



**HIRSCHMANN**

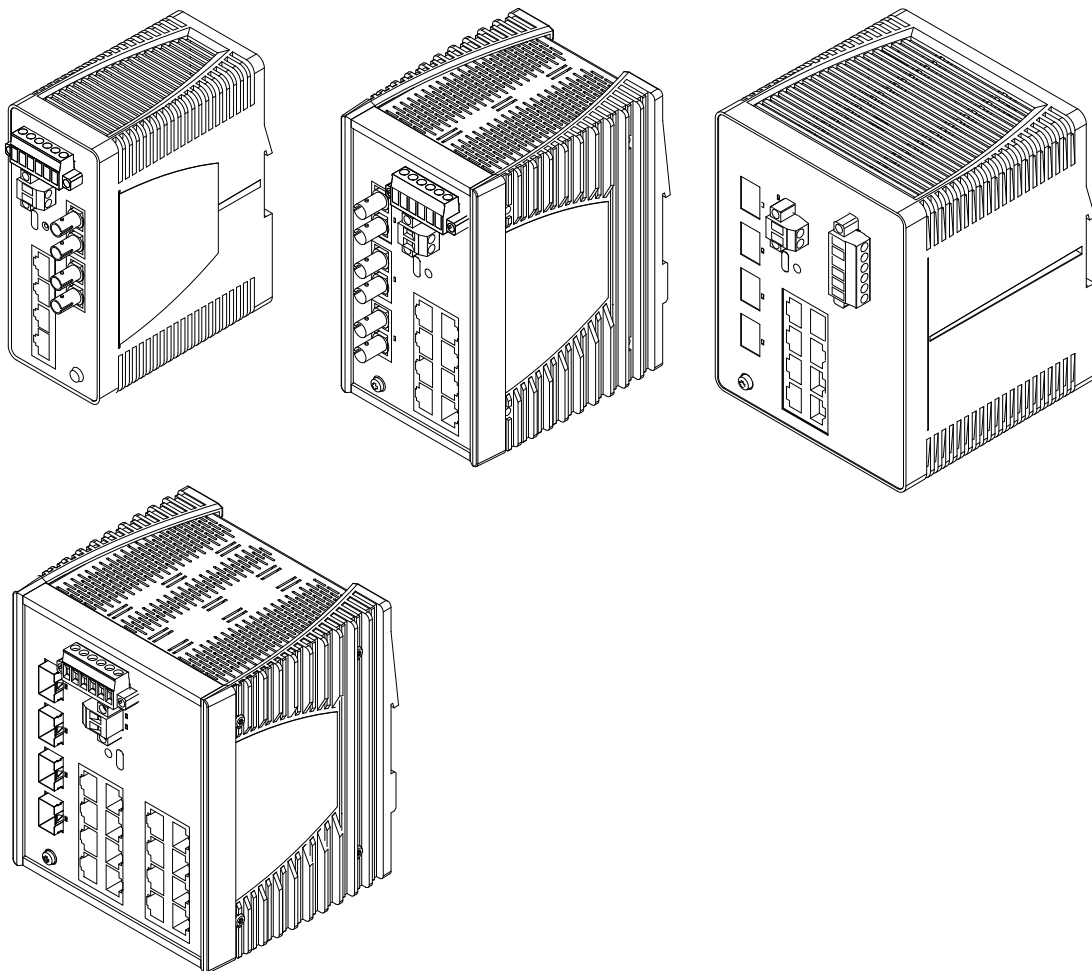
A **BELDEN** BRAND

# User Manual

## Installation

### Industrial Ethernet BOBCAT Rail Switch

### BRS20/22/30/32/40/42/50/52



The naming of copyrighted trademarks in this manual, even when not specially indicated, should not be taken to mean that these names may be considered as free in the sense of the trademark and tradename protection law and hence that they may be freely used by anyone.

© 2021 Hirschmann Automation and Control GmbH

Manuals and software are protected by copyright. All rights reserved. The copying, reproduction, translation, conversion into any electronic medium or machine scannable form is not permitted, either in whole or in part. An exception is the preparation of a backup copy of the software for your own use.

The performance features described here are binding only if they have been expressly agreed when the contract was made. This document was produced by Hirschmann Automation and Control GmbH according to the best of the company's knowledge. Hirschmann reserves the right to change the contents of this document without prior notice. Hirschmann can give no guarantee in respect of the correctness or accuracy of the information in this document.

Hirschmann can accept no responsibility for damages, resulting from the use of the network components or the associated operating software. In addition, we refer to the conditions of use specified in the license contract.

You can get the latest version of this manual on the Internet at:  
<https://www.doc.hirschmann.com>

Hirschmann Automation and Control GmbH  
Stuttgarter Str. 45-51  
72654 Neckartenzlingen  
Germany

# Contents

Important information	6
Safety instructions	8
About this manual	21
Key	22
1 Description	23
1.1 General device description	23
1.2 Device name and product code	24
1.3 Device views	29
1.3.1 Front view	29
1.3.2 Rear view	32
1.4 Power supply	33
1.4.1 Supply voltage with characteristic value T	33
1.4.2 Supply voltage with characteristic value F	33
1.4.3 Supply voltage with characteristic value U	33
1.4.4 Supply voltage with characteristic value P	33
1.5 Ethernet ports	34
1.5.1 10/100 Mbit/s twisted pair port	34
1.5.2 10/100/1000 Mbit/s twisted pair port	34
1.5.3 100 Mbit/s F/O port	35
1.5.4 100/1000 Mbit/s F/O port	36
1.5.5 100/1000/2500 Mbit/s F/O port	36
1.5.6 Support of PoE(+)	37
1.6 Display elements	38
1.6.1 Device state	38
1.6.2 Port status	39
1.7 Management interfaces	42
1.7.1 Signal contact	42
1.7.2 USB-C interface	43
1.7.3 Digital input	44
2 Installation	45

