ARS*-B2-IA*

Ethernet-APL Rail Field Switch

Hardware Manual

Your automation, our passion.

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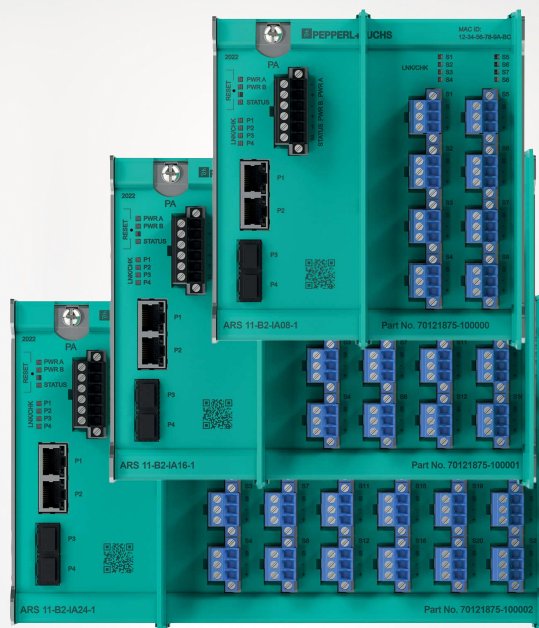
With regard to the supply of products, the current issue of the following document is applicable: The General Terms of Delivery for Products and Services of the Electrical Industry, published by the Central Association of the Electrical Industry (Zentralverband Elektrotechnik und Elektroindustrie (ZVEI) e.V.) in its most recent version as well as the supplementary clause: "Expanded reservation of proprietorship"

Contents

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1 Introduction

1.1 Content of this Document

This document contains information that you need in order to use your product throughout the applicable stages of the product life cycle. These can include the following:

- Product identification
- Delivery, transport, and storage
- Mounting and installation
- Commissioning and operation
- Maintenance and repair
- Troubleshooting
- Dismounting
- Disposal

Note

This document does not substitute the instruction manual.

Note

For full information on the product, refer to the instruction manual and further documentation on the Internet at www.pepperl-fuchs.com.

Note

For specific device information such as the year of construction, scan the QR code on the device. As an alternative, enter the serial number in the serial number search at www.pepperl-fuchs.com.

The documentation consists of the following parts:

- Present document
- Instruction manual
- Datasheet

Additionally, the following parts may belong to the documentation, if applicable:

- EU-type examination certificate
- EU declaration of conformity
- Attestation of conformity
- Certificates
- Control drawings
- Functional safety manual
- Additional documents

1.2 Target Group, Personnel

Responsibility for planning, assembly, commissioning, operation, maintenance, and dismounting lies with the plant operator.

Only appropriately trained and qualified personnel may carry out mounting, installation, commissioning, operation, maintenance, and dismounting of the product. The personnel must have read and understood the instruction manual and the further documentation.

Prior to using the product make yourself familiar with it. Read the document carefully.

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1.3 Symbols Used

This document contains symbols for the identification of warning messages and of informative messages.

Warning Messages

You will find warning messages, whenever dangers may arise from your actions. It is mandatory that you observe these warning messages for your personal safety and in order to avoid property damage.

Depending on the risk level, the warning messages are displayed in descending order as follows:

Danger!

This symbol indicates an imminent danger.

Non-observance will result in personal injury or death.

Warning!

This symbol indicates a possible fault or danger.

Non-observance may cause personal injury or serious property damage.

Caution!

This symbol indicates a possible fault.

Non-observance could interrupt the device and any connected systems and plants, or result in their complete failure.

Informative Symbols

Note

This symbol brings important information to your attention.

Action

1. This symbol indicates a paragraph with instructions. You are prompted to perform an action or a sequence of actions.

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2 Product Description

2.1 Overview and Application

The Ethernet-APL series of Rail Field Switches are ruggedized, managed switches. The rail field switches provide connectivity for Ethernet-APL and optionally PROFIBUS PA field devices to 100/1000-MBit/s industrial Ethernet networks. Port diagnostics facilitate fault finding in Ethernet-APL networks and providing information for preventive maintenance of the rail field switches and the network they are connected to. The rail field switches are managed with an integrated web server.

The rail field switches are suitable for DIN rail mounting or wall mounting. The rail field switches can be installed in the explosion hazardous Zone 2. The spur connections of the rail field switches provide power to the connected field devices and are rated intrinsically safe Ex ia IIC for Zone 1/0 and Zone 20 mounting. The spurs are compatible with the Ethernet-APL port profile SPAA. 2 RJ45 and 2 SFP Ethernet interfaces permit the connection to industrial Ethernet networks like PROFINET or EtherNet/IP. 2 of the 4 ports may be used in ring configuration.

Fiber optic small form-factor pluggable (SFP) transceivers are available as accessories. Product versions with pluggable screw terminals and spring terminals are available.
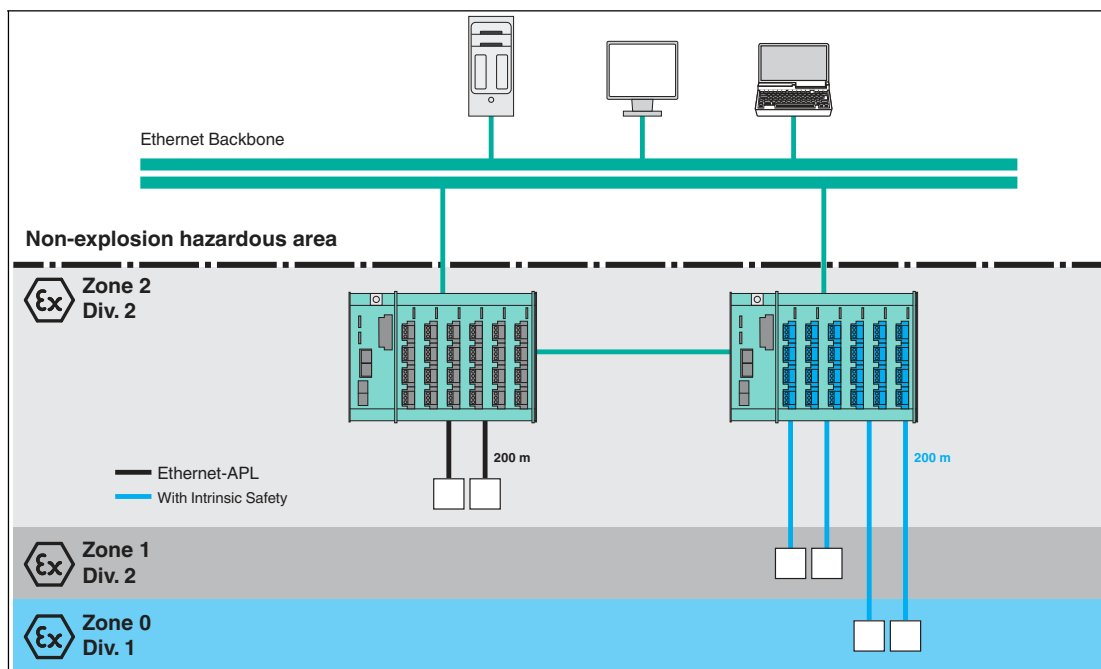

Figure 2.1   Typical network structure using Ethernet-APL rail field switches

Note

For further information regarding Ethernet-APL refer to the "Engineering Guideline Ethernet-APL."

Note

The rail field switches are commissioned and configured using the PANOS software. You can access the software manual from our website.

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2.2 Type Codes

The rail field switch series consist in the following range of products:

Order designation	Number of Ethernet-APL spur connections	Terminal (pluggable)	
		Screw terminal	Spring terminal
ARS1*-B2-IA08-1	8	x	
ARS1*-B2-IA08-2	8		x
ARS1*-B2-IA16-1	16	x	
ARS1*-B2-IA16-2	16		x
ARS1*-B2-IA24-1	24	x	
ARS1*-B2-IA24-2	24		x

Table 2.1

The * asterisk stands for different firmware functionality. Refer to the datasheet or software manual for further details.

