towards the contactor.
- ② Push the locking slide up with a screwdriver.
It is not possible to unlock from below.

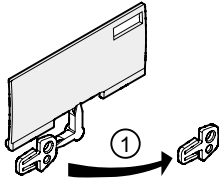


- ③ Pull the function module for IO-Link straight out from the contactor.

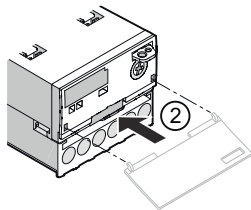
9.5 Mounting the cover sealing

You can use a sealable cover to block function modules against unauthorized operation.

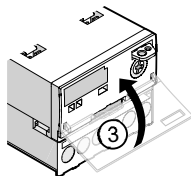
Mounting the sealable cover on function modules for IO-Link



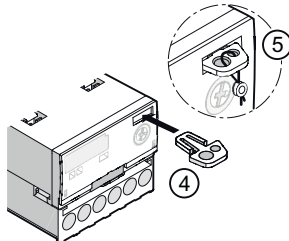
- ① Break off the clip on the sealable cover.



- ② Insert the sealable cover into the openings on the IO-Link basic module.



- ③ Fold up the sealable cover.



- ④ Insert the clip into the opening until it engages.
- ⑤ Seal the clip to secure it against unauthorized removal.

Connecting

10.1 Connection via terminals

Connection types

The function modules for IO-Link are connected via removable terminals with the following connection options:

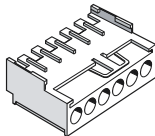
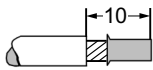
- Free wiring on screw-type terminals
- Free wiring on spring-loaded terminals

When ordering the function modules, select the appropriate article number supplement for the desired connection option.

Screw terminals

For the conductor cross-sections and stripping lengths, see the table.

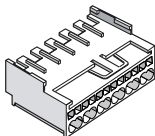
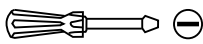
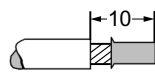
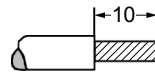
Table 10-1 Conductor cross-sections for screw-type terminals

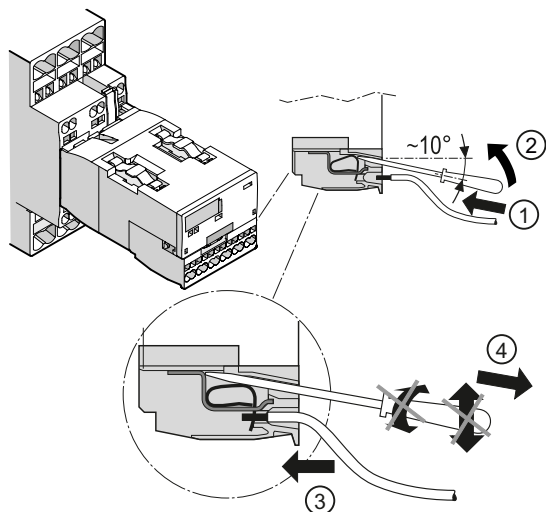
Connection type	Conductor cross-section
	 Ø 5 ... 6 mm/PZ 2
	0.8 ... 1.2 Nm (7 to 10.3 lb·in)
	1 x (0.5 ... 4) mm ² 2 x (0.5 ... 2.5) mm ²
	1 x (0.5 ... 2.5) mm ² 2 x (0.5 ... 1.5) mm ²
AWG	2 x (20 to 14)

Spring-loaded terminals

For the conductor cross-sections and stripping lengths, see the table.

Table 10-2 Conductor cross-sections for spring-loaded terminals

Connection type	Conductor cross-section
	 3RA2908-1A (3.0 x 0.5) mm
	2 x (0.25 ... 1.5) mm ²
	2 x (0.25 ... 1.5) mm ²
	2 x (0.25 ... 1.5) mm ²
AWG	2 x (24 to 16)



- ① To release the clamping springs, insert the screwdriver as far as it will go into the square opening of the spring-loaded terminal.
- ② Angle the screwdriver up and insert it fully in the actuation opening. The screwdriver blade automatically keeps the spring-loaded terminal open.
- ③ Insert the cable as far as it will go into the oval opening and hold it in place.
- ④ Remove the screwdriver. The terminal closes and the conductor is now securely clamped. Pull on the cable to ensure it is tight.

Replacing the removable terminals



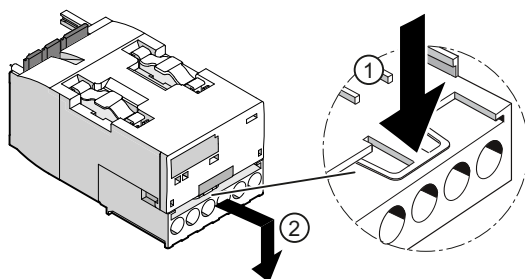
DANGER

Hazardous voltage!

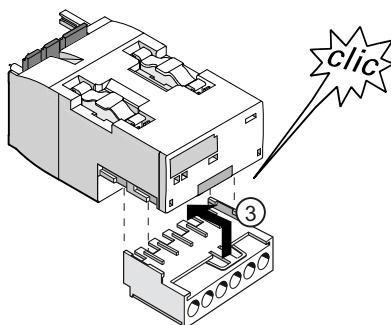
Will cause death or serious injury.

Turn off and lock out power before working on this equipment.

The removable terminals of the basic modules facilitate module replacement when necessary.



- ① Press the locking interlock.
- ② Remove the terminal.



- ③ Attach the new terminal and press the terminal into the device until the interlock audibly engages.

10.2 Connecting function modules for IO-Link

Connecting IO-Link master and auxiliary voltage (V_{Aux})

NOTICE

PELV power -adapter (in accordance with IEC EN 50178)

Use a 24 V DC power supply that meets the requirements of protective extra-low voltage (ES1/PELV).

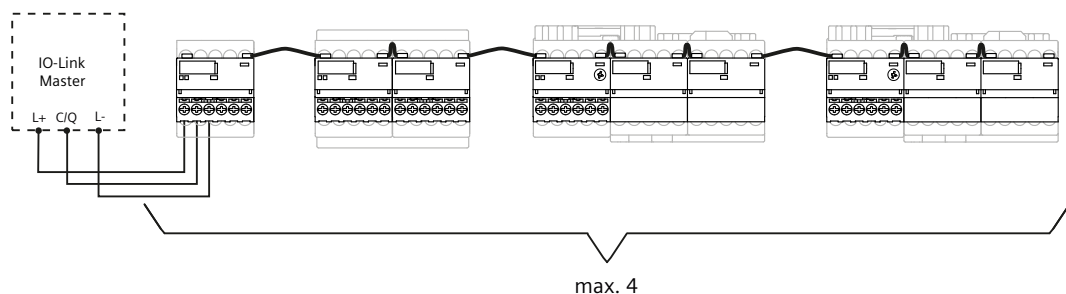
The surge protection for the 24 V DC auxiliary voltage can be implemented by an external device.

Disconnect the system and device from the power supply before connecting.

The IO-Link master and the 24 V DC auxiliary voltage are connected to the basic modules for IO-Link via removable terminals (direct start, reversing start and star-delta (wye-delta) start).

If multiple starters are implemented, the connection to the first basic module occurs in the configuration. The other starters are supplied via the module connectors. Up to four starter combinations can be connected to one IO-Link master.

The diagram below provides an example of starter combination connections (a mix comprising direct start, reversing start and star-delta (wye-delta) start) in the contactor sizes 3RT201, 3RT202, 3RT203, 3RT204.



Assembling three star-delta (wye-delta) starters (3RT204 contactor and function module for IO-Link 3RA2711-CA00 star-delta (wye-delta) starter)

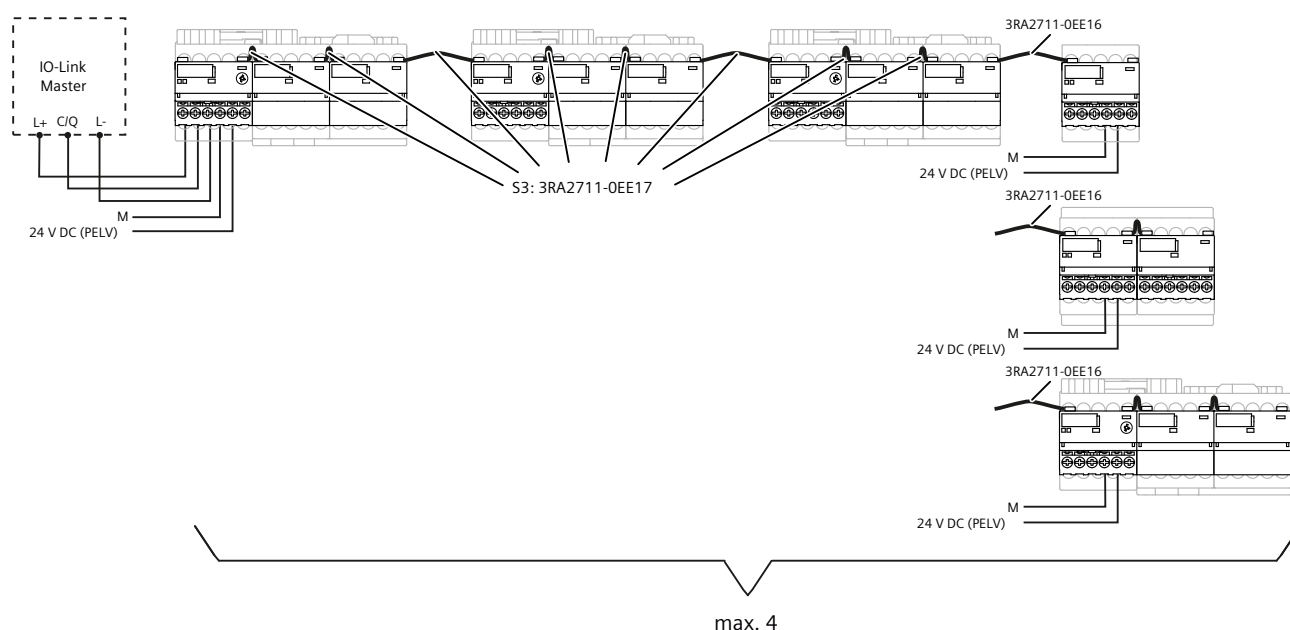
The following steps are required when assembling a motor starter group comprising three 3RA244 star-delta (wye-delta) starters and one direct starter / reversing starter / star-delta (wye-delta) starter (3RT201 / 3RT202 / 3RT203 / 3RT204):

- In addition, connect the 24 V DC V_{Aux} auxiliary voltage to the fourth motor starter.
- Use the 10-pin 3RA2711-0EE16 module connector for the connection between the third and fourth motor starter.