2.1	Checking the package contents	45
2.2	Installing and grounding the device	45
2.2.1	Installing the device onto the DIN rail	45
2.2.2	Grounding the device	47
2.2.3	Connecting the ferrite (optional)	47
2.3	Installing an SFP transceiver (optional)	48
2.4	Connecting the terminal blocks	48
2.4.1	Power supply	48
2.4.2	Signal contact (optional)	53
2.4.3	Digital input (optional)	54
2.5	Operating the device	55
2.6	Connecting data cables	56
2.7	Filling out the inscription label	56
3	Making basic settings	57
3.1	First login (Password change)	58
4	Monitoring the ambient air temperature	59
5	Maintenance and service	60
6	Disassembly	61
6.1	Removing an SFP transceiver (optional)	61
6.2	Removing the device	62
7	Technical data	63
7.1	General data	63
7.2	Supply voltage	67
7.3	Power consumption/power output	69
7.4	Signal contact	70
7.5	Digital input	71
7.6	Climatic conditions during operation	72
7.7	Climatic conditions during storage	73
7.8	Dimension drawings	74
7.8.1	Device variants with casing with characteristic value C (plastic casing)	74

7.8.2	Device variants with casing with characteristic value E/D (metal casing)	77
7.9	Immunity	80
7.10	Electromagnetic compatibility (EMC)	80
7.11	Network range	82
7.11.1	10/100/1000 Mbit/s twisted pair port	82
7.11.2	Fast Ethernet SFP transceiver	82
7.11.3	Gigabit Ethernet SFP transceiver	83
7.11.4	2.5 Gigabit Ethernet SFP transceiver	85
7.11.5	Bidirectional Fast Ethernet SFP transceiver	85
7.11.6	Bidirectional Gigabit Ethernet SFP transceiver	86
7.12	Derating due to SFP transceiver	87
7.12.1	Fast Ethernet SFP transceiver	87
7.12.2	Gigabit Ethernet SFP transceiver	88
7.12.3	2.5 Gigabit Ethernet SFP transceiver	89
7.12.4	Bidirectional Fast Ethernet SFP transceiver	89
7.12.5	Bidirectional Gigabit Ethernet SFP transceiver	90
8	Scope of delivery	91
9	Accessories	92
9.1	General accessories	92
9.2	Order numbers for standard variants	92
9.3	Fast Ethernet SFP transceiver	94
9.4	Gigabit Ethernet SFP transceiver	95
9.5	2.5 Gigabit Ethernet SFP transceiver	96
9.6	Bidirectional Fast Ethernet SFP transceiver	96
9.7	Bidirectional Gigabit Ethernet SFP transceiver	97
10	Underlying technical standards	98
A	Further support	99

# Important information

**Note:** Read these instructions carefully, and familiarize yourself with the device before trying to install, operate, or maintain it. The following notes may appear throughout this documentation or on the device. These notes warn of potential hazards or call attention to information that clarifies or simplifies a procedure.

## ■ Symbol explanation



This is a general warning symbol. This symbol alerts you to potential personal injury hazards. Observe all safety notes that follow this symbol to avoid possible injury or death.



If this symbol is displayed in addition to a safety instruction of the type “Danger” or “Warning”, it means that there is a danger of electric shock and failure to observe the instructions will inevitably result in injury.



This symbol indicates the danger of hot surfaces on the device. In connection with safety instructions, non-observance of the instructions will inevitably result in injuries.



## DANGER

**DANGER** draws attention to an immediately dangerous situation, which will **inevitably** result in a serious or fatal accident if not observed.



## WARNING

**WARNING** indicates a potentially hazardous situation which, if not avoided, **could** result in death or serious injury.



## CAUTION

**CAUTION** indicates a possible danger which, if not avoided, **may** result in minor injuries.

# NOTICE

**NOTE** provides information about procedures that do not involve the risk of injury.

# 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.**

### ■ Strain relief

**Note:** If the strain relief is insufficient, there is a potential risk of torsion, contact problems and creeping interruptions.

- ☐ Relieve the connection points of cables and lines from mechanical stress.
- ☐ Design strain reliefs in such a way that they help prevent any mechanical damage to cables, wires or conductors caused by external influences or their own weight.
- ☐ To help prevent damage to device connections, connectors and cables, follow the instructions for proper installation in accordance with DIN VDE 0100-520:2013-06, sections 522.6, 522.7 and 522.13.

### ■ 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 63.](#)
  - ☐ 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. 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 63.](#)
- 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 74.](#)
  - ☐ 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 °C (36 °F) 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 voltage connected complies with the requirements for a safety extra-low voltage (SELV) as per IEC 60950-1 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 63.](#)
-

- 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:

- ▶ 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) according to IEC 60950-1 or ES1 according to 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 mm<sup>2</sup> (North America: AWG18) on the supply voltage input.  
The wire diameter of the power supply cable is at least 1 mm<sup>2</sup> (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	<p><b>All</b> of the following requirements are complied with:</p> <p>Supply with DC voltage:</p> <ul style="list-style-type: none"> <li>▶ 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: <a href="#">See “Technical data” on page 63.</a></li> <li>▶ The negative conductors of the voltage inputs are on ground potential.</li> </ul>
Device variants featuring supply voltage with characteristic value F	<p><b>All</b> of the following requirements are complied with:</p> <p>Supply with AC voltage:</p> <ul style="list-style-type: none"> <li>▶ There are fuses in the supply lines, or the voltage sources are appropriately current-limited. Regarding the properties of this fuse: <a href="#">See “Technical data” on page 63.</a></li> <li>▶ The power sources are electrically isolated from the ground potential.</li> </ul>
Device variants featuring supply voltage with characteristic value P	<p><b>All</b> of the following requirements are complied with:</p> <ul style="list-style-type: none"> <li>▶ 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: <a href="#">See “Technical data” on page 63.</a></li> <li>▶ 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.</li> </ul>