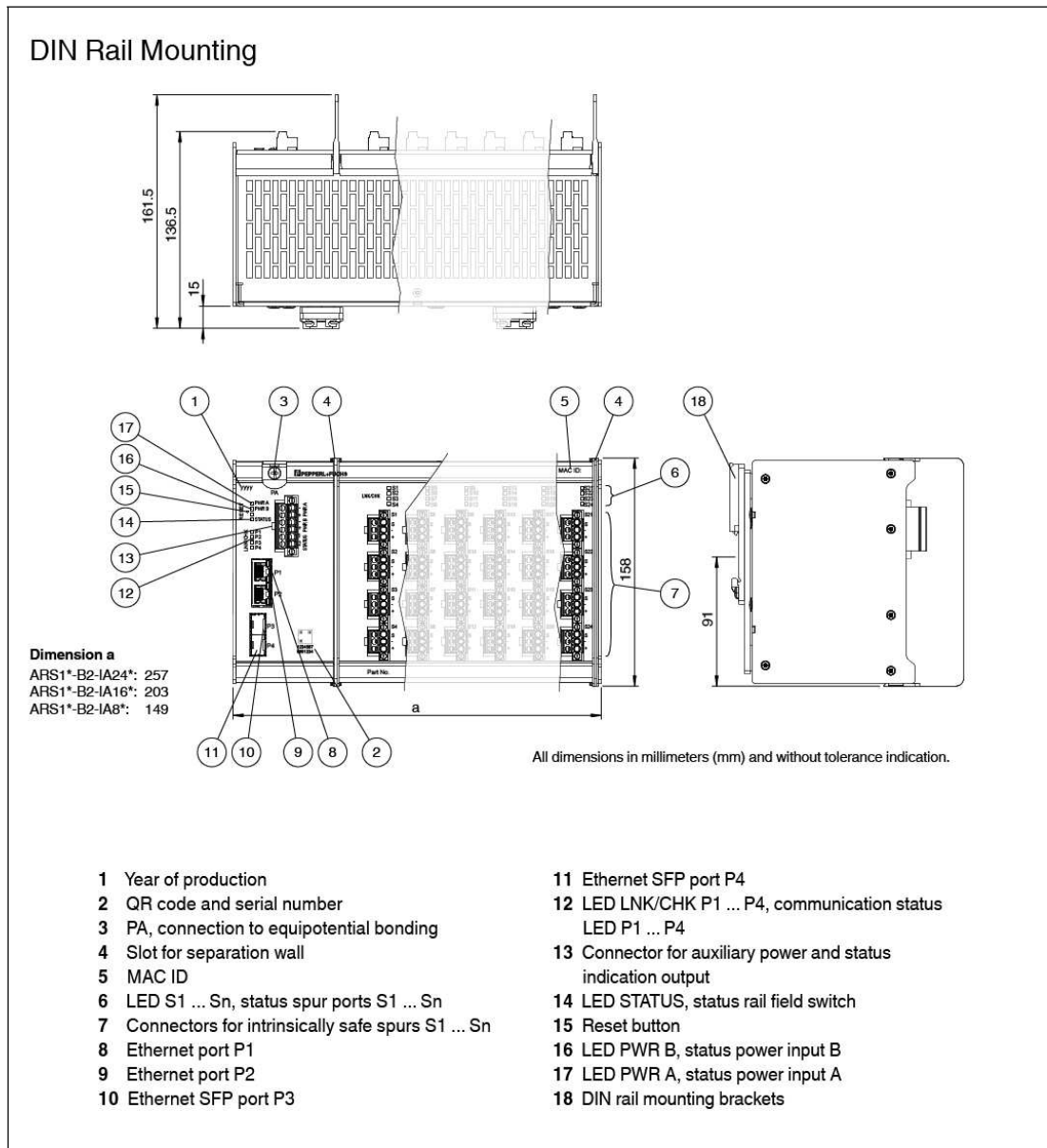Contact your Pepperl+Fuchs representative to check the availability of individual product versions.

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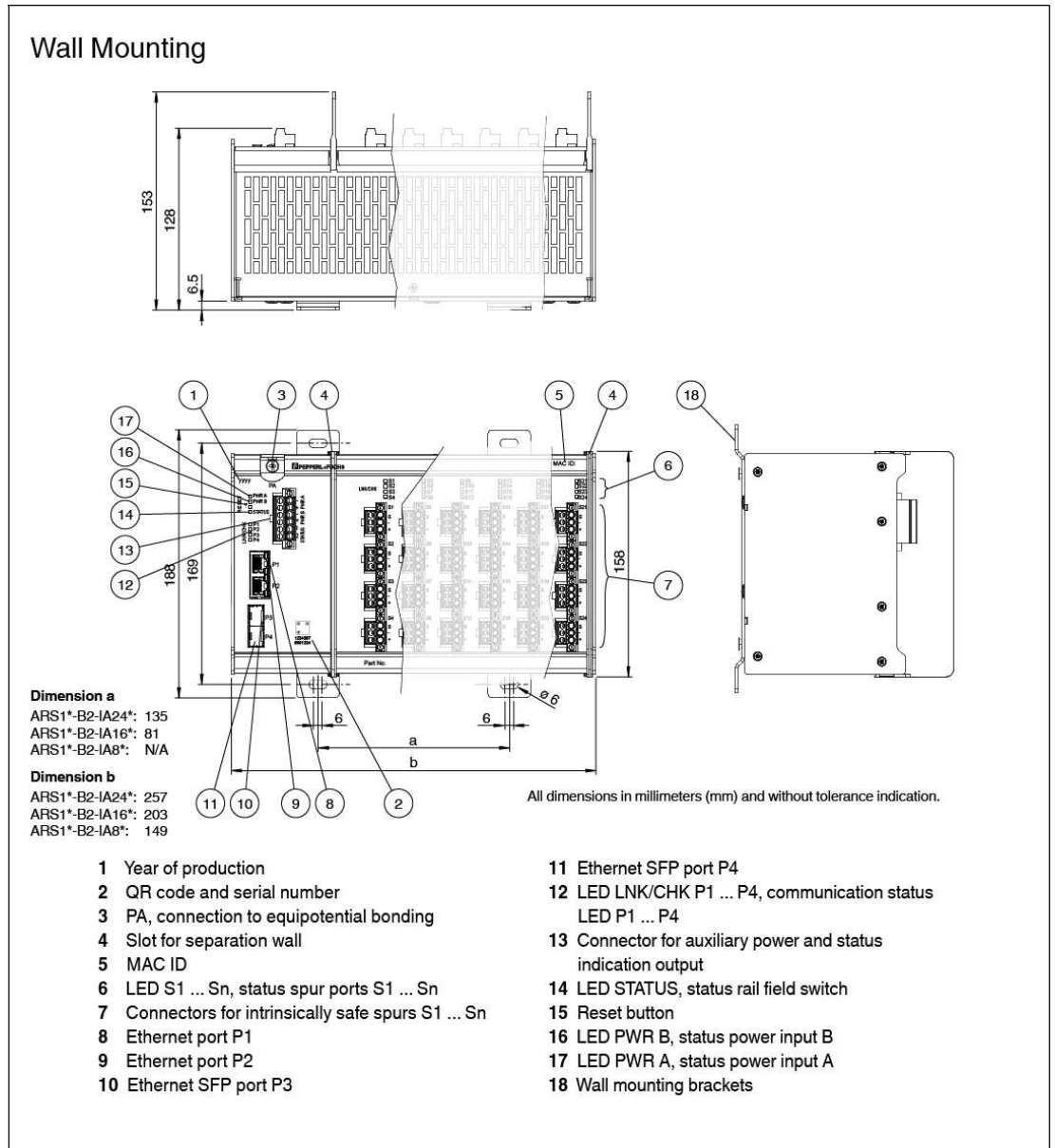
2.3 Components and Dimensions

DIN Rail Mounting

Dimension a
ARS1*-B2-IA24*: 257
ARS1*-B2-IA16*: 203
ARS1*-B2-IA8*: 149

All dimensions in millimeters (mm) and without tolerance indication.

1	Year of production	
2	QR code and serial number	
3	PA, connection to equipotential bonding	
4	Slot for separation wall	
5	MAC ID	
6	LED S1 ... Sn, status spur ports S1 ... Sn	
7	Connectors for intrinsically safe spurs S1 ... Sn	
8	Ethernet port P1	
9	Ethernet port P2	
10	Ethernet SFP port P3	
11	Ethernet SFP port P4	
12	LED LNK/CHK P1 ... P4, communication status LED P1 ... P4	
13	Connector for auxiliary power and status indication output	
14	LED STATUS, status rail field switch	
15	Reset button	
16	LED PWR B, status power input B	
17	LED PWR A, status power input A	
18	DIN rail mounting brackets	

Figure 2.2

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Wall Mounting

Dimension a
ARS1*-B2-IA24*: 135
ARS1*-B2-IA16*: 81
ARS1*-B2-IA8*: N/A

Dimension b
ARS1*-B2-IA24*: 257
ARS1*-B2-IA16*: 203
ARS1*-B2-IA8*: 149

All dimensions in millimeters (mm) and without tolerance indication.

