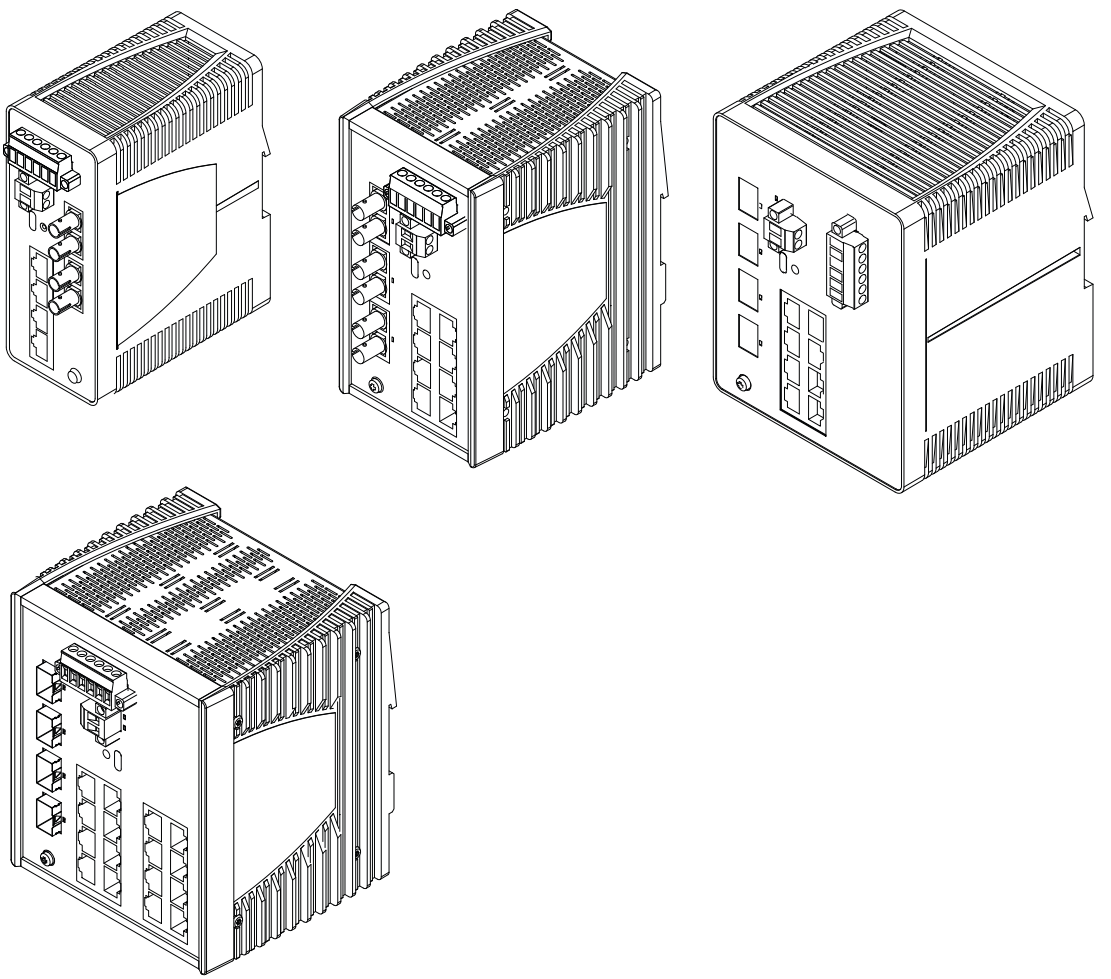
HIRSCHMANN
A BELDEN BRAND

User Manual

Installation
Industrial Ethernet BOBCAT Rail Switch
BRS20/22/30/32/40/42/50/52



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You can get the latest version of this manual on the Internet at the Hirschmann product site (www.hirschmann.com).

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Stuttgarter Str. 45-51
72654 Neckartenzlingen
Germany

Contents

Safety instructions

⚠ WARNING

UNCONTROLLED MACHINE ACTIONS

To avoid uncontrolled machine actions caused by data loss, configure all the data transmission devices individually.
Before you start any machine which is controlled via data transmission, be sure to complete the configuration of all data transmission devices.

Failure to follow this instruction can result in death, serious injury, or equipment damage.

General safety instructions

You operate this device with electricity. Improper usage of the device entails the risk of physical injury or significant property damage. The proper and safe operation of this device depends on proper handling during transportation, proper storage and installation, and careful operation and maintenance procedures.

- ☐ Before connecting any cable, read this document, and the safety instructions and warnings.
- ☐ Operate the device with undamaged components exclusively.
- ☐ The device is free of any service components. In case of a damaged or malfunctioning device, turn off the supply voltage and return the device to Hirschmann for inspection.

Certified usage

- ☐ Use the product only for the application cases described in the Hirschmann product information, including this manual.
- ☐ Operate the product only according to the technical specifications. See “Technical data” on page 57.
- ☐ Connect to the product only components suitable for the requirements of the specific application case.

Installation site requirements

WARNING

FIRE HAZARD

If you connect the device to a power supply that does **NOT** meet the requirements for Limited Power Source, NEC Class 2 or PS2 according to IEC/EN 62368-1 and is **NOT** limited to 100 W output power, the device must be installed in either a switch cabinet or other fire enclosure.

The fire enclosure can be made of metal or plastic with fire-protection properties of at least V-1 according to IEC 60695-11-10. The bottom openings of the fire enclosure must **NOT** exceed 2 mm in diameter.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

- ☐ Install this device only in a switch cabinet or in an operating site with restricted access, to which maintenance staff have exclusive access.
- ☐ When you are selecting the installation location, make sure you observe the climatic threshold values specified in the technical data.
- ☐ Use the device in an environment with a maximum pollution degree that complies with the specifications in the technical data.
  See “Technical data” on page 57.

Qualification requirements for personnel

- ☐ Only allow qualified personnel to work on the device.

Qualified personnel have the following characteristics:

- ▶ Qualified personnel are properly trained. Training as well as practical knowledge and experience make up their qualifications. This is the prerequisite for grounding and labeling circuits, devices, and systems in accordance with current standards in safety technology.
- ▶ Qualified personnel are aware of the dangers that exist in their work.
- ▶ Qualified personnel are familiar with appropriate measures against these hazards in order to reduce the risk for themselves and others.
- ▶ Qualified personnel receive training on a regular basis.

Device casing

Only technicians authorized by the manufacturer are permitted to open the casing.

Shielding ground

The shielding ground of the connectable twisted pair cables is connected to the ground connection as a conductor.

☐ Beware of possible short circuits when connecting a cable section with conductive shielding braiding.

Grounding the device

The device is grounded via the separate ground screw. The grounding screw is located on the front right side of the device for narrow casing sizes. For the medium and wide casing sizes, the grounding screw is located at the bottom left of the front side of the device.

See “Dimension drawings” on page 68.

☐ Ground the device before connecting any other cables.

☐ Disconnect the grounding only after disconnecting all other cables.

Requirements for connecting electrical wires

Before connecting the electrical wires, **always** verify that the requirements listed are complied with.

The following requirements apply without restrictions:

- The electrical wires are voltage-free.
- The cables used are permitted for the temperature range of the application case.

Only use power supply cables that are suitable for a temperature 20 K higher than the maximum ambient air temperature at which the device is used.
Only use copper wire.

Requirements for connecting the signal contact

Before connecting the signal contact, **always** verify that the requirements listed are complied with.

The following requirements apply without restrictions:

- The connected voltage complies with the requirements for a safety extra-low voltage (SELV) or ES1 as per IEC/EN 62368-1.
- The connected voltage is limited by a current limitation device or a fuse.
  Observe the electrical threshold values for the signal contact.
  See “Technical data” on page 57.

Requirements for connecting the supply voltage

Before connecting the supply voltage, **always** verify that the requirements listed are complied with.

Prerequisites:

All of the following requirements are complied with:

Prerequisites:

- The supply voltage corresponds to the voltage specified on the type plate of the device.
- The power supply complies with the requirements for a safety extra-low voltage (SELV) or ES1 as per IEC/EN 62368-1.
- The power supply has an easily accessible disconnecting device (for example a switch or a plug). This disconnecting device is clearly identified. So in the case of an emergency, it is clear which disconnecting device belongs to which power supply cable.
- The wire diameter of the power supply cable is at least 0.75 mm² (North America: AWG18) on the supply voltage input.
  The wire diameter of the power supply cable is at least 1 mm² (North America: AWG16) on the supply voltage input for PoE device variants.
- The cross-section of the ground conductor is the same size as or bigger than the cross-section of the power supply cables.

Depending on the voltage input used (characteristic value F, T, U, P) and the supply voltage used (DC, AC), the following additional requirements apply:

Device variants featuring supply voltage with characteristic value F, T, U	**All** of the following requirements are complied with: Supply with DC voltage: ▶ There are fuses suitable for DC voltage in the positive conductors of the supply lines, or the voltage sources are appropriately current-limited. Regarding the properties of this fuse: See “Technical data” on page 57. ▶ The negative conductors of the voltage inputs are on ground potential.
Device variants featuring supply voltage with characteristic value F	**All** of the following gerequirements are complied with: Supply with AC voltage: ▶ There are fuses in the supply lines, or the voltage sources are appropriately current-limited. Regarding the properties of this fuse: See “Technical data” on page 57. ▶ The power sources are electrically isolated from the ground potential.
Device variants featuring supply voltage with characteristic value P	**All** of the following requirements are complied with: ▶ There are fuses suitable for DC voltage in the positive conductors of the supply lines, or the voltage sources are appropriately current-limited. Regarding the properties of this fuse: See “Technical data” on page 57. ▶ The power sources are electrically isolated from the ground potential. According to specification IEEE 802.3, the insulation voltage must be 1500 V AC or 2250 V DC.

Note: The devices can be supplied either via one voltage input or redundantly via both voltage inputs.

Supply voltage

The supply voltage is connected to the device casing through protective elements exclusively.

LED or laser components

LED or LASER components according to IEC 60825-1 (2014):
CLASS 1 LASER PRODUCT
CLASS 1 LED PRODUCT

National and international safety regulations

Verify that the electrical installation meets local or nationally applicable safety regulations.

Relevant for use in explosion hazard areas (Hazardous Locations, Class I, Division 2)

This equipment is exclusively suitable for use in Class I, Division 2, Groups A, B, C, and D or non-hazardous locations.

This device is an open-type device that is to be installed in an enclosure suitable for the environment and accessible exclusively with the use of a tool.

Exclusively use the device for the application cases specified by the manufacturer. Failure to follow these instructions can impair device protection.

WARNING – EXPLOSION HAZARD – DO NOT DISCONNECT EQUIPMENT UNLESS POWER HAS BEEN SWITCHED OFF OR THE AREA IS KNOWN TO BE NON-HAZARDOUS.

Avertissement - Risque d'explosion - Ne pas débrancher tant que le circuit est sous tension à moins que l'emplacement soit connu pour ne contenir aucune concentration de gaz inflammable.

WARNING - EXPLOSION HAZARD - SUBSTITUTION OF ANY COMPONENT MAY IMPAIR SUITABILITY FOR CLASS I, DIVISION 2.

Avertissement - Risque d'explosion - La substitution de tout composant peut rendre ce matériel incompatible pour une utilisation en classe I, division 2.

The storage medium ACA22-USB-C (EEC) is mechanically secured to prevent the connection from being disconnected.
Le dispositif de sauvegarde ACA22-USB-C (EEC)est fixé mécaniquement pour éviter toute déconnexion de la connexion.

A USB cable for configuring the device may only be used in a non-explosive area.
Un câble USB pour la configuration de l'équipement ne doit être utilisé que dans une zone non explosive.

WARNING!
Connection or disconnection in an explosive atmosphere could result in an explosion.
AVERTISSEMENT!
Le branchement ou le débranchement dans une atmosphère explosive peut entraîner une explosion.

Ordinary Location,
Non-Hazardous Area,
Non-Explosive Atmosphere

Explosive Atmosphere
Class I, Division 2, Groups A, B, C, D, T4 (**)
Hazardous Location

BRS - Industrial Ethernet
BOBCAT Rail Switch

Relay contacts:
Equipment with nonincendive field wiring parameters.
Polarity is not relevant.

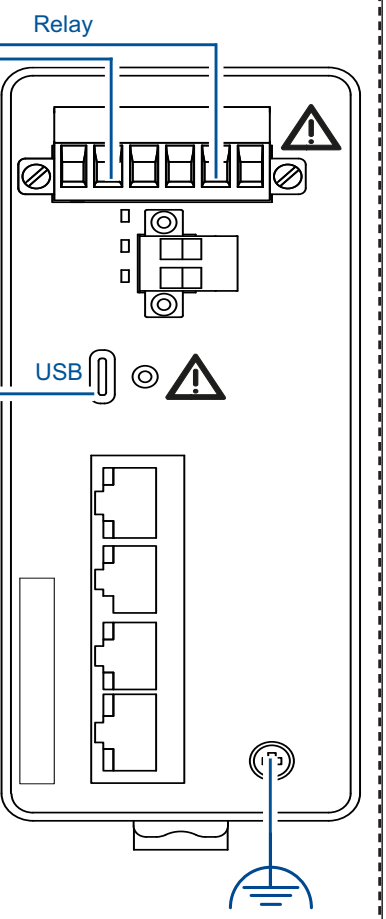
The relay terminals are dependent upon the following entity parameters (*):

V max	I max	C_i	L_i
30 V	90 mA	2 nF	1 µH

The ACA22-USB-C (EEC) storage medium is mechanically secured to prevent disconnection.

A USB cable for configuration the device may exclusively be used in non-hazardous locations.

WARNING!
Connection or disconnection in an explosive atmosphere could result in an explosion.



(*) Associated apparatus:
The nonincendive field wiring circuit concept allows interconnection of nonincendive field wiring apparatus and associated nonincendive field wiring apparatus using any of the wiring methods permitted for unclassified locations when certain parametric conditions are met.
Capacity: $C_a \geq C_i + C_{Cable}$; Inductivity: $L_a \geq L_i + L_{Cable}$

(**) Temperature Code: T4
Ambient Temperature rating:
Ta: 0 °C to +60 °C for “S“ or “C“ temperature types
Ta: −40 °C to +70 °C for “T“ or “E“ temperature types
(Refer to the type designation on the device.)

The maximum cable length has to be determined as follows:
(a) max. cable length **< $(L_a - L_i) / Cable_L$**
(“**$Cable_L$**“ denotes the inductance per unit length of used cable)
and
(b) max. cable length **< $(C_a - C_i) / Cable_C$**
(“**$Cable_C$**“ denotes the capacitance per unit length of used cable)
The lower value of (a) and (b) is to apply.

The earth conductor must be at least the same wire size (mm² or AWG) as the supply conductors of the supply voltage.

Control Drawing for BRS devices according to Class I, Division 2 Hazardous Locations		
Rev.: 3	Document No.: 000217023DNR	Page 1/2

For use in Hazardous Locations Class I, Division 2, Groups A, B, C, D:

Exclusively allowed for BRS model No´s which are individually labeled
"**FOR USE IN HAZARDOUS LOCATIONS**".

This equipment is exclusively suitable for use in Class I, Division 2, Groups A, B, C, and D or non-hazardous locations.

Nonincendive field wiring circuits must be wired in accordance with the National Electrical Code (NEC), NFPA 70, article 501.

WARNING – EXPLOSION HAZARD
Substitution of any components may impair suitability for hazardous locations or explosive atmospheres.

WARNING – EXPLOSION HAZARD
Do not disconnect equipment unless power has been switched off or the area is known to be non-hazardous.

THIS IS AN OPEN-TYPE DEVICE THAT IS TO BE INSTALLED IN AN ENCLOSURE SUITABLE FOR THE ENVIRONMENT AND ACCESSIBLE EXCLUSIVELY WITH THE USE OF A TOOL.

ATEX directive 2014/34/EU – specific regulations for safe operation

Relevant for BRS devices when operating in explosive gas atmospheres according to ATEX directive 2014/34/EU, the following applies:

☐ List of standards:
EN IEC 60079-0:2018
EN 60079-7:2015 + A1:2018
EN IEC 60079-15:2019

☐ Make sure that the device has the following label:
II 3G Ex ec nC IIC T4 Gc DEKRA 20ATEX0134 X
for BRS types.

T4: 0 °C ≤ Ta ≤ +60 °C for “S” or “C” types
(Item 16 of nomenclature breakdown)
T4: −40 °C ≤ Ta ≤ +70 °C for “T”, “E” or “G” types
(Item 16 of nomenclature breakdown)

☐ The modules shall be installed in a suitable enclosure in accordance with EN 60079-7 providing a degree of protection of at least IP54 according to EN 60529, taking into account the environmental conditions under which the equipment will be used.
☐ When the temperature under rated conditions exceeds 70 °C at the cable or conduit entry point, or 80 °C at the branching point of the conductors, the temperature specification of the selected cable and cable entries shall be in compliance with the actual measured temperature values.
☐ Connectors shall be connected or disconnected exclusively in dead-voltage state.

When using the ACA22-USB-C (EEC) storage medium on the USB interface, verify that the ACA22-USB-C (EEC) is mechanically secured with the fastening screw. The ACA22-USB-C (EEC) shall be connected or disconnected exclusively in dead-voltage state. Only the ACA22-USB-C (EEC) may be operated on the USB-C interface in potentially explosive atmospheres.

IECEx – Certification Scheme for Explosive Atmospheres

For BRS devices labeled with an IECEx certificate number, the following applies:

- ☐ List of standards:
  IEC 60079-0:2017
  IEC 60079-7:2015
  IEC 60079-15:2017
- ☐ The equipment shall only be used in an area of not more than pollution degree 2, as defined in IEC 60664-1.
- ☐ Make sure that the device has the following label:
  Ex ec nC IIC T4 Gc **IECEx: DEK 20.0079 X**
  for BRS types.

  T4: 0 °C ≤ Ta ≤ +60 °C for "S" or "C" types
  (Item 16 of nomenclature breakdown) or
  T4: −40 °C ≤ Ta ≤ +70 °C for "T", "E" or "G" types
  (Item 16 of nomenclature breakdown.

- ☐ The modules shall be installed in a suitable enclosure in accordance with IEC 60079-7 providing a degree of protection of at least IP54 according to IEC 60529, taking into account the environmental conditions under which the equipment will be used.
- ☐ When the temperature under rated conditions exceeds 70 °C at the cable or conduit entry point, or 80 °C at the branching point of the conductors, the temperature specification of the selected cable and cable entries shall be in compliance with the actual measured temperature values.
- ☐ Connectors shall be connected or disconnected exclusively in dead-voltage state.

When using the ACA22-USB-C (EEC) storage medium on the USB interface, verify that the ACA22-USB-C (EEC) is mechanically secured with the fastening screw. The ACA22-USB-C (EEC) shall be connected or disconnected exclusively in dead-voltage state. Only the ACA22-USB-C (EEC) may be operated on the USB-C interface in potentially explosive atmospheres.

CE marking

The labeled devices comply with the regulations contained in the following European directive(s):

2011/65/EU and 2015/863/EU (RoHS)
Directive of the European Parliament and of the Council on the restriction of the use of certain hazardous substances in electrical and electronic equipment.

2014/30/EU (EMC)
Directive of the European Parliament and of the Council on the harmonisation of the laws of the Member States relating to electromagnetic compatibility.

The ATEX Directive applies exclusively to the device variants labeled with an ATEX certificate number: See “ATEX directive 2014/34/EU – specific regulations for safe operation” on page 13.

2014/34/EU
Directive of the European Parliament and the council on the harmonisation of the laws of the Member States relating to equipment and protective systems intended for use in potentially explosive atmospheres.

In accordance with the above-named EU directive(s), the EU conformity declaration will be available to the relevant authorities at the following address:

Hirschmann Automation and Control GmbH
Stuttgarter Str. 45-51
72654 Neckartenzlingen
Germany
www.doc.hirschmann.com/certificates.html

The device can be used in the industrial environments.

- Interference immunity: EN 61000-6-2
- Emitted interference: EN 55032

You find more information on technical standards here:
“Technical data” on page 57

The assembly guidelines provided in these instructions must be strictly adhered to in order to observe the EMC threshold values.

Warning! This is a class A device. This device can cause interference in living areas, and in this case the operator may be required to take appropriate measures.

FCC note

Supplier's Declaration of Conformity
47 CFR § 2.1077 Compliance Information

Industrial Ethernet BOBCAT Rail Switch
BRS20/22/30/32/40/42/50/52

U.S. Contact Information
Belden – St. Louis
1 N. Brentwood Blvd. 15th Floor
St. Louis, Missouri 63105, United States
Phone: 314.854.8000

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Recycling note

After usage, this device must be disposed of properly as electronic waste, in accordance with the current disposal regulations of your county, state, and country.

About this manual

The “Installation” user manual contains a device description, safety instructions, a description of the display, and the other information that you need to install the device.

Documentation mentioned in the “User Manual Installation” that is not supplied with your device as a printout can be found as PDF files for downloading on the Internet at: https://www.doc.hirschmann.com

Key

The symbols used in this manual have the following meanings:

▶	Listing
☐	Work step
■	Subheading

1 Description

1.1 General device description

The device is designed for the special requirements of industrial automation. The device meets the relevant industry standards, provides very high operational reliability, even under extreme conditions, and also long-term reliability and flexibility.
The device allows you to set up switched Industrial Ethernet networks according to standard IEEE 802.3.

You can choose from between a wide range of variants. You have the option to set up your device individually based on different criteria:

- Number of ports
- Transmission speed
- Types of connectors
- Temperature range
- Supply voltage range
- Certifications
- Software level
- IP degree of protection: IP30 (plastic casing) or IP30/IP40 (metal casing)

Mounting the device

- Mounting on the DIN rail

You have the option of choosing various media to connect to the end devices and other network components:

- Twisted pair cable
- Multimode F/O
- Singlemode F/O

There are convenient options for managing the device. Manage your devices via:

- Web browser
- SSH
- Telnet
- Network management software (for example Industrial HiVision)
  The Network Management Software Industrial HiVision provides you with options for smooth configuration and monitoring. You find further information on the Internet at the Hirschmann product pages:
  http://www.hirschmann.com/en/QR/INET-Industrial-HiVision
- USB-C interface (locally on the device)

The device provides you with a large range of functions, which the manuals for the operating software inform you about. You can download these manuals as PDF files from the Internet on the Hirschmann product pages (http://www.doc.hirschmann.com).

1.2 Device name and product code

The device name corresponds to the product code. The product code is made up of characteristics with defined positions. The characteristic values stand for specific product properties.
You have numerous options of combining the device characteristics. You can determine the possible combinations using the configurator which is available in the Belden Online Catalog https://catalog.belden.com on the web page of the device.