**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.

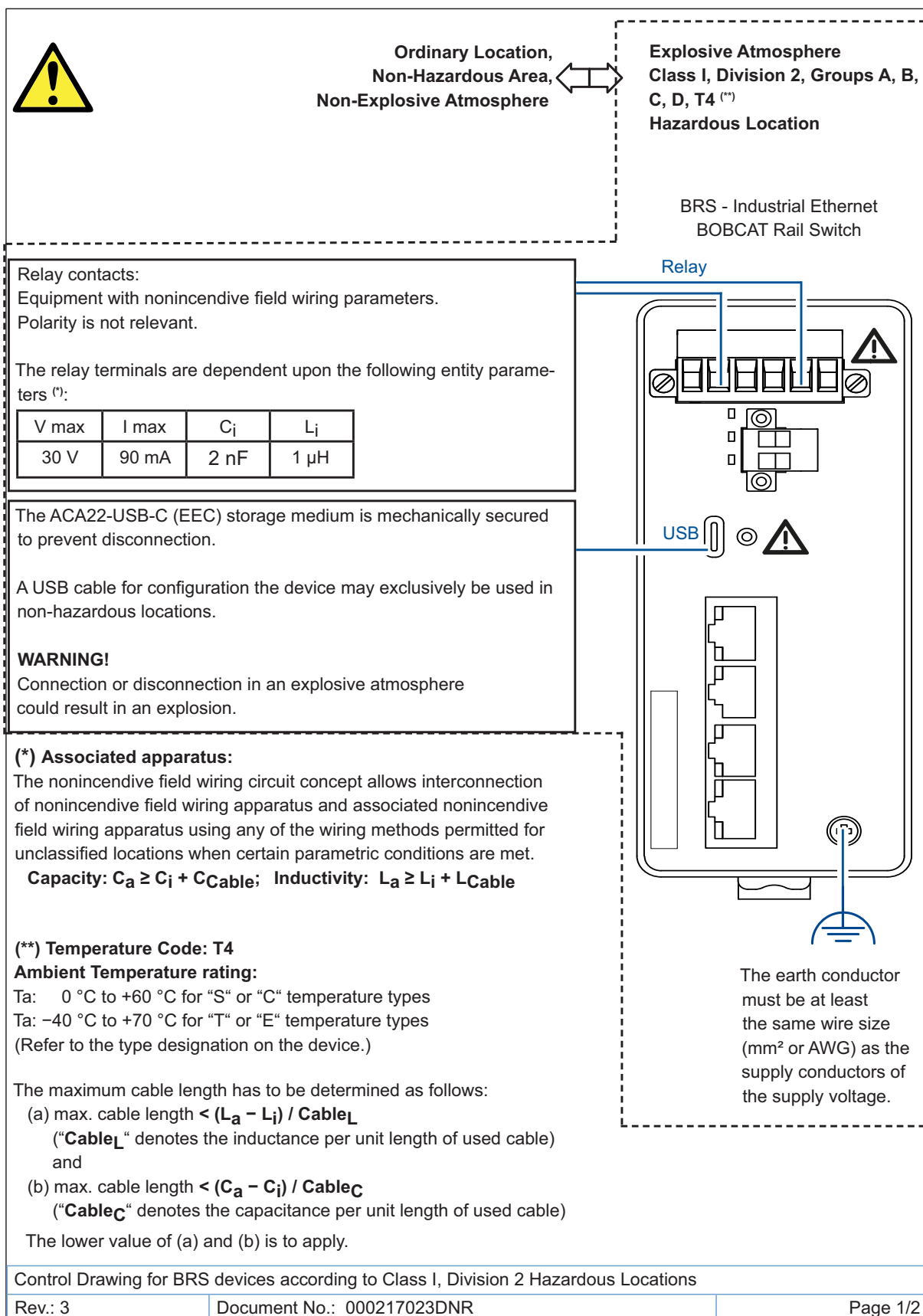
**WARNING!**

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

**AVERTISSEMENT!**

**Avertissement** - Le branchement ou le débranchement dans une atmosphère explosive peut entraîner une explosion.

---



**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.**

Control Drawing for BRS devices according to Class I, Division 2 Hazardous Locations

Rev.: 3

Document No.: 000217023DNR

Page 2/2

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

The following applies to BRS devices if you operate them in areas with explosive gases according to ATEX directive 2014/34/EU:

☐ 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**

**T4: 0 °C (+32 °F) ≤ Ta ≤ +60 °C (+140 °F) for "S" or "C" types**  
(position 16 of nomenclature breakdown)


**T4: -40 °C (-40 °F) ≤ Ta ≤ +70 °C (+158 °F) for "T", "E" or "G" types**  
(position 16 of nomenclature breakdown)

- ☐ The equipment is suitable for use in an area with maximum pollution degree 2, as defined in IEC 60664-1.
- ☐ The modules shall be installed in a suitable enclosure in accordance with IEC 60079-0 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 (+158 °F) at the cable or the conduit entry point, or +80 °C (+176 °F) at the branching point of the conductors, take measures so that the temperature specification of the selected cable and cable entries is 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.

- UK regulation S.I. 2016:1107  
(as amended by S.I. 2019:696) - Schedule 3A, Part 6  
The following applies to BRS devices if you operate them in areas with explosive gases:

- ☐ 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 21UKEX0040X**

**T4: 0 °C (+32 °F) ≤ Ta ≤ +60 °C (+140 °F) for "S" or "C" types**  
(position 16 of nomenclature breakdown)

**T4: -40 °C (-40 °F) ≤ Ta ≤ +70 °C (+158 °F) for "T", "E" or "G" types**  
(position 16 of nomenclature breakdown)

- ☐ The equipment is suitable for use in an area with maximum pollution degree 2, as defined in IEC 60664-1.
- ☐ The modules shall be installed in a suitable enclosure in accordance with IEC 60079-0 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 (+158 °F) at the cable or the conduit entry point, or +80 °C (+176 °F) at the branching point of the conductors, take measures so that the temperature specification of the selected cable and cable entries is 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 60079-7:2017
  - IEC 60079-15:2017
- ☐ Make sure that the device has the following label:  
**Ex ec nC IIC T4 Gc                      IECEx: DEK 20.0079 X**