1	Year of production	**11**	Ethernet SFP port P4
2	QR code and serial number	**12**	LED LNK/CHK P1 ... P4, communication status LED P1 ... P4
3	PA, connection to equipotential bonding	**13**	Connector for auxiliary power and status indication output
4	Slot for separation wall		
5	MAC ID	**14**	LED STATUS, status rail field switch
6	LED S1 ... Sn, status spur ports S1 ... Sn	**15**	Reset button
7	Connectors for intrinsically safe spurs S1 ... Sn	**16**	LED PWR B, status power input B
8	Ethernet port P1	**17**	LED PWR A, status power input A
9	Ethernet port P2	**18**	Wall mounting brackets
10	Ethernet SFP port P3		

Figure 2.3

2.4   Accessories

Overview

Order designation	Description
SFP-1	SFP transceiver, 2 km, 100BASE-FX, fast Ethernet multimode fiber
SFP-2	SFP transceiver, 550 m, 1000BASE-SX, Gigabit Ethernet multimode fiber
SFP-3	SFP transceiver, 30 km, 100BASE-LX, fast Ethernet single-mode fiber
SFP-4	SFP transceiver, 10 km, 1000BASE-LX, Gigabit Ethernet, single-mode fiber
ACC-PC-45	Protective covers for RJ45 sockets (packaging unit: 10 pieces)

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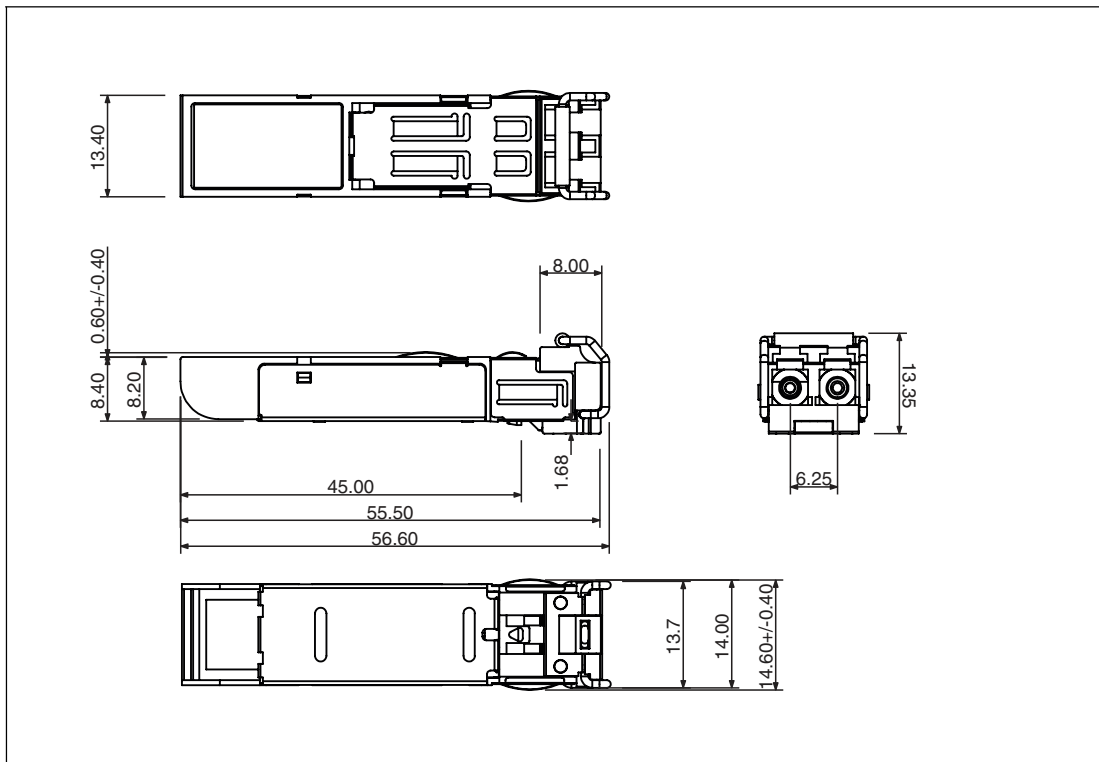| Order designation	Description
ACC-PC-SFP	Protective covers for SFP sockets (packaging unit: 10 pieces)
ACC-ARS-SW	Separation wall for intrinsically safe port application (packaging unit: 2 pieces)
ACC-ARS-WMK	Wall mounting kit consisting of 2 mounting brackets

Table 2.2

Fiber Optic SFP Transceivers

Figure 2.4

The rail field switches provide 2 sockets for small form-factor pluggable (SFP) transceiver Ethernet modules. Pepperl+Fuchs' SFP transceivers are intended to be used in applications, where extended distances are required. The SFP transceivers fulfill enhanced requirements for industrial use as such as installation in explosion-hazardous area, extended temperature range, and enhanced electromagnetic compatibility (EMC).

Note

Only use SFP transceivers approved by Pepperl+Fuchs for the intended use. Pepperl+Fuchs accepts no liability as a result of performance issues related to third-party SFP solutions.

SFP-1

- Complies with 100BASE-FX
- Transfer rate 100 Mbit/s
- Reach length of up to 2 km
- LC duplex connector
- Multi-mode fiber with 1310 nm wavelength
- Complies with a Class 1 laser product in accordance with EN 60825-1.

SFP-2

- Complies with IEEE 802.3z Gigabit Ethernet standard 1000BASE-SX
- Transfer rate 1 Gbit/s

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- Reach length of up to 550 m
- LC duplex connector
- Multi-mode fiber with 850 nm wavelength
- Complies with a Class 1 laser product in accordance with EN 60825-1.

SFP-3

- Complies with IEEE 802.3z Fast Ethernet standard 100BASE-LX
- Transfer rate 100 Mbit/s
- Reach length of up to 30 km
- LC duplex connector
- Single-mode fiber with 850 nm wavelength
- Complies with a Class 1 laser product in accordance with EN 60825-1
- Fiber optic diagnostic monitoring.

SFP-4

- Complies with IEEE 802.3z Gigabit Ethernet standard 1000BASE-LX
- Transfer rate 1 Gbit/s
- Reach length of up to 10 km
- LC duplex connector
- Single-mode fiber with 850 nm wavelength
- Complies with a Class 1 laser product in accordance with EN 60825-1
- Fiber optic diagnostic monitoring.

For further SFP transceiver versions contact your Pepperl+Fuchs sales representative.

Protective Cover for RJ45 Sockets
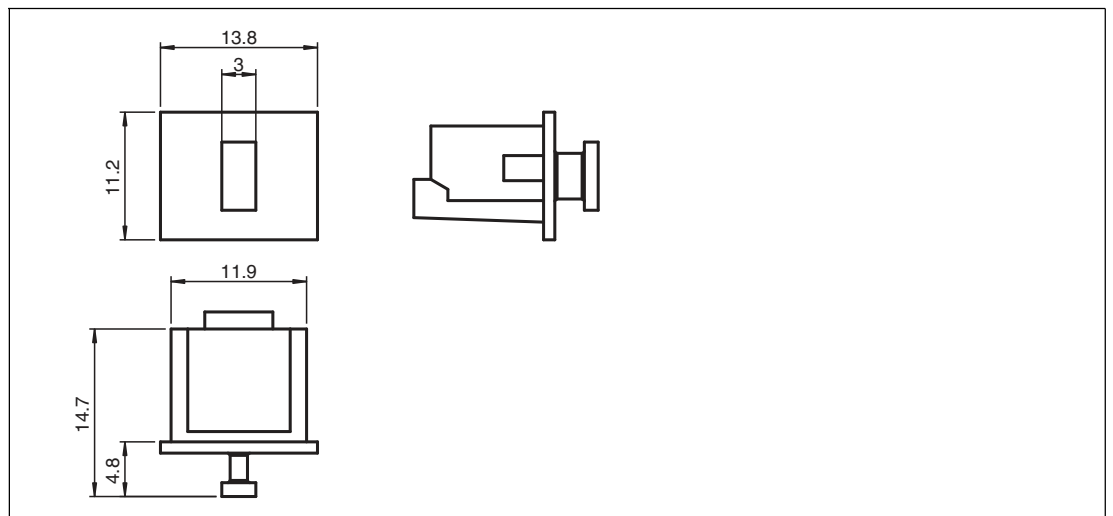
Figure 2.5

To protect unused RJ45 sockets against dust or unintentional harm, protective covers are provided.

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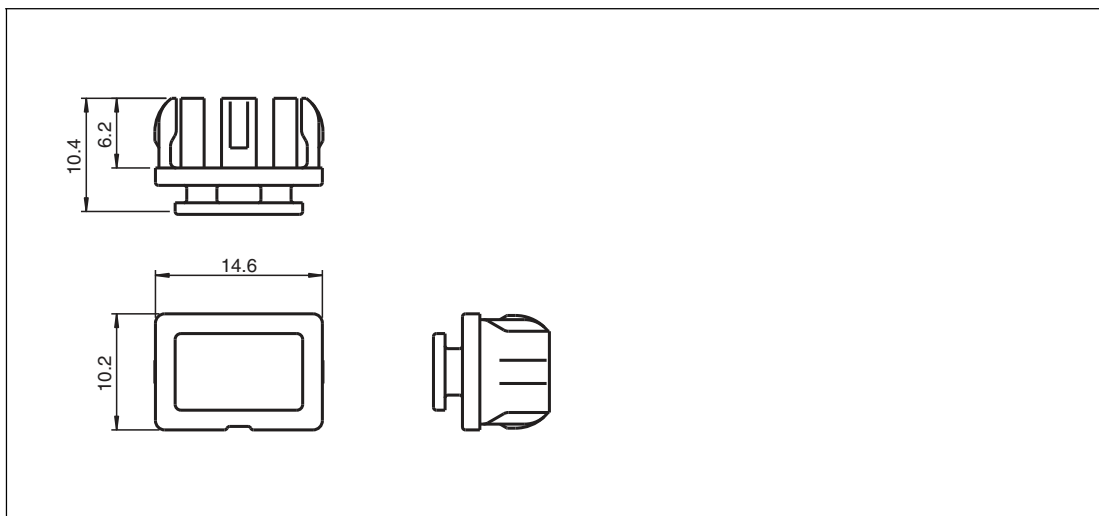## Protective Cover for SFP Sockets