Item	Characteristic	Characteristic value	Description	
1 ... 3	Product	BRS	BOBCAT Rail Switch	
4	Data rate	2	100 Mbit/s	
		3	100/1000 Mbit/s	
		4	1000 Mbit/s	
		5	1000/2500 Mbit/s	
5	Hardware type	0	Standard	
		2	PoE	
6	(hyphen)	–		
7 ... 8	Number: 100 Mbit/s ports	00	0 ×	10/100 Mbit/s ports
		04	4 ×	10/100 Mbit/s ports
		05	5 ×	10/100 Mbit/s ports
		06	6 ×	10/100 Mbit/s ports
		08	8 ×	10/100 Mbit/s ports
		09	9 ×	10/100 Mbit/s ports
		10	10 ×	10/100 Mbit/s ports
		11	11 ×	10/100 Mbit/s ports
		12	12 ×	10/100 Mbit/s ports
		16	16 ×	10/100 Mbit/s ports
		20	20 ×	10/100 Mbit/s ports
		24	24 ×	10/100 Mbit/s ports

Table 1: Device name and product code

Item	Characteristic	Characteristic value	Description	
9 ... 10	Number: 100/1000/ 2500 Mbit/s ports	00	0 ×	100/1000 Mbit/s ports
		04	4 ×	100/1000 Mbit/s ports
		08	8 ×	100/1000 Mbit/s ports
		12	12 ×	100/1000 Mbit/s ports
		12	12 ×	8 × 100/1000-Mbit/s-Ports + 4 × 100/1000/ 2500 Mbit/s
		16	16 ×	100/1000 Mbit/s ports
		20	20 ×	100/1000 Mbit/s ports
		20	20 ×	16 × 100/1000-Mbit/s ports + 4 × 100/1000/ 2500 Mbit/s ports
		24	24 ×	100/1000 Mbit/s ports
		24	24 ×	20 × 100/1000-Mbit/s ports + 4 × 100/1000/ 2500 Mbit/s ports
11 ... 12	Configuration of the first uplink ports	99	Not present	
		M2	1 ×	DSC multimode socket for 100 Mbit/s F/O connections
		M4	1 ×	DST multimode socket for 100 Mbit/s fiber optic connections
		S2	1 ×	DSC singlemode socket for 100 Mbit/s F/O connections
		S4	1 ×	DST singlemode socket for 100 Mbit/s fiber optic connections
		E2	1 ×	DSC singlemode (plus) socket for 100 Mbit/s fiber optic connections
		L2	1 ×	DSC singlemode (LH) socket for 100 Mbit/s fiber optic connections
		G2	1 ×	DSC singlemode (LH) socket for 100 Mbit/s fiber optic connections, 200 km
		Z6	1 ×	SFP slot for 100 Mbit/s F/O connections
		MM	2 ×	DSC multimode socket for 100 Mbit/s F/O connections
		NN	2 ×	DST multimode socket for 100 Mbit/s fiber optic connections
		VV	2 ×	DSC singlemode socket for 100 Mbit/s F/O connections
		UU	2 ×	DST singlemode socket for 100 Mbit/s fiber optic connections
		EE	2 ×	DSC singlemode (plus) socket for 100 Mbit/s fiber optic connections
		LL	2 ×	DSC singlemode (LH) socket for 100 Mbit/s fiber optic connections
		GG	2 ×	DSC singlemode (LH) socket for 100 Mbit/s fiber optic connections, 200 km
		ZZ	2 ×	SFP slot for 100 Mbit/s F/O connections
		OO	2 ×	SFP slot for 100/1000 Mbit/s F/O connections
		2Q	2 ×	SFP slot for 100/1000/2500 Mbit/s fiber optic connections

Table 1: Device name and product code

Item	Characteristic	Characteristic value	Description		
13 ... 14	Configuration of the second uplink ports	99	Not present		
		M2	1 ×	DSC multimode socket for 100 Mbit/s F/O connections	
		M4	1 ×	DST multimode socket for 100 Mbit/s fiber optic connections	
		S2	1 ×	DSC singlemode socket for 100 Mbit/s F/O connections	
		S4	1 ×	DST singlemode socket for 100 Mbit/s fiber optic connections	
		E2	1 ×	DSC singlemode (plus) socket for 100 Mbit/s fiber optic connections	
		L2	1 ×	DSC singlemode (LH) socket for 100 Mbit/s fiber optic connections	
		G2	1 ×	DSC singlemode (LH) socket for 100 Mbit/s fiber optic connections, 200 km	
		Z6	1 ×	SFP slot for 100 Mbit/s F/O connections	
		ZZ	2 ×	SFP slot for 100 Mbit/s F/O connections	
		OO	2 ×	SFP slot for 100/1000 Mbit/s F/O connections	
		2Q	2 ×	SFP slot for 100/1000/2500 Mbit/s fiber optic connections	
15	(hyphen)	–			
16	Temperature range	S	Standard	+32 °F ... +140 °F (0 °C ... +60 °C)	
		C	Standard with Conformal Coating	+32 °F ... +140 °F (0 °C ... +60 °C)	
		T	Extended	-40 °F ... +158 °F (-40 °C ... +70 °C)	
		E	Extended with Conformal Coating	-40 °F ... +158 °F (-40 °C ... +70 °C)	
		G	Extended with Conformal Coating, glued	-40 °F ... +158 °F (-40 °C ... +70 °C)	
17	Supply voltage	T	2 ×	12 V DC ... 24 V DC	
		U	2 ×	24 V DC	
		F	2 ×	24 V DC ... 48 V DC / 24 V AC	
		P	2 ×	48 V DC (PoE) / 54 V DC (PoE+)	
18	Housing	C	IP30	Plastic	
		D	IP30	Metal	
		E	IP40	Metal	

Table 1: Device name and product code

Item	Characteristic	Characteristic value	Description
19	Certificates and declarations[a] Part A	Z	CE, FCC, EN 61131-2, EN 62368-1, (NEMA TS2[b])
		Y	Z + cUL 61010
		X	cUL 61010 + ANSI/UL 121201
		V	Z + IEC 61850-3
		U	Z + DNV GL
		W	Z + ATEX/IECEx
		T	Z + EN 50121-4
20	Certificates and declarations Part B	9	Not present
		Y	cUL 61010
		X	cUL 61010 + ANSI/UL 121201
		V	IEC 61850-3
		U	DNV GL
		W	ATEX/IECEx
		T	EN 50121-4
21	Software packages	9	Reserved
22 ... 23	Customer-specific version	HH	Hirschmann
24	Hardware configuration	S	Standard
25	Software configuration	E	Entry (without configuration)
26	Software level	S	HiOS Layer 2 Standard
		A	HiOS Layer 2 Advanced
27 ... 31	Software version	08.3.	Software version 08.3
		XX.X	Current software version
32 ... 33	Maintenance	00	Bugfix version 00
		XX	Current bugfix version

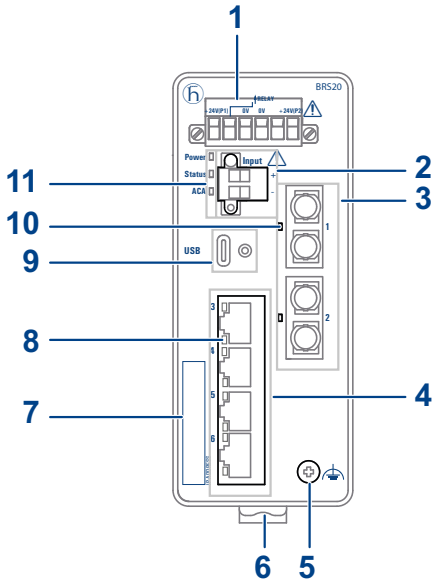
Table 1: Device name and product code

a. You will find detailed information on the approvals and self-declarations applying to your device in the data sheet. You will find the data sheet on the Hirschmann product pages www.hirschmann.com
b. Exclusively applies to device variants with extended temperature range.

1.3 Device views

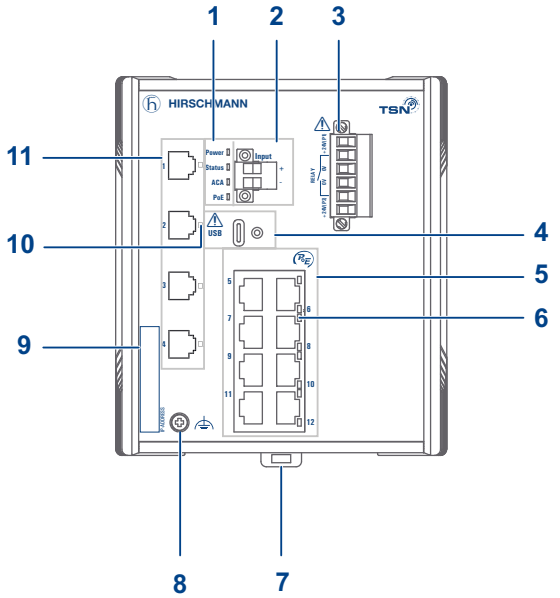
1.3.1 Front view

Example of a low-port device variant



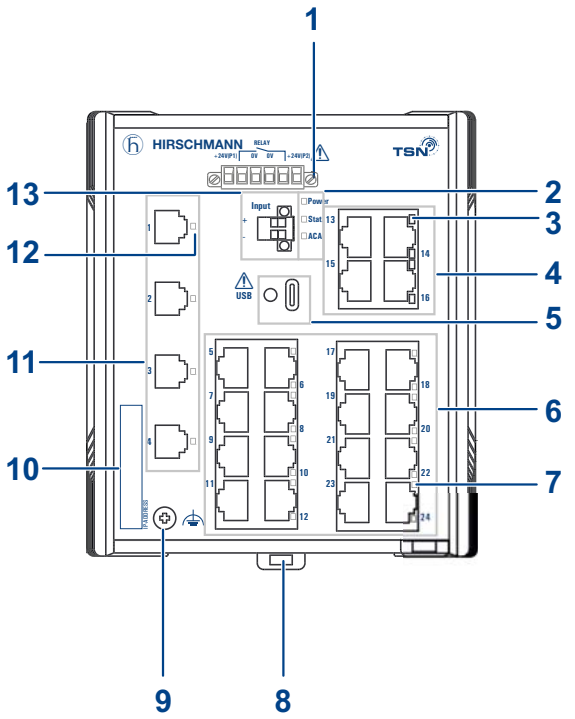
1	6-pin terminal block with screw lock for redundant power supply and signal contact
2	2-pin terminal block with screw lock for the digital input
3	depending on device variant ▶ SFP slot for 100 Mbit/s F/O connections ▶ DSC or DST singlemode socket for 100 Mbit/s fiber optic connections ▶ DSC or DST multimode socket for 100 Mbit/s fiber optic connections ▶ Not present
4	RJ45 socket for 10/100 Mbit/s Twisted pair connections
5	Grounding screw
6	Rail lock slide for DIN rail mounting
7	Label area for IP address
8,10	LED display elements for port status
9	USB-C interface
11	LED display elements for device status

Example of a low-port device variant with PoE



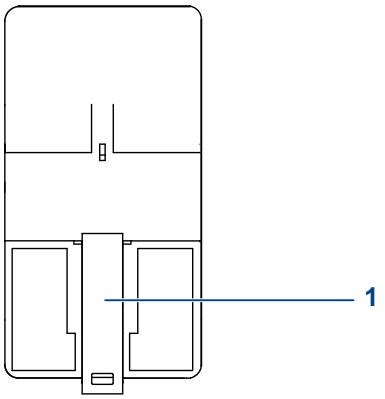
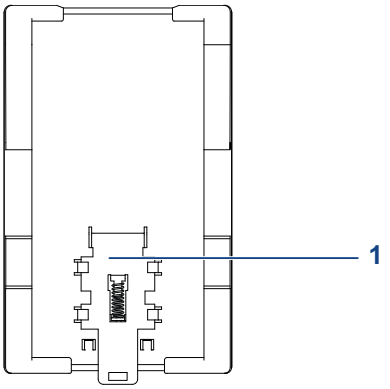
1	LED display elements for device status
2	2-pin terminal block with screw lock for the digital input
3	6-pin terminal block with screw lock for redundant power supply and signal contact
4	USB-C interface
5	**BRS20/22/30/32** depending on device variant ▶ RJ45 socket for 10/100 Mbit/s Twisted pair connections ▶ RJ45 socket with PoE support **BRS40/42/50/52** depending on device variant ▶ RJ45 socket for 10/100/1000 Mbit/s Twisted Pair connections ▶ RJ45 socket with PoE support
6,10	LED display elements for port status
7	Rail lock slide for DIN rail mounting
8	Grounding screw
9	Label area for IP address
11	**BRS20/22** depending on device variant ▶ SFP slot for 100 Mbit/s F/O connections ▶ DSC or DST singlemode socket for 100 Mbit/s fiber optic connections ▶ DSC or DST multimode socket for 100 Mbit/s fiber optic connections ▶ Not present **BRS30/32** SFP slot for 100/1000 Mbit/s fiber optic connections **BRS40/42** depending on device variant ▶ SFP slot for 100/1000 Mbit/s fiber optic connections ▶ Not present **BRS50/52** SFP slot for 100/1000/2500 Mbit/s fiber optic connections

Example of a high-port device variant



1	6-pin terminal block with screw lock for redundant power supply and signal contact
2	LED display elements for device status
3,7,12	LED display elements for port status
4,6	**BRS20/30** RJ45 socket for 10/100 Mbit/s Twisted pair connections
	BRS40/50 RJ45 socket for 10/100/1000 Mbit/s Twisted Pair connections
5	USB-C interface
8	Rail lock slide for DIN rail mounting
9	Grounding screw
10	Label area for IP address of device
11	**BRS20** depending on device variant ▶ SFP slot for 100 Mbit/s F/O connections ▶ SFP slot for 100/1000/2500 Mbit/s fiber optic connections ▶ Not present
	BRS30 SFP slot for 100/1000 Mbit/s fiber optic connections
	BRS40 depending on device variant ▶ SFP slot for 100/1000 Mbit/s fiber optic connections ▶ Not present
	BRS50 SFP slot for 100/1000/2500 Mbit/s fiber optic connections
13	2-pin terminal block with screw lock for the digital input

1.3.2 Rear view

Device variants with casing characteristic value C	Device variants with casing with characteristic value E or D
	

1	Rail lock slide for DIN rail mounting

1.4 Power supply

1.4.1 Supply voltage with characteristic value T

The following options for power supply are available:

- 6-pin terminal block
  You will find information on connecting the supply voltage here:
  See “Supply voltage with characteristic value T” on page 43.

1.4.2 Supply voltage with characteristic value F

The following options for power supply are available:

- 6-pin terminal block
  You will find information on connecting the supply voltage here:
  See “Supply voltage with characteristic value F” on page 44.

1.4.3 Supply voltage with characteristic value U

The following options for power supply are available:

- 6-pin terminal block
  You will find information on connecting the supply voltage here:
  See “Supply voltage with characteristic value U” on page 45.

1.4.4 Supply voltage with characteristic value P

The following options for power supply are available:

- 6-pin terminal block
  You will find information on connecting the supply voltage here:
  See “Supply voltage with characteristic value P” on page 46.
  These device variants support PoE(+).

1.5 Ethernet ports

You can connect end devices and other segments to the device ports using twisted pair cables or optical fibers (F/O).

1.5.1 10/100 Mbit/s twisted pair port

This port is an RJ45 socket.
The 10/100 Mbit/s twisted pair port allows you to connect network components according to the IEEE 802.3 10BASE-T/100BASE-TX standard.
This port supports:

- Autonegotiation
- Autopolarity
- Autocrossing

- 10 Mbit/s half-duplex mode, 10 Mbit/s full duplex mode
- 100 Mbit/s half-duplex mode, 100 Mbit/s full duplex mode

Delivery state: Autonegotiation activated
The port casing is electrically connected to the front panel.
The pin assignment corresponds to MDI-X.

1.5.2 10/100/1000 Mbit/s twisted pair port

This port is an RJ45 socket.
The 10/100/1000 Mbit/s twisted pair port allows you to connect network components according to the IEEE 802.3 10BASE-T/100BASE-TX/ 1000BASE-T standard.
This port supports:

- Autonegotiation
- Autopolarity
- Autocrossing
- 10 Mbit/s half-duplex mode, 10 Mbit/s full duplex mode
- 100 Mbit/s half-duplex mode, 100 Mbit/s full duplex mode
- 1000 Mbit/s full duplex

Delivery state: Autonegotiation activated
The port casing is electrically connected to the front panel.
The pin assignment corresponds to MDI-X.

Note: Exclusively applies for high port device variants with 24 × ports: The ports 13, 14, 15 and 16, as shown in figure 1, do not support 10 Mbit/s and 100 Mbit/s half duplex.

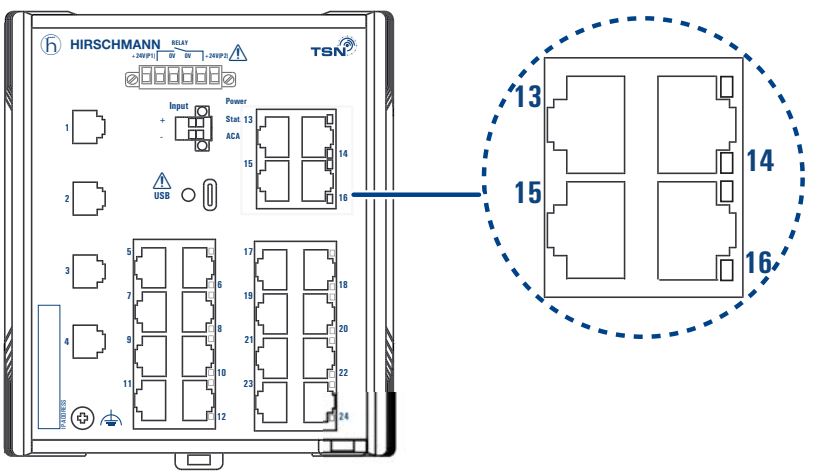


Figure 1: Example of a 24 × high-port device variant

Pin assignment

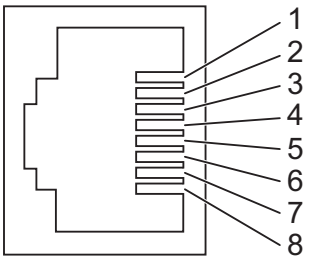
RJ45	Pin	10/100 Mbit/s	1000/25000 Mbit/s	PoE
	**MDI mode**			
	1	TX+	BI_DA+	Negative V_{PSE}
	2	TX−	BI_DA−	Negative V_{PSE}
	3	RX+	BI_DB+	Positive V_{PSE}
	4	—	BI_DC+	—
	5	—	BI_DC−	—
	6	RX−	BI_DB−	Positive V_{PSE}
	7	—	BI_DD+	—
	8	—	BI_DD−	—
	MDI-X mode			
	1	RX+	BI_DB+	Negative V_{PSE}
	2	RX−	BI_DB−	Negative V_{PSE}
	3	TX+	BI_DA+	Positive V_{PSE}
	4	—	BI_DD+	—
	5	—	BI_DD−	—
	6	TX−	BI_DA−	Positive V_{PSE}
	7	—	BI_DC+	—
	8	—	BI_DC−	—

Table 2: Pin assignment 10/100/1000/25000 Mbit/s twisted pair port, RJ45 socket, MDI-X mode

1.5.3 100 Mbit/s F/O port

This port is a DST/DSC socket or an SFP slot.
The 100 Mbit/s F/O port allows you to connect network components according to the IEEE 802.3 100BASE-FX standard.
This port supports:

- 100 Mbit/s, full duplex

Delivery state:

- 100 Mbit/s full duplex when using a Fast Ethernet SFP transceiver

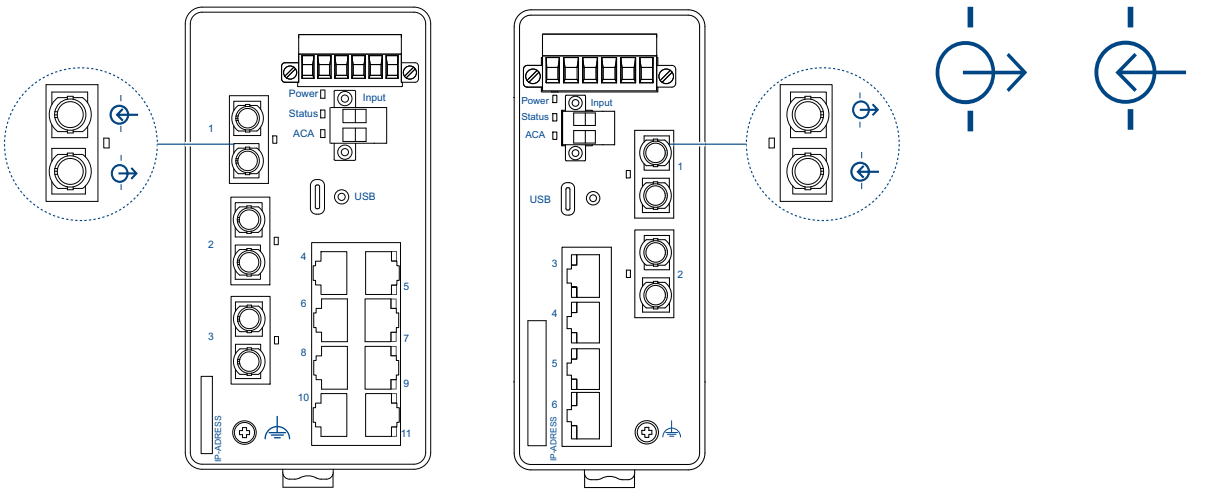
Example:	Sending direction	Receiving direction
		

Table 3: Sending and receiving directions

1.5.4 100/1000 Mbit/s F/O port

This port is an SFP slot.
The 100/1000 Mbit/s F/O port allows you to connect network components according to standard IEEE 802.3 100BASE-FX/1000BASE-SX/1000BASE-LX.
This port supports:

- 100 Mbit/s, full duplex
- 1000 Mbit/s full duplex

Delivery state:

- 100 Mbit/s full duplex when using a Fast Ethernet SFP transceiver
- 1000 Mbit/s full duplex when using a Gigabit Ethernet SFP transceiver

1.5.5 100/1000/2500 Mbit/s F/O port

This port is an SFP slot.
The 100 Mbit/s F/O port allows you to connect network components according to the standard IEEE 802.3 100BASE-FX.
The port allows you to connect network components according to standard IEEE 802.3 1000BASE-SX/1000BASE-LX.
The port allows you to connect network components according to IEEE P802.3bz 2.5 Gbit/s.
This port supports:

- 100 Mbit/s full duplex
- 1000 Mbit/s full duplex
- 2500 Mbit/s full duplex

Delivery state:

- 100 Mbit/s full duplex when using a Fast Ethernet SFP transceiver
- 1000 Mbit/s full duplex when using a Gigabit Ethernet SFP transceiver
- 2500 Mbit/s full duplex when using a Gigabit Ethernet SFP transceiver

1.5.6 Support of PoE(+)

The device variants BRS22/32/42/52 support Power over Ethernet (PoE) and Power over Ethernet Plus (PoE+).

PoE-capable Ethernet ports are designed as 8 × RJ45 sockets.
See “Front view” on page 24.

The port allows you to connect network components via a PoE voltage source according to the standard IEEE 802.3af/at.