**T4: 0 °C (+32 °F) ≤ Ta ≤ +60 °C (+140 °F) for “S” or “C” types**  
(position 16 of nomenclature breakdown) or

**T4: -40 °C (-40 °F) ≤ Ta ≤ +70 °C (+158 °F) for “T”, “E” or “G” types**  
(position 16 of nomenclature breakdown)

- ☐ The equipment is suitable for use in an area with maximum pollution degree 2, as defined in IEC 60664-1.
- ☐ The modules shall be installed in a suitable enclosure in accordance with IEC 60079-0 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 (+158 °F) at the cable or the conduit entry point, or +80 °C (+176 °F) at the branching point of the conductors, take measures so that the temperature specification of the selected cable and cable entries is 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.
- ▶ 2014/34/EU (ATEX)  
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.

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 15.

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

You find the EU conformity declaration as PDF file for downloading on the Internet at: <https://www.doc.hirschmann.com/certificates.html>

The device can be used in industrial environments.

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

You find more information on technical standards here:

“Technical data” on page 63

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.

■ UKCA marking

The labeled devices comply with the following UK regulations:

- ▶ S.I. 2012 No. 3032 Restriction of the Use of Certain Hazardous Substances in Electrical and Electronical Equipment Regulations
- ▶ S.I. 2016/1091 Electromagnetic Compatibility Regulations 2016
- ▶ S.I. 2016/1107 Equipment and Protective Systems Intended for use in Potentially Explosive Atmospheres Regulations 2016

**Note:** The regulation applies exclusively to the device variants labeled with a UKEX certificate number: [See “UK regulation S.I. 2016:1107 \(as amended by S.I. 2019:696\) - Schedule 3A, Part 6” on page 16.](#)



The UKCA conformity declaration will be available to the relevant authorities at the following address:

Belden UK Ltd.  
1 The Technology Centre, Station Road  
Framlingham, IP13 9EZ, United Kingdom

You find the UKCA conformity declaration as PDF file for downloading on the Internet at: <https://www.doc.hirschmann.com/certificates.html>

## ■ 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 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 at: <https://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	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	16 × 100/1000-Mbit/s ports + 4 × 100/1000/ 2500 Mbit/s ports
		24	24 × 100/1000 Mbit/s ports
		24	20 × 100/1000-Mbit/s ports + 4 × 100/1000/ 2500 Mbit/s ports

*Table 1: Device name and product code*

Item	Characteristic	Characteristic value	Description
11 ... 12	Configuration of the first uplink ports	99	Identical to the standard ports or not present ▶ Standard ports for BRS20/22/30/32: 10/100 Mbit/s ▶ Standard ports for BRS40/42/50/52: 10/100/1000 Mbit/s
		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
		2T	2 × RJ45 socket for 10/100/1000 Mbit/s Twisted Pair connections

Table 1: Device name and product code

Item	Characteristic	Characteristic value	Description
13 ... 14	Configuration of the second uplink ports	99	Identical to the standard ports or not present ► Standard ports for BRS20/22/30/32: 10/100 Mbit/s ► Standard ports for BRS40/42/50/52: 10/100/1000 Mbit/s
		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
		2T	2 × RJ45 socket for 10/100/1000 Mbit/s Twisted Pair connections
15	(hyphen)	–	
16	Temperature range	S	Standard 0 °C ... +60 °C (+32 °F ... +140 °F)
		C	Standard with Conformal Coating 0 °C ... +60 °C (+32 °F ... +140 °F)
		T	Extended -40 °C ... +70 °C (-40 °F ... +158 °F)
		E	Extended with Conformal Coating -40 °C ... +70 °C (-40 °F ... +158 °F)
		G	Extended with Conformal Coating, glued -40 °C ... +70 °C (-40 °F ... +158 °F)
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 <sup>a</sup> Part A	Z	CE, FCC, EN 61131-2, EN 62368-1, (NEMA TS2 <sup>b</sup> )
		Y	Z + cUL 61010
		X	cUL 61010 + ANSI/UL 121201
		V	Z + IEC 61850-3
		U	Z + DNV GL
		W	Z + ATEX/IECEX
		S	Z + DNV GL + extended ship approval
		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
		W	ATEX/IECEX
		S	Z + DNV GL + extended ship approval
		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)
		P	PROFINET
26	Software level	S	HiOS Layer 2 Standard
		A	HiOS Layer 2 Advanced
27 ... 31	Software version	08.7.	Software version 08.7.
		XX.X	Current software version
32 ... 33	Maintenance	00	Bugfix version 00
		XX	Current bugfix version

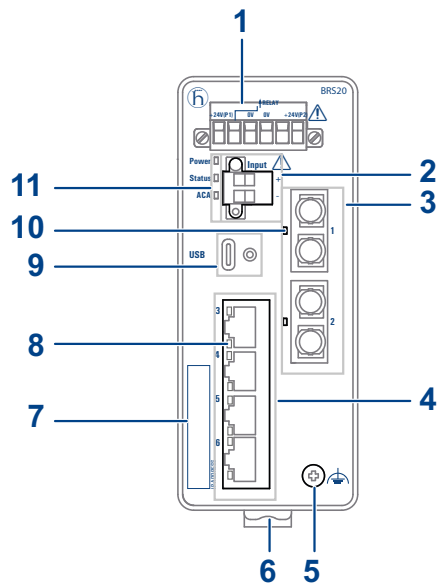
**Table 1: Device name and product code**

- 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](http://www.hirschmann.com)
- b. Applies exclusively to device variants with extended temperature range.