Figure 2.6

To protect unused SFP sockets against dust or unintentional harm, protective covers are provided.
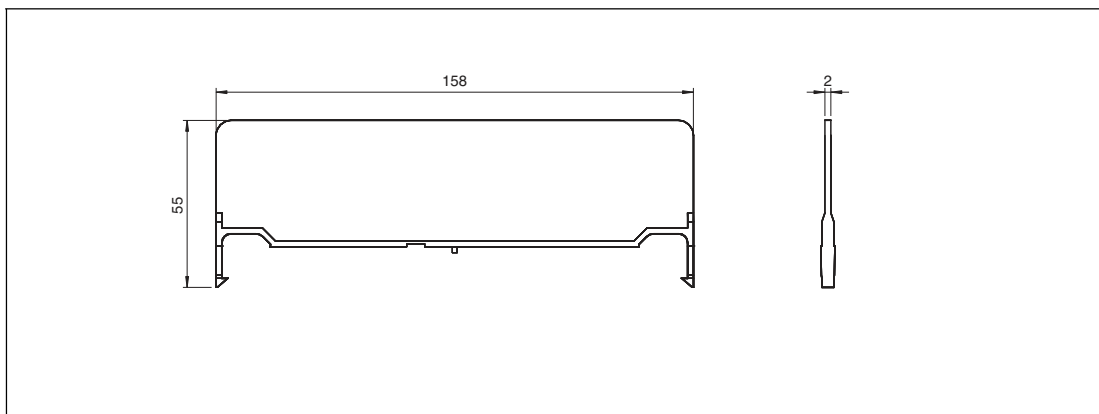
Separation Wall

Figure 2.7

Using the spurs in type of protection Ex ia requires clearance of 50 mm between the non-intrinsically safe circuits as, e.g. the Ethernet ports P1 ... P4 or circuits of other equipment installed near the rail field switch and the intrinsically safe spur terminals.
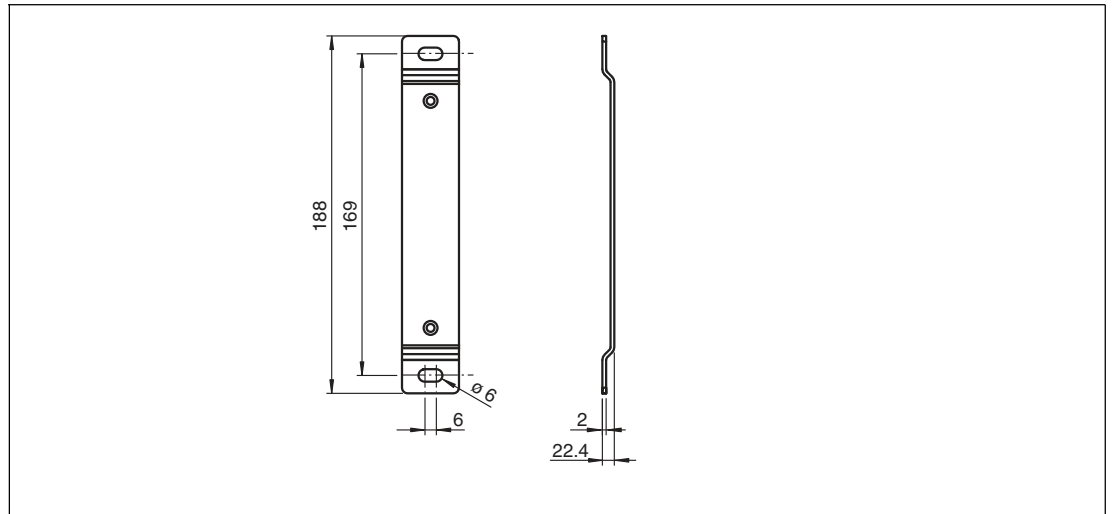
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Wall Mounting Kit

Figure 2.8

A wall mounting kit is provided as an accessory. The kit includes 2 brackets. The factory-installed DIN mounting rail clamps must be removed before installing.

2.5 Scope of Delivery

The rail field switch is delivered with mounting brackets for DIN mounting rail.

2.6 Technical data

Depending on the mounting position of the rail field switch and the use of SFP transceivers, the maximum ambient temperature of the rail field switches is reduced.
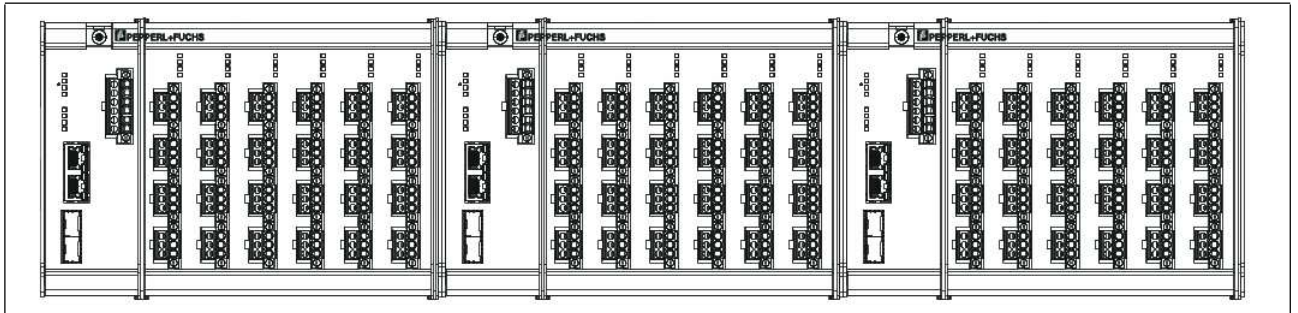
Horizontal Mounting Position

Figure 2.9

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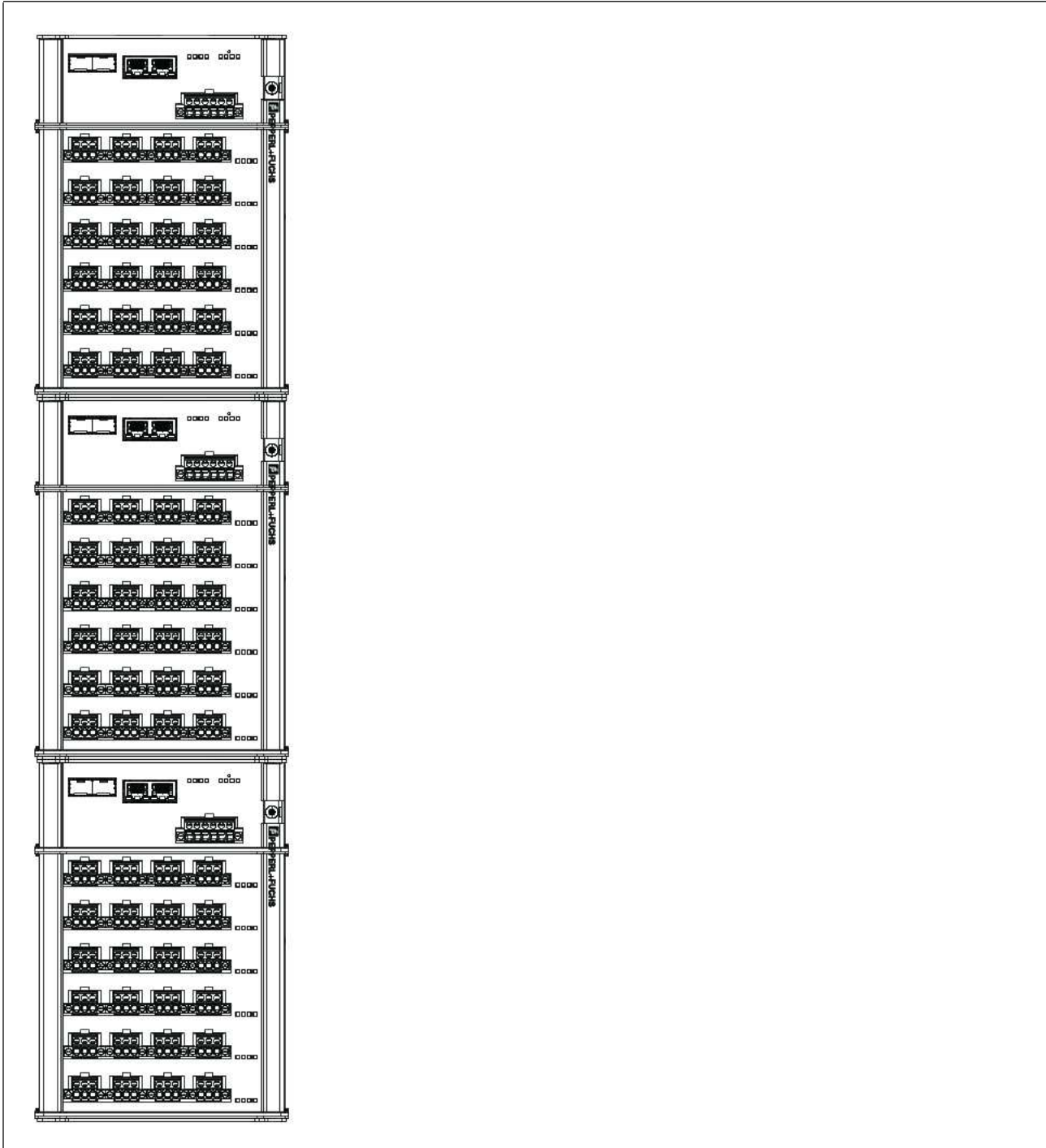
Vertical Mounting Position

Figure 2.10

Mounting position	Use of SFP transceivers	Ambient temperature
Horizontal	No	-40 °C ... +70 °C
Horizontal	Yes	-40 °C ... +65 °C
Vertical	No	-40 °C ... +55 °C
Vertical	Yes	-40 °C ... +55 °C

Table 2.3

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3 Installation

3.1 General Installation Information

Danger!