Note**Mounting function modules onto 3RT2.4 contactors**

When assembling the motor starter group comprising three 3RA244 star-delta (wye-delta) starters, use the 3RA2711-0EE17 14-pin module connector.

The diagram below provides an example of starter combination connections (a mix comprising direct start, reversing start and star-delta (wye-delta) start) in the contactor sizes 3RT01, 3RT02, 3RT03, 3RT04.

**NOTICE****Material damage to the module connector!**

If the module connector is operated above the permissible current consumption capability, it heats up and can be destroyed. The proper functioning of the function module can no longer be assured.

If you assemble a motor starter group comprising three star-delta (wye-delta) starters (3RT204) and one direct-on-line starter / reversing starter / star-delta (wye-delta) starter (3RT01 / 3RT02 / 3RT03 / 3RT204), you must additionally connect the 24 V DC auxiliary voltage V_{Aux} to the fourth motor starter, and use the 10-pin module connector 3RA2711-0EE16 for the connection between the third and fourth motor starter.

Pin assignments of the basic modules for IO-Link

The following pin assignments apply for all basic modules for IO-Link with screw-type terminals or spring-loaded terminals.

Table 10-3 Pin assignments of the basic modules for IO-Link

Mark- ing	Meaning	Image
L+	Connection for IO-Link Master	
C/Q		
L-		
A4-	Auxiliary voltage V_{Aux} (ES1/PELV) (-)	
A3+/Y1	Auxiliary voltage V_{Aux} (ES1/PELV) (+) Optional connection for NC contact	
Y2	Optional connection for NC contact	
①	Conductor bridge pre-mounted at factory	
②	Optional limit switch (max. 30 m)	

Terminal labels and notes on the protection of device connections

L+	Connection for IO-Link Master	No additional measures are required for short-circuit protection.
C/Q		
L-		
A4-	Auxiliary voltage V_{Aux} (ES1/PELV) (-)	Observe the relevant standards and regulations for the configuration of control panels and the parts and components contained therein, e.g. when dimensioning the cables. Select a current-limiting power supply for the protection of these circuits, for example. When selecting the source and the connecting cable, observe the load characteristics of the contactor on which the function module is mounted. The same applies when selecting appropriate protective devices. You can find the technical specifications of the 3RA2711 in the Siemens Industry Online Support (https://support.industry.siemens.com/cs/ww/en/ps/16132/td). You can find all the technical data of the 3RT2 in the Siemens Industry Online Support (https://support.industry.siemens.com/cs/ww/en/ps/16132/td). Further recommendations, e.g. the use of miniature circuit breakers or equipment circuit breakers in control circuits, can be found under the following link: Practical tip for control panels: Selecting and dimensioning suitable power supplies quickly and reliably. (https://new.siemens.com/global/en/markets/panel-building/tips/design-and-engineering-in-the-control-circuit.html)

A3+	Auxiliary voltage V_{AUX} (ES1/PELV) (+)	Observe the relevant standards and regulations for the configuration of control panels and the parts and components contained therein, e.g. when dimensioning the cables. Select a current-limiting power supply for the protection of these circuits, for example. When selecting the source and the connecting cable, observe the load characteristics of the contactor on which the function module is mounted. The same applies when selecting appropriate protective devices. You can find the technical specifications of the 3RA2711 in the Siemens Industry Online Support (https://support.industry.siemens.com/cs/ww/en/ps/16132/td). You can find all the technical data of the 3RT2 in the Siemens Industry Online Support (https://support.industry.siemens.com/cs/ww/en/ps/16132/td). Further recommendations, e.g. the use of miniature circuit breakers or equipment circuit breakers in control circuits, can be found under the following link: Practical tip for control panels: Selecting and dimensioning suitable power supplies quickly and reliably. (https://new.siemens.com/global/en/markets/panel-building/tips/design-and-engineering-in-the-control-circuit.html)
Y1	Optional connection for NC contact	No additional measures are required for short-circuit protection.
Y2	Optional connection for NC contact	No additional measures are required for short-circuit protection.

10.3 Input for local shutdown

Optional NC contacts for local shutdown can be connected to all basic modules and all coupling modules for reversing starting.

The function "End position right and end position left" immediately shuts down the contactor when the contacts open. The contactor coil is interrupted via terminals A3+/Y1 - Y2.

Note

Conductor length

The conductor length from the function module for IO-Link to the optional NC contact must have a minimum cross-section of 0.5 mm² and must not exceed a length of 30 m.

Connection for optional NC contacts for local shutdown

Note

Before connecting an optional NC contact

When delivered, terminals A3+/Y1 - Y2 are bridged as standard by a conductor. Remove this conductor bridge before connecting an optional NC contact.

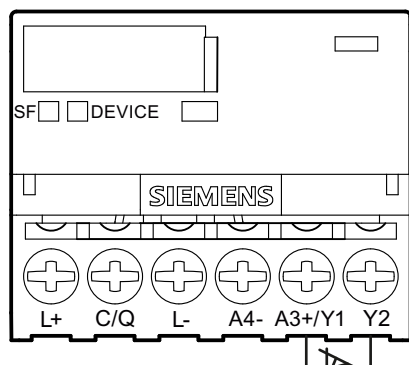


Figure 10-1 Optional NC contact - direct starting

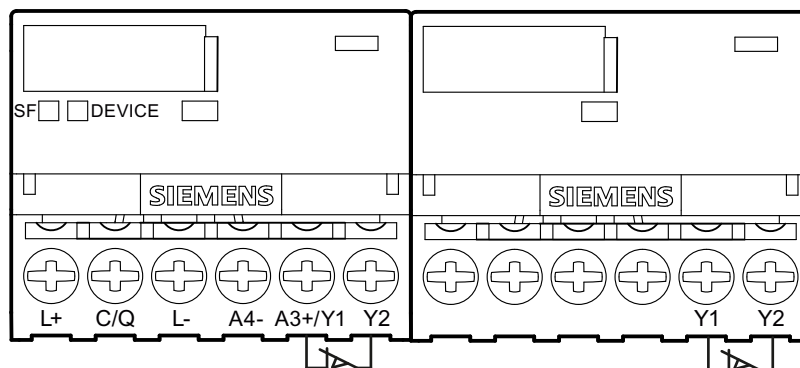


Figure 10-2 Optional NC contact - reversing starting

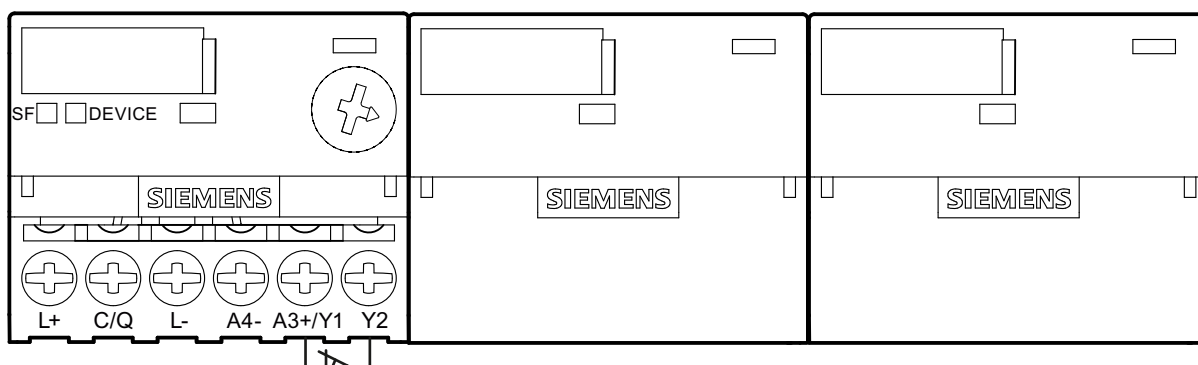


Figure 10-3 Optional NC contact - star-delta starting

See also

Connection via terminals (Page 81)

10.4 EMERGENCY STOP

EMERGENCY STOP function

The EMERGENCY STOP function is implemented via shutdown of the auxiliary voltage V_{Aux} . For this purpose, integrate an NC contact into the auxiliary voltage circuit. The NC contact is opened via an EMERGENCY STOP button and interrupts the auxiliary voltage. Interruption of V_{Aux} results in shutdown of the motor starters or motor starter groups.

Connecting the EMERGENCY STOP function

The auxiliary voltage V_{Aux} is supplied in the first motor starter of a motor starter group via terminals A4-/A3+ on the function module. The 3 other motor starters are supplied with the auxiliary voltage via the 14-pin connecting cable.

If the auxiliary voltage is interrupted, all motor starters combined into a group using the 14-pin module connector are shut down.

So that not all motor starters of a group are switched off by EMERGENCY STOP, you can supply the auxiliary voltage V_{Aux} for individual motor starters or motor starter groups from different systems. Motor starters with their own V_{Aux} supply are connected with the upstream motor starter not via the 14-pin module connector but via the 10-pin module connector (3RA2711-0EE16).