## 1.3 Device views

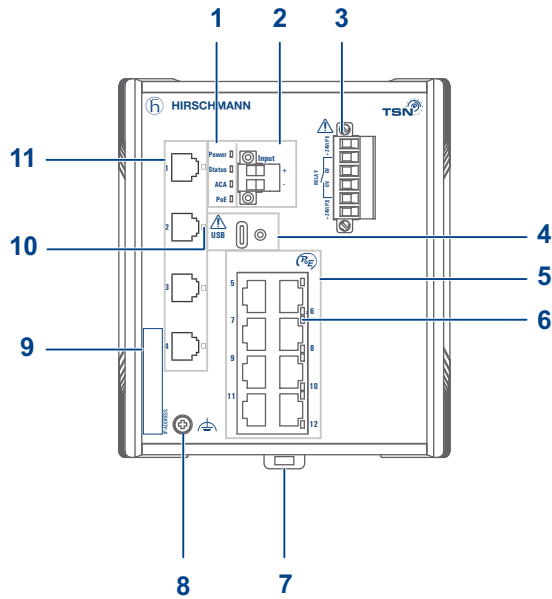
### 1.3.1 Front view

■ Example of a device variant with 4 ... 6 ports without PoE



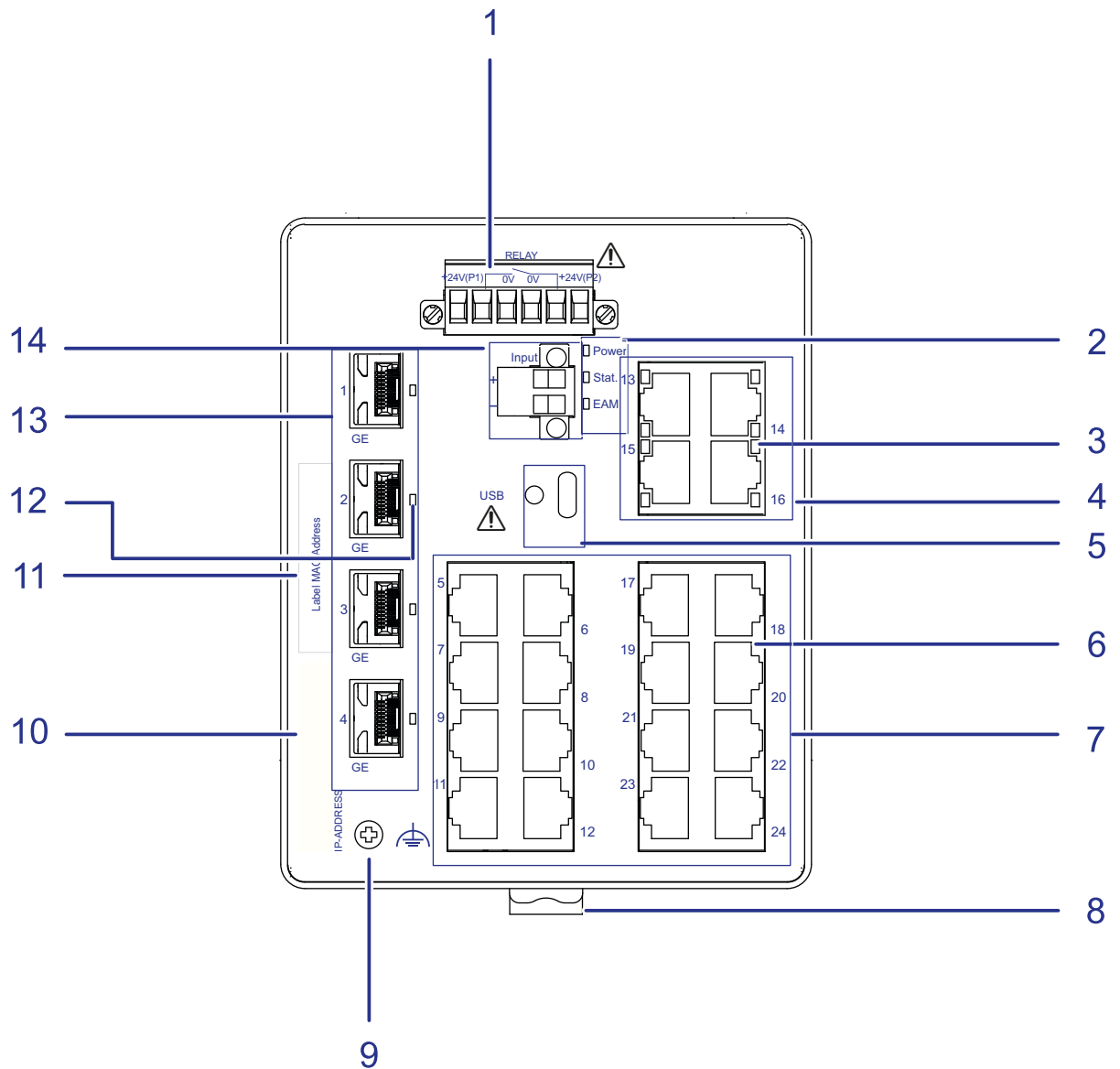
1	6-pin terminal block with screw lock for redundant power supply and signal contact
2	2-pin terminal block with screw lock for the digital input
3	depending on device variant <ul style="list-style-type: none"><li>▶ SFP slot for 100 Mbit/s F/O connections</li><li>▶ DSC or DST singlemode socket for 100 Mbit/s fiber optic connections</li><li>▶ DSC or DST multimode socket for 100 Mbit/s fiber optic connections</li><li>▶ Not present</li></ul>
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 device variant with 8 ... 12 ports 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	depending on the device variants <b>BRS22/32</b> <ul style="list-style-type: none"> <li>▶ RJ45 socket for 10/100 Mbit/s Twisted pair connections</li> <li>▶ RJ45 socket with PoE support</li> </ul> <b>BRS42/52</b> <ul style="list-style-type: none"> <li>▶ RJ45 socket for 10/100/1000 Mbit/s Twisted Pair connections</li> <li>▶ RJ45 socket with PoE support</li> </ul>
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	depending on the device variants <b>BRS22</b> <ul style="list-style-type: none"> <li>▶ SFP slot for 100 Mbit/s F/O connections</li> <li>▶ Not present</li> </ul> <b>BRS32</b> <ul style="list-style-type: none"> <li>▶ SFP slot for 100/1000 Mbit/s fiber optic connections</li> <li>▶ RJ45 socket for 10/100/1000 Mbit/s Twisted Pair connections</li> </ul> <b>BRS42</b> <ul style="list-style-type: none"> <li>▶ SFP slot for 100/1000 Mbit/s fiber optic connections</li> <li>▶ RJ45 socket for 10/100/1000 Mbit/s Twisted Pair connections</li> <li>▶ Not present</li> </ul> <b>BRS52</b> <ul style="list-style-type: none"> <li>▶ SFP slot for 100/1000/2500 Mbit/s fiber optic connections</li> </ul>