Explosion hazard from damaged electronic components

Premature wear of electronic components in a device that was previously used in a general electrical installation can cause sparks that can ignite the surrounding potentially explosive atmosphere.

Never install devices that have already been operated in general electrical installations in electrical installations used in combination with hazardous areas!

Danger!

Explosion hazard from exposure to potentially explosive gas atmosphere

If the device is installed in Zone 2 without mounting it in a sufficiently suitable surrounding enclosure, gas, dust, water or other external interferences can cause the live device to spark. The sparks can ignite the surrounding potentially explosive atmosphere.

Mount the device in a surrounding enclosure that complies with the requirements for surrounding enclosures according to IEC/EN 60079–0, and that is rated with the degree of protection IP54 according to IEC/EN 60529. The surrounding enclosure must have an EU declaration of conformity according to the ATEX Directive for at least equipment protection level Gc.

Danger!

Explosion hazard from exposure to potentially explosive dust atmosphere

If the device is installed in Zone 22 without mounting it in a sufficiently suitable surrounding enclosure, dust, water or other external interferences can cause the live device to spark. The sparks can ignite the surrounding potentially explosive atmosphere.

Only mount the device in a suitable surrounding enclosure. The surrounding enclosure must have an EU declaration of conformity according to the ATEX Directive for at least equipment protection level Dc.

The device can get very hot during operation. To protect the device from excessive heating, observe the required clearances and sufficient ventilation when installing the device.

3.2 Installation in a Surrounding Enclosure in Zone 2

The rail field switch includes electrical circuits that are not intrinsically safe. When mounted in explosion-hazardous areas, special care has to be taken when opening the enclosure of the rail field switch while it is energized.

Opening the enclosure is only authorized when the following conditions are given:

- When a potentially explosive atmosphere is absent, or
- When the non-intrinsically safe circuits of the rail field switch are protected by a degree of protection IP30

The following are examples of how to comply with degree of protection IP30. The examples vary depending on the type of terminal of the auxiliary power connector of the rail field switch.

Versions with Screw Terminals (ARS*-1)

Ethernet ports P1 ... P4

Not used Ethernet ports P1 ... P4 have to be equipped with the corresponding covers:

- Protection cover ACC-PC-45 for Ethernet ports P1 and P2
- Protection cover ACC-PC-SFP for Ethernet ports P3 and P4

6-pole auxiliary power connector

The isolation of installed wires must finish at the terminal cage. Alternatively, isolated wire end ferrules can be used.

The terminal cages of unused terminal connections for PWR A and PWR B must be covered, for example, with isolated wire end ferrules. Crimp the insulation tube so that no conductive parts of the wire end ferrule are exposed.

To comply with degree of protection IP30, cover the connectors on PWR A and PWR B and, if used, the connector for status indicator output. During maintenance, the cover must prevent a screwdriver from making unintended contact with conducting non-intrinsically safe components of the power connector.

Versions with Spring Terminals (ARS*-2)

Ethernet ports P1 ... P4

Not used Ethernet ports P1 ... P4 have to be equipped with the corresponding covers:

- Protection cover ACC-PC-45 for Ethernet ports P1 and P2
- Protection cover ACC-PC-SFP for Ethernet ports P3 and P4

6-pole auxiliary power connector

The isolation of installed wires must finish at the terminal cage. Alternatively, isolated wire end ferrules can be used.

The terminal cages of unused terminal connections for PWR A and PWR B must be covered, for example, with isolated wire end ferrules. Crimp the insulation tube so that no conductive parts of the wire end ferrule are exposed.

3.3   Mounting and Dismounting

Mounting or Dismounting Rail Field Switches

Mounting DIN mounting rail

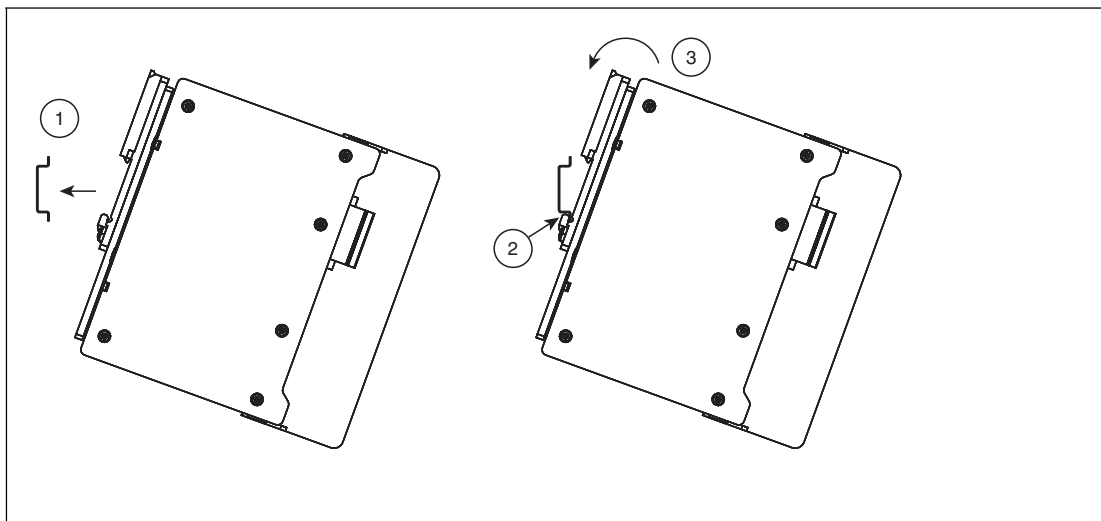The rail field switches are designed for mounting on a 35 mm DIN mounting rail in accordance with EN 50022.

Figure 3.1

1.   Position the rail field switch on the DIN mounting rail.

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2. Use the bottom hook in order to hook the electronics onto the DIN mounting rail.

3. Move the top hook over the upper end of the DIN mounting rail until the locking mechanism engages.
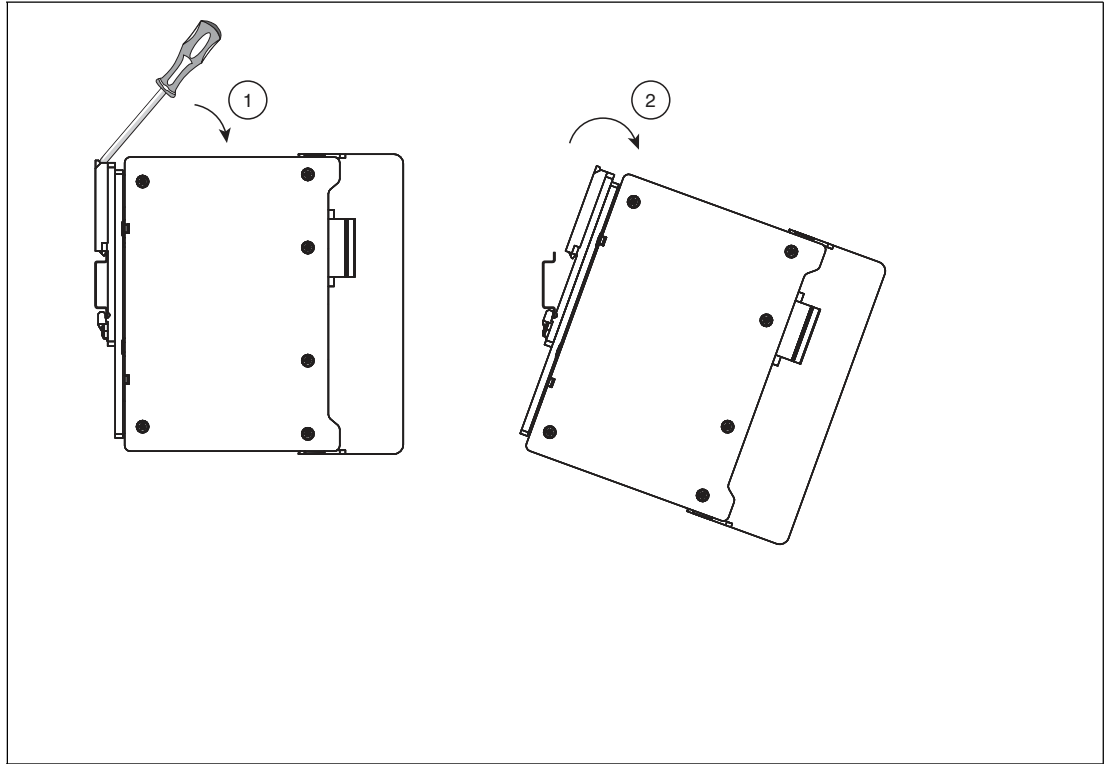
Dismounting DIN mounting rail

Figure 3.2

1. Use a slot-head screwdriver and push down the locking mechanism to release the device.

2. Tilt the device downwards to free it from the DIN mounting rail.

Wall Mounting

The accessory kit includes 2 brackets.