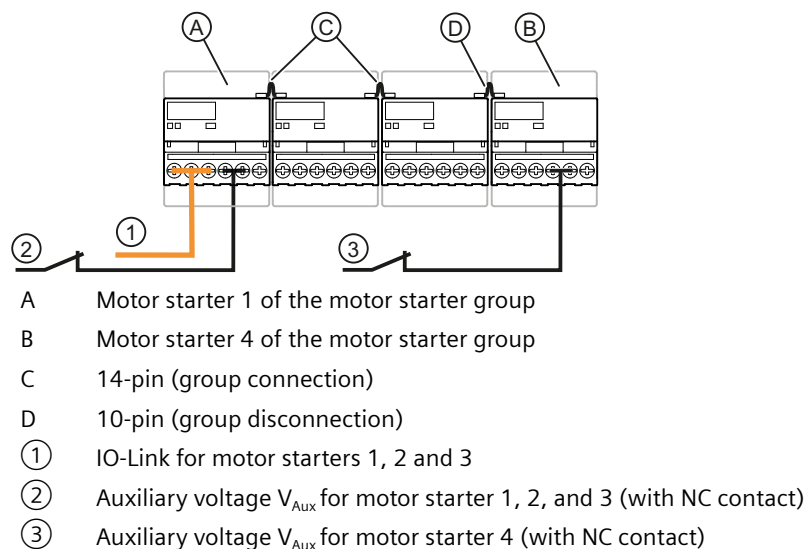


Figure 10-4 Connecting the EMERGENCY STOP function

Operator control

11.1 Settings on the function modules for IO-Link

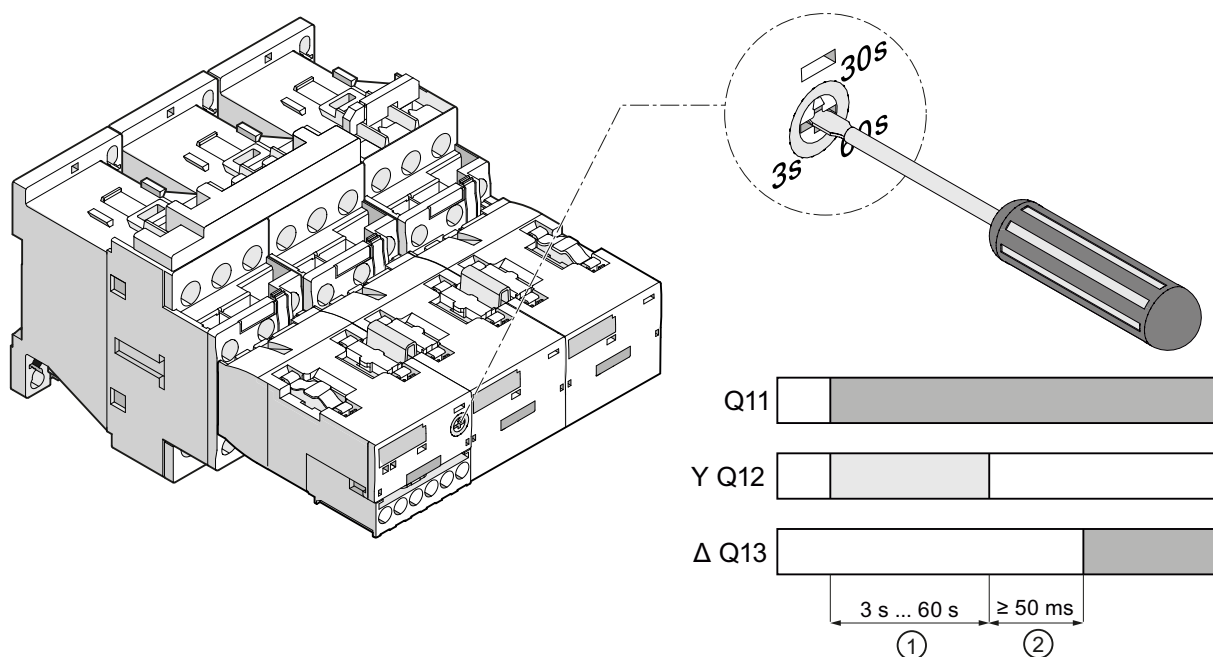
Direct and reversing starters

No settings are necessary on direct and reversing starters before commissioning.

Star-delta starter

On the IO-Link basic module for star-delta starting, use the setting controller to set the startup time in star mode. You can select a startup time between 3 and 60 seconds. After expiry of the startup time, the basic module switches to delta mode.

The switchover time from star mode to delta mode is at least 50 ms.



- ① Startup time in star mode
- ② Switchover time from star mode to delta mode

Figure 11-1 Setting the switchover time from star mode to delta mode

11.2 Operation using the operator panel

The starters are controlled with the operator panel in manual mode. The states of the device are also queried for up to 4 starters. The 4 starters with function modules have to be connected for this purpose with one another via module connectors and connected to an IO-Link master.

For additional information on connecting multiple starters, please refer to Section "Connecting IO-Link starters (Page 73)".

Connecting

The operator panel is connected to the last available interface of a starter group via the 10-core connecting cable.

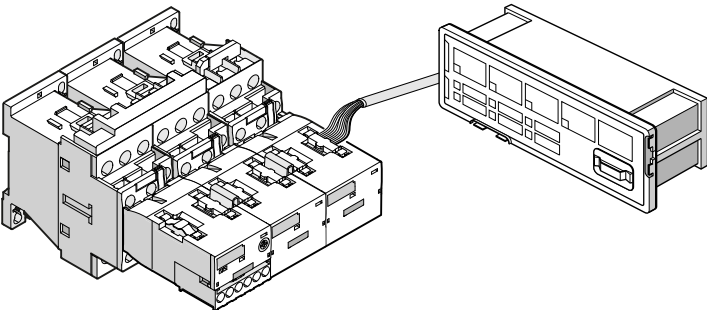
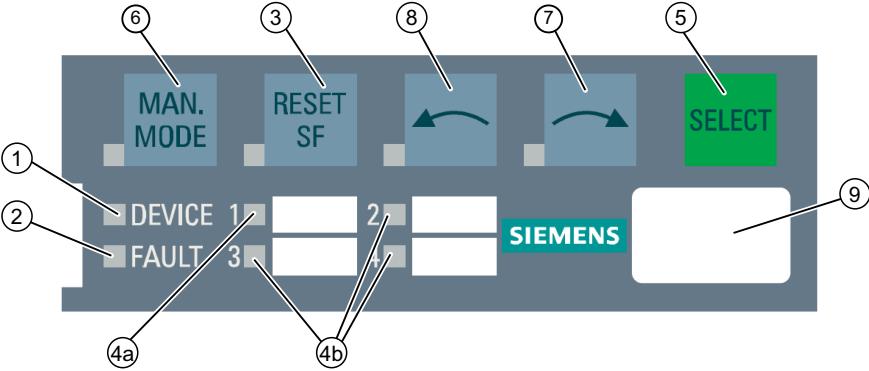


Figure 11-2 Connecting the operator panel to a star-delta starter

Operator control and display elements of the operator panel

The representation below explains the operator controls and display elements of the operator panel.

Table 11-1 Operator control and display elements of the operator panel

		
①	DEVICE LED	The DEVICE LED indicates whether the operator panel is ready to run: - Green: Operator panel is ready. - Red: Operator panel is not ready.

②	FAULT LED	The FAULT LED indicates whether communication between the starter and the operator panel is functioning properly: - Red: No communication between starter and operator panel. - Off: Communication between starter and operator panel is functioning properly.
③	SF LED	The SF LED shows a RED light if there is a group fault. (Note: The SF/RESET button has no function.)
④	LED 1 - 4	LEDs 1 to 4 indicate which starter has been selected: - Yellow: Starter selected. - Off: Starter is not selected. There is always only one starter selected.
⑤	SELECT button	If you press the SELECT button for less than 5 seconds, you switch between the starters 1 to 4. Gaps in the configuration are skipped. The starter selected in each case is indicated by LEDs 1 to 4. If you press the SELECT button for more than 5 seconds, you switch the entire starter group between jog mode and continuous mode. The change to the operating mode is confirmed by the "MANUAL MODE" LED flashing.
⑥	Manual Mode button and LED	You isolate the individual starters for manual mode using the MANUAL MODE button. Activation of a starter is confirmed by the MANUAL MODE LED flashing.
⑦	 Button and LED	You use the  button to drive the currently selected starter in direction of rotation 1 (clockwise). The LED lights up to confirm this.
⑧	 Button and LED	You use the  button to drive the currently selected starter in direction of rotation 2 (counter-clockwise). The LED lights up to confirm this.
⑨	Slot for enabling block	Plug the enabling block into the slot to take control priority of the starters.

Monitoring mode

The operator panel is always in monitoring mode as standard. The user can read the modes of the starters and detect group faults.

Table 11-2 Monitoring mode of the operator panel

Action	Procedure
Reading the selection	1. Select a starter. To do so, press the SELECT button until the desired LED (1, 2, 3 or 4) lights up. 2. Read off the selection: –  LED shows a yellow light: Direction of rotation 1 (clockwise) on. –  LED shows a yellow light: Direction of rotation 2 (counter-clockwise) on. –  LED and  LED are off: No selection.
Detecting group faults	1. Select a starter. To do so, press the SELECT button until the desired LED (1, 2, 3 or 4) lights up. 2. Check whether a group fault is present: – SF LED red: Group fault present. – SF LED off: No group fault

Manual mode

You can take the control priority over the function module for IO-Link in manual mode. This enables the user to set the starters using the operator panel.

To activate manual mode, users require an enabling block to authorize manual mode.

Table 11-3 Manual mode of the operator panel

Action	Procedure
Activating manual mode	1. Insert the enabling block into the slot in the operator panel. 2. Select a starter. To do so, press the SELECT button until the desired LED (1, 2, 3 or 4) lights up. 3. Press the MANUAL MODE button to activate manual mode. Successful activation is confirmed by lighting up of the MANUAL MODE LED.
Activate the starter in jog mode	1. Activate the starter by – pressing the  button for direction of rotation 1 (clockwise). – pressing the  button for direction of rotation 2 (counter-clockwise). 2. Hold the button pressed while activating. Activation stops as soon as you release the button.
Change from jog mode ¹⁾ to continuous mode ²⁾	Change to continuous mode by pressing the SELECT button for longer than 5 seconds. The changeover is confirmed by the flashing of the MANUAL MODE LED.
Activating the starter in continuous operation	1. Activate the starter by – pressing the  button for direction of rotation 1 (clockwise). – pressing the  button for direction of rotation 2 (counter-clockwise). 2. Press the  or  button again to stop activation.
Change from continuous mode ²⁾ to jog mode ¹⁾	Change to jog mode by pressing the SELECT button for longer than 5 seconds. The changeover is confirmed by the flashing of the MANUAL MODE LED. Only the selected starter can work in continuous mode.
Resetting to automatic mode	1. Make sure that the starter is not activated. 2. Press the MANUAL MODE button to activate automatic mode. If activation is successful, the LED MANUAL MODE goes out. 3. Remove the enabling block from the operator panel.