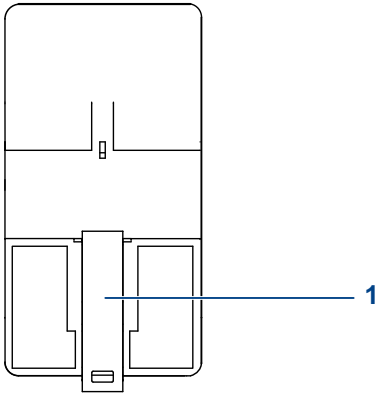
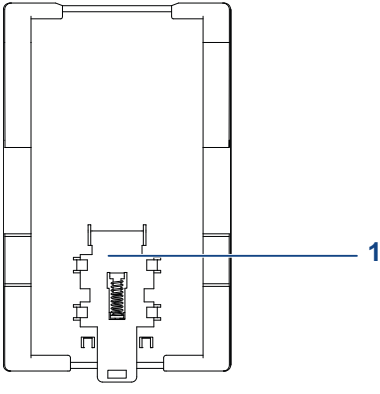
## ■ Example of a device variant with 8 ... 24 ports without PoE



- |   |  |
|---|--|
| 1 | 6-pin terminal block with screw lock for redundant power supply and signal contact   |
| 2 | LED display elements for device status   |
| 3 | LED display elements for port status   |
| 4 | depending on the device variants   |
|   | <ul style="list-style-type: none"> <li>► <b>BRS20/30</b><br/>4 × RJ45 socket for 10/100 Mbit/s twisted pair connections<br/>These ports support full duplex only.</li> <li>► <b>BRS40/50</b><br/>4 × RJ45 socket for 10/100/1000 Mbit/s twisted pair connections<br/>These ports support full duplex only.</li> <li>► Not present</li> </ul> |
| 5 | USB-C interface  |
| 6 | LED display elements for port status   |

7	depending on the device variants <b>BRS20/30</b> <ul style="list-style-type: none"> <li>▶ 8 × RJ45 socket for 10/100 Mbit/s twisted pair connections</li> <li>▶ 16 × RJ45 socket for 10/100 Mbit/s twisted pair connections</li> </ul> <b>BRS40/50</b> <ul style="list-style-type: none"> <li>▶ 8 × RJ45 socket for 10/100/1000 Mbit/s twisted pair connections</li> <li>▶ 16 × RJ45 socket for 10/100/1000 Mbit/s twisted pair connections</li> </ul>
8	Rail lock slide for DIN rail mounting
9	Grounding screw
10	Label area for IP address of device
11	Label area for MAC address of device
12	LED display elements for port status
13	depending on the device variants <b>BRS20</b> <ul style="list-style-type: none"> <li>▶ SFP slot for 100 Mbit/s F/O connections</li> <li>▶ DSC or DST singlemode socket for 100 Mbit/s fiber optic connections</li> <li>▶ DSC or DST multimode socket for 100 Mbit/s fiber optic connections</li> <li>▶ RJ45 socket for 10/100 Mbit/s Twisted pair connections These ports support full duplex only.</li> <li>▶ Not present</li> </ul> <b>BRS30</b> <ul style="list-style-type: none"> <li>▶ RJ45 socket for 10/100/1000 Mbit/s Twisted Pair connections These ports support full duplex only.</li> <li>▶ SFP slot for 100/1000 Mbit/s F/O connections</li> </ul> <b>BRS40</b> <ul style="list-style-type: none"> <li>▶ SFP slot for 100/1000 Mbit/s F/O connections</li> <li>▶ RJ45 socket for 10/100/1000 Mbit/s Twisted Pair connections These ports support full duplex only.</li> </ul> <b>BRS50</b> <ul style="list-style-type: none"> <li>▶ SFP slot for 100/1000/2500 Mbit/s fiber optic connections</li> </ul>
14	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 49.](#)

### 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 50.](#)

### 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 51.](#)

### 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 52.](#)

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.

**Note:** Some ports support full duplex mode only: [See “Example of a device variant with 8 ... 24 ports without PoE” on page 31.](#)

### 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:** Some ports support full duplex mode only: [See “Example of a device variant with 8 ... 24 ports without PoE” on page 31.](#)

## ■ Pin assignment

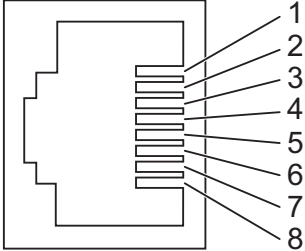
RJ45	Pin	10/100 Mbit/s	1000/25000 Mbit/s	PoE
	<b>MDI mode</b>			
	1	TX+	BI_DA+	Negative $V_{PSE}$
	2	TX-	BI_DA-	Negative $V_{PSE}$
	3	RX+	BI_DB+	Positive $V_{PSE}$
	4	—	BI_DC+	—
	5	—	BI_DC-	—
	6	RX-	BI_DB-	Positive $V_{PSE}$
	7	—	BI_DD+	—
	8	—	BI_DD-	—
	<b>MDI-X mode</b>			
	1	RX+	BI_DB+	Negative $V_{PSE}$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