Note

When using product version with 8 Ethernet-APL spur connections, only 1 bracket is needed.

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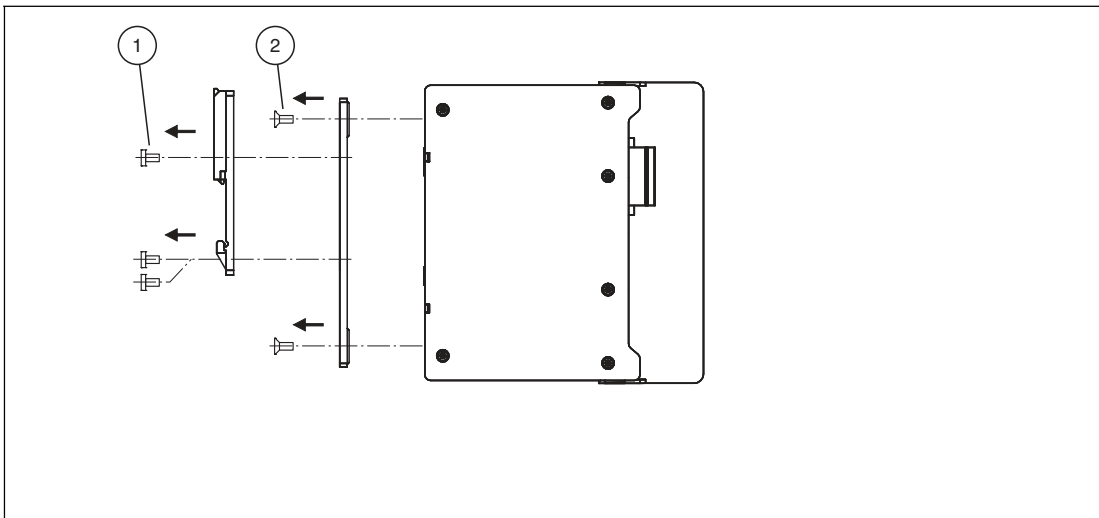
Mounting wall-mounting brackets

Figure 3.3

1 Screws for DIN mounting rail clamp

2 TX20 screws for adapter

1. Before installing wall-mounting bracket, remove the factory-installed DIN mounting rail clamps:
- To remove the DIN mounting rail clamps, loosen 3 screws each clamp.
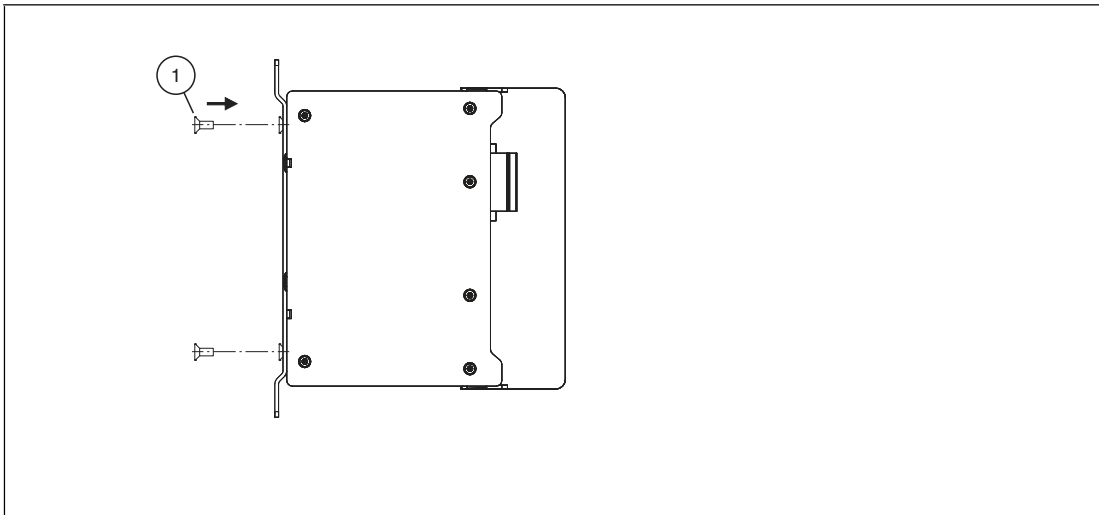- To remove the adapter, loosen 2 screws each adapter.

Figure 3.4

1 Screw

> **i** **Note**
>
> In the wall-mounting kit screws for wall-mounting brackets are not included.
> Use the TX20 screws that are obtained by removing adapter.

2. Fit each wall-mounting bracket with 2 screws.

3. Fit the device to the wall with M6 screws.

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Inserting or Removing Fiber Optic SFP Transceiver

Danger!

Explosion hazard from sparking when using operating elements!

Using operating elements in a potentially explosive atmosphere can cause sparks that can ignite the surrounding atmosphere.

- While power is on, do not insert and remove SFP transceivers.
- When installing or removing SFP transceivers, make sure that power is removed.
- Only use operating elements (e.g., switch, slider, button, etc.) in the absence of a potentially explosive atmosphere.

Danger!

Explosion hazard from electrostatic charge!

Electrostatic charges can discharge and consequently ignite a surrounding potentially explosive atmosphere while installing or operating the device.

- Avoid electrostatic charges during installation and operation of the device.
- Observe electrostatic discharge (ESD) precautions.
- Wear an antistatic wrist or ankle strap that connects to an approved grounding source.

In explosion hazardous areas only use SFP transceivers listed in the SFP transceiver certificate that is referenced in the certificate of this product.

Ensure to cover unused SFP transceivers slots with the provided dust protection caps.

Inserting fiber optic SFP transceiver

1. If installed, pull the protective cover from the SFP socket on the rail field switch.

2. Line-up the SFP transceiver and insert it into the socket of port P3 or P4. The transceiver is fully seated when you hear a click.

   Note

   Verify that the SFP transceiver is completely seated and secured in its assigned socket on the rail field switch by firmly pushing on the SFP transceiver. If the SFP transceiver is not completely seated and secured in the receptacle, you will hear a click as the triangular pin on the bottom of the SFP transceiver snaps into the hole in the receptacle.

3. Remove the dust protection cap from the SFP transceiver.

4. Insert the LC connector of the fiber optic cable into the SFP transceiver.

Removing fiber optic SFP transceiver

1. Disconnect the LC connector from the SFP transceiver.

2. Open the bale clasp on the SFP transceiver by pushing it into downward direction with your index finger. If the bale clasp is obstructed and you cannot use your index finger to open it, use a small slot-head screwdriver to open the bale clasp.

3. Insert a dust protection cap into the SFP transceiver.

4. Pick the SFP transceiver and carefully remove it from the socket.

5. Install a new SFP transceiver or put a protective cover onto the SFP socket of the rail field switch.

Mounting or Dismounting Separation Wall

Danger!

Explosion hazard from wrong separation distances!

If you do not observe the minimum separation distances between intrinsically safe circuits of associated apparatus and non-intrinsically safe circuits, this can lead to added currents or voltages. This can result in current/voltage flashover generating sparks. The sparks can ignite the surrounding potentially explosive atmosphere.

Ensure that you observe the compliance of the separation distances to all non-intrinsically safe circuits according to IEC/EN 60079-14.