With the presence of the PoE power supply, a separate power supply for the connected device is unnecessary.
The PoE power is supplied via the wire pairs transmitting the signal (phantom voltage).

The individual ports are not electrically insulated from each other (common PoE voltage).
For the maximum power available to PoE end devices in total, see the technical data: See “Technical data” on page 57.

Note: Connect only PoE-supplier devices whose data connections are located in the interior of the building and are specified as SELV circuits.

1.6 Display elements

1.6.1 Device state

These LEDs provide information about conditions which affect the operation of the whole device.

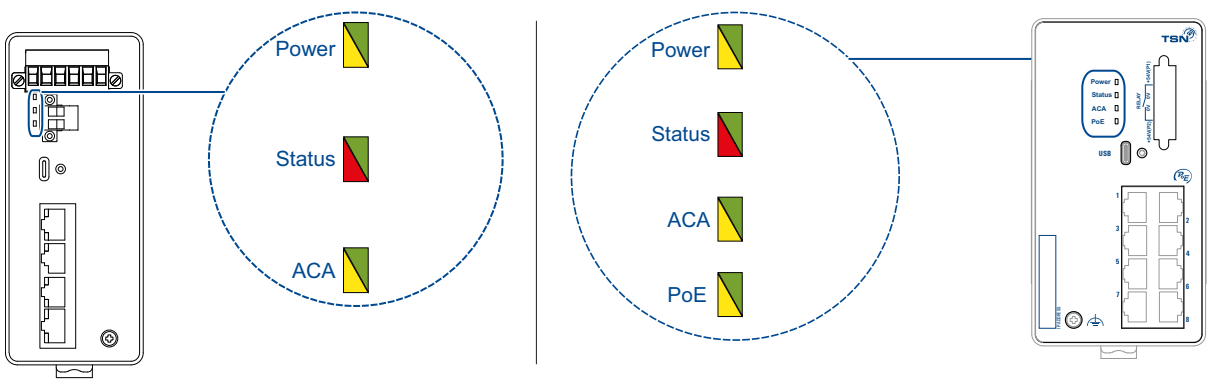


Figure 2: LED display elements for device status

LED	Display	Color	Activity	Meaning
Power	Supply voltage	—	none	Supply voltages 1 **and** 2 are too low.
		yellow	lights up	Supply voltage 1 **or** 2 is on
			flashes 4 times a period	Software update is running. Maintain the power supply.
		green	lights up	Supply voltage 1 **and** 2 is on
Status	Device Status	—	none	Device starts Device is not ready for operation
		green	lights up	Device is ready for operation Characteristics can be configured
		red	lights up	Device is not ready for operation
			flashes 1 time a period	The boot parameters used when the device has been started differ from the boot parameters saved. Start the device again.
			flashes 4 times a period	Device has detected a multiple IP address
		red/ green	flashing alternately	Device is in the recovery mode.
ACA	Storage medium ACA22-USB-C (EEC)	—	none	No ACA connected
		green	lights up	ACA is plugged
			flashes 3 times a period	Device writes to/reads from the storage medium
		yellow	lights up	ACA is not ready for operation
PoE		—	none	Supply voltage is too low
		yellow	lights up	Supply voltage is too low for PoE support.
		green	lights up	PoE voltage is on

Table 4: Meaning of the device display elements

1.6.2 Port status

These LEDs display port-related information.

Note:

- For device variants with 4 × RJ45 sockets:
  The LEDs are directly located at the ports.
  See figure 3 on page 34.
- For device variants with 8 × RJ45 sockets:
  The LEDs are located on the right side of the device.
  See figure 4 on page 34.
  See figure 5 on page 35.
- For device variants with ports that are DSC/DST sockets and SFP slots:
  The LEDs are directly located at the ports.
  See figure 4 on page 34.
  See figure 5 on page 35.

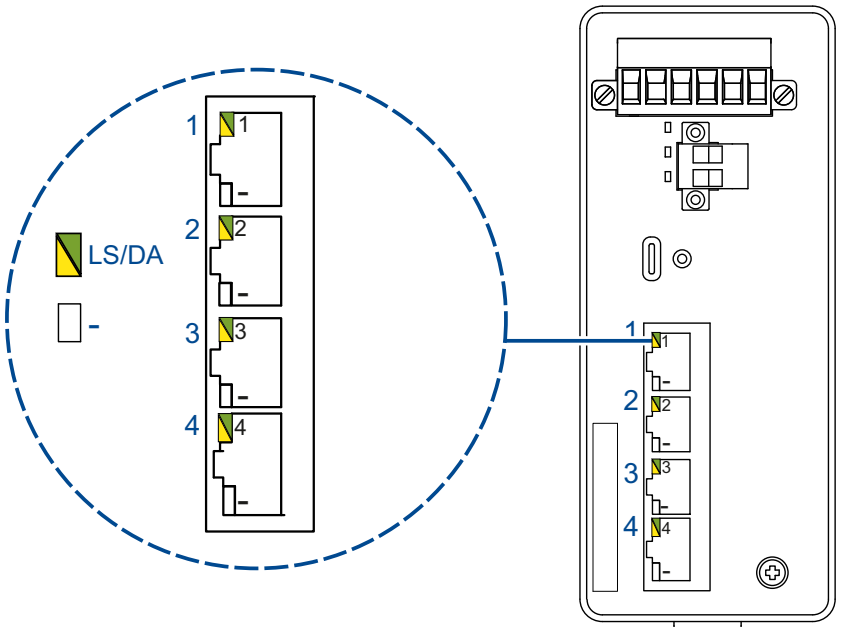


Figure 3: LED display elements for device variants with 4 × RJ45 sockets

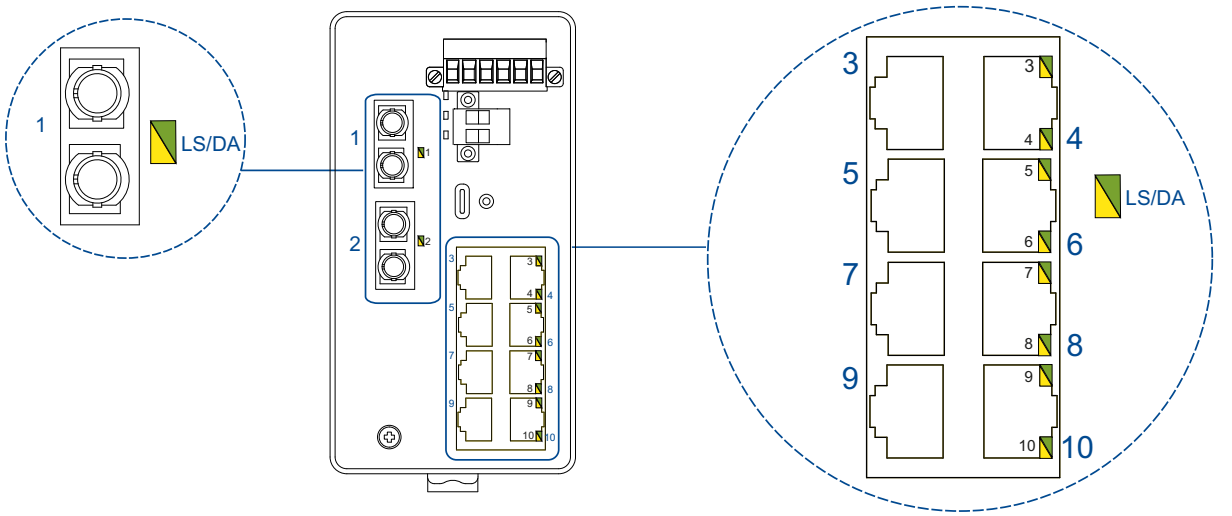


Figure 4: LED display elements for device variants with DSC, DST and 8 × RJ45 sockets

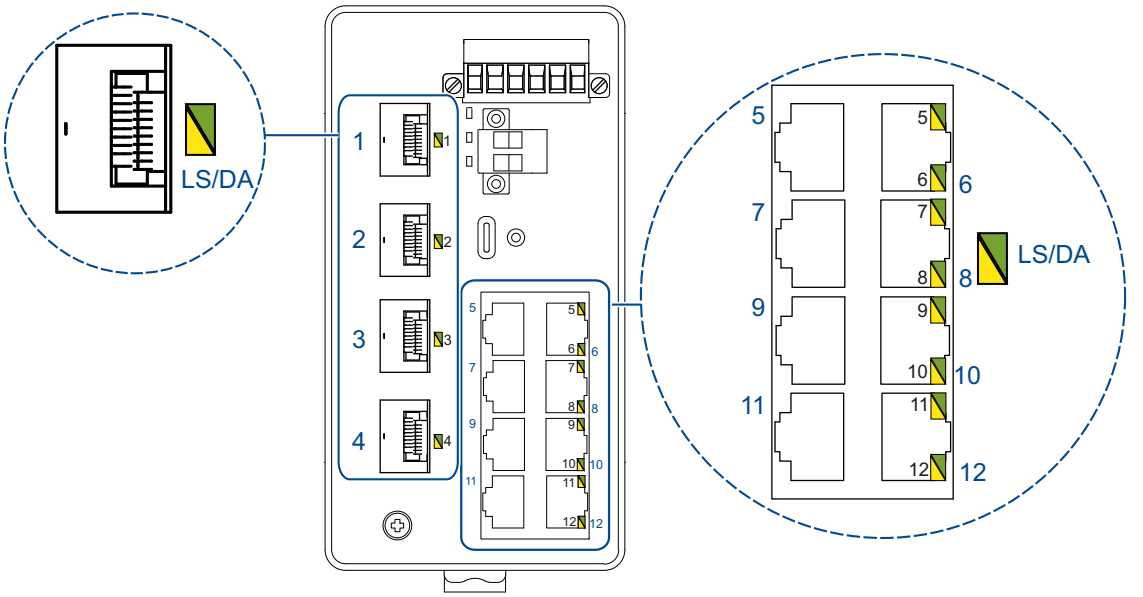


Figure 5: LED display elements for device variants with SFP slots and 8 × RJ45 sockets

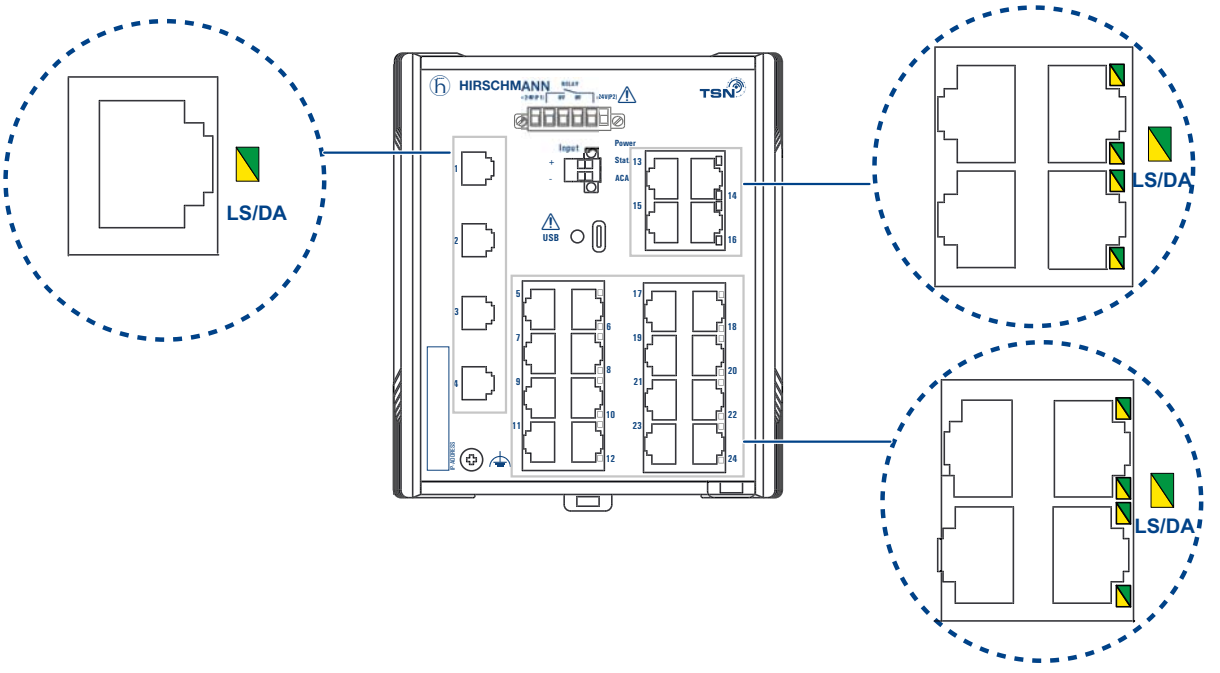


Figure 6: LED display elements for a high-port device variant with SFP slots and 20 × RJ45 sockets

Display	Color	Activity	Meaning
LS/DA Link status Data traffic	—	none	Device detects an invalid or missing link
	green	lights up	Device detects a valid link
		flashes 1 time a period	Port is switched to stand-by
		flashes 3 times a period	Port is switched off
	yellow	flashing	Device is transmitting and/or receiving data
		flashes 3 times a period	The device deactivates the relevant port (auto-deactivation).

Table 5: Meaning of the port display elements

1.7 Management interfaces

1.7.1 Signal contact

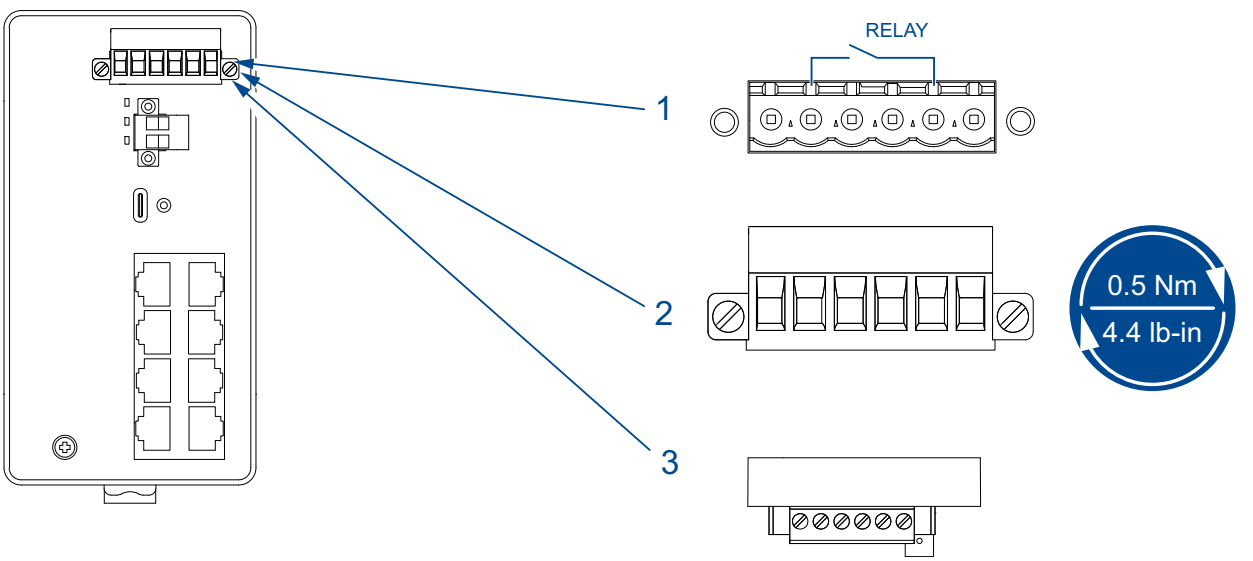


Figure 7: (1) Connection on the device, (2) terminal block mounted on the device (front view), tightening torque, (3) terminal block mounted on the device (view from above).

The signal contact is a potential-free relay contact. The signal contact is open when the device is not connected to a power supply.
The signal contact allows you to control external devices or monitor device functions.
In the configuration, you specify how the device uses the signal contact.
You will find detailed information on possible applications and the configuration of the signal contact in the software user documentation. You will find the software user documentation as PDF files on the Internet at https://www.doc.hirschmann.com

1.7.2 USB-C interface

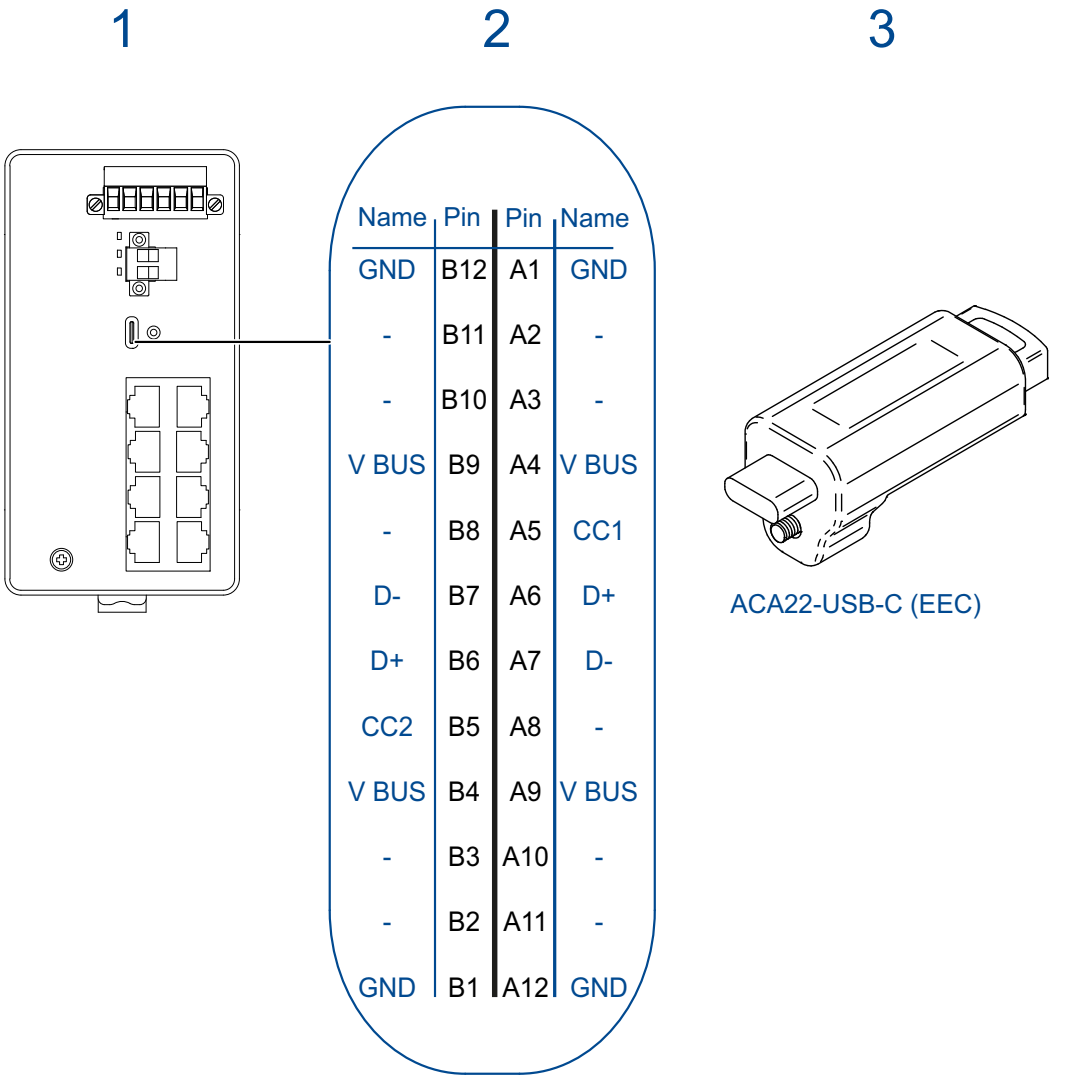


Figure 8: (1) Position of the USB-C interface on the device, (2) pin assignment of the USB-C interface, (3) view of the ACA22-USB-C (EEC).

The USB-C interface allows you to connect the AutoConfiguration Adapter ACA22-USB-C (EEC) storage medium. It is used for saving/loading the configuration data and diagnostic information, and for loading the software.

You have the option to configure your device using the USB-C interface. You find detailed information in the software user documentation. You find the software user documentation as PDF files on the Internet at http://www.doc.hirschmann.com

The USB-C interface has the following properties:

- Supports the USB master mode and slave
- Supports USB 2.0 (data rate max. 480 Mbit/s)
- Connector: type C
- Supplies current of max. 500 mA

- Voltage not electrically insulated
- Supported file system: FAT32

Note: A USB cable is used exclusively for the configuration of your device.

Note: The ACA22-USB-C (EEC) storage medium can remain permanently connected to the device.

1.7.3 Digital input

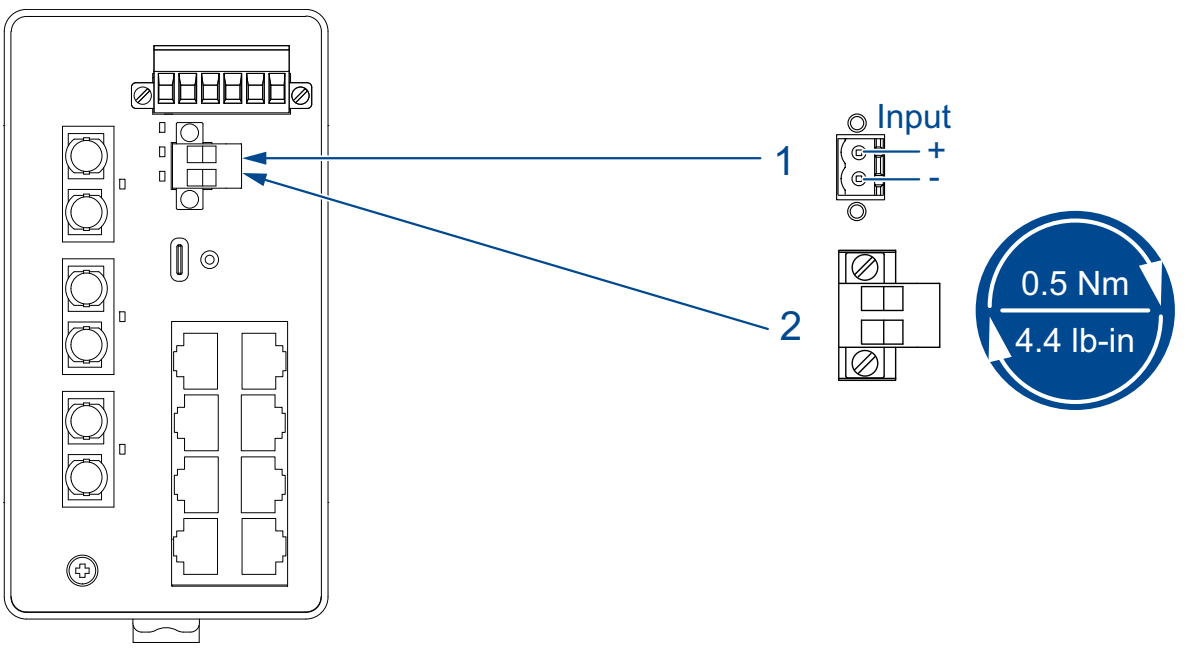


Figure 9: (1) Connection on the device, (2) terminal block mounted on the device (front view), tightening torque.