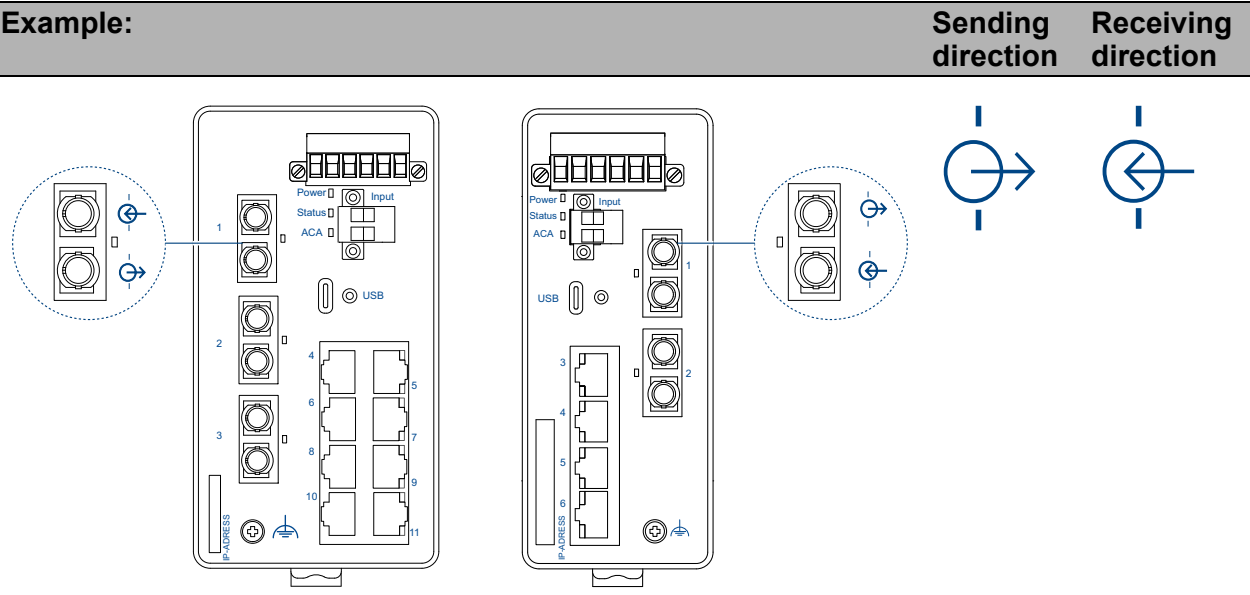


Table 3: Sending and receiving directions

### 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 29](#).

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 63](#).

**Note:** Connect only PoE-powered devices whose data connections are located in the interior of the building and are specified as SELV circuits according to IEC 60950-1 or ES1 circuits according to IEC/EN 62368-1.

# 1.6 Display elements

## 1.6.1 Device state

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

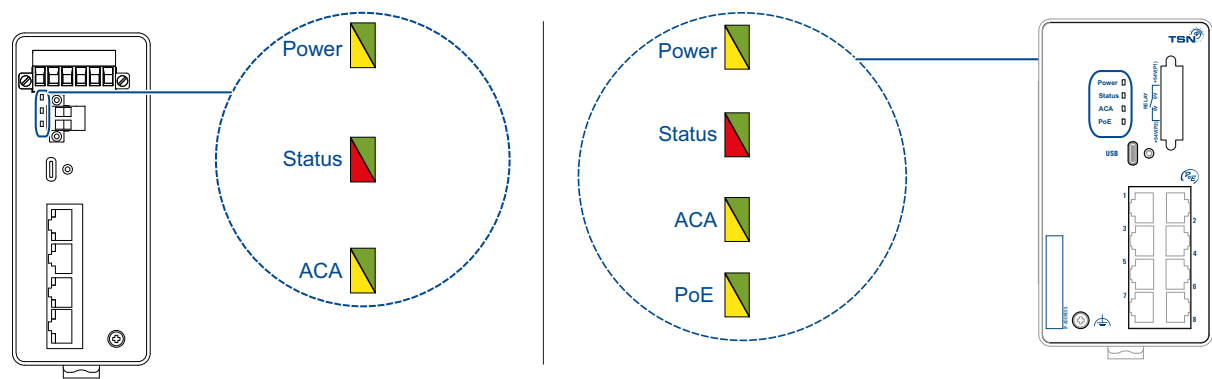


Figure 1: LED display elements for device status

LED	Display	Color	Activity	Meaning
Power	Supply voltage	—	none	Supply voltages 1 <b>and</b> 2 are too low.
		yellow	lights up	Supply voltage 1 <b>or</b> 2 is on
			flashes 4 times a period	Software update is running. Maintain the power supply.
Status	Device Status	green	lights up	Supply voltage 1 <b>and</b> 2 is on
		—	none	Device starts
				Device is not ready for operation
		green	lights up	Device is ready for operation
				Characteristics can be configured
ACA	Storage medium ACA22-USB-C (EEC)	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
PoE		red/ green	flashing alternately	Device is in the recovery mode.
		—	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
		—	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 2 on page 39.](#)
- ▶ For device variants with 8 × RJ45 sockets:  
The LEDs are located on the right side of the device.  
[See figure 3 on page 40.](#)  
[See figure 4 on page 40.](#)
- ▶ For device variants with ports that are DSC/DST sockets and SFP slots:  
The LEDs are directly located at the ports.  
[See figure 3 on page 40.](#)  
[See figure 4 on page 40.](#)