¹⁾ **Jogging:** The starter is only activated while you press the  or  button. Activation stops as soon as you release the button.

²⁾ **Continuous operation:** If you press the  or  button, the starter is activated until you press the button again.

Note**Resetting to automatic mode!**

If you remove the enabling block from the operator panel while in manual mode, the starter switches to the safe state and the "DEVICE" LED flashes yellow.

For this reason, reset the starter to automatic mode before removing the enabling block.

**WARNING****Motor start-up!****Can Cause Death, Serious Injury, or Property Damage.**

If you reset the operator panel to automatic mode while an ON command is simultaneously pending via the IO-Link, the starter switches back on immediately and the machine starts up. People may be injured if they stay in the danger area of the machine.

Make sure that the danger area of the machine is kept clear of people.

See also

Scope of supply (Page 30)

Diagnostics

IO-Link diagnostics

The manufacturer-specific diagnostics listed in the table are reported via the diagnostic mechanism of IO-Link. The table below provides information on possible causes and remedial measures:

Table 12-1 Possible causes and remedial measures

Diagnostics and messages	Possible cause	Possible remedial measures
Preset <> actual configuration	Configured type of starter or number of starters not equal to the starters physically available	- Correct the physical number of starters - Correct "starter available" parameter - Correct "type of starter" parameter - Change parameter "Operation at Preset <> Actual Operation" to "enable":
Switching element defective	- Contactor welded - Contactor coil defective - Function module defective	- Replace contactor - Replace contactor - Replace function module
Supply voltage switching element missing	Auxiliary voltage V_{Aux} (terminal A3+/Y1) < 19.2 V	- Check the 24 V DC (ES1/PELV) power supply - Observe notes for group of 4 star-delta (see Section "Connecting function modules for IO-Link (Page 84)")
No mains voltage	Main voltage too weak or not present	- Check circuit breaker - Check main voltage
Switch off - end position right	Local deactivation on the basic module	Close bridge A3+ / Y1-Y2 (limit switch) (see Section "Input for local shutdown (Page 88)")
Switch off - end position left	Local deactivation on the coupling module	Close bridge Y1-Y2 (limit switch) (see Section "Input for local shutdown (Page 88)")
Process mapping error	Process output image: Clockwise and counter-clockwise rotation simultaneously active	Correct activation by means of process image
Manual operation aborted	Operator panel removed in "manual operation"	Remount operator panel and perform "reset to automatic operation" (see Section "Operation using the operator panel (Page 92)")
Manual operation	Operator panel connected and "manual operation activated" executed	- None if "manual operation" is supposed to be valid - Perform "reset to automatic operation" to have PLC assume control

Diagnostics and messages	Possible cause	Possible remedial measures
Configuration change denied	Attempt to change parameters with activated starter	- Deactivate starter - Repeat parameter change
Error-free operation via PLC	Control priority via PLC	—

The table below indicates how the manufacturer-specific diagnostics are reported:

Table 12-2 Diagnostics and messages

Diagnostics and messages	IO-Link for event code ¹⁾	PII ²⁾		Data set 90	LED	
		SF ³⁾	SW ⁴⁾		SF	DEVICE
Preset <> actual configuration	0x8CB0	X		X	red	flashing red
Switching element defective	0x8CA9	X		X	red	red
Supply voltage switching element missing	0x8CB1	X		X	red	off
No mains voltage	—		X	X	o	flashing yellow
Switch off - end position right	0x8CBA	X		X	red	o
Switch off - end position left	0x8CBA	X		X	red	o
Process mapping error	0x8CBA	X		X	red	yellow
Manual operation aborted	—	—	X	X	o	flashing yellow
Manual operation	—		X	X ⁵⁾	o	flashing yellow
Configuration change denied	0x8CB3	—	—	—	—	—
Trouble-free operation via PLC (in the case of devices according to IO-Link communication specification V1.0/V1.1)	—	—	—	—	off	flashing green/ green

¹⁾ The manufacturer-specific diagnostic events listed in the table are reported to the IO-Link master via the diagnostics mechanism of IO-Link.

²⁾ With the "process input image" (see Section "Process image (Page 67)"), you can determine via the group fault (SF) bit or group warning (SW) bit in the user program whether detailed information on diagnostics or messages in diagnostic data set 90 are present. If the bit is set (= 1), you can obtain detailed information on what caused a "group fault" or "group warning" by reading data set 90. The table below provides information on the possible cause and remedial measures.

³⁾ SF = group fault: You can obtain detailed information via diagnostics data set 90 (see Section "Group diagnostics - data set (index) 90 (Page 113)").

⁴⁾ SW = group warning: You can obtain detailed information via diagnostics data set 90 (see Section "Group diagnostics - data set (index) 90 (Page 113)").

⁵⁾ for a restart

x: Bit set

o: Not relevant

—: Status does not change

Appendix

A.1 CAX data

You can find the CAX data in the Siemens Industry Online Support (<https://support.industry.siemens.com/cs/ww/en/ps/16208/td>).

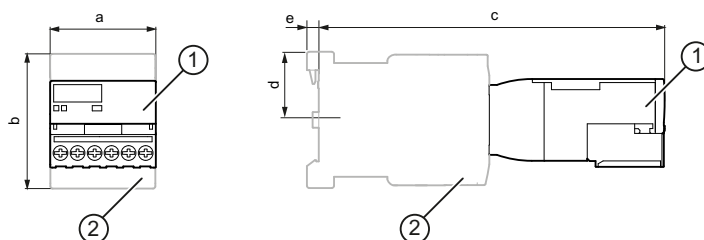
1. Enter the full article number of the desired device in the "Product" field, and confirm with the Enter key.
2. Click the "CAX data link.

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

A.2 Dimension drawings

The following dimension drawings show the example of the size 3RT202.

Function module for IO-Link, direct start with screw-type terminals (with contactor)

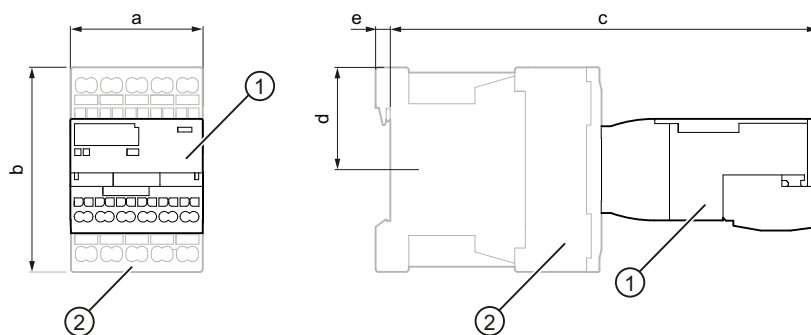


- ① Function module for IO-Link, direct start
- ② 3RT20 contactor

Table A-1 Dimensions in mm

Size	a	b	c	d	e
3RT201	45	57.5	142	29	5
3RT202 (AC)	45	85	166	43	5
3RT202 (DC)	45	85	176	43	5
3RT203	55	110	199	55	5
3RT204	70	140	221	70	5

Function module for IO-Link, direct start with spring-loaded terminals (with contactor)

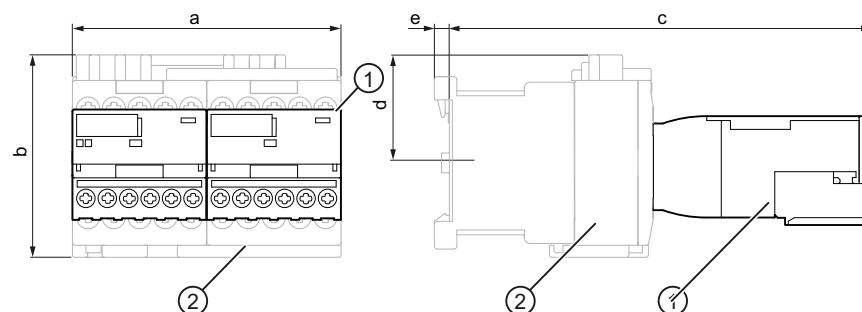


- ① Function module for IO-Link, direct start
- ② 3RT20 contactor

Table A-2 Dimensions in mm

Size	a	b	c	d	e
3RT201	45	70	152	33	5
3RT202 (AC)	45	101.5	166	43	5
3RT202 (DC)	45	101.5	176	43	5
3RT203	55	110	199	55	5
3RT204	70	140	221	70	5

Function module for IO-Link, reversing start with screw-type terminals (with contactors)

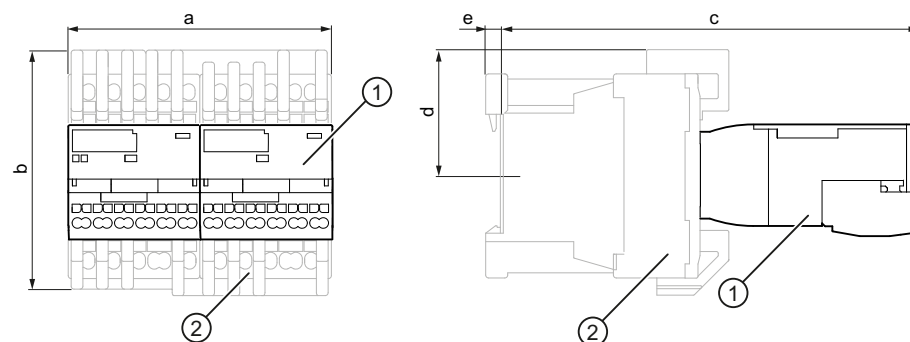


- ① Function modules for IO-Link, reversing start
- ② 3RT20 contactors

Table A-3 Dimensions in mm

Size	a	b	c	d	e
3RT201	90	68	142	36	5
3RT202 (AC)	90	101	166	53	5
3RT202 (DC)	90	101	176	53	5
3RT203	120	140.5	199	73	5
3RT204	150	159.5	221	82	5

Function module for IO-Link, reversing start with screw-type terminals (with contactors)