The digital input allows you to capture and forward signals from digital sensors. In the configuration, you specify how the device uses the digital input.
You will find detailed information on possible applications and the configuration of the digital input in the software user documentation. You will find the software user documentation as PDF files on the Internet at https://www.doc.hirschmann.com

Note: For PoE device variants, the digital input is only available for device variants with a wide casing.
See “General data” on page 57.

2 Installation

The devices have been developed for practical application in a harsh industrial environment.
On delivery, the device is ready for operation.

Perform the following steps to install and configure the device:

- Checking the package contents
- Installing and grounding the device
- Connecting the ferrite (optional)
- Installing an SFP transceiver (optional)
- Connecting the terminal blocks
- Connecting data cables
- Filling out the inscription label
- Making basic settings

2.1 Checking the package contents

☐ Check whether the package includes all items named in the section “Scope of delivery” on page 86.
☐ Check the individual parts for transport damage.

2.2 Installing and grounding the device

2.2.1 Installing the device onto the DIN rail

Prerequisite:
☐ Verify that the minimum clearance at the ventilation slots is maintained to meet the climatic conditions during operation:
Minimum clearance at the ventilation slots: 2 in (5 cm)

Note: Decreasing the minimum clearance reduces the specified maximum operating temperature.
See table 6 on page 40.

Mounting	Minimum clearance at the ventilation slots	Temperature derating
Standard mounting (vertical)	2 in (5 cm)	0 K
	0.8 in (2 cm)	3 K
	0 in (0 cm)	15 K
90° rotated mounting (horizontal)	0 in (0 cm)	15 K

Table 6: Derating for different mounting positions

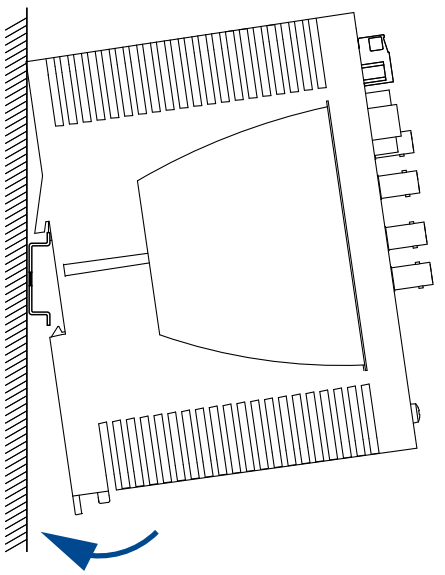


Figure 10: Mounting on the DIN rail

Proceed as follows:

☐ Slide the upper snap-in guide of the device into the DIN rail.
☐ Push the device downwards and onto the DIN rail.
☐ Snap-in the device.

2.2.2 Grounding the device

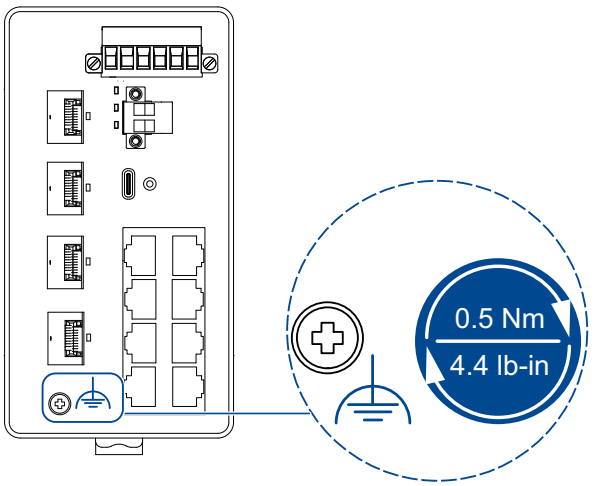


Figure 11: Position of the ground connection on the device; tightening torque.

All device variants have a functional ground connection.

Proceed as follows:

☐ Ground the device via the ground screw.

2.2.3 Connecting the ferrite (optional)

Exclusively applies to device variants with 8 ... 12 ports and device variants with DNV GL approval.

Device variants featuring supply voltage with characteristic value P do not require ferrites.

To adhere to EMC conformity, connect the one of the supplied ferrites to the voltage input via the power supply cable.

With redundant power supply, connect one of the supplied ferrites via both power supply cables.

Proceed as follows:

☐ Insert the power supply cable through the ferrite 2 times.

☐ Position the ferrite as close as possible to the voltage input (max. distance 2 in (5 cm)).

2.3 Installing an SFP transceiver (optional)

Prerequisites:
Exclusively use Hirschmann SFP transceivers.
See “Accessories” on page 87.

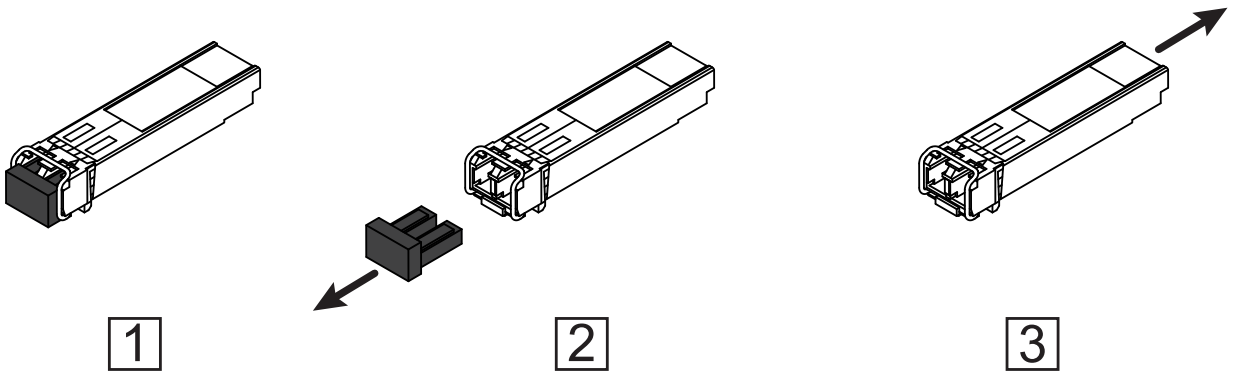


Figure 12: Installing SFP transceivers: Installation sequence

Proceed as follows:
☐ Take the SFP transceiver out of the transport packaging (1).
☐ Remove the protection cap from the SFP transceiver (2).
☐ Push the SFP transceiver with the lock closed into the slot until it latches in (3).

2.4 Connecting the terminal blocks

2.4.1 Power supply

Note: The supply voltage is connected to the device casing through protective elements exclusively.

Supply voltage with characteristic value T

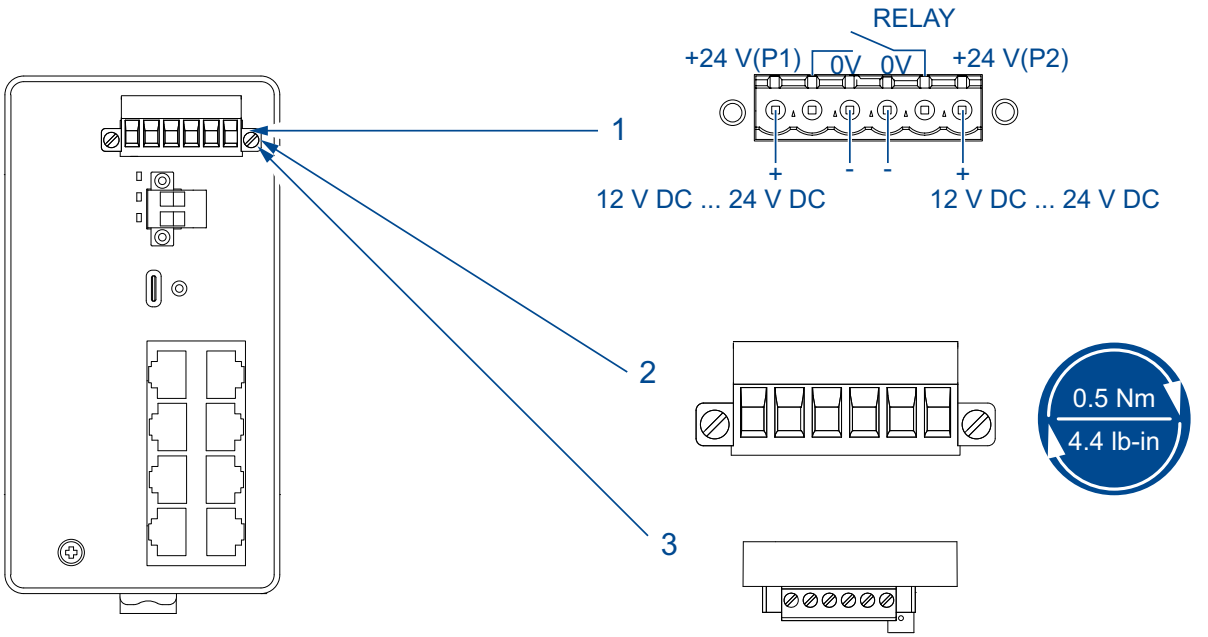


Figure 13: (1) DC voltage connection on the device, (2) terminal block mounted on the device (front view), tightening torque, (3) terminal block mounted on the device (view from above).

Type of the voltages that can be connected	Specification of the supply voltage	Pin assignment	
DC voltage	Rated voltage range DC: 12 V DC ... 24 V DC Voltage range DC incl. maximum tolerances: 9.6 V DC ... 32 V DC	+24 V	Plus terminal of the supply voltage
		0 V	Minus terminal of the supply voltage

Table 7: Supply voltage with characteristic value T: type and specification of the supply voltage, pin assignment

For the supply voltage to be connected, perform the following steps:

- ☐ Remove the terminal connector from the device.
- ☐ Connect the wires according to the pin assignment on the device with the clamps.
- ☐ Fasten the wires in the terminal block by tightening the terminal screws.
- ☐ Mount the terminal block on the device using screws.

Supply voltage with characteristic value F

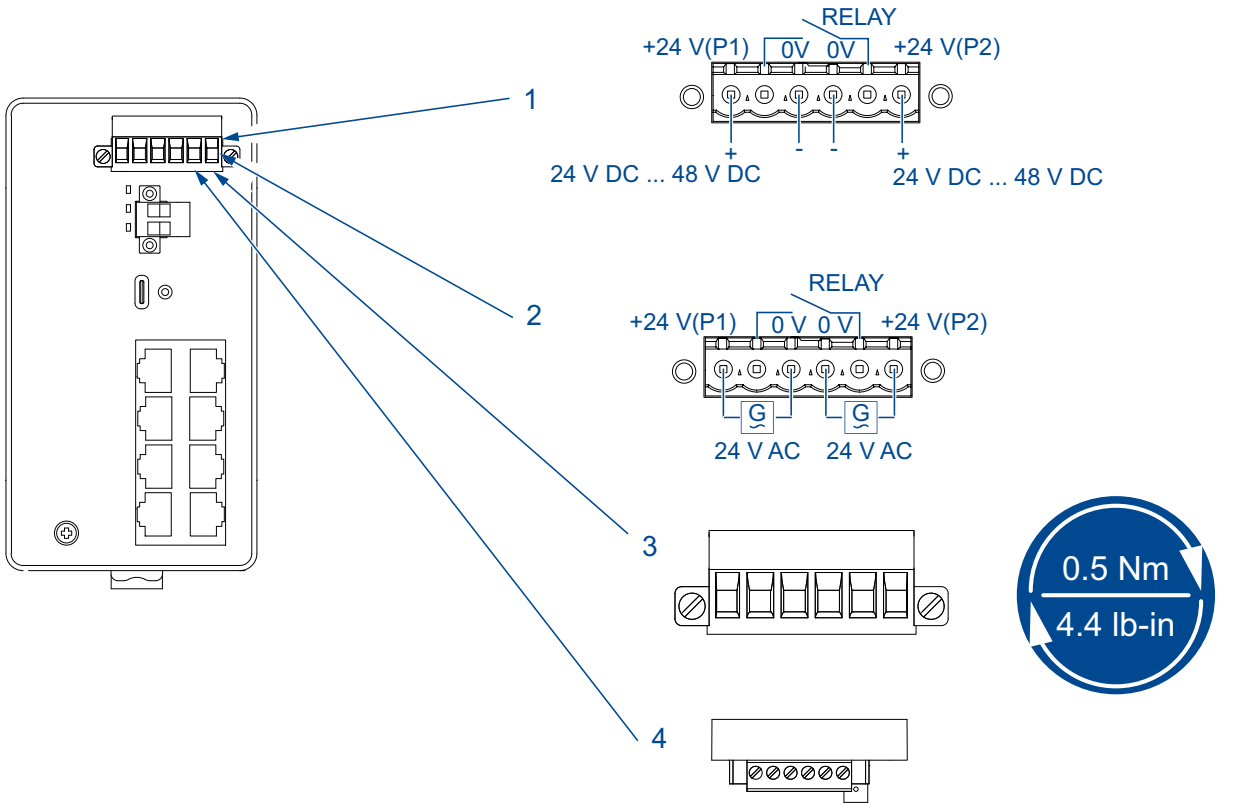


Figure 14: (1) DC voltage connection on the device, (2) AC voltage connection on the device, (3) terminal block mounted on the device (front view), tightening torque, (4) terminal block mounted on the device (view from above).

Type of the voltages that can be connected	Specification of the supply voltage	Pin assignment	
DC voltage	Rated voltage range DC: 24 V DC ... 48 V DC Voltage range DC incl. maximum tolerances: 18 V DC ... 60 V DC	+24 V	Plus terminal of the supply voltage
		0 V	Minus terminal of the supply voltage
AC voltage	Rated voltage AC: 24 V AC Voltage range AC incl. maximum tolerances: 18 V AC ... 30 V AC, 50 Hz ... 60 Hz		

Table 8: Supply voltage with characteristic value F: type and specification of the supply voltage, pin assignment

For the supply voltage to be connected, perform the following steps:

☐ Remove the terminal connector from the device.

☐ Connect the wires according to the pin assignment on the device with the clamps.

☐ Fasten the wires in the terminal block by tightening the terminal screws.
☐ Mount the terminal block on the device using screws.

Supply voltage with characteristic value U

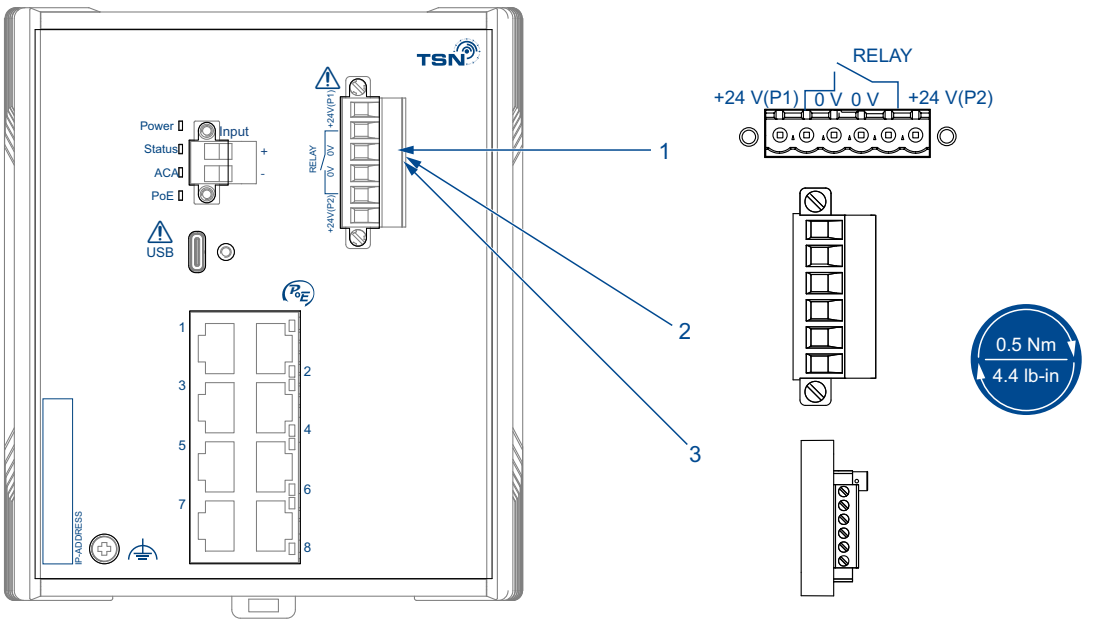


Figure 15: (1) DC voltage connection on the device, (2) terminal block mounted on the device (front view), tightening torque, (3) terminal block mounted on the device (view from above).

Type of the voltages that can be connected	Specification of the supply voltage	Pin assignment	
DC voltage	Rated voltage DC: 24 V DC Voltage range DC incl. maximum tolerances: 18 V DC ... 30 V DC	+24 V	Plus terminal of the supply voltage
		0 V	Minus terminal of the supply voltage

Table 9: Supply voltage with characteristic value U: type and specification of the supply voltage, pin assignment

For the supply voltage to be connected, perform the following steps:
☐ Remove the terminal connector from the device.
☐ Connect the wires according to the pin assignment on the device with the clamps.
☐ Fasten the wires in the terminal block by tightening the terminal screws.
☐ Mount the terminal block on the device using screws.

Supply voltage with characteristic value P

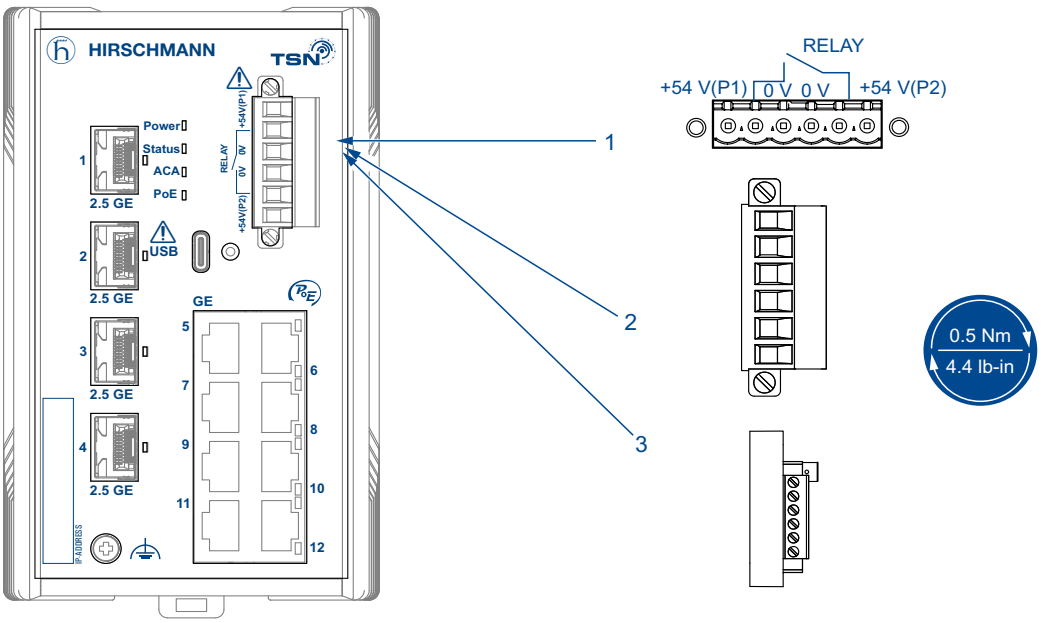


Figure 16: (1) DC voltage connection on the device, (2) terminal block mounted on the device (front view), tightening torque, (3) terminal block mounted on the device (view from above).

Type of the voltages that can be connected	Specification of the supply voltage	Pin assignment	
When using PoE: DC voltage	Rated voltage DC: 48 V DC	+	Plus terminal of the supply voltage
	Voltage range DC incl. maximum tolerances: 46 V DC ... 57 V DC	-	Minus terminal of the supply voltage
When using PoE+:	Rated voltage DC: 54 V DC	+	Plus terminal of the supply voltage
	Voltage range DC incl. maximum tolerances: 52 V DC ... 57 V DC	-	Minus terminal of the supply voltage
Without using PoE or PoE+: DC voltage	Rated voltage range DC: 24 V DC ... 48 V DC	+	Plus terminal of the supply voltage
	Voltage range DC incl. maximum tolerances: 19 V DC ... 60 V DC	-	Minus terminal of the supply voltage

Table 10: Supply voltage with characteristic value P: type and specification of the supply voltage, pin assignment

For the supply voltage to be connected, perform the following steps:

☐ Remove the terminal connector from the device.

☐ Connect the wires according to the pin assignment on the device with the clamps.

☐ Fasten the wires in the terminal block by tightening the terminal screws.
☐ Mount the terminal block on the device using screws.

2.4.2 Signal contact (optional)

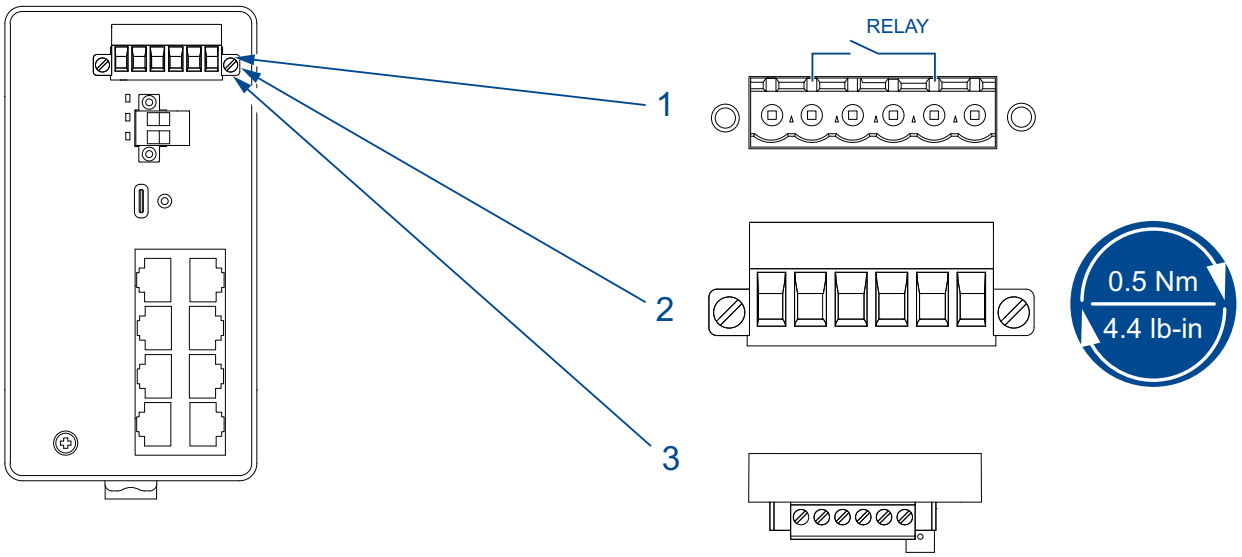


Figure 17: (1) Connection on the device, (2) terminal block mounted on the device (front view), tightening torque, (3) terminal block mounted on the device (view from above).