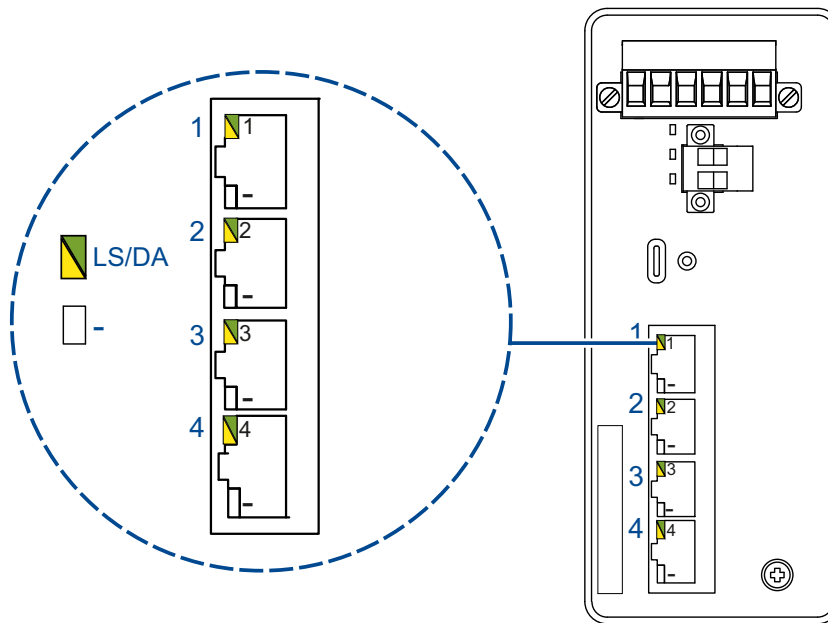


Figure 2: LED display elements for device variants with 4 × RJ45 sockets

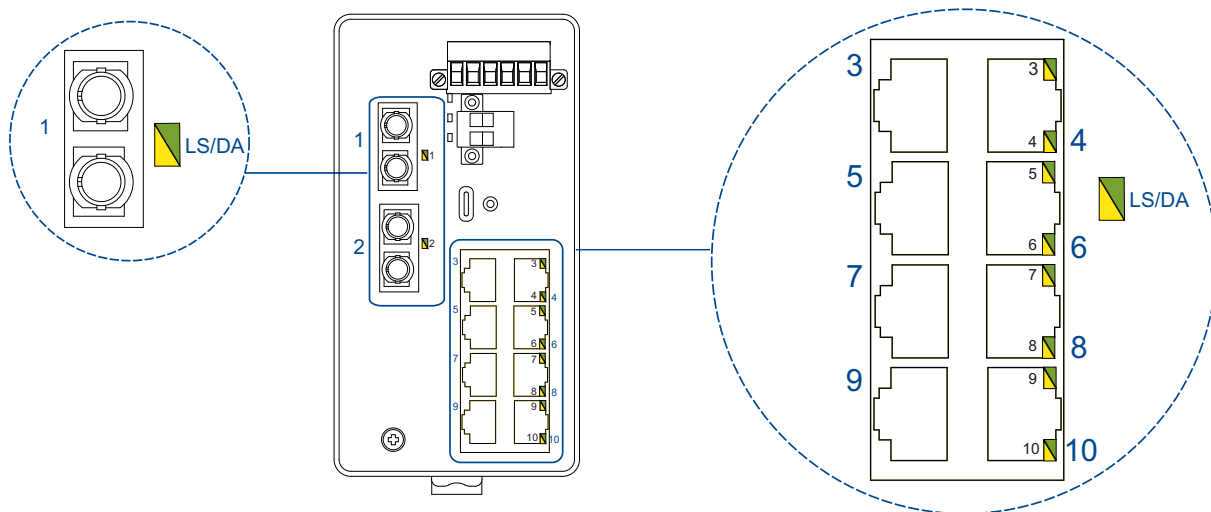


Figure 3: LED display elements for device variants with DSC, DST and 8 x RJ45 sockets

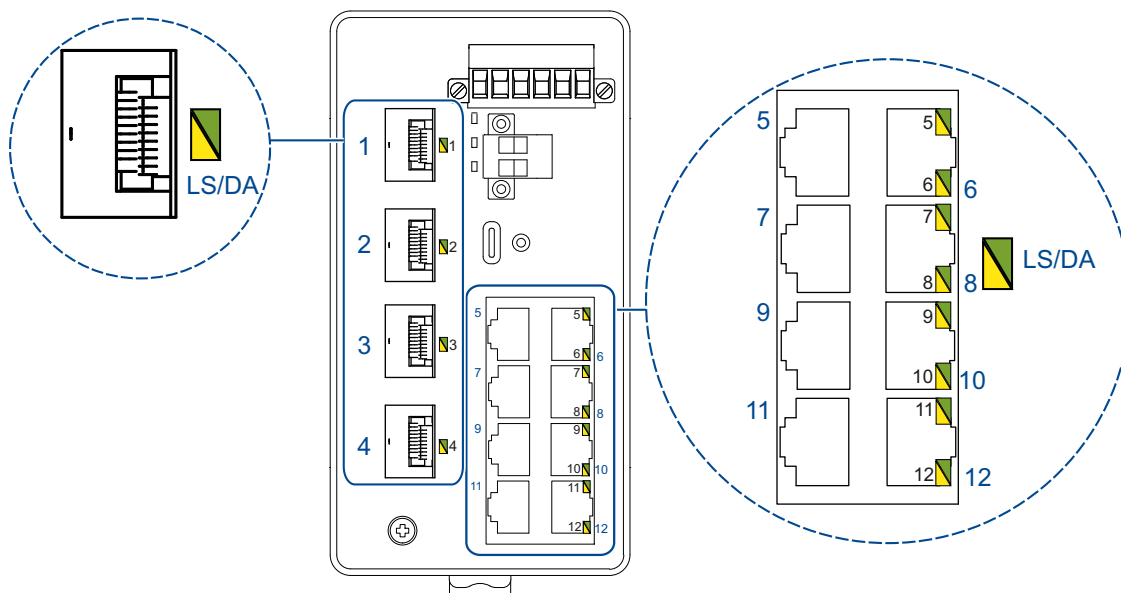


Figure 4: LED display elements for device variants with SFP slots and 8 x RJ45 sockets