Mounting separation wall

To provide clearance distance of 50 mm between the non-intrinsically safe circuits and intrinsically safe circuits, install the separation walls.
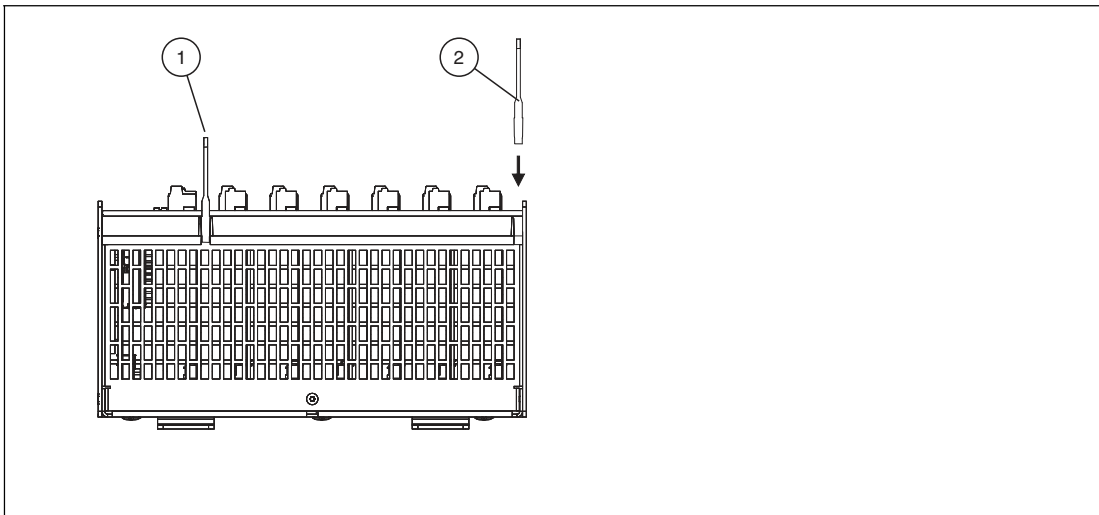

Figure 3.5

1   Separation wall 1

2   Separation wall 2

1. Press the separation walls into the provided slots on the front of the rail field switch.

2. Make sure that they are locked in place.

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3.4 Connection Assignment

Danger!

Danger to life from incorrect installation

Incorrect installation of cables and connection lines can compromise the function and the electrical safety of the device.

- Observe the permissible core cross section of the conductor.
- When using stranded conductors, crimp wire end ferrules on the conductor ends.
- Use only one conductor per terminal.
- When installing the conductors the insulation must reach up to the terminal.
- Observe the tightening torque of the terminal screws.

Danger!

Explosion hazard from connection damage

Manipulating connections outside of the specified ambient temperature range can lead to material damage, resulting in an unwanted failure of the connection. This could result in an increased explosion hazard in potentially explosive atmospheres.

Only manipulate connections in the specified ambient temperature range.
Temperature range: -5 C° ... +70 C°

Danger!

Explosion hazard from exposed conductors

Exposed conductors of inadequately attached cables can cause sparks that can ignite the surrounding potentially explosive atmosphere.

When installing the device ensure that the cables are adequately attached.

Danger!

Danger to life from incorrect installation!

Incorrect installation of cables and connection lines can compromise the function and the electrical safety of the device.

- Protect connectors against loosening.
- Attach connectors with the fastening screws as designated.

Observe the permissible cable type and cable length given in the respective hazardous area certificate.

The following section describes the different connection details of the rail field switch with particular reference to the torques required for a safe installation. For any terminal connections, observe the following cable and connection information.

Connector with Screw Terminals: Cable and Connection Information

- Permissible core cross section: Screw terminals with flexible or rigid wires: 0.2 mm^2 ... 2.5 mm^2
- Insulation stripping length: 9 mm ... 10 mm
- If you use stranded connectors: Crimp on wire end ferrules
- Ensure that connectors are mechanically locked
- Torque required for tightening the terminal screws: 0.5 Nm
- Torque required for tightening the retaining screws: 0.3 Nm

Connector with Spring Terminals: Cable and Connection Information

- Permissible core cross section: Spring terminals with flexible or rigid wires:
  0.5 mm^2 ... 2.5 mm^2
- Insulation stripping length: 10 mm ... 11 mm

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- Ensure that connectors are mechanically locked
- Torque required for tightening the retaining screws: 0.3 Nm

Auxiliary Power Connection

The rail field switch provides redundant auxiliary power supply inputs PWR A and PWR B.
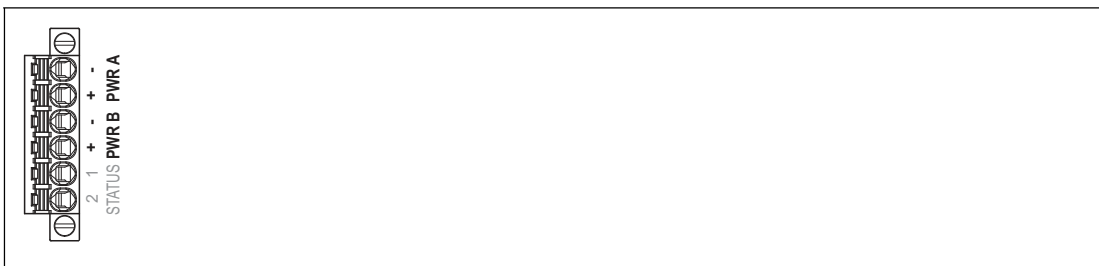

Figure 3.6   Connector with screw terminals

Figure 3.7   Connector with spring terminals

The rail field switch must be supplied with a DC voltage U_n = 20 V ... 60 V that meets the requirements for safety extra-low voltage (SELV) or protective extra-low voltage (PELV) and not exceed a maximum voltage of 60 V DC even under fault condition. At the power terminal the cross section of the cables must be chosen in accordance with the maximum fuse protection of the external circuit.

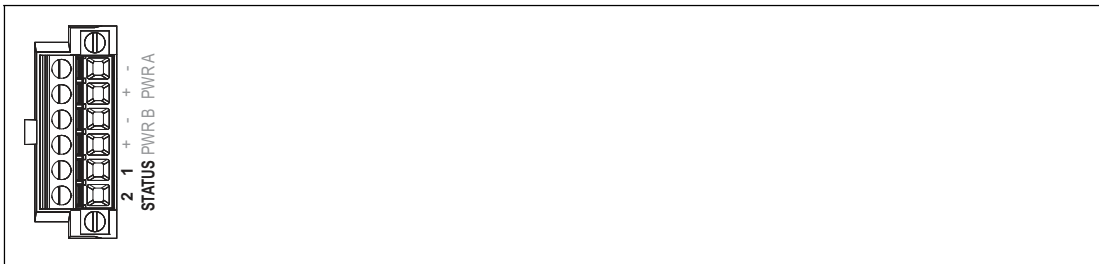## Status Indication Output

Figure 3.8   Connector with screw terminals

Figure 3.9   Connector with spring terminals

The rail field switch provides a relay contact output for status indication.
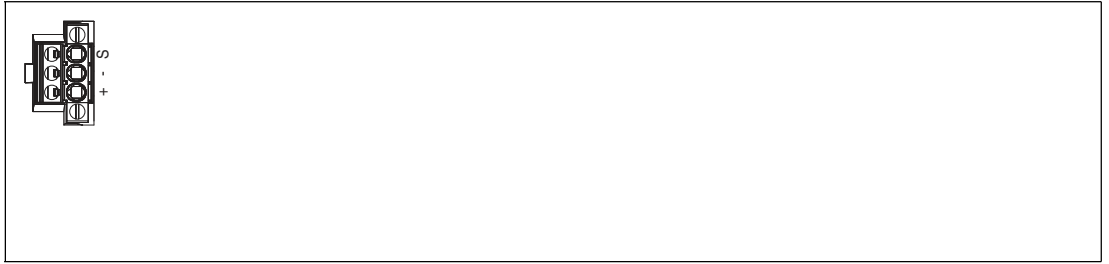
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Spur Connection

Figure 3.10   Connector with screw terminals
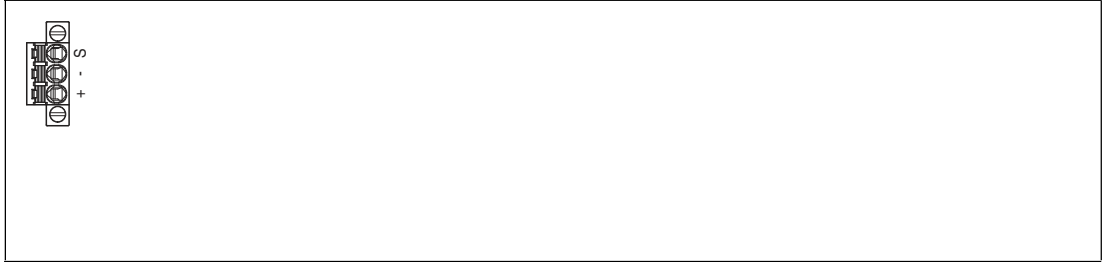

Figure 3.11   Connector with spring terminals

The Ethernet-APL field devices are connected through a pluggable 3-pin connector.

3.5   Grounding / Shielding

Danger!

Explosion hazard from wrong or missing grounding!

Wrong or missing grounding can cause sparks. This can ignite the surrounding potentially explosive atmosphere.

- Ground the device. Observe the grounding requirements for type of protection Ex i according to IEC/EN 60079-14.
- Ensure that external ground connections exist, are in good condition, and are not damaged or corroded.

Caution!

Risk of electric shock or property damage from inadequate grounding!

If you fail to connect all metal parts of the device to protective local earth correctly, this could result in potential equalization currents. These currents could hurt operating personnel or cause property damage.

- The grounding terminal is not a safety earth: Do not use the grounding terminal to ground exposed metal parts.
- Ground exposed metal parts of the device separately. Ensure that a correct grounding is guaranteed at all times.

Grounding the Device

The grounding terminal is marked with "PA".