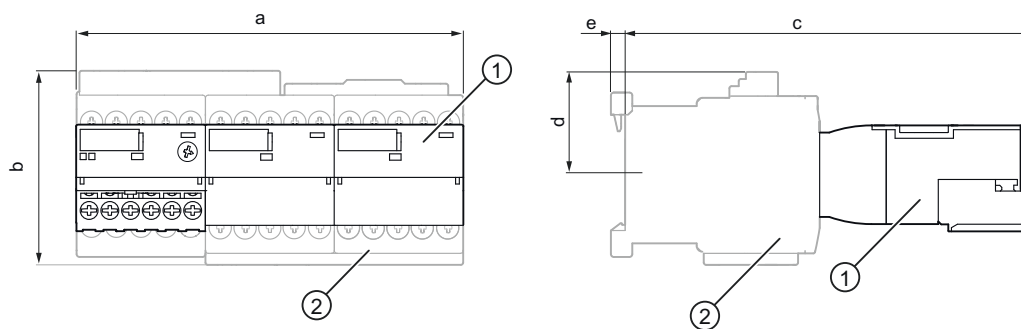


- ① Function modules for IO-Link, reversing start
- ② 3RT20 contactors

Table A-4 Dimensions in mm

Size	a	b	c	d	e
3RT201	90	84	142	43	5
3RT202 (AC)	90	114	166	59	5
3RT202 (DC)	90	114	176	59	5
3RT203	120	140.5	199	73	5
3RT204	150	159.5	221	82	5

Function module for IO-Link, star-delta (wye-delta) start with screw-type terminals (with contactors)

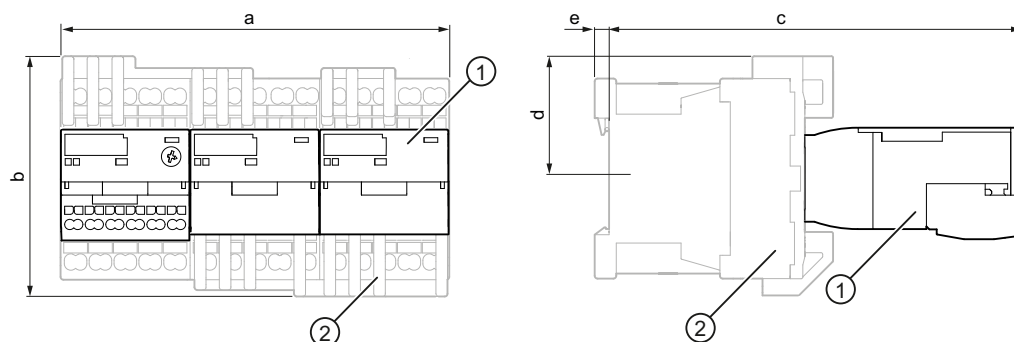


- ① Function modules for IO-Link, star-delta (wye-delta) start
- ② 3RT20 contactors

Table A-5 Dimensions in mm

Size	a	b	c	d	e
3RT201	135	68	142	36	5
3RT202 (AC)	135	101	166	53	5
3RT202 (DC)	135	101	176	53	5

Function module for IO-Link, star-delta (wye-delta) start with spring-loaded terminals (with contactors)

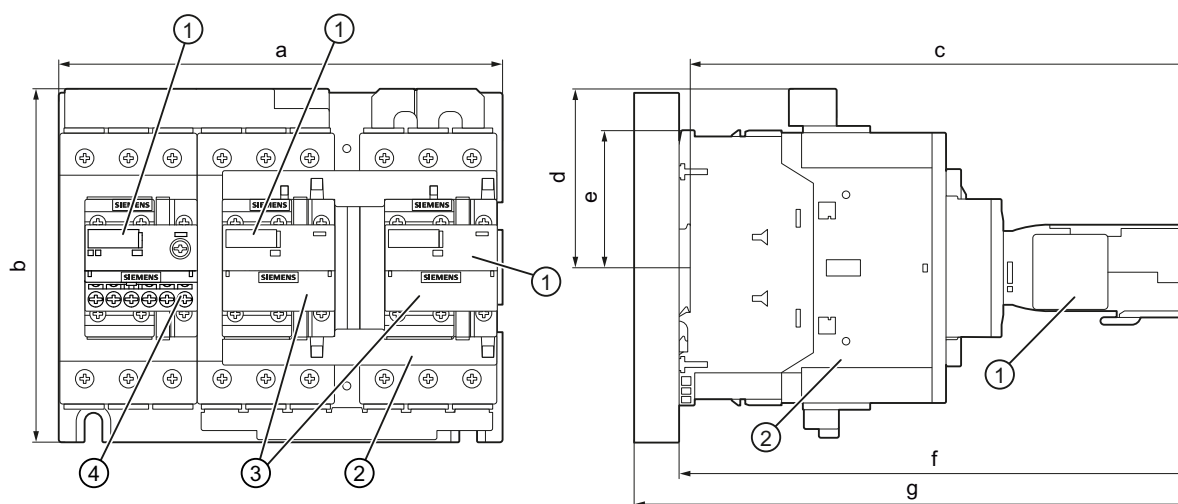


- ① Function modules for IO-Link, star-delta (wye-delta) start
- ② 3RT20 contactors

Table A-6 Dimensions in mm

Size	a	b	c	d	e
3RT201	135	84	142	43	5
3RT202 (AC)	135	114	166	59	5
3RT202 (DC)	135	114	176	59	5

Function module for IO-Link, star-delta (wye-delta) start (with contactor)



- ① Function modules for IO-Link, star-delta (wye-delta) start
- ② 3RT20 contactor
- ③ Coupling modules
- ④ Basic module

Table A-7 Dimensions in mm

Size	a	b	c	d	e	f	g
3RT203	177.5	141.5	199	72	55.1	204	222.3
3RT204	230	180	221	90	70	226	244.5