Proceed as follows:

☐ Connect the signal contact lines with the terminal block connections.
☐ Fasten the wires in the terminal block by tightening the terminal screws.
☐ Mount the terminal block on the device using screws.

2.4.3 Digital input (optional)

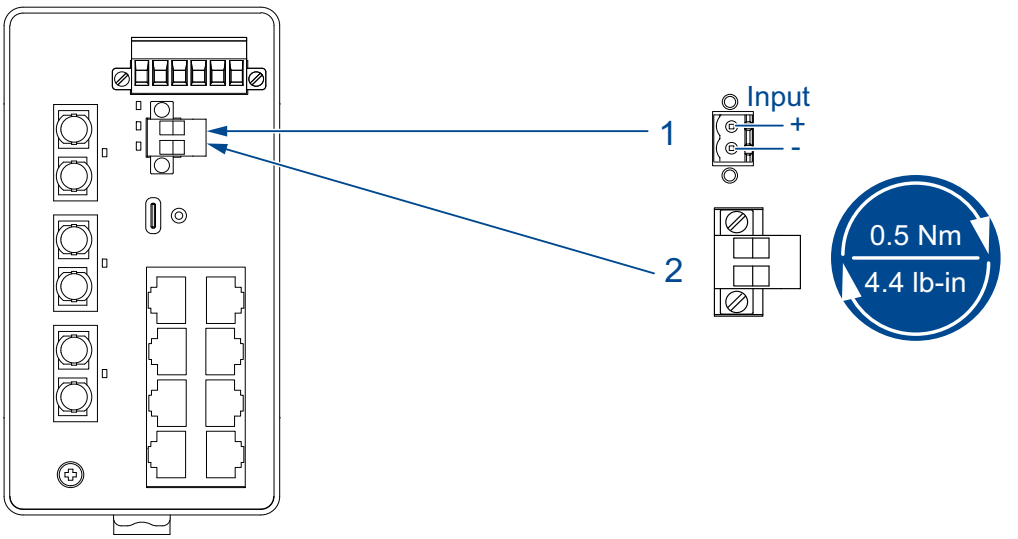


Figure 18: (1) Connection on the device, (2) terminal block mounted on the device (front view), tightening torque.

Pin	Signal, terminal	Function
1	DI (+)	Signal input
2	DI (−)	Reference potential

Table 11: Digital input: pin assignment

Proceed as follows:

☐ Remove the terminal connector from the device.
☐ Connect the wires according to the pin assignment on the device with the clamps.
☐ Fasten the wires in the terminal block by tightening the terminal screws.
☐ Mount the terminal block on the device using screws.

Connection constellations of sensors

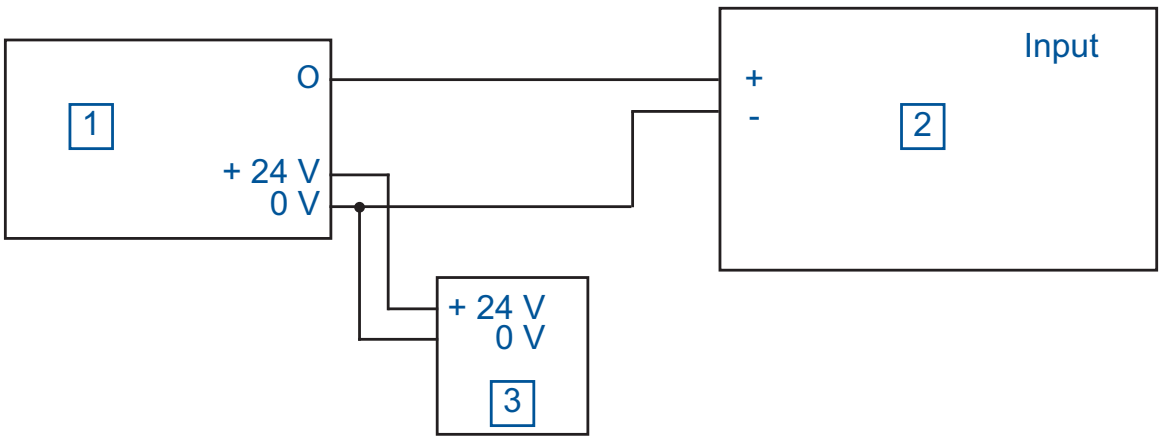


Figure 19: Connection of a sensor (3 pin) with separate power supply
1 - Sensor
2 - BRS20/22/30/32/40/42/50/52I
3 - Separate power supply for sensor

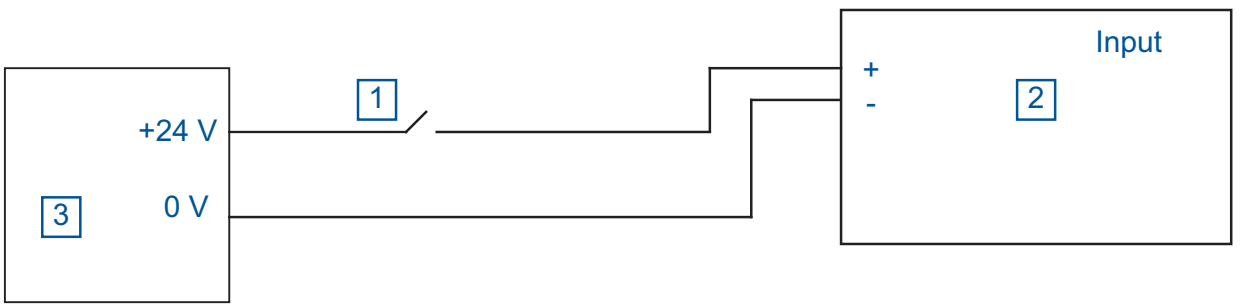


Figure 20: Connection of a sensor (2 pin) with separate power supply
1 - Sensor (2 pin sensor)
2 - BRS20/22/30/32/40/42/50/52I
3 - Separate power supply for sensor

2.5 Operating the device

When you connect the supply voltage, you start up the device.

2.6 Connecting data cables

Note the following general recommendations for data cable connections in environments with high electrical interference levels:

- ☐ Keep the length of the data cables as short as possible.
- ☐ Use optical data cables for the data transmission between the buildings.
- ☐ When using copper cables, provide a sufficient separation between the power supply cables and the data cables. Ideally, install the cables in separate cable channels.
- ☐ Verify that power supply cables and data cables do not run parallel over longer distances. If reducing the inductive coupling is necessary, verify that the power supply cables and data cables cross at a 90° angle.
- ☐ Use shielded data cables for gigabit transmission via copper cables. Only use shielded data cables to meet EMC requirements according to EN 50121-4 and marine applications.
  See “Electromagnetic compatibility (EMC)” on page 74.
- ☐ Connect the data cables according to your requirements.
  See “Ethernet ports” on page 28.

2.7 Filling out the inscription label

The information field for the IP address helps you identify your device.

3 Making basic settings

Note: 2 or more devices configured with the same IP address can cause unpredictable operation of your network.
Install and maintain a process that assigns a unique IP address to every device in the network.

The IP parameters must be entered when the device is installed for the first time. The device provides the following options for configuring IP addresses:

- Input via the HiView or Industrial HiVision application. You find further information about the applications HiView or Industrial HiVision on the Internet at the Hirschmann product pages:
  HiView
  http://www.hirschmann.com/en/QR/INET-HiView
  Industrial HiVision
  http://www.hirschmann.com/en/QR/INET-Industrial-HiVision
- Configuration via BOOTP
- Configuration via DHCP (Option 82)
- AutoConfiguration AdapterACA22-USB-C (EEC)
- Configuration via USB-C interface

■ **Default settings**
- IP address: The device looks for the IP address using DHCP
- Ethernet ports: link status is not evaluated (signal contact)
- Optical ports: Full duplex
  TP ports: Autonegotiation
- RSTP (Rapid Spanning Tree) activated

3.1 First login (Password change)

To help prevent undesired access to the device, it is imperative that you change the default password during initial setup.

Perform the following steps:

☐ Open the Graphical User Interface, the Command Line Interface, or HiView the first time you log on to the device.
☐ Log on to the device with the default password “private”. The device prompts you to type in a new password.
☐ Type in your new password.
To help increase security, choose a password that contains at least 8 characters which includes upper-case characters, lower-case characters, numerical digits, and special characters.

☐ When you log on to the device with the Command Line Interface, then the device prompts you to confirm your new password.
☐ Log on to the device again with your new password.

Note: If you lost your password, then use the System Monitor to reset the password.

For further information see:
https://hirschmann-support.belden.com/en/kb/required-password-change-new-procedure-for-first-time-login

4 Monitoring the ambient air temperature

Operate the device below the specified maximum ambient air temperature exclusively.
See “Climatic conditions during operation” on page 66.

The ambient air temperature is the temperature of the air at a distance of 2 in (5 cm) from the device. It depends on the installation conditions of the device, for example the distance from other devices or other objects, and the output of neighboring devices.

The temperature displayed in the CLI and the GUI is the internal temperature of the device. It is higher than the ambient air temperature. The maximum internal temperature of the device named in the technical data is a guideline that indicates to you that the maximum ambient air temperature has possibly been exceeded.

5 Maintenance and service

- When designing this device, Hirschmann largely avoided using high-wear parts. The parts subject to wear and tear are dimensioned to last longer than the lifetime of the product when it is operated normally. Operate this device according to the specifications.
- Relays are subject to natural wear. This wear depends on the frequency of the switching operations. Check the resistance of the closed relay contacts and the switching function depending on the frequency of the switching operations.
- Hirschmann is continually working on improving and developing their software. Check regularly whether there is an updated version of the software that provides you with additional benefits. You find information and software downloads on the Hirschmann product pages on the Internet (http://www.hirschmann.com).
- Depending on the degree of pollution in the operating environment, check at regular intervals that the ventilation slots in the device are not obstructed.

Note: You find information on settling complaints on the Internet at http://www.beldensolutions.com/en/Service/Repairs/index.phtml.

6 Disassembly

6.1 Removing an SFP transceiver (optional)

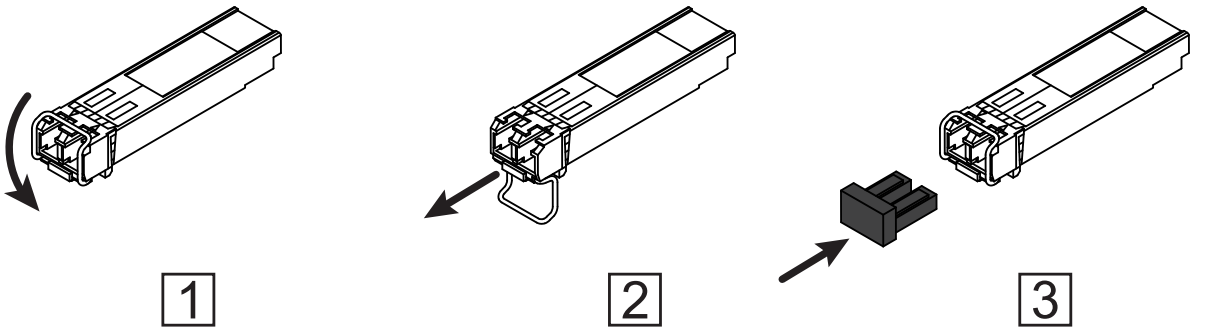


Figure 21: De-installing SFP transceivers: De-installation sequence

Proceed as follows:

☐ Open the locking mechanism of the SFP transceiver (1).
☐ Pull the SFP transceiver out of the slot via the open locking mechanism (2).
☐ Close the SFP transceiver with the protection cap (3).

6.2 Removing the device

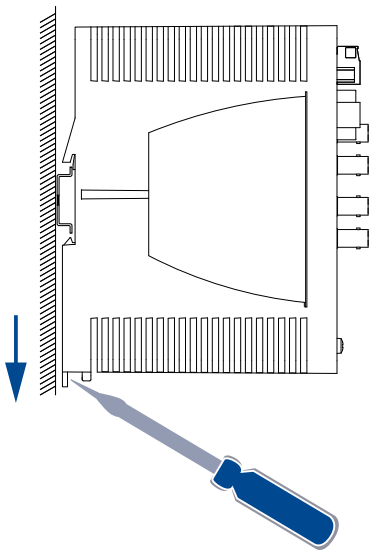


Figure 22: Removal from the DIN rail

Proceed as follows:

☐ Disconnect the data cables.
☐ Disable the supply voltage.
☐ Disconnect the terminal blocks.
☐ Disconnect the grounding.
☐ Insert a screwdriver horizontally below the casing into the locking gate.
☐ Pull the rail lock slide down using a screwdriver and fold the device up.

7 Technical data

7.1 General data

Product name	Weight Plastic casing	Weight Metal casing	Casing width	Degree of protection Plastic casing	Degree of protection Metal casing	Digital input (Availability)
BRS20-0400...	12.22 oz (380 g)	30.69 oz (870 g)	narrow	IP30	IP40	Yes
BRS20-0500...	14.82 oz (420 g)	32.09 oz (910 g)	narrow	IP30	IP40	Yes
BRS20-0600...	14.82 oz (420 g)	32.09 oz (910 g)	narrow	IP30	IP40	Yes
BRS20-0800....S;C...	14.82 oz (420 g)	35.98 oz (1020 g)	medium	IP30	IP40	Yes
BRS20-0800....T;E;G...	17.64 oz (500 g)	35.98 oz (1020 g)	medium	IP30	IP40	Yes
BRS20-0900....S;C...	17.64 oz (500 g)	38.45 oz (1090 g)	medium	IP30	IP40	Yes
BRS20-0900....T;E;G...	20.10 oz (570 g)	38.45 oz (1090 g)	medium	IP30	IP40	Yes
BRS20-1000....S;C...	17.64 oz (500 g)	38.45 oz (1090 g)	medium	IP30	IP40	Yes
BRS20-1000....T;E;G...	20.10 oz (570 g)	38.45 oz (1090 g)	medium	IP30	IP40	Yes
BRS20-1100....S;C...	17.64 oz (500 g)	38.45 oz (1090 g)	medium	IP30	IP40	Yes
BRS20-1100....T;E;G...	20.10 oz (570 g)	38.45 oz (1090 g)	medium	IP30	IP40	Yes
BRS20-1200....S;C...	17.64 oz (500 g)	38.45 oz (1090 g)	medium	IP30	IP40	Yes
BRS20-1200....T;E;G...	20.10 oz (570 g)	38.45 oz (1090 g)	medium	IP30	IP40	Yes
BRS20-1600....S;C...	31.04 oz (880 g)	51.14 oz (1450 g)	wide	IP30	IP40	Yes
BRS20-1600....T;E;G...	not available	51.14 oz (1450 g)	wide	not available	IP30	Yes
BRS20-2000....S;C...	33.51 oz (950 g)	53.61 oz (1520 g)	wide	IP30	IP40	Yes
BRS20-2000....T;E;G...	not available	53.61 oz (1520 g)	wide	not available	IP30	Yes
BRS20-2400....S;C...	1050 g	57.14 oz (1620 g)	wide	IP30	IP40	Yes
BRS20-2400....T;E;G...	not available	57.14 oz (1620 g)	wide	not available	IP30	Yes

Table 12: General data

Product name	Weight Plastic casing	Weight Metal casing	Casing width	Degree of protection Plastic casing	Degree of protection Metal casing	Digital input (Availability)
BRS30-0804...	20.10 oz (570 g)	38.45 oz (1090 g)	medium	IP30	IP40	Yes
BRS30-1604....S;C...	33.51 oz (950 g)	53.61 oz (1520 g)	wide	IP30	IP40	Yes
BRS30-1604....T;E;G...	not available	53.61 oz (1520 g)	wide	not available	IP30	Yes
BRS30-2004....S;C...	1050 g	57.14 oz (1620 g)	wide	IP30	IP40	Yes
BRS30-2004....T;E;G...	not available	57.14 oz (1620 g)	wide	not available	IP30	Yes
BRS40-0008...	17.64 oz (500 g)	35.98 oz (1020 g)	medium	IP30	IP40	Yes
BRS40-0012...	20.10 oz (570 g)	38.45 oz (1090 g)	medium	IP30	IP40	Yes
BRS40-0016....S;C...	31.04 oz (880 g)	51.14 oz (1450 g)	wide	IP30	IP40	Yes
BRS40-0016....T;E;G...	not available	51.14 oz (1450 g)	wide	not available	IP30	Yes
BRS40-0020....S;C...	33.51 oz (950 g)	53.61 oz (1520 g)	wide	IP30	IP40	Yes
BRS40-0020....T;E;G...	not available	53.61 oz (1520 g)	wide	not available	IP30	Yes
BRS40-0024....S;C...	1050 g	57.14 oz (1620 g)	wide	IP30	IP40	Yes
BRS40-0024....T;E;G...	not available	57.14 oz (1620 g)	wide	not available	IP30	Yes
BRS50-0012...	20.10 oz (570 g)	38.45 oz (1090 g)	medium	IP30	IP40	Yes
BRS50-0020....S;C...	33.51 oz (950 g)	53.61 oz (1520 g)	wide	IP30	IP40	Yes
BRS50-0020....T;E;G...	not available	53.61 oz (1520 g)	wide	not available	IP30	Yes
BRS50-0024....S;C...	1050 g	57.14 oz (1620 g)	wide	IP30	IP40	Yes
BRS50-0024....T;E;G...	not available	57.14 oz (1620 g)	wide	not available	IP30	Yes
PoE device variants Supply voltage with characteristic value U						
BRS22-0800....S;C...	26.46 oz (750 g)	49.38 oz (1400 g)	wide	IP30	IP40	Yes
BRS22-0800....T;E;G...	not available	49.38 oz (1400 g)	wide	not available	IP30	Yes
BRS32-0804....S;C...	28.21 oz (800 g)	51.14 oz (1450 g)	wide	IP30	IP40	Yes
BRS32-0804....T;E;G...	not available	51.14 oz (1450 g)	wide	not available	IP30	Yes
BRS42-0008....S;C...	26.46 oz (750 g)	49.38 oz (1400 g)	wide	IP30	IP40	Yes
BRS42-0008....T;E;G...	not available	49.38 oz (1400 g)	wide	not available	IP30	Yes

Table 12: General data

Product name	Weight Plastic casing	Weight Metal casing	Casing width	Degree of protection Plastic casing	Degree of protection Metal casing	Digital input (Availability)
BRS42-0012....S;C...	28.21 oz (800 g)	51.14 oz (1450 g)	wide	IP30	IP40	Yes
BRS42-0012....T;E;G...	not available	51.14 oz (1450 g)	wide	not available	IP30	Yes
BRS52-0012....S;C...	28.21 oz (800 g)	51.14 oz (1450 g)	wide	IP30	IP40	Yes
BRS52-0012....T;E;G...	not available	51.14 oz (1450 g)	wide	not available	IP30	Yes
PoE device variants Supply voltage with characteristic value P						
BRS22-0800....S;C...	17.64 oz (500 g)	38.80 oz (1100 g)	medium	IP30	IP40	No
BRS22-0800....T;E;G...	not available	44.09 oz (1250 g)	wide	not available	IP30	Yes
BRS32-0804....S;C...	19.4 oz (550 g)	40.56 oz (1150 g)	medium	IP30	IP40	No
BRS32-0804....T;E;G...	not available	45.85 oz (1300 g)	wide	not available	IP30	Yes
BRS42-0008....S;C...	17.64 oz (500 g)	38.80 oz (1100 g)	medium	IP30	IP40	No
BRS42-0008....T;E;G...	not available	44.09 oz (1250 g)	wide	not available	IP30	Yes
BRS42-0012....S;C...	19.4 oz (550 g)	40.56 oz (1150 g)	medium	IP30	IP40	No
BRS42-0012....T;E;G...	not available	45.85 oz (1300 g)	wide	not available	IP30	Yes
BRS52-0012....S;C...	19.4 oz (550 g)	40.56 oz (1150 g)	medium	IP30	IP40	No
BRS52-0012....T;E;G...	not available	45.85 oz (1300 g)	wide	not available	IP30	Yes

Table 12: General data

General data	
Dimensions W × H × D	See “Dimension drawings” on page 68.
Mounting	See “Installing the device onto the DIN rail” on page 39.
Pollution degree	2
Degree of protection	IP30 See “General data” on page 57.
	IP40 See “General data” on page 57.
	Note: IP protection is not evaluated by UL.
Laser protection	Class 1 in compliance with IEC 60825-1

Table 13: General data

7.2 Supply voltage

Supply voltage with characteristic value T		
Rated voltage range DC:	12 V DC ... 24 V DC	
Voltage range DC incl. maximum tolerances:	9.6 V DC ... 32 V DC	
Connection type	6-pin terminal block with screw lock	
	Tightening torque	4.4 lb-in (0.5 Nm)
	min. conductor diameter	AWG18 (0.75 mm²)
	max. conductor diameter	AWG12 (2.5 mm²)
Power loss buffer	>10 ms at 20.4 V DC	
Overload current protection on the device	Non-replaceable fuse	
Back-up fuse for each voltage input	Nominal rating:	2 A ... 10 A
	Characteristic:	slow blow
Current integral I²t	<1 A²s	
Connection for functional ground	See “Grounding the device” on page 41.	

Table 14: Supply voltage with characteristic value T

Supply voltage with characteristic value F	
Rated voltage range DC: Rated voltage AC:	24 V DC ... 48 V DC 24 V AC
Voltage range DC incl. maximum tolerances:	18 V DC ... 60 V DC
Voltage range AC incl. maximum tolerances:	18 V AC ... 30 V AC, 50 Hz ... 60 Hz

Table 15: Supply voltage with characteristic value F

Supply voltage with characteristic value F		
Connection type	6-pin terminal block with screw lock	
	Tightening torque	4.4 lb-in (0.5 Nm)
	min. conductor diameter	AWG18 (0.75 mm²)
	max. conductor diameter	AWG12 (2.5 mm²)
Power loss buffer	>10 ms at 20.4 V DC ... 48 V DC and 24 V AC	
Overload current protection on the device	Non-replaceable fuse	
Back-up fuse for each voltage input	Nominal rating:	2 A ... 10 A
	Characteristic:	slow blow
Current integral I²t	<1 A²s at 24 V DC	
Connection for functional ground	See “Grounding the device” on page 41.	

Table 15: Supply voltage with characteristic value F

Supply voltage with characteristic value U		
Rated voltage DC:	24 V DC	
Voltage range DC incl. maximum tolerances:	18 V DC ... 30 V DC	
Max. PoE power	90 W	< +140 °F (+60 °C) ambient air temperature
	60 W	+140 °F ... +158 °F (+60 °C ... +70 °C) ambient air temperature
Connection type	6-pin terminal block with screw lock	
	Tightening torque	4.4 lb-in (0.5 Nm)
	min. conductor diameter	AWG16 (1 mm²)
	max. conductor diameter	AWG12 (2.5 mm²)
Power loss buffer	>10 ms at 20.4 V DC	
Overload current protection on the device	Non-replaceable fuse	
Back-up fuse for each voltage input	Nominal rating:	10 A
	Characteristic:	slow blow
Current integral I²t	<36 A^2s	
Connection for functional ground	See “Grounding the device” on page 41.	