The device provides a grounding terminal to which an equipotential bonding conductor with a minimum cross section of 4 mm^2 must be connected.

Connecting the Ground Connection Cable

1. Connect the ground cable to a cable lug.

2. Position the cable lug over the grounding terminal with the cable pointing downwards.

3. Screw the cable lug to the grounding terminal with 3 flat washers and 1 spring washer inserted between screw, lug, and terminal as illustrated:
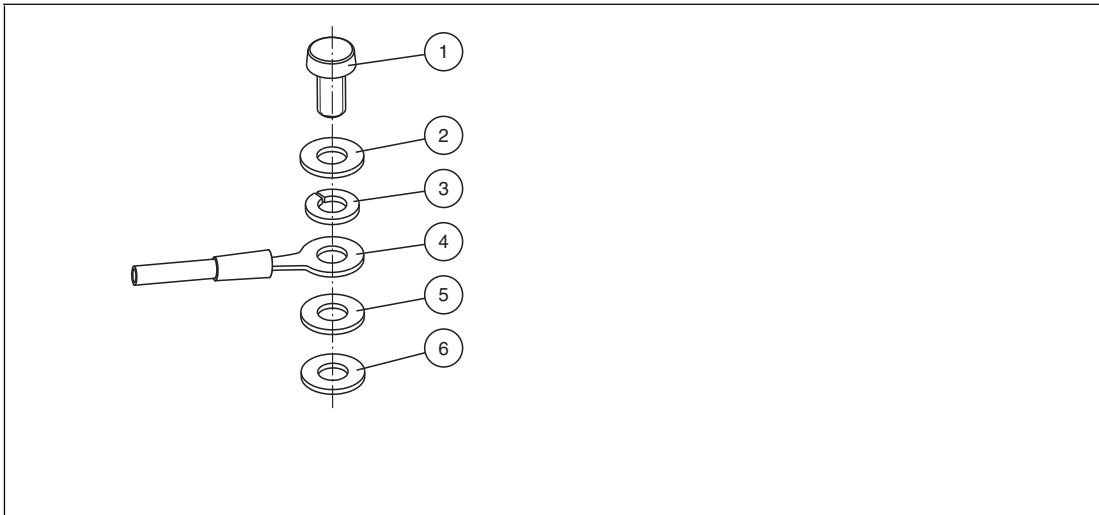

Figure 3.12   Connecting the ground connection cable

1   Phillips-head screw M4 x 16 mm

2   Flat washer M4

3   Spring washer

4   Cable lug

5   Flat washer M4

6   Flat washer M4

4. Tighten the screw with a torque of 1.5 Nm.

↳ The cable lug is properly attached and cannot come loose.

Cable Shield Grounding of the Spur Cables

Each spur cable shield (S) is capacitively coupled with the grounding terminal (PA). The cable shields at the field devices must be connected to local earth.

Observe that the continuity of the cable shield to the spur shield terminal (S) is maintained, if following situations apply:

- If the cable shield at the rail field switch requires direct earthing of the shield through, e.g., an earth bar
- If surge protectors are used to protect the rail field switch against high voltages caused, e.g., by indirect lightning strikes
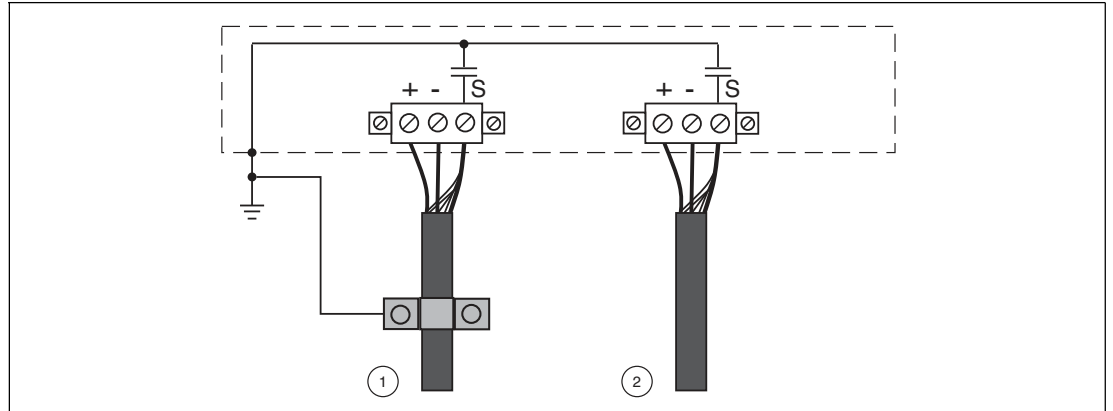
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Figure 3.13

1   Direct cable shield grounding through earth bar.
      Shield continuity to the device shield terminals

2   Capacitive cable shield grounding through the device terminals.
      Shield continuity to the device shield terminals

⚠ **Warning!**

Dangerous atmospheres and plant damages due to communication loss!

Connecting signal leads of the spur lines to the earth potential or the cable shield during plant operation can cause communication loss with the segment. This can lead to serious plant damages or dangerous atmospheres.

Do not connect any signal leads of spur lines to earth potential or cable shield. After maintenance activities, ensure that all the wirings have been reattached properly.

Grounding the Ethernet Copper Cable

The Ethernet cable is directly connected to the grounding terminal (PA) through the RJ45 connector.

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4 Operation

4.1 Operating Elements

Indicators

The rail field switch provides LEDs showing status and diagnosis information about the rail field switch itself, the Ethernet ports and the spur ports. Refer to section Product Specifications for location of the LEDs. See chapter 2

LED identification	Description	Color	Status / Possible cause	Troubleshooting
PWR A, PWR B	Status of power supply A and B	Green on	Power available	-
		Off	No power available	• Check power supply and connection to the rail field switch. • Restart rail field switch. If the problem persists, send the rail field switch to Pepperl+Fuchs.
STATUS	Status of the rail field switch	Off	Good	-
		Blue on	Maintenance required	See note
		Red on	Failure	See note
LNK/CHK P1 ... P4	Status of the Ethernet ports	Off	No communication link established	-
		Green on	Communication link established	-
		Green flashing	Communication link activity	-
		Red flashing	Check function	See note
	Locating devices	P1 ... P4: Green simultaneous flashing (1 Hz)	Loacte device function activated	-
S1 ... Sn	Status of the spurs	Off	No communication link established	Check connection to the field device.
		Green on	Communication link with Ethernet-APL field device established	-
		Green flashing	Communication link activity with Ethernet-APL field device established	-
		Yellow flashing	Communication with PROFIBUS PA field device established.	
		Red flashing	Check function Overload condition Cable is too short Field device takes too much current	See note

Table 4.1

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<table>
<tr><td>**Note**

For more information refer to the software manual or read the diagnosis information provided by the web server or the asset management tool.</td></tr>
</table>

Reset Button

If the device is installed in explosion hazardous area, the reset button may be operated during operation.
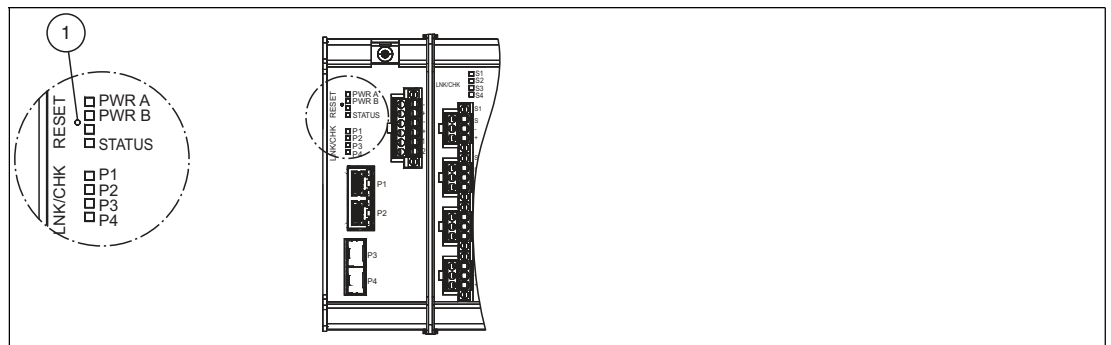
Rebooting the Rail Field Switch

Figure 4.1

1   Reset button

1. To reboot the rail field switch, push the reset button for at least 5 seconds.

Spurs Start-Up Management

Sequential Start-Up of Spurs

During start-up, the spurs are sequentially activated to minimize the initial high inrush current demand for the auxiliary power supply. Therefore, the auxiliary power supply is less stressed during the start-up phase, and its expected useful lifetime is increased.

Fold-Back Characteristics of the Spur Short Circuit Current Limitation

If a spur short circuit occurs, the spur current is switched off quickly. When the short circuit current has been cleared, the spur current returns. If multiple simultaneous short circuit currents occur, the current management system minimizes the additional current demand of the auxiliary power supply.

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- Photoelectric Sensors
- Industrial Vision
- Ultrasonic Sensors
- Rotary Encoders
- Positioning Systems
- Inclination and Acceleration Sensors
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