A.3 Circuit diagrams

A.3.1 Main circuit

Direct starter

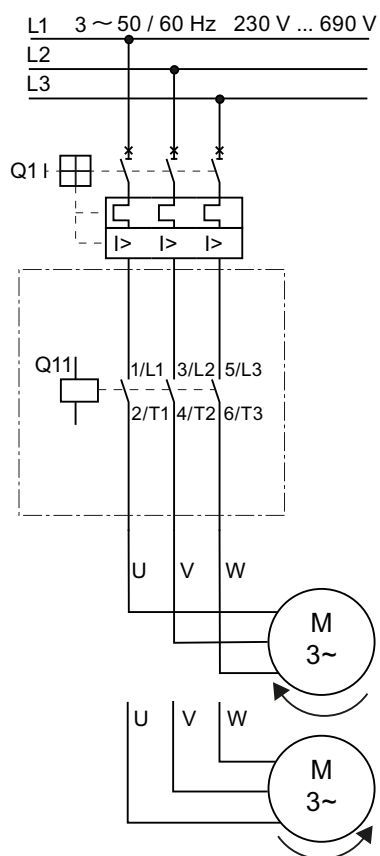


Figure A-1 Main circuit direct starter

Reversing starter

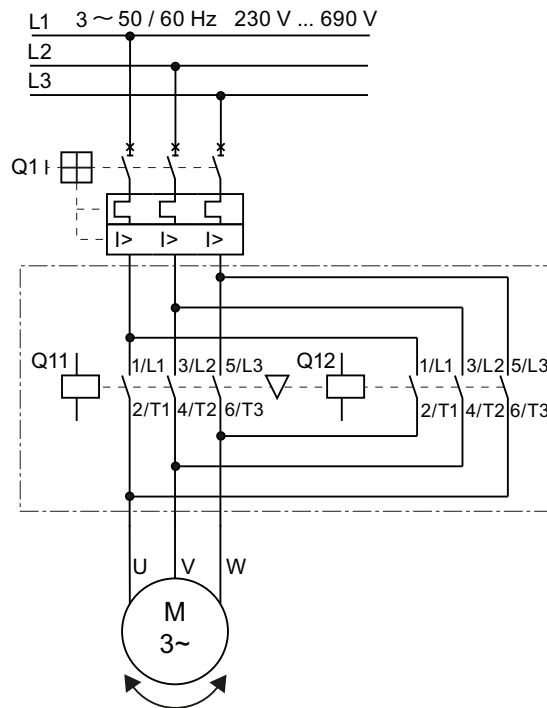


Figure A-2 Main circuit reversing starter

Star-delta starter

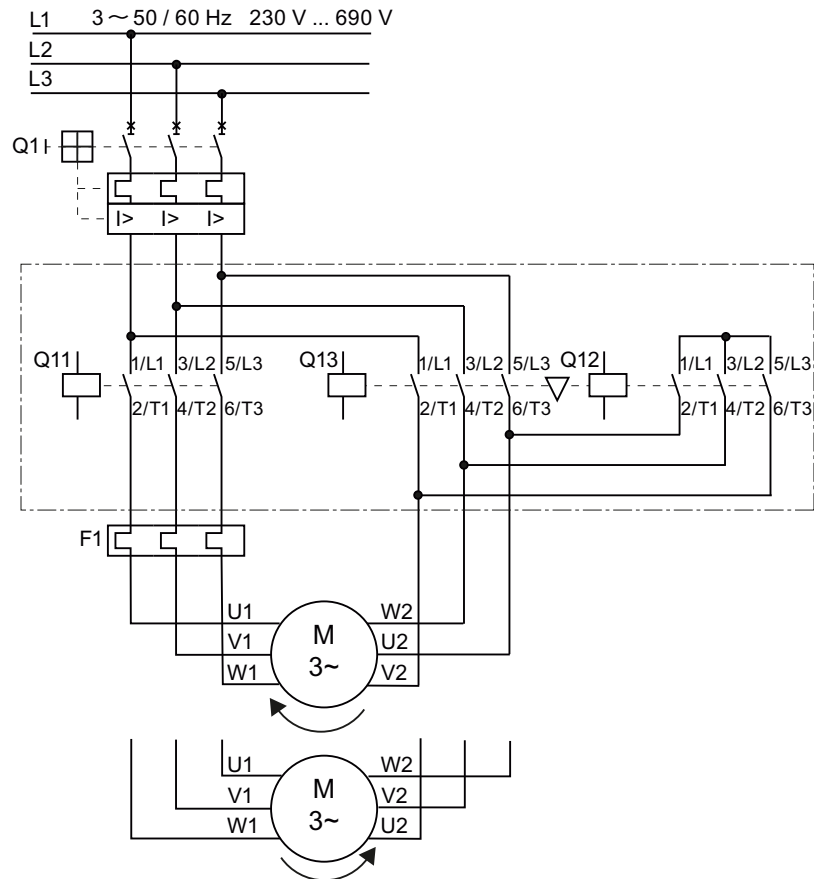


Figure A-3 Main circuit star-delta starter

A.3.2 Control circuit

Direct starter

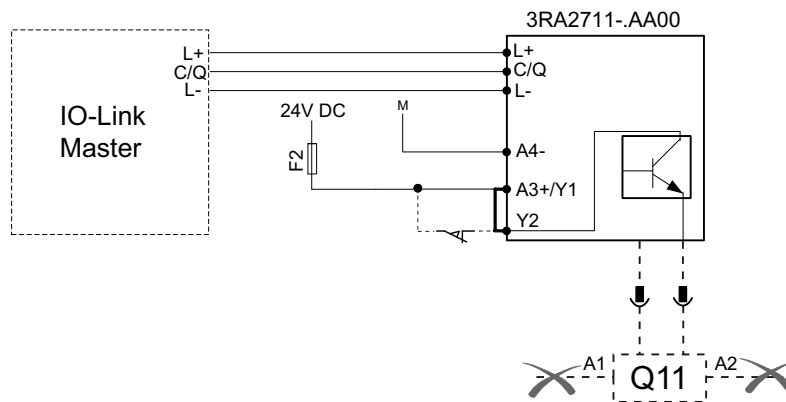


Figure A-4 Control circuit direct starter

Reversing starter

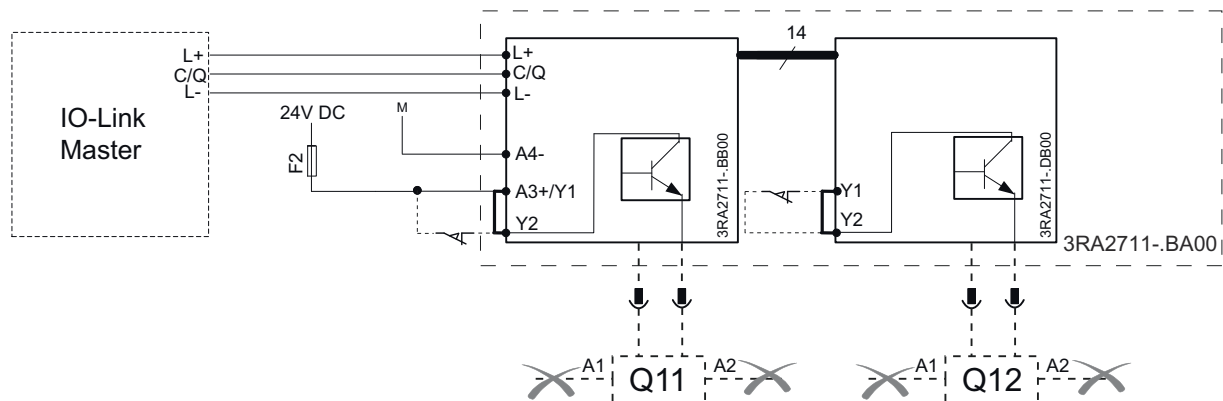


Figure A-5 Control circuit reversing starter

Star-delta starter

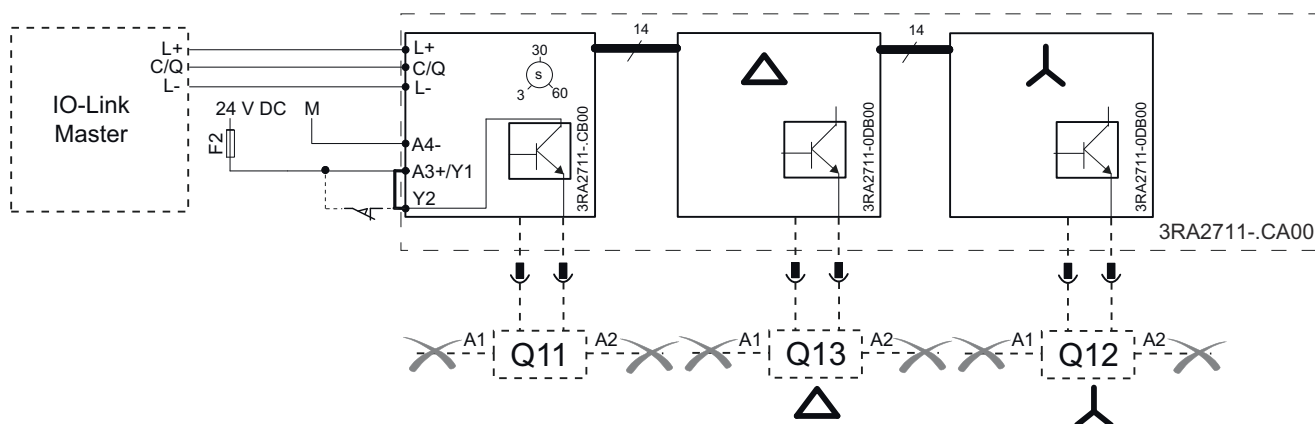


Figure A-6 Control circuit star-delta starter

A.4 Data sets

A.4.1 Structure of the data sets

Overview of the data sets

Table A-8 Data sets - overview

Data set			Name	Access	Value	Length (bytes)
Index (dec)	Index (hex)	Subindex supported				
0	0	Yes	Parameter Page 1	r	—	16
1	1	Yes	Parameter Page 2	r/w	—	16
16	10	No	Vendor Name	r	Siemens AG	10
17	11	No	Vendor Text	r	—	58
18	12	No	Product Name	r	SIRIUS Function Module IO-Link	30
19	13	No	Product ID	r	3RA2711	8
20	14	No	Product Text	r	—	2
21	15	No	Serial number	r	—	8
22	16	No	Hardware Revision	r	—	4
23	17	No	Firmware Revision	r	—	4
24	18	No	Application Specific Name	r/w	—	Max. 32 ¹⁾ / max. 64 ²⁾
90	5A	No	Group diagnostics	r	—	53
105	69	No	Actual configuration	r	—	43
130	82	No	Preset configuration	r/w	—	43

¹⁾ IO-Link IODD file V1.1

²⁾ IO-Link IODD file V1.0.1

A.4.2 IO-Link communication parameters

Parameter Page 1 - IO-Link communication parameters

Table A-9 Parameter Page 1

Address	Parameter name	Access	Description
0x00	Master Command	r/w	—
0x01	Master Cycle Time	r/w	—
0x02	Min. Cycle Time	r	0x32
0x03	Frame Capability	r	0x11

Address	Parameter name	Access	Description
0x04	IO-Link Revision ID	r	0x10 (IO-Link 1.0)/0x11 (IO-Link 1.1)
0x05	Process data IN	r	0x10
0x06	Process data OUT	r	0x10
0x07	Vendor ID 1	r	0x00
0x08	Vendor ID 2	r	0x2A
0x09	Device ID 1	r	0x09
0x0A	Device ID 2	r	0x03
0x0B	Device ID 3	r	0x00 (IO-Link 1.0)/0x01 (IO-Link 1.1)
0x0C	Function ID 1	r	0x00
0x0D	Function ID 2	—	0x00
0x0E	Reserved	—	—
0x0F	Reserved	—	—

A.4.3 Device-specific parameters

Parameter Page 2 - device-specific parameters

Table A-10 Parameter Page 2 - device-specific parameters (byte 0 to 11)

Byte.Bit		Meaning
0.0...0.7		SIRIUS product family (0x62)
		Starter status
1.0	Starter 1	0: Target/actual comparison: yes 1: Target/actual comparison: No
1.1		0: Starter available: no 1: Starter available: yes (default)
1.2	Starter 2	See 1.0
1.3		See 1.1
1.4	Starter 3	See 1.0
1.5		See 1.1
1.6	Starter 4	See 1.0
1.7		See 1.1
2.0	Operator panel	See 1.0
2.1		See 1.1
2.2		0: Reserved
2.3		0: Reserved
2.4 to 2.7	Profile version	1: Starter group
3	Starter 1	Type of starter ¹⁾
4.0...4.7		Reserved
5	Starter 2	Type of starter ¹⁾
6.0...6.7		Reserved

Byte.Bit		Meaning
7	Starter 3	Type of starter ¹⁾
8.0...8.7		Reserved
9	Starter 4	Type of starter ¹⁾
10.0...10.7		Reserved
11	Operator panel	0: Operator panel available: no 1: Operator panel available: yes (default)

¹⁾ You can find more information on the "Type of starter" parameter in Section ""Starter type" parameter (Page 60)".

A.4.4 Identification data

Identification data

Identification data refers to data stored in a module that supports users in the following areas:

- When checking the system configuration
- When locating modified system hardware
- When troubleshooting a system.

Modules can be uniquely identified with the identification data.

Identification data

DPP ¹⁾ Index	Data set		Access	Parameter	Length (bytes)	Default setting
	Index	Subindex				
0x07	—	—	r	Vendor ID	2	0x00
0x08	—	—	r			0x2A
0x09	—	—	r	Device ID	3	0x09
0x0A	—	—	r			0x03
0x0B	—	—	r			0x00
—	0x10	0	r	Vendor Name	10	Siemens AG
—	0x11	0	r	Vendor Text	58	—
—	0x12	0	r	Product Name	30	SIRIUS Function Module IO-Link
—	0x13	0	r	Product ID	8	3RA2711
—	0x14	0	r	Product Text	2	—
—	0x15	0	r	Serial Number	8	—
—	0x16	0	r	Hardware Revision	4	—

DPP ¹⁾	Data set		Access	Parameter	Length (bytes)	Default setting
Index	Index	Subindex				
—	0x17	0	r	Firmware Revision	4	—
—	0x18	0	r/w	Application Specific Name	Max. 32 ²⁾ /max. 64 ³⁾	—

¹⁾ Direct Parameter Page

²⁾ IO-Link IODD file V1.1

³⁾ IO-Link IODD file V1.0.1

A.4.5 Group diagnostics - data set (index) 90

Data set (index) 90 - group diagnostics

Note

The "motor starters" are referred to as "starters" in the following tables.