Table 16: Supply voltage with characteristic value U

Supply voltage with characteristic value P		
Rated voltage DC:	When using PoE:	48 V DC
	When using PoE+:	54 V DC
	Without using PoE or PoE+:	24 V DC ... 48 V DC

Table 17: Supply voltage with characteristic value P

Supply voltage with characteristic value P		
Max. PoE power	240 W	+32 °F ... +122 °F (0 °C ... +50 °C) ambient air temperature[a] Ambient air temperature
	180 W	> +122 °F ... +131 °F (+50 °C ... +55 °C)[a] ambient air temperature
	120 W	> +131 °F ... +140 °F (+55 °C ... +60 °C)[a] ambient air temperature
Voltage range DC incl. maximum tolerances:	When using PoE:	46 V DC ... 57 V DC
	When using PoE+:	52 V DC ... 57 V DC
	Without using PoE or PoE+:	19 V DC ... 60 V DC
Connection type	6-pin terminal block with screw lock	
	Tightening torque	4.4 lb-in (0.5 Nm)
	min. conductor diameter	AWG18 (0.75 mm²)
	max. conductor diameter	AWG12 (2.5 mm²)
Power loss buffer	>10 ms at 20.4 V DC	
Overload current protection on the device	Non-replaceable fuse	
Back-up fuse for each voltage input	Nominal rating:	10 A
	Characteristic:	slow blow
Current integral I^2t	<25 A^2s	
Insulation requirement	2250 V DC to casing ground/functional ground for at least 60 seconds	
Connection for functional ground	See “Grounding the device” on page 41.	

Table 17: Supply voltage with characteristic value P

a. The de-ratings apply to all PoE device variants in medium plastic casings and with standard temperature range.

7.3 Power consumption/power output

Device name	Total power consumption	Thermal power output	PoE power output
BRS20-0400...	5 W	17 Btu (IT)/h	0 W
BRS20-0500...	6 W	20 Btu (IT)/h	0 W
BRS20-0600...	7 W	24 Btu (IT)/h	0 W
BRS20-0800...	6 W	20 Btu (IT)/h	0 W
BRS20-0900...	7 W	24 Btu (IT)/h	0 W
BRS20-1000...	8 W	27 Btu (IT)/h	0 W
BRS20-1100...	9 W	31 Btu (IT)/h	0 W

Table 18: Power consumption/power output

Device name	Total power consumption	Thermal power output	PoE power output
BRS20-1200...	9 W	31 Btu (IT)/h	0 W
BRS20-1600...	10 W	34 Btu (IT)/h	0 W
BRS20-2000...	15 W	51 Btu (IT)/h	0 W
BRS20-2400...	16 W	55 Btu (IT)/h	0 W
BRS30-0804...	9 W	31 Btu (IT)/h	0 W
BRS30-1604...	15 W	51 Btu (IT)/h	0 W
BRS30-2004...	16 W	55 Btu (IT)/h	0 W
BRS40-0008...	8 W	27 Btu (IT)/h	0 W
BRS40-0012...	11 W	38 Btu (IT/h)	0 W
BRS40-0016...	14 W	48 Btu (IT/h)	0 W
BRS40-0020...	17 W	58 Btu (IT)/h	0 W
BRS40-0024...	19 W	65 Btu (IT)/h	0 W
BRS50-0012...	12 W	41 Btu (IT)/h	0 W
BRS50-0020...	17 W	58 Btu (IT)/h	0 W
BRS50-0024...	20 W	68 Btu (IT)/h	0 W
BRS22-08009999U...	104 W	48 Btu (IT/h)	90 W
BRS22-08009999P...	247 W	24 Btu (IT)/h	240 W
BRS32-0804OOOOU...	107 W	58 Btu (IT)/h	90 W
BRS32-0804OOOOP...	250 W	34 Btu (IT)/h	240 W
BRS42-00089999U...	106 W	55 Btu (IT)/h	90 W
BRS42-00089999P...	249 W	31 Btu (IT)/h	240 W
BRS42-0012OOOOU...	109 W	65 Btu (IT)/h	90 W
BRS42-0012OOOOP...	252 W	41 Btu (IT)/h	240 W
BRS52-0012OOOOU...	110 W	68 Btu (IT)/h	90 W
BRS52-0012OOOOP...	253 W	44 Btu (IT)/h	240 W

Table 18: Power consumption/power output

7.4 Signal contact

Signal contact Device variants featuring supply voltage with characteristic value F, P and T		
Connection type	6-pin terminal block with screw lock	
	Tightening torque	4.4 lb-in (0.5 Nm)
	min. conductor diameter	0.08 mm^2 (AWG 28)
	max. conductor diameter	AWG12 (2.5 mm^2)

Table 19: Signal contact: device variants featuring supply voltage with characteristic value F, P and T

Signal contact Device variants featuring supply voltage with characteristic value F, P and T	
Nominal value	I_{max} = 1 A at U_{max} = 30 V AC (resistive load) I_{max} = 1 A at U_{max} = 60 V DC (resistive load)
	according to the UL Standards: I_{max} = 0.5 A at U_{max} = 30 V AC (resistive load) I_{max} = 1 A at U_{max} = 30 V DC (resistive load)
	as per ANSI/UL 121201: See control drawing in chapter “Relevant for use in explosion hazard areas (Hazardous Locations, Class I, Division 2)” on page 10

Table 19: Signal contact: device variants featuring supply voltage with characteristic value F, P and T

Signal contact Device variants featuring supply voltage with characteristic value U		
Connection type	6-pin terminal block with screw lock	
	Tightening torque	4.4 lb-in (0.5 Nm)
	min. conductor diameter	0.08 mm^2 (AWG 28)
	max. conductor diameter	AWG12 (2.5 mm²)
	I_{max} = 1 A at U_{max} = 30 V AC (resistive load) I_{max} = 0.5 A at U_{max} = 60 V DC (resistive load) I_{max} = 1 A at U_{max} = 30 V DC (resistive load)	
	according to the UL Standards: I_{max} = 0.5 A at U_{max} = 30 V AC (resistive load) I_{max} = 1 A at U_{max} = 30 V DC (resistive load)	
	as per ANSI/UL 121201: See control drawing in chapter “Relevant for use in explosion hazard areas (Hazardous Locations, Class I, Division 2)” on page 10	

Table 20: Signal contact: device variants featuring supply voltage with characteristic value U

7.5 Digital input

Digital input		
Connection type	2-pin terminal block with screw lock	
	Tightening torque	4.4 lb-in (0.5 Nm)
	min. conductor diameter	0.08 mm^2 (AWG 28)
	max. conductor diameter	AWG12 (2.5 mm²)
Maximum permitted input voltage range	between -32 V DC and +32 V DC	
Nominal input voltage	+24 V DC	
Input voltage, low level, status “0”	-0.3 V DC … +5 V DC	

Table 21: Digital input

Digital input	
Input voltage, high level, status “1”	+11 V DC … +30 V DC
Maximum input current at nominal input voltage	15 mA
Permitted closed-circuit current for 2-wire sensors	1.5 mA
Input characteristic according to IEC 61131-2 (current-consuming)	Typ 3

Table 21: Digital input

7.6 Climatic conditions during operation

Climatic conditions during operation		
Minimum clearance at the ventilation slots	See “Installing the device onto the DIN rail” on page 39.	
Ambient air temperature[a]	Standard	
	▶ up to 6562 ft ASL (2000 m ASL)	+32 °F ... +140 °F (0 °C ... +60 °C)
	▶ 6560 ft ASL ... 9842 ft ASL (2000 m ASL ... 3000 m ASL)	+32 °F ... +122 °F (0 °C ... +50 °C)
	▶ 9842 ft ASL ... 13120 ASL (3000 m ü. NN ... 4000 m ü. NN)	+32 °F ... +113 °F (0 °C ... +45 °C)
	▶ 13120 ft ASL ... 14763 ft ASL (4000 m ü. NN ... 4500 m ü. NN)	+32 °F ... +104 °F (0 °C ... +40 °C)
	▶ 14763 ft ASL ... 16404 ft ASL (4500 m ü. NN ... 5000 m ü. NN)	+32 °F ... +95 °F (0 °C ... +35 °C)
	Extended	
	▶ up to 6562 ft ASL (2000 m ASL)	-40 °F ... +158 °F (-40 °C ... +70 °C)
	▶ 6560 ft ASL ... 9842 ft ASL (2000 m ASL ... 3000 m ASL)	-40 °F ... +140 °F (-40 °C ... +60 °C)
	▶ 9842 ft ASL ... 13120 ASL (3000 m ü. NN ... 4000 m ü. NN)	-40 °F ... +131 °F (-40 °C ... +55 °C)
	▶ 13120 ft ASL ... 14763 ft ASL (4000 m ü. NN ... 4500 m ü. NN)	-40 °F ... +122 °F (-40 °C ... +50 °C)
	▶ 14763 ft ASL ... 16404 ft ASL (4500 m ü. NN ... 5000 m ü. NN)	−104 °F ... +185 °F (−40 °C ... +85 °C)
	Note: Note the following de-ratings due to: ▶ Mounting: See table 6 on page 40. ▶ PoE power output: See table 16 on page 61. See table 17 on page 61. ▶ SFP transceiver See “Derating due to SFP transceiver” on page 82.	

Table 22: Climatic conditions during operation

Climatic conditions during operation		
Maximum inner temperature of device (guideline)		
▶ Device variants in plastic casing with standard temperature range: BRSXX-XXXXXXXX-**S**/**C**x**C**... See “Device name and product code” on page 20.		185 °F (85 °C)
▶ Device variants in metal casing with standard temperature range: BRSXX-XXXXXXXX-**S**/**C**x**D**... See “Device name and product code” on page 20.		176 °F (80 °C)
▶ Device variants in metal casing with extended temperature range: BRSXX-XXXXXXXX-**T**/**E**x**E**... See “Device name and product code” on page 20.		185 °F (85 °C)
Humidity	1 % ... 95 % (non-condensing)	
Air pressure	Without derating	
	▶ min. 795 hPa (+6562 ft; +2000 m)	
	▶ max. 1060 hPa (-1312 ft; -400 m)	
	With derating	
	▶ min. 600 hPa (+13123 ft; +4000 m)	
	▶ max. 1060 hPa (-1312 ft; -400 m)	

Table 22: Climatic conditions during operation

a. Temperature of the ambient air at a distance of 2 in (5 cm) from the device

7.7 Climatic conditions during storage

Climatic conditions during storage		
Ambient temperature	−40 °F ... +185 °F (−40 °C ... +85 °C)	up to 3 months
	-40 °F ... +158 °F (-40 °C ... +70 °C)	up to 1 year
	-40 °F ... +122 °F (-40 °C ... +50 °C)	up to 2 years
	+32 °F ... +86 °F (0 °C ... +30 °C)	up to 10 years
Humidity		1 % ... 95 % (non-condensing)
Air pressure		▶ min. 600 hPa (+13123 ft; +4000 m)
		▶ max. 1060 hPa (-1312 ft; -400 m)

Table 23: Climatic conditions during storage

7.8 Dimension drawings

7.8.1 Device variants with casing with characteristic value C (plastic casing)

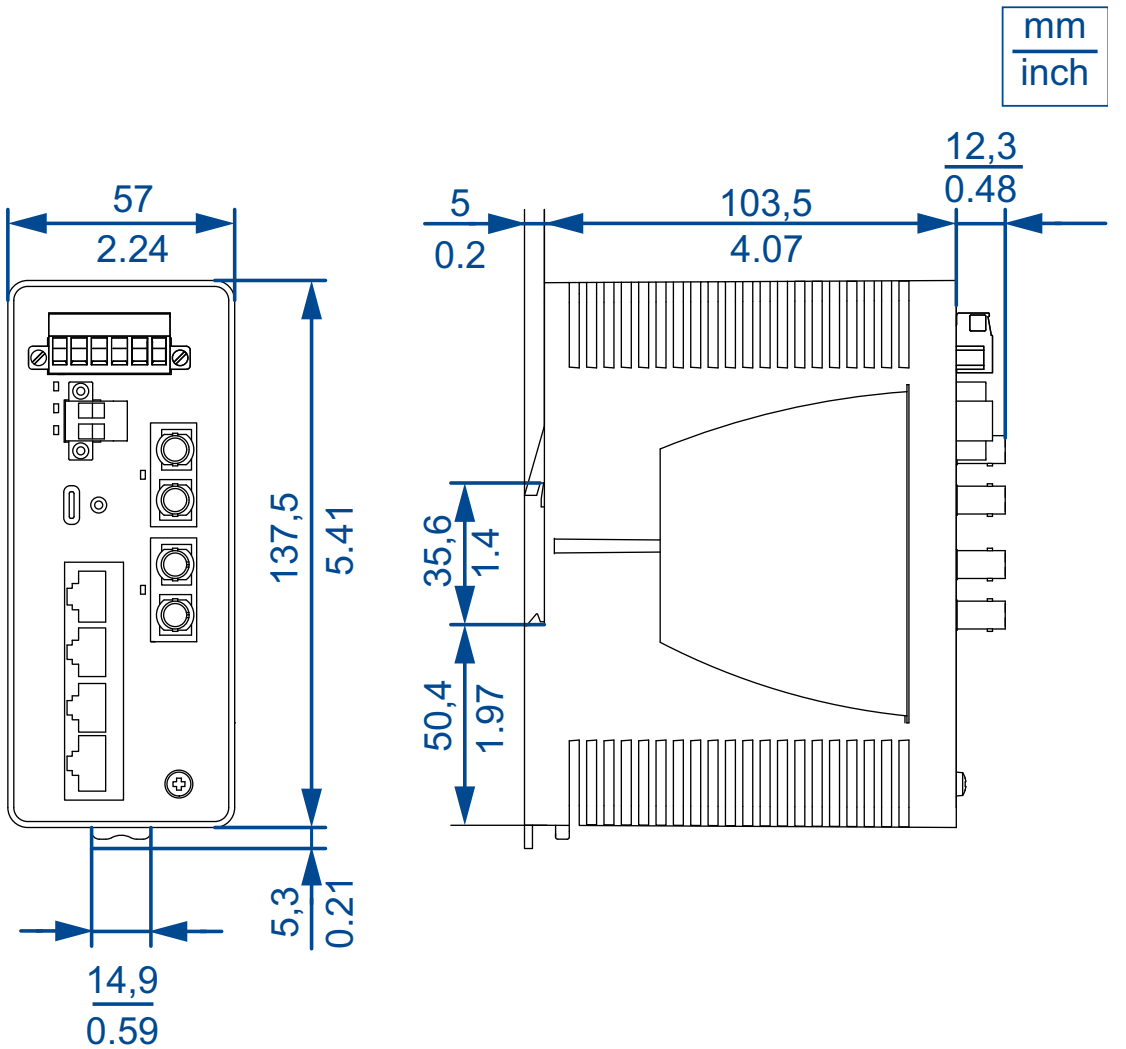


Figure 23: Narrow plastic casing

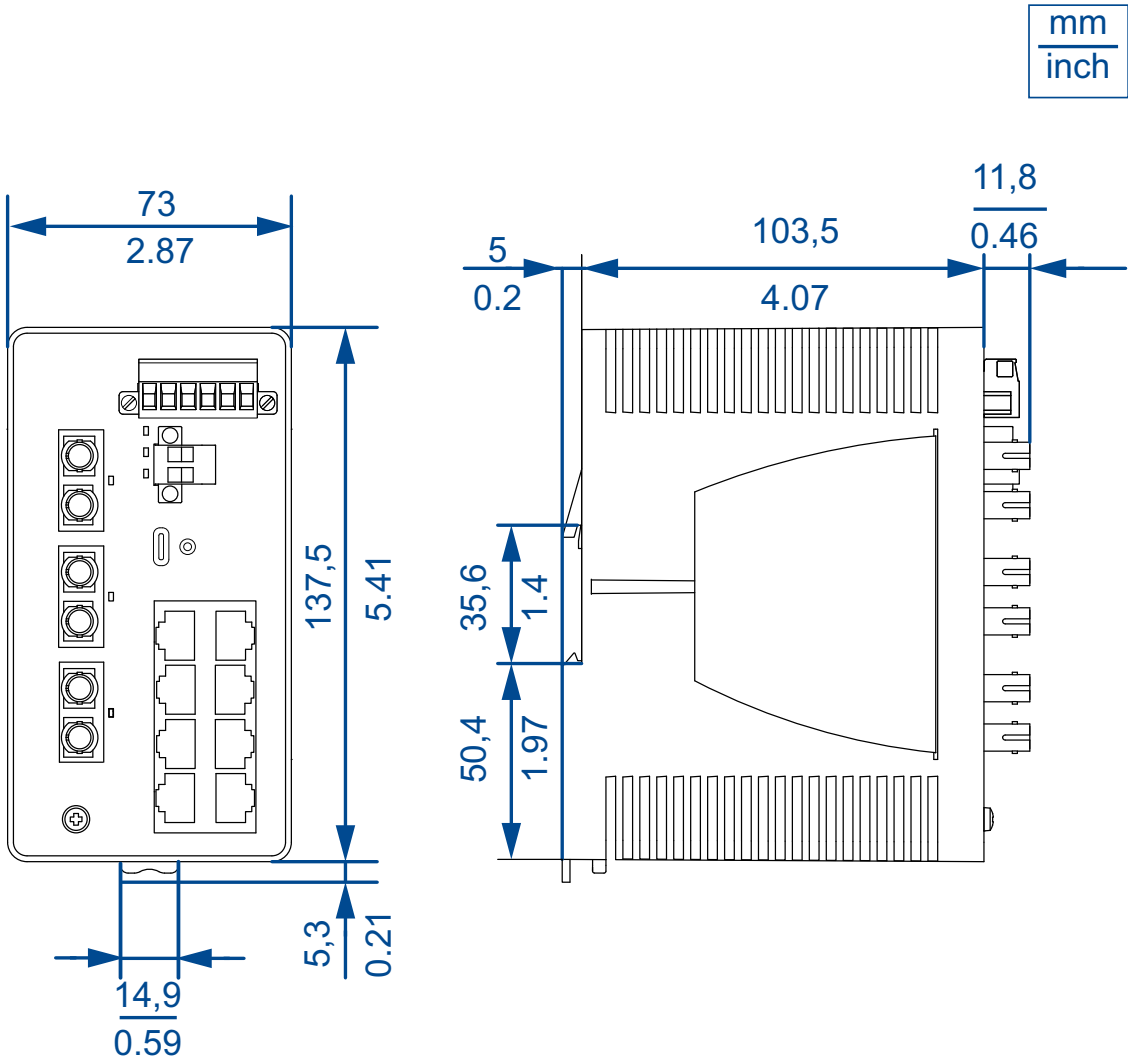


Figure 24: Medium plastic casing

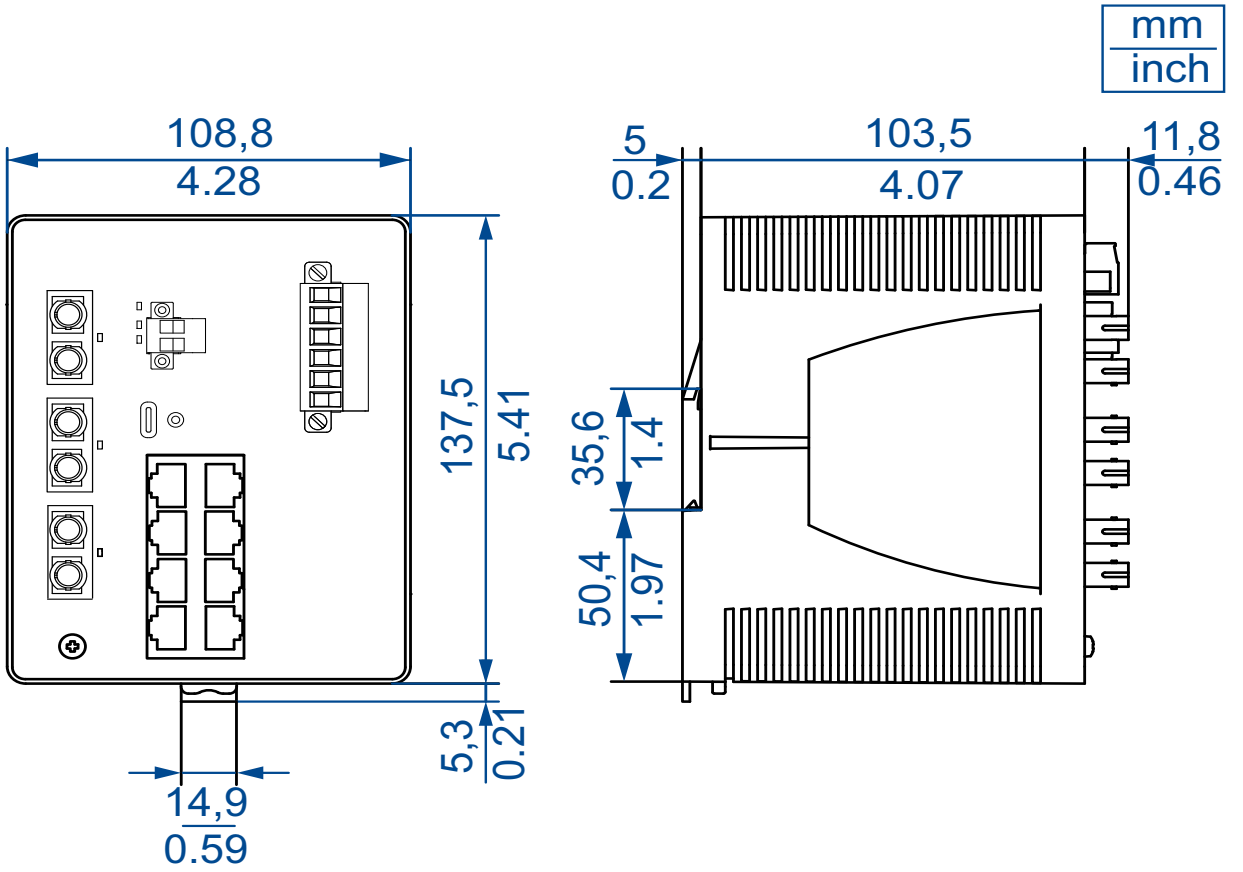


Figure 25: Wide plastic casing

7.8.2 Device variants with casing with characteristic value E/D (metal casing)

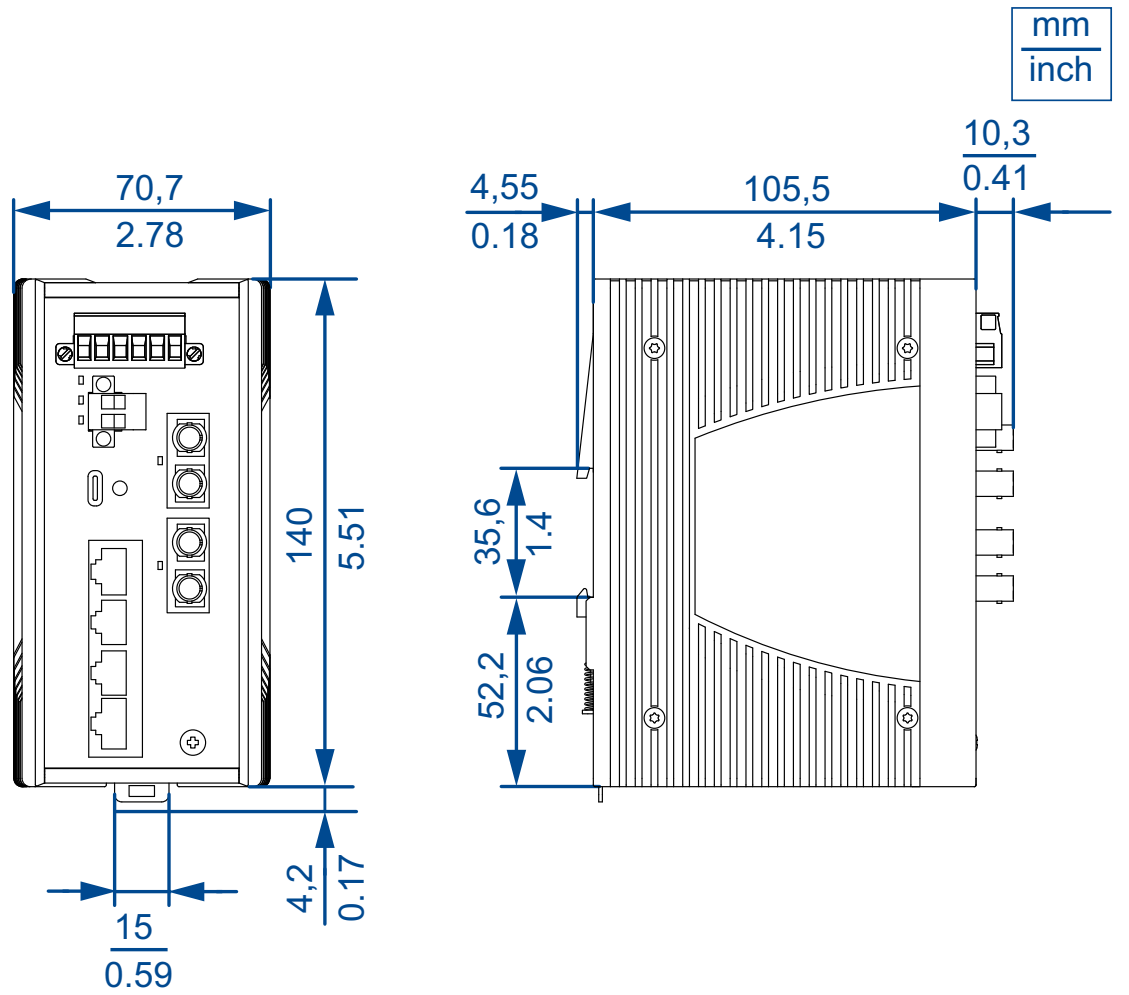


Figure 26: Narrow metal casing

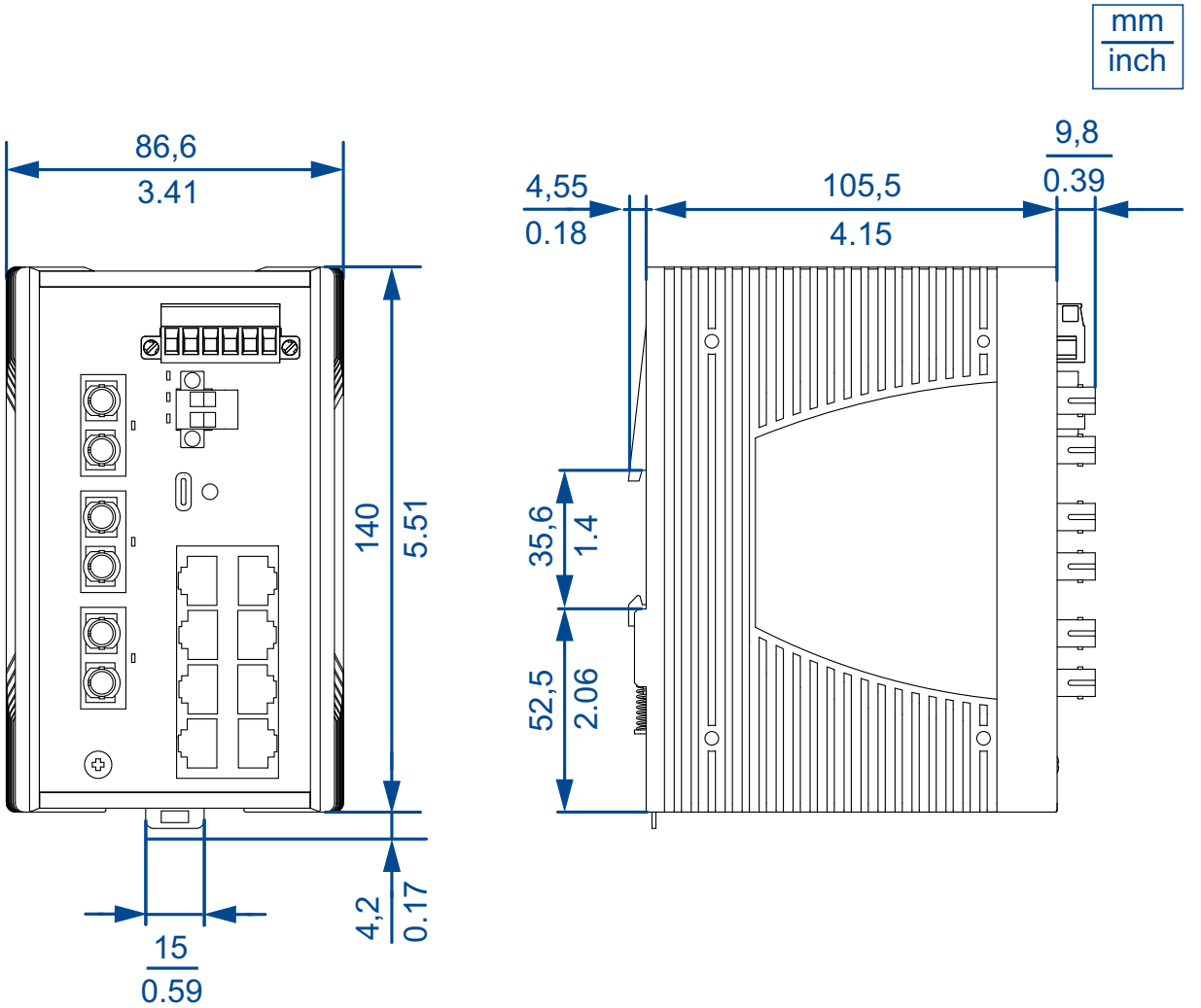


Figure 27: Medium metal casing

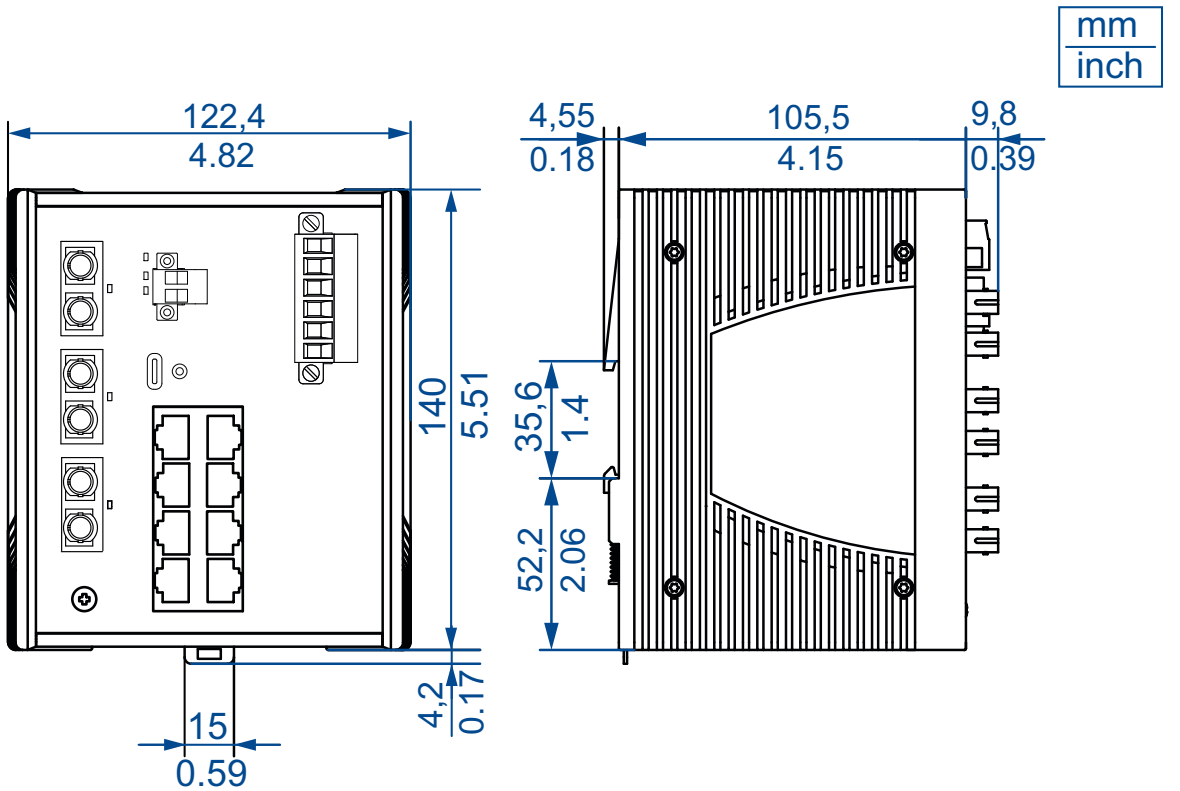


Figure 28: Wide metal casing

7.9 Immunity

Immunity		Standard applications[a]	Navy applications	Railway applications (trackside) as per EN 50121-4
IEC 60068-2-6, test Fc	Vibration	5 Hz ... 8.4 Hz with 0.14 in (3.5 mm) amplitude	2 Hz ... 13.2 Hz with 0.04 in (1 mm) amplitude	—
		8.4 Hz ... 200 Hz with 1 g	13.2 Hz ... 100 Hz with 0.7 g	—
IEC 60068-2-27, test Ea	Shock	15 g at 11 ms	—	—

Table 24: Immunity

a. EN 61131-2, CE, FCC – applies to all devices

7.10 Electromagnetic compatibility (EMC)

Note: Use shielded data cables for gigabit transmission via copper cables. Use shielded data cables for all transmission rates to meet the requirements according to EN 50121-4 and marine applications.

EMC interference emission	Standard applications[a]	Navy applications	Railway applications (trackside) as per EN 50121-4
EN 55032	Class A	—	—
DNV GL Guidelines	—	EMC B	—
FCC 47 CFR Part 15	Class A	—	—
EN 61000-6-4	Fulfilled	—	Fulfilled

Table 25: EMC interference emission

a. EN 61131-2, CE, FCC – applies to all devices

EMC interference immunity		Standard applications[a]	Navy applications	Railway applications (trackside) as per EN 50121-4
Electrostatic discharge				
EN 61000-4-2	Contact discharge	±4 kV	±6 kV	±6 kV
EN 61000-4-2	Air discharge	±8 kV	±8 kV	±8 kV
Electromagnetic field				
EN 61000-4-3	80 MHz ... 800 MHz	—	—	max. 10 V/m
	80 MHz ... 1000 MHz	max. 10 V/m	—	—
	800 MHz ... 1000 MHz	—	—	20 V/m
	80 MHz ... 2000 MHz	—	max. 10 V/m	—
	1.4 GHz ... 2.0 GHz	3 V/m	—	max. 10 V/m
	2.0 GHz ... 2.7 GHz	1 V/m	—	5 V/m
	5.1 GHz ... 6.0 GHz	—	—	3 V/m
Fast transients (burst) – power supply connection				
EN 61000-4-4		±2 kV	±2 kV	±2 kV
Fast transients (burst) – data line				
EN 61000-4-4		±1 kV	±1 kV	±2 kV
Voltage surges – power supply connection				
EN 61000-4-5	line/ground	±2 kV	±1 kV	±2 kV
EN 61000-4-5	line/line	±1 kV	±0.5 kV	±1 kV
Voltage surges - data line				
EN 61000-4-5	line/ground	±1 kV	—	±2 kV
Conducted disturbances				
EN 61000-4-6	150 kHz ... 80 MHz	10 V	10 V	10 V

Table 26: EMC interference immunity

a. EN 61131-2, CE, FCC – applies to all devices

7.11 Network range

Note: The line lengths specified for the transceivers apply for the respective fiber data (fiber attenuation and Bandwidth Length Product (BLP)/ Dispersion).

7.11.1 10/100/1000 Mbit/s twisted pair port

10/100/1000 Mbit/s twisted pair port	
Length of a twisted pair segment	max. 328 ft (100 m) (for Cat5e cable)

Table 27: Network range: 10/100/1000 Mbit/s twisted pair port

7.11.2 Fast Ethernet SFP transceiver

Product code	Mode[a]	Wave length	Fiber	System attenuation	Example for F/O line length[b]	Fiber attenuation	BLP/Dispersion
M-FAST-SFP-MM/LC...	MM	1310 nm	50/125 µm	0 dB ... 8 dB	0 mi ... 3.11 mi (0 km ... 5 km)	1.0 dB/km	800 MHz×km
M-FAST-SFP-MM/LC...	MM	1310 nm	62.5/125 µm	0 dB ... 11 dB	0 mi ... 2.49 mi (0 km ... 4 km)	1.0 dB/km	500 MHz×km
M-FAST-SFP-SM/LC...	SM	1310 nm	9/125 µm	0 dB ... 13 dB	0 mi ... 15.53 mi (0 km ... 25 km)	0.4 dB/km	3.5 ps/(nm×km)
M-FAST-SFP-SM+/LC...	SM	1310 nm	9/125 µm	10 dB ... 29 dB	15.53 mi ... 40.39 mi (25 km ... 65 km)	0.4 dB/km	3.5 ps/(nm×km)
M-FAST-SFP-LH/LC...	SM	1550 nm	9/125 µm	10 dB ... 29 dB	29.20 mi ... 64.62 mi (47 km ... 104 km)	0.25 dB/km	19 ps/(nm×km)
M-FAST-SFP-LH/LC...	SM	1550 nm	9/125 µm	10 dB ... 29 dB	14.29 mi ... 86.99 mi (55 km ... 140 km)	0.18 dB/km[c]	18 ps/(nm×km)
SFP-FAST-MM/LC[d]	MM	1310 nm	50/125 µm	0 dB ... 8 dB	0 mi ... 3.11 mi (0 km ... 5 km)	1.0 dB/km	800 MHz×km

Table 28: F/O port 100BASE-FX (SFP Fiber Optic Fast Ethernet Transceiver)

Product code	Mode[a]	Wave length	Fiber	System attenuation	Example for F/O line length[b]	Fiber attenuation	BLP/Dispersion
SFP-FAST-MM/LC EEC[d]	MM	1310 nm	62.5/125 µm	0 dB ... 11 dB	0 mi ... 2.49 mi (0 km ... 4 km)	1.0 dB/km	500 MHz×km
SFP-FAST-SM/LC[d]	SM	1310 nm	9/125 µm	0 dB ... 13 dB	0 mi ... 15.53 mi (0 km ... 25 km)	0.4 dB/km	3.5 ps/(nm×km)
SFP-FAST-SM/LC EEC[d]	SM	1310 nm	9/125 µm	0 dB ... 13 dB	0 mi ... 15.53 mi (0 km ... 25 km)	0.4 dB/km	3.5 ps/(nm×km)

Table 28: F/O port 100BASE-FX (SFP Fiber Optic Fast Ethernet Transceiver)

a. MM = Multimode, SM = Singlemode, LH = Singlemode Longhaul
b. Including 3 dB system reserve when compliance with the fiber data is observed.
c. With ultra-low-loss optical fiber.
d. You will find further information on certifications on the Internet on the Hirschmann product pages (www.hirschmann.com).

Product code	Mode[a]	Wave length	Fiber	System attenuation	Example for F/O cable length[b]	Fiber attenuation	BLP/Dispersion
-M2, -MM	MM	1300 nm	50/125 µm	0 dB ... 8 dB	0 mi ... 3.11 mi (0 km ... 5 km)	1.0 dB/km	800 MHz×km
-M2, -MM	MM	1300 nm	62.5/125 µm	0 dB ... 11 dB	0 mi ... 2.49 mi (0 km ... 4 km)	1.0 dB/km	500 MHz×km
-M4, -NN	SM	1300 nm	62.5/125 µm	0 dB ... 11 dB	0 mi ... 2.49 mi (0 km ... 4 km)	1.0 dB/km	500 MHz×km
-S2, -VV	SM	1300 nm	9/125 µm	0 dB ... 16 dB	0 mi ... 18.64 mi (0 km ... 30 km)	0.4 dB/km	3.5 ps/(nm×km)
-S4, -UU	SM	1300 nm	9/125 µm	0 dB ... 16 dB	0 mi ... 18.64 mi (0 km ... 30 km)	0.4 dB/km	3.5 ps/(nm×km)
-E2, EE	SM+	1300 nm	9/125 µm	7 dB ... 29 dB	12.43 mi ... 40.39 mi (25 km ... 65 km)	0.4 dB/km	3.5 ps/(nm×km)

Table 29: F/O port 100BASE-FX (DSC/DST fiber optic Fast Ethernet Transceiver)

Product code	Mode[a]	Wave length	Fiber	System attenuation	Example for F/O cable length[b]	Fiber attenuation	BLP/Dispersion
-L2, -LL	LH	1550 nm	9/125 µm	3 dB ... 29 dB	8.70 mi ... 64.62 mi (14 km ... 104 km)	0.25 dB/km	19 ps/(nm×km)
-G2, -GG	LH+	1550 nm	9/125 µm	14 dB ... 47 dB	41.63 mi ... 109.36 mi (67 km ... 176 km)	0.25 dB/km	19 ps/(nm×km)

Table 29: F/O port 100BASE-FX (DSC/DST fiber optic Fast Ethernet Transceiver)

a. MM = Multimode, SM = Singlemode, LH = Singlemode Longhaul
b. Including 3 dB system reserve when compliance with the fiber data is observed.

7.11.3 Gigabit Ethernet SFP transceiver

Product code M-SFP-...	Mode[a]	Wave length	Fiber	System attenuation	Example for F/O cable length[b]	Fiber attenuation	BLP[c]/ Dispersion
-SX/LC...	MM	850 nm	50/125 µm	0 dB ... 7.5 dB	0 mi ... 0.34 mi (0 km ... 0.55 km)	3.0 dB/km	400 MHz×km
-SX/LC...	MM	850 nm	62.5/125 µm	0 dB ... 7.5 dB	0 mi ... 0.17 mi (0 km ... 0.275 km)	3.2 dB/km	200 MHz×km
-MX/LC...	MM	1310 nm	50/125 µm	0 dB ... 12 dB	0 mi ... 0.93 mi (0 km ... 1.5 km)	1.0 dB/km	800 MHz×km
-MX/LC...	MM	1310 nm	62.5/125 µm	0 dB ... 12 dB	0 mi ... 31.06 mi (0 km ... 50 km)	1.0 dB/km	500 MHz×km
-LX/LC...	MM	1310 nm[d]	50/125 µm	0 dB ... 10.5 dB	0 mi ... 0.34 mi (0 km ... 0.55 km)	1.0 dB/km	800 MHz×km
-LX/LC...	MM	1310 nm[e]	62.5/125 µm	0 dB ... 10.5 dB	0 mi ... 0.34 mi (0 km ... 0.55 km)	1.0 dB/km	500 MHz×km
-LX/LC...	SM	1310 nm	9/125 µm	0 dB ... 10.5 dB	0 mi ... 12.43 mi (0 km ... 20 km)[f]	0.4 dB/km	3.5 ps/ (nm×km)

Table 30: F/O port 1000BASE-FX (SFP fiber optic Gigabit Ethernet Transceiver)

Product code M-SFP-...	Mode[a]	Wave length	Fiber	System attenuation	Example for F/O cable length[b]	Fiber attenuation	BLP[c]/ Dispersion
-LX+/LC...	SM	1310 nm	9/125 µm	5 dB ... 20 dB	8.70 mi ... 26.10 mi (14 km ... 42 km)	0.4 dB/km	3.5 ps/ (nm×km)
-LH/LC...	LH	1550 nm	9/125 µm	5 dB ... 22 dB	14.29 mi ... 49.71 mi (23 km ... 80 km)	0.25 dB/km	19 ps/ (nm×km)
-LH+/LC	LH	1550 nm	9/125 µm	15 dB ... 30 dB	44.12 mi ... 67.11 mi (71 km ... 108 km)	0.25 dB/km	19 ps/ (nm×km)
-LH+/LC	LH	1550 nm	9/125 µm	15 dB ... 30 dB	44.12 mi ... 79.54 mi (71 km ... 128 km)	0.21 dB/km (typically)	19 ps/ (nm×km)
-LH+/LC...	LH	1550 nm	9/125 µm	13 dB ... 32 dB	38.52 mi ... 72.07 mi (62 km ... 116 km)	0.25 dB/km	19 ps/ (nm×km)
-LH+/LC...	LH	1550 nm	9/125 µm	13 dB ... 32 dB	38.52 mi ... 85.75 mi (62 km ... 138 km)	0.21 dB/ km (typically)	19 ps/ (nm×km)
SFP-GIG-LX/LC...	MM	1310 nm[g]	50/125 µm	0 dB ... 10.5 dB	0 mi ... 0.34 mi (0 km ... 0.55 km)	1.0 dB/km	800 MHz×km
SFP-GIG-LX/LC...	MM	1310 nm[h]	62.5/125 µm	0 dB ... 10.5 dB	0 mi ... 0.34 mi (0 km ... 0.55 km)	1.0 dB/km	500 MHz×km
SFP-GIG-LX/LC...	SM	1310 nm	9/125 µm	0 dB ... 10.5 dB	0 mi ... 12.43 mi (0 km ... 20 km)[i]	0.4 dB/km	3.5 ps/ (nm×km)

Table 30: F/O port 1000BASE-FX (SFP fiber optic Gigabit Ethernet Transceiver)

a. MM = Multimode, SM = Singlemode, LH = Singlemode Longhaul
b. Including 3 dB system reserve when compliance with the fiber data is observed.
c. Using the bandwidth-length product is inappropriate for expansion calculations.
d. With F/O adapter compliant with IEEE 802.3-2002 Clause 38 (single-mode fiber offset-launch mode conditioning patch cord).
e. With F/O adapter compliant with IEEE 802.3-2002 Clause 38 (single-mode fiber offset-launch mode conditioning patch cord).
f. Including 2.5 dB system reserve when compliance with the fiber data is observed.
g. With F/O adapter compliant with IEEE 802.3-2002 Clause 38 (single-mode fiber offset-launch mode conditioning patch cord).
h. With F/O adapter compliant with IEEE 802.3-2002 Clause 38 (single-mode fiber offset-launch mode conditioning patch cord).

i. Including 2.5 dB system reserve when compliance with the fiber data is observed.