Note

Bits that are not described in the tables below are reserved and should be ignored.

Table A-11 Data set (index) 90 - group diagnostics: Starter group

Data set		Byte.Bit	Description
Index	Subindex		
Diagnosis of the starter group			
90	1	4.0...4.6	Number of starters (starters and operator panel)
90	2	5.0	Preset <> actual configuration

Starter 1

Table A-12 Data set (index) 90 - starter 1

Data set		Byte.Bit	Description
Index	Subindex		
Specific module diagnostics - starter 1			
90	3	9.0...9.6	Starter 1 (item number)
90	4	10.0	Module fault (device fault)
90	5	10.1	Starter available
90	6	10.2	Reserved
Specific diagnostics - starter 1			

Data set		Byte.Bit	Description
Index	Subindex		
90	7	15.0	Switching element defective
90	8	15.1	Supply voltage switching element missing
90	9	15.2	No mains voltage
90	10	15.3	Reserved
90	11	15.4	Reserved
90	12	15.5	Switch off - end position right
90	13	15.6	Switch off - end position left
90	14	15.7	Process mapping error
90	15	16.0	Manual operation
90	16	16.1	Manual operation aborted
90	17	16.2	Reserved

Starter 2

Table A-13 Data set (index) 90 - starter 2

Data set		Byte.Bit	Description
Index	Subindex		
Specific module diagnostics - starter 2			
90	18	18.0...18.6	Starter 2 (item number)
90	19	19.0	Module fault (device fault)
90	20	19.1	Starter available
90	21	19.2	Reserved
Specific diagnostics - starter 2			
90	22	24.0	Switching element defective
90	23	24.1	Supply voltage switching element missing
90	24	24.2	No mains voltage
90	25	24.3	Reserved
90	26	24.4	Reserved
90	27	24.5	Switch off - end position right
90	28	24.6	Switch off - end position left
90	29	24.7	Process mapping error
90	30	25.0	Manual operation
90	31	25.1	Manual operation aborted
90	32	25.2	Reserved

Starter 3

Table A-14 Data set (index) 90 - starter 3

Data set		Byte.Bit	Description
Index	Subindex		
Specific module diagnostics - starter 3			
90	33	27.0...27.6	Starter 3 (item number)
90	34	28.0	Module fault (device fault)
90	35	28.1	Starter available
90	36	28.2	Reserved
Specific diagnostics - starter 3			
90	37	33.0	Switching element defective
90	38	33.1	Supply voltage switching element missing
90	39	33.2	No mains voltage
90	40	33.3	Reserved
90	41	33.4	Reserved
90	42	33.5	Switch off - end position right
90	43	33.6	Switch off - end position left
90	44	33.7	Process mapping error
90	45	34.0	Manual operation
90	46	34.1	Manual operation aborted
90	47	34.2	Reserved

Starter 4

Table A-15 Data set (index) 90 - starter 4

Data set		Byte.Bit	Description
Index	Subindex		
Specific module diagnostics - starter 4			
90	48	36.0...36.6	Starter 4 (item number)
90	49	37.0	Module fault (device fault)
90	50	37.1	Starter available
90	51	37.2	Reserved
Specific diagnostics - starter 4			
90	52	42.0	Switching element defective
90	53	42.1	Supply voltage switching element missing
90	54	42.2	No mains voltage
90	55	42.3	Reserved
90	56	42.4	Reserved
90	57	42.5	Switch off - end position right
90	58	42.6	Switch off - end position left
90	59	42.7	Process mapping error

Data set		Byte.Bit	Description
Index	Subindex		
90	60	43.0	Manual operation
90	61	43.1	Manual operation aborted
90	62	43.2	Reserved

Operator panel

Table A-16 Data set (index) 90 - operator panel

Data set		Byte.Bit	Description
Index	Subindex		
Specific module diagnostics - operator panel			
90	63	45.0..45.6	Operator panel (item number)
90	64	46.0	Operator panel fault
90	64	46.1	Operator panel available

You will find additional information in Section "Process image (Page 67)".

A.4.6 Actual configuration - data set (index) 105

Data set (index) 105 (actual configuration)

Note

A "motor starter" is referred to as "starter" in the table below.

Table A-17 Data set (index) 105 (actual configuration) - diagnostics of the starter group

Data set		Byte.Bit	Description
Index	Subindex		
105	1	0.0...0.7	Fixed value 0x21
105	2	1.0...1.7	Fixed value 0x00
105	3	2.0...2.7	Fixed value 0x00
105	4	3.0...3.7	Fixed value 0x00
Diagnostics of the motor starter group			
105	5	4.0...4.6	Fixed value 0x05
105	6	8.0...8.7	Fixed value 0x07

Data set (index) 105 - (actual configuration) - starter 1

Table A-18 Data set (index) 105 - (actual configuration) - starter 1

Data set		Byte.Bit	Description
Index	Subindex		
105	7	9.0...9.6	Starter 1 (item number)
105	8	10.0...10.7	Fixed value 0x62
105	9	11.0	Starter fault
105	10	11.1	Starter available ¹⁾
105	11	12.0...12.7	Type of starter ²⁾
105	12	13.0...14.7	Reserved
—	13	15.0...15.7	Fixed value 0x07

¹⁾ You can find more information on the "Starter available" parameter in Section Starter available parameter (Page 60).

²⁾ You can find more information on the "Type of starter" parameter in Section Type of starter parameter (Page 60).

Data set (index) 105 - (actual configuration) - starter 2

Table A-19 Data set (index) 105 - (actual configuration) - starter 2

Data set		Byte.Bit	Description
Index	Subindex		
105	14	16.0...16.6	Starter 2 (item number)
105	15	17.0...17.7	Fixed value 0x62
105	16	18.0	Starter fault
105	17	18.1	Starter available ¹⁾
105	18	19.0...19.7	Type of starter ²⁾
105	19	20.0...21.7	Reserved
-	20	22.0...22.7	Fixed value 0x07

¹⁾ You can find more information on the "Starter available" parameter in Section Starter available parameter (Page 60).

²⁾ You can find more information on the "Type of starter" parameter in Section Type of starter parameter (Page 60).

Data set (index) 105 - (actual configuration) - starter 3

Table A-20 Data set (index) 105 - (actual configuration) - starter 3

Data set		Byte.Bit	Description
Index	Subindex		
105	21	23.0...23.6	Starter 3 (item number)
105	22	24.0...24.7	Fixed value 0x62

Data set		Byte.Bit	Description
Index	Subindex		
105	23	25.0	Starter fault
105	24	25.1	Starter available ¹⁾
105	25	26.0...26.7	Type of starter ²⁾
105	26	27.0...28.7	Reserved
—	27	29.0...29.7	Fixed value 0x07

¹⁾ You can find more information on the "Starter available" parameter in Section Starter available parameter (Page 60).

²⁾ You can find more information on the "Type of starter" parameter in Section Type of starter parameter (Page 60).

Data set (index) 105 - (actual configuration) - starter 4

Table A-21 Data set (index) 105 - (actual configuration) - starter 4

Data set		Byte.Bit	Description
Index	Subindex		
105	28	30.0...30.6	Starter 4 (item number)
105	29	31.0...31.4	Fixed value 0x62
105	30	32.0	Starter fault
105	31	32.1	Starter available ¹⁾
105	32	33.0...33.7	Type of starter ²⁾
105	33	34.0...35.7	Reserved
—	34	36.0...36.7	Fixed value 0x07

¹⁾ You can find more information on the "Starter available" parameter in Section Starter available parameter (Page 60).

²⁾ You can find more information on the "Type of starter" parameter in Section Type of starter parameter (Page 60).

Data set (index) 105 (actual configuration) - operator panel

Table A-22 Data set (index) 105 (actual configuration) - operator panel

Data set		Byte.Bit	Description
Index	Subindex		
105	35	37.0...37.6	Operator panel (item number)
105	36	38.0...38.7	Fixed value 0x60
105	37	39.1	Operator panel available ¹⁾
105	38	40.0...40.7	Fixed value 0xD2
105	39	41.0...42.7	Reserved

¹⁾ You can find more information on the "Starter available" parameter in Section Starter available parameter (Page 60).

A.4.7 Preset configuration - data set (index) 130

⚠ WARNING Danger of uncontrolled motor start-up Can Cause Death, Serious Injury, or Property Damage. The preset configuration of a starter group is saved by the starter connected to the IO-Link master via the removable terminal. Make sure that the correct preset configuration is saved in the new starter after the starters have been replaced. For additional information on the procedure, please refer to Section "Parameters (Page 59)".
--

Data set (index) 130 (preset configuration)

Table A-23 Data set (index) 130 (preset configuration) - diagnostics of the starter group

Data set		Byte.Bit	Description
Index	Subindex		
130	1	0.0...0.7	Fixed value 0x21
130	2	1.0...1.7	Fixed value 0x00
130	3	2.0...2.7	Fixed value 0x00
130	4	3.0...3.7	Fixed value 0x00
Diagnostics of the compact starter group			
130	5	4.0...4.6	Fixed value 0x05
130	6	8.0...8.7	Fixed value 0x07

Data set (index) 130 - (preset configuration) - starter 1

Table A-24 Data set (index) 130 - (preset configuration) - starter 1

Data set		Byte.Bit	Description
Index	Subindex		
130	7	9.0...9.6	Starter 1 (item number)
130	8	10.0...10.7	Fixed value 0x62
130	9	11.0	Preset <> actual configuration ¹⁾
130	10	11.1	Starter available ²⁾
130	11	12.0...12.7	Type of starter ³⁾
130	12	13.0...14.7	Starter version
130	13	15.0...15.7	Fixed value 0x07

Data set (index) 130 - (preset configuration) - starter 2

Table A-25 Data set (index) 130 - (preset configuration) - starter 2

Data set		Byte.Bit	Description
Index	Subindex		
130	14	16.0...16.6	Starter 2 (item number)
130	15	17.0...17.7	Fixed value 0x62
130	16	18.0	Preset <> actual configuration ¹⁾
130	17	18.1	Starter available ²⁾
130	18	19.0...19.7	Type of starter ³⁾
130	19	20.0...21.7	Starter version
130	20	22.0...22.7	Fixed value 0x07

Data set (index) 130 - (preset configuration) - starter 3

Table A-26 Data set (index) 130 - (preset configuration) - starter 3

Data set		Byte.Bit	Description
Index	Subindex		
130	21	23.0...23.6	Starter 3 (item number)
130	22	24.0...24.7	Fixed value 0x62
130	23	25.0	Preset <> actual configuration ¹⁾
130	24	25.1	Starter available ²⁾
130	25	26.0...26.7	Type of starter ³⁾
130	26	27.0...28.7	Starter version
130	27	29.0...29.7	Fixed value 0x07

Data set (index) 130 - (preset configuration) - starter 4

Table A-27 Data set (index) 130 - (preset configuration) - starter 4

Data set		Byte.Bit	Description
Index	Subindex		
130	28	30.0...30.6	Starter 4 (item number)
130	29	31.0...31.4	Fixed value 0x62
130	30	32.0	Preset <> actual configuration ¹⁾
130	31	32.1	Starter available ²⁾
130	32	33.0...33.7	Type of starter ³⁾

Data set		Byte.Bit	Description
Index	Subindex		
130	33	34.0...35.7	Starter version
130	34	36.0...36.7	Fixed value 0x07

Data set (index) 130 (target configuration) - operator panel

Table A-28 Data set (index) 130 (target configuration) - operator panel

Data set		Byte.Bit	Description
Index	Subindex		
130	35	37.0...37.6	Operator panel (item number)
130	36	38.0...38.7	Fixed value 0x60
130	37	39.0	Preset <> actual configuration ¹⁾
130	38	39.1	Operator panel available

¹⁾ You can find additional information on the parameter "Operation at preset <> actual" in Section "Parameter "Operation at Preset <> Actual Operation" (Page 61)".

²⁾ You can find additional information on the "Starter available" parameter in Section ""Starter available" parameter (Page 60)".

³⁾ You can find additional information on the "Type of starter" parameter in Section ""Starter type" parameter (Page 60)".

A.5 References

A.5.1 References

Further references

In addition to this manual, please refer to the operating instructions and manuals for any accessories. You can download the relevant documentation from the Internet (<http://www.siemens.com/sirius/manuals>). Simply enter the article number of the relevant item into the search field.

Operating instructions

Title	Article number
Function modules for IO-Link	
Function modules for IO-Link, direct start and reversing start	3ZX1012-ORA27-1AA1
Function modules for IO-Link, star-delta (wye-delta) start	3ZX1012-ORA27-1CA1
Contactors	
Contactor S00	3ZX1012-ORH21-1AA1
Contactor S0	3ZX1012-ORT22-1AA1
Contactor S2	3ZX1012-ORT20-3AA1
Contactor S3	3ZX1012-ORT20-4AA1
Contactor assemblies	
Reversing contactor assembly S00	3ZX1012-ORA23-8AA1
Reversing contactor assembly S0	3ZX1012-ORA23-8BA1
Reversing contactor assembly S2	3ZX1012-ORA23-8CA1
Reversing contactor assembly S3	3ZX1012-ORA23-8DA1
Assembly kit for reversing contactor assembly S00	3ZX1012-ORA20-4AA1
Assembly kit for reversing contactor assembly S0	3ZX1012-ORA20-3AA1
Assembly kit for reversing contactor assembly S2	3ZX1012-ORA20-2AA1
Assembly kit for reversing contactor assembly S3	3ZX1012-ORA20-2CA1
Assembly kit for contactor assembly for star-delta (wye-delta) start S00	3ZX1012-ORA20-4BA1
Assembly kit for contactor assembly for star-delta (wye-delta) start S0	3ZX1012-ORA20-3BA1
Assembly kit for contactor assembly for star-delta (wye-delta) start S2	3ZX1012-ORA20-2BA1
Assembly kit for contactor assembly for star-delta (wye-delta) start S3	3ZX1012-ORA20-4CA1

A.5.2 Manuals - SIRIUS Modular System

Manuals - SIRIUS Modular System

You can download the SIRIUS manuals from the Internet.

Information about ...	Is available in ...
SIRIUS - system overview	"SIRIUS - System Overview" (https://support.industry.siemens.com/cs/ww/en/view/60311318) manual
Contactors and contactor assemblies 3RT, 3RH and 3RA	"SIRIUS - SIRIUS 3RT Contactors and Contactor Assemblies" (https://support.industry.siemens.com/cs/ww/en/view/60306557) manual
3RF34 electronic switching devices	"SIRIUS - SIRIUS 3RF34 electronic Switching Devices" (https://support.industry.siemens.com/cs/ww/en/view/60298187) manual
3RW soft starters	"SIRIUS 3RW30/3RW40 Soft Starter" (https://support.industry.siemens.com/cs/ww/en/view/38752095) manual "SIRIUS 3RW44 Soft Starter" (https://support.industry.siemens.com/cs/ww/en/view/21772518) manual
3RV motor starter protectors	"SIRIUS 3RV Motor Starter Protectors" (https://support.industry.siemens.com/cs/ww/en/view/60279172) manual
3RU, 3RB overload relays	"SIRIUS 3RU Thermal Overload Relays / SIRIUS 3RB Electronic Overload Relays" (https://support.industry.siemens.com/cs/ww/en/view/60298164) manual
3RB24 electronic overload relay	"3RB24 Electronic Overload Relay for IO-Link" (https://support.industry.siemens.com/cs/ww/en/view/46165627) manual
3UG4 monitoring relays / 3RR2 current monitoring relays	"3UG4/3RR2 Monitoring Relay" (https://support.industry.siemens.com/cs/ww/en/view/54397927) manual
3RS1/3RS2 temperature monitoring relays	"3RS1/3RS2 Temperature Monitoring Relays" (https://support.industry.siemens.com/cs/ww/en/view/54999309) manual
3UG48 monitoring relays / 3RR24 current monitoring relays for IO-Link	"3UG48/3RR24 Monitoring Relays for IO-Link" (https://support.industry.siemens.com/cs/ww/en/view/54375430) manual
3RS14/3RS15 temperature monitoring relays for IO-Link	"3RS14/3RS15 Temperature Monitoring Relays for IO-Link" (https://support.industry.siemens.com/cs/ww/en/view/54375463) manual
3RA load feeders	"SIRIUS - SIRIUS 3RA Load Feeders" (https://support.industry.siemens.com/cs/ww/en/view/60284351) manual
3RA6 compact starters	"SIRIUS 3RA6 Compact Starter" (https://support.industry.siemens.com/cs/ww/en/view/27865747) manual
3RA28 function modules for mounting on contactors	"SIRIUS - SIRIUS 3RA28 Function Modules for Mounting on 3RT2 Contactors" (https://support.industry.siemens.com/cs/ww/en/view/60279150) manual
3RA27 function modules for connection to the higher-level control	"SIRIUS - SIRIUS 3RA2712 Function Modules for AS-Interface" (https://support.industry.siemens.com/cs/ww/en/view/39318922) manual "SIRIUS - SIRIUS 3RA2711 Function Modules for IO-Link" (https://support.industry.siemens.com/cs/ww/en/view/39319600) manual

A.6 ESD Guidelines

Definition of ESD

All electronic modules 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 electrostatic sensitive components/modules are commonly referred to as ESD devices. This is also the international abbreviation for such devices.

ESD modules are identified by the following symbol:



NOTICE
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 electrostatic discharge current may lead to latent failure of a module, that is, this damage may not be significant immediately, but in operation may cause malfunction.

Electrostatic charging

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

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

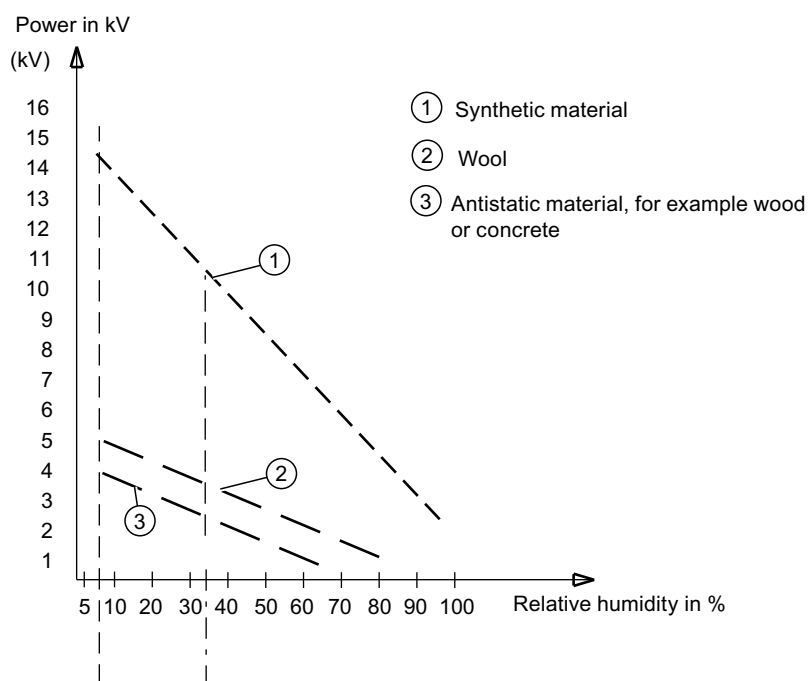


Figure A-7 Electrostatic voltages on an operator

Basic protective measures against electrostatic discharge

- Ensure good equipotential bonding:
When handling electrostatic sensitive devices, ensure that your body, the workplace and packaging are grounded. This prevents electrostatic charge.
- Avoid direct contact:
As a general rule, only touch electrostatic sensitive devices when this is unavoidable (e.g. during maintenance work). Handle the modules without touching any chip pins or PCB traces. In this way, the discharged energy can not affect the sensitive devices. Discharge your body before you start taking any measurements on a module. Do so by touching grounded metallic parts. Always use grounded measuring instruments.

A.7 Electromagnetic compatibility (EMC) according to IEC 60947-4-2

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

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