7.11.4 2.5 Gigabit Ethernet SFP transceiver

Product code M-SFP-2.5-...	Mode[a]	Wave length	Fiber	System attenuation	Example for F/O cable length	Fiber attenuation	BLP/dispersion
MM/LC EEC	MM	850 nm	50/125 µm	0 dB ... 4 dB	0.34 mi (0.55 km)	3.5 dB/km	2000 MHz×km (OM3)
MM/LC EEC	MM	850 nm	50/125 µm	0 dB ... 4 dB	0.25 mi (0.4 km)	3.5 dB/km	500 MHz×km (OM2)
MM/LC EEC	MM	850 nm	62.5/125 µm	0 dB ... 4 dB	0.11 mi (0.17 km)	3.5 dB/km	200 MHz×km (OM1)
SM-/LC EEC	SM	1310 nm	9/125 µm	0 dB ... 8.5 dB	3.11 mi (5 km)	0.4 dB/km	3.5 ps/(nm×km)
SM/LC EEC	SM	1310 nm	9/125 µm	0 dB ... 13 dB	12.43 mi (20 km)	0.4 dB/km	3.5 ps/(nm×km)
SM+/LC EEC	SM	1310 nm	9/125 µm	12 dB ... 25 dB	27.96 mi (45 km)	0.4 dB/km	3.5 ps/(nm×km)
LH/LC	SM	1551 nm	9/125 µm	14 dB ... 28 dB	80 km[b]	0.25 dB/km	19 ps/(nm×km)

Table 31: F/O port 2.5 Gbit/s (SFP fiber optic Gigabit Ethernet transceiver)

a. MM = Multimode, SM = Singlemode, LH = Singlemode Longhaul
b. Typically the DWDM (Dense Wave Division Multiplexing) links have filters because the remaining attenuation budget is consumed by the filters.For point-to-point connections without filters and with max. 1.5 dB of connector losses you can cover up to 59 mi (95 km).

7.11.5 Bidirectional Fast Ethernet SFP transceiver

Product code SFP-FAST-B...	Mode[a]	Wave length TX	Wave length RX	Fiber	System attenuation	Example for F/O cable length[b]	Fiber attenuation	Dispersion
SFP-FAST-BA MM/LC EEC	MM	1310 nm	1550 nm	50/125 µm 62.5/125 µm	0 dB ... 16 dB	0 mi ... 1.24 mi (0 km ... 2 km)	1.0 dB/km	800 MHz×km 500 MHz×km
SFP-FAST-BB MM/LC EEC	MM	1550 nm	1310 nm	50/125 µm 62.5/125 µm	0 dB ... 16 dB	0 mi ... 1.24 mi (0 km ... 2 km)	1.0 dB/km	800 MHz×km 500 MHz×km

Table 32: F/O port (bidirectional Fast Ethernet SFP transceiver)

Product code SFP-FAST-B...	Mode[a]	Wave length TX	Wave length RX	Fiber	System attenuation	Example for F/O cable length[b]	Fiber attenuation	Dispersion
SFP-FAST-BA SM/LC EEC	SM	1310 nm	1550 nm	9/125 µm	0 dB ... 18 dB	0 km ... 12.43 mi (0 km ... 20 km)	0.4 dB/km	3.5 ps/(nm×km)
SFP-FAST-BB SM/LC EEC	SM	1550 nm	1310 nm	9/125 µm	0 dB ... 18 dB	0 km ... 12.43 mi (0 km ... 20 km)	0.25 dB/km	19 ps/(nm×km)
SFP-FAST-BA SM+/LC EEC	SM	1310 nm	1550 nm	9/125 µm	0 dB ... 29 dB	0 mi ... 37.29 mi (0 km ... 60 km)	0.4 dB/km	3.5 ps/(nm×km)
SFP-FAST-BB SM+/LC EEC	SM	1550 nm	1310 nm	9/125 µm	0 dB ... 29 dB	0 mi ... 37.29 mi (0 km ... 60 km)	0.25 dB/km	19 ps/(nm×km)

Table 32: F/O port (bidirectional Fast Ethernet SFP transceiver)

a. MM = Multimode, SM = Singlemode, LH = Singlemode Longhaul
b. Including 3 dB system reserve when compliance with the fiber data is observed.

7.11.6 Bidirectional Gigabit Ethernet SFP transceiver

Product code SFP-GIG-B...	Mode[a]	Wave length TX	Wave length RX	Fiber	System attenuation	Example for F/O cable length[b]	Fiber attenuation	Dispersion
SFP-GIG-BA LX/ LC EEC	SM	1310 nm	1550 nm	9/125 µm	0 dB ... 15 dB	0 km ... 12.43 mi (0 km ... 20 km)	0.4 dB/km	3.5 ps/(nm×km)
SFP-GIG-BB LX/ LC EEC	SM	1550 nm	1310 nm	9/125 µm	0 dB ... 15 dB	0 km ... 12.43 mi (0 km ... 20 km)	0.25 dB/km	19 ps/(nm×km)
SFP-GIG-BA LX+/ LC EEC	SM	1310 nm	1550 nm	9/125 µm	3 dB ... 20 dB	7.45 mi ... 24.86 mi (12 km ... 40 km)	0.4 dB/km	3.5 ps/(nm×km)
SFP-GIG-BB LX+/ LC EEC	SM	1550 nm	1310 nm	9/125 µm	3 dB ... 20 dB	7.45 mi ... 24.86 mi (12 km ... 40 km)	0.25 dB/km	19 ps/(nm×km)

Table 33: F/O port (bidirectional Gigabit Ethernet SFP transceiver)

Product code SFP-GIG-B...	Mode[a]	Wave length TX	Wave length RX	Fiber	System attenuation	Example for F/O cable length[b]	Fiber attenuation	Dispersion
SFP-GIG-BA LH/ LC EEC	SM	1490 nm	1550 nm	9/125 µm	4 dB ... 24 dB	11.80 mi ... 49.71 mi (19 km ... 80 km)	0.25 dB/km	19 ps/(nm×km)
SFP-GIG-BB LH/ LC EEC	SM	1550 nm	1490 nm	9/125 µm	4 dB ... 24 dB	11.80 mi ... 49.71 mi (19 km ... 80 km)	0.25 dB/km	19 ps/(nm×km)

Table 33: F/O port (bidirectional Gigabit Ethernet SFP transceiver)

a. MM = Multimode, SM = Singlemode, LH = Singlemode Longhaul
b. Including 3 dB system reserve when compliance with the fiber data is observed.

7.12 Derating due to SFP transceiver

7.12.1 Fast Ethernet SFP transceiver

Product code	De-rating for a device with operating temperature +140 °F (+60 °C) per SFP transceiver used	De-rating for a device with operating temperature +158 °F (+70 °C) per SFP transceiver used	Order number
M-FAST SFP-MM/LC	0 K	**a**	943 865-001
M-FAST SFP-MM/LC EEC	0 K	0 K	943 945-001
M-FAST SFP-SM/LC	0 K	**a**	943 866-001
M-FAST SFP-SM/LC EEC	0 K	0 K	943 946-001
M-FAST SFP-SM+/LC	0 K	**a**	943 867-001
M-FAST SFP-SM+/LC EEC	0 K	0 K	943 947-001
M-FAST SFP-LH/LC	0 K	**a**	943 868-001

Table 34: De-rating due to Fast Ethernet SFP transceivers

Product code	De-rating for a device with operating temperature +140 °F (+60 °C) per SFP transceiver used	De-rating for a device with operating temperature +158 °F (+70 °C) per SFP transceiver used	Order number
M-FAST SFP-LH/LC EEC	0 K	0 K	943 948-001
M-FAST SFP-TX/RJ45	0 K	**a**	942 098-001
M-FAST SFP-TX/RJ45 EEC	0 K	0 K	942 098-002
SFP-FAST-MM/LC	0 K	**a**	942 194-001
SFP-FAST-MM/LC EEC	0 K	0 K	942 194-002
SFP-FAST-SM/LC	0 K	**a**	942 195-001
SFP-FAST-SM/LC EEC	0 K	0 K	942 195-002

Table 34: De-rating due to Fast Ethernet SFP transceivers

a - By using a SFP transceiver without “EEC” extension, the temperature of the device is reduced by 15 K.

7.12.2 Gigabit Ethernet SFP transceiver

Product code	De-rating for a device with operating temperature +140 °F (+60 °C) per SFP transceiver used	De-rating for a device with operating temperature +158 °F (+70 °C) per SFP transceiver used	Order number
M-SFP-SX/LC	0 K	**a**	943 014-001
M-SFP-SX/LC EEC	0 K	0 K	943 896-001
M-SFP-LX/LC	0 K	**a**	943 015-001
M-SFP-LX/LC EEC	0 K	0 K	943 897-001
M-SFP-LH/LC	2 K	**a**	943 042-001
M-SFP-LH/LC EEC	0 K	2 K	943 898-001
M-SFP-LH+/LC	2 K	**a**	943 049-001
M-SFP-TX/RJ45	3 K	**a**	943 977-001
M-SFP-TX/RJ45 EEC	0 K	3 K	942 161-001
SFP-GIG-LX/LC	0 K	**a**	942 196-001

Table 35: De-rating due to Gigabit Ethernet SFP transceivers

Product code	De-rating for a device with operating temperature +140 °F (+60 °C) per SFP transceiver used	De-rating for a device with operating temperature +158 °F (+70 °C) per SFP transceiver used	Order number
SFP-GIG-LX/LC EEC	0 K	0 K	942 196-002
M-SFP-LX+/LC	0 K	**a**	942 023-001
M-SFP-LX+/LC EEC	0 K	0 K	942 024-001
M-SFP-LH+/LC EEC	0 K	2 K	942 119-001
M-SFP-MX/LC EEC	0 K	2 K	942 108-001

Table 35: De-rating due to Gigabit Ethernet SFP transceivers

a - By using a SFP transceiver without “EEC” extension, the temperature of the device is reduced by 15 K.

7.12.3 2.5 Gigabit Ethernet SFP transceiver

Product code	De-rating for a device with operating temperature +140 °F (+60 °C) per SFP transceiver used	De-rating for a device with operating temperature +158 °F (+70 °C) per SFP transceiver used	Order number
M-SFP-2.5-MM/LC EEC	0 K	0 K	942 162-001
M-SFP-2.5-SM-/LC EEC	0 K	0 K	942 163-001
M-SFP-2.5-SM/LC EEC	0 K	2 K	942 164-001
M-SFP-2.5-SM+/LC EEC	0 K	0 K	942 165-001
M-SFP-2.5-LH/LC	2 K	**a**	942 220-001

Table 36: De-rating due to 2.5 Gigabit Ethernet SFP transceivers

a - By using a SFP transceiver without “EEC” extension, the temperature of the device is reduced by 15 K.

7.12.4 Bidirectional Fast Ethernet SFP transceiver

Product code	De-rating for a device with operating temperature +140 °F (+60 °C) per SFP transceiver used	De-rating for a device with operating temperature +158 °F (+70 °C) per SFP transceiver used	Order number
SFP-FAST-BA MM/LC EEC	0 K	0 K	942 204-001
SFP-FAST-BB MM/LC EEC	0 K	0 K	942 204-002
SFP-FAST-BA SM/LC EEC	0 K	0 K	942 205-001
SFP-FAST-BB SM/LC EEC	0 K	0 K	942 205-002
SFP-FAST-BA SM+/LC EEC	0 K	0 K	942 206-001
SFP-FAST-BB SM+/LC EEC	0 K	0 K	942 206-002

Table 37: De-rating due to bidirectional Fast Ethernet SFP transceivers

7.12.5 Bidirectional Gigabit Ethernet SFP transceiver

Product code	De-rating for a device with operating temperature +140 °F (+60 °C) per SFP transceiver used	De-rating for a device with operating temperature +158 °F (+70 °C) per SFP transceiver used	Order number
SFP-GIG-BA LX/LC EEC	0 K	0 K	942 207-001
SFP-GIG-BB LX/LC EEC	0 K	0 K	942 207-002
SFP-GIG-BA LX+/LC EEC	0 K	0 K	942 208-001
SFP-GIG-BB LX+/LC EEC	0 K	0 K	942 208-002
SFP-GIG-BA LH/LC EEC	0 K	0 K	942 209-001
SFP-GIG-BB LH/LC EEC	0 K	0 K	942 209-002

Table 38: De-rating due to bidirectional Gigabit Ethernet SFP transceivers

8 Scope of delivery

Scope of delivery	
1 ×	Device
1 ×	Safety and general information sheet
1 ×	Terminal block for supply voltage and signal contact
1 ×	Terminal block for the digital input depending on device variant
2 ×	Ferrites with key depending on device variant See “Connecting the ferrite (optional)” on page 41.

Table 39: Scope of delivery

9 Accessories

9.1 General accessories

General accessories You find more information on available accessories in the Belden Online Catalog https://catalog.belden.com	
AutoConfiguration Adapter ACA22-USB-C (EEC)	942-239-001
6-pin terminal block with screw lock (10 pieces)	972 272-303
6-pin terminal block with screw lock (50 pieces)	943 845-013
2-pin terminal block with screw lock (10 pieces)	972 272-201
2-pin terminal block with screw lock (50 pieces)	943 845-009
Industrial HiVision Network Management Software	943 156-xxx

Table 40: Accessories: General accessories

9.2 Order numbers for standard variants

Name	Order number
BRS20-4TX	942 170-001
BRS20-8TX	942 170-002
BRS20-4TX/2FX	942 170-003
BRS20-8TX/2FX	942 170-004
BRS20-4TX/2FX-SM	942 170-005
BRS20-8TX/2FX-SM	942 170-006
BRS20-4TX-EEC	942 170-011
BRS20-8TX-EEC	942 170-012
BRS20-4TX/2FX-EEC	942 170-013
BRS20-8TX/2FX-EEC	942 170-014
BRS20-4TX/2FX-SM-EEC	942 170-015
BRS20-8TX/2FX-SM-EEC	942 170-016
BRS20-4TX/2SFP	942 170-021
BRS20-4TX/2SFP-EEC	942 170-022
BRS20-4TX-HL	942 170-023
BRS20-8TX-HL	942 170-024
BRS20-4TX/2FX-HL	942 170-025
BRS20-8TX/2FX-HL	942 170-026
BRS20-4TX/2FX-SM-HL	942 170-027
BRS20-8TX/2FX-SM-HL	942 170-028
BRS20-4TX/2SFP-HL	942 170-029
BRS20-4TX-EEC-HL	942 170-034

Table 41: Order numbers for standard variants in plastic casing

Name	Order number
BRS20-8TX-EEC-HL	942 170-035
BRS20-4TX/2FX-EEC-HL	942 170-036
BRS20-8TX/2FX-EEC-HL	942 170-037
BRS20-4TX/2FX-SM-EEC-HL	942 170-038
BRS20-8TX/2FX-SM-EEC-HL	942 170-039
BRS20-4TX/2SFP-EEC-HL	942 170-040
BRS30-8TX/4SFP	942 170-007
BRS30-8TX/4SFP-EEC	942 170-017
BRS30-8TX/4SFP-HL	942 170-030
BRS30-8TX/4SFP-EEC-HL	942 170-041
BRS40-8TX	942 170-008
BRS40-8TX/4SFP	942 170-009
BRS40-8TX-EEC	942 170-018
BRS40-8TX/4SFP-EEC	942 170-019
BRS40-8TX/4SFP-HL	942 170-032
BRS40-8TX-HL	942 170-031
BRS40-8TX-EEC-HL	942-170-042
BRS40-8TX/4SFP-EEC-HL	942-170-043
BRS50-8TX/4SFP	942 170-010
BRS50-8TX/4SFP-EEC	942 170-020
BRS50-8TX/4SFP-HL	942 170-033
BRS50-8TX/4SFP-EEC-HL	942 170-044

Table 41: Order numbers for standard variants in plastic casing

9.3 Fast Ethernet SFP transceiver

Fast Ethernet SFP transceiver	Order number
M-FAST SFP-TX/RJ45	942 098-001
M-FAST SFP-TX/RJ45 EEC	942 098-002
The following operating conditions apply to twisted pair transceivers: ▶ Longer RSTP switching times and link loss detection times compared to twisted pair ports provided by the device directly. ▶ It is currently not possible to set autocrossing manually.	
M-FAST SFP-MM/LC	943 865-001
M-FAST SFP-MM/LC EEC	943 945-001
M-FAST SFP-SM/LC	943 866-001
M-FAST SFP-SM/LC EEC	943 946-001
M-FAST SFP-SM+/LC	943 867-001
M-FAST SFP-SM+/LC EEC	943 947-001
M-FAST SFP-LH/LC	943 868-001
M-FAST SFP-LH/LC EEC	943 948-001
SFP-FAST-MM/LC[a]	942 194-001
SFP-FAST-MM/LC EEC[a]	942 194-002

Table 42: Accessory: Fast Ethernet SFP transceiver

Fast Ethernet SFP transceiver	Order number
SFP-FAST-SM/LC[a]	942 195-001
SFP-FAST-SM/LC EEC[a]	942 195-002

Table 42: Accessory: Fast Ethernet SFP transceiver

a. You will find further information on certifications on the Internet on the Hirschmann product pages (www.hirschmann.com).

9.4 Gigabit Ethernet SFP transceiver

Gigabit Ethernet SFP transceiver	Order number
M-SFP-TX/RJ45	943 977-001
M-SFP-TX/RJ45 EEC	942 161-001
The following operating conditions apply to twisted pair transceivers: ▶ Longer RSTP switching times and link loss detection times compared to twisted pair ports provided by the device directly. ▶ Cannot be used with Fast Ethernet ports. ▶ Exclusively supports the autonegotiation mode including autocrossing.	
M-SFP-SX/LC	943 014-001
M-SFP-SX/LC EEC	943 896-001
M-SFP-MX/LC EEC	942 108-001
M-SFP-LX/LC	943 015-001
M-SFP-LX/LC EEC	943 897-001
M-SFP-LX+/LC	942 023-001
M-SFP-LX+/ LC EEC	942 024-001
M-SFP-LH/LC	943 042-001
M-SFP-LH/LC EEC	943 898-001
M-SFP-LH+/LC	943 049-001
M-SFP-LH+/LC EEC	942 119-001
SFP-GIG-LX/LC[a]	942 196-001
SFP-GIG-LX/LC EEC[a]	942 196-002

Table 43: Accessory: Gigabit Ethernet SFP transceiver

a. You will find further information on certifications on the Internet on the Hirschmann product pages (www.hirschmann.com).

9.5 2.5 Gigabit Ethernet SFP transceiver

2.5 Gigabit Ethernet SFP transceiver	Order number
M-SFP-2.5-MM/LC EEC	942 162-001
M-SFP-2.5-SM-/LC EEC	942 163-001
M-SFP-2.5-SM/LC EEC	942 164-001

Table 44: Accessory: 2.5 Gigabit Ethernet SFP transceiver

2.5 Gigabit Ethernet SFP transceiver	Order number
M-SFP-2.5-SM+/LC EEC	942 165-001
M-SFP-2.5-LH/LC	942 220-001

Table 44: Accessory: 2.5 Gigabit Ethernet SFP transceiver

9.6 Bidirectional Fast Ethernet SFP transceiver

Bidirectional Fast Ethernet SFP transceivers[a]	Order number
SFP-FAST-BA MM/LC EEC	942 204-001
SFP-FAST-BB MM/LC EEC	942 204-002
SFP-FAST-BA SM/LC EEC	942 205-001
SFP-FAST-BB SM/LC EEC	942 205-002
SFP-FAST-BA SM+/LC EEC	942 206-001
SFP-FAST-BB SM+/LC EEC	942 206-002

Table 45: Accessory: Bidirectional Fast Ethernet SFP transceiver

a. You find further information on certifications on the Internet on the Hirschmannproduct pages (www.hirschmann.com).

9.7 Bidirectional Gigabit Ethernet SFP transceiver

Bidirectional Gigabit Ethernet SFP Transceivers[a]	Order number
SFP-GIG-BA LX/LC EEC	942 207-001
SFP-GIG-BB LX/LC EEC	942 207-002
SFP-GIG-BA LX+/LC EEC	942 208-001
SFP-GIG-BB LX+/LC EEC	942 208-002
SFP-GIG-BA LH/LC EEC	942 209-001
SFP-GIG-BB LH/LC EEC	942 209-002

Table 46: Accessories: Bidirectional Gigabit Ethernet SFP transceivers

a. You find further information on certifications on the Internet on the Hirschmann product pages (www.hirschmann.com).

10 Underlying technical standards

Name	
ANSI/UL 121201	Nonincendive Electrical Equipment for Use in Class I and II, Division 2 and Class III, Divisions 1 and 2 Hazardous (Classified) Locations
DNVGL-CG-0339	Environmental test specification for electrical, electronic and programmable equipment and systems.
FCC 47 CFR Part 15	Code of Federal Regulations
NEMA TS 2	Traffic Controller Assemblies with NTCIP Requirements (environmental requirements)
RCM	Australian Regulatory Compliance Mark (RCM) Australian Radiocommunications Standard 2008, Radiocommunications Act 1992
UL/IEC 61010-2-201	Safety for Control Equipment
EN 50121-4	Railway applications – EMC – Emission and immunity of the signaling and telecommunications apparatus (Rail Trackside)
EN 55032	Electromagnetic compatibility of multimedia equipment – Emission Requirements
EN 62368-1	Equipment for audio/video, information and communication technology - Part 1: safety requirements
EN 61000-6-2	Electromagnetic compatibility (EMC) – Part 6-2: Generic standards – Immunity for industrial environments
EN 61131-2	Programmable controllers – Part 2: Equipment requirements and tests
IEEE 802.3	Ethernet

Table 47: List of the technical standards

The device has an approval based on a specific standard exclusively if the approval indicator appears on the device casing.
If your device has a shipping approval according to DNV GL, you find the approval mark printed on the device label. You will find out whether your device has other shipping approvals on the Hirschmann website at www.hirschmann.com in the product information.
The device generally fulfills the technical standards named in their current versions.

A Further support

Technical questions

For technical questions, please contact any Hirschmann dealer in your area or Hirschmann directly.

You find the addresses of our partners on the Internet at http://www.hirschmann.com.

A list of local telephone numbers and email addresses for technical support directly from Hirschmann is available at https://hirschmann-support.belden.com.

This site also includes a free of charge knowledge base and a software download section.

Hirschmann Competence Center

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- Training offers you an introduction to the basics, product briefing and user training with certification.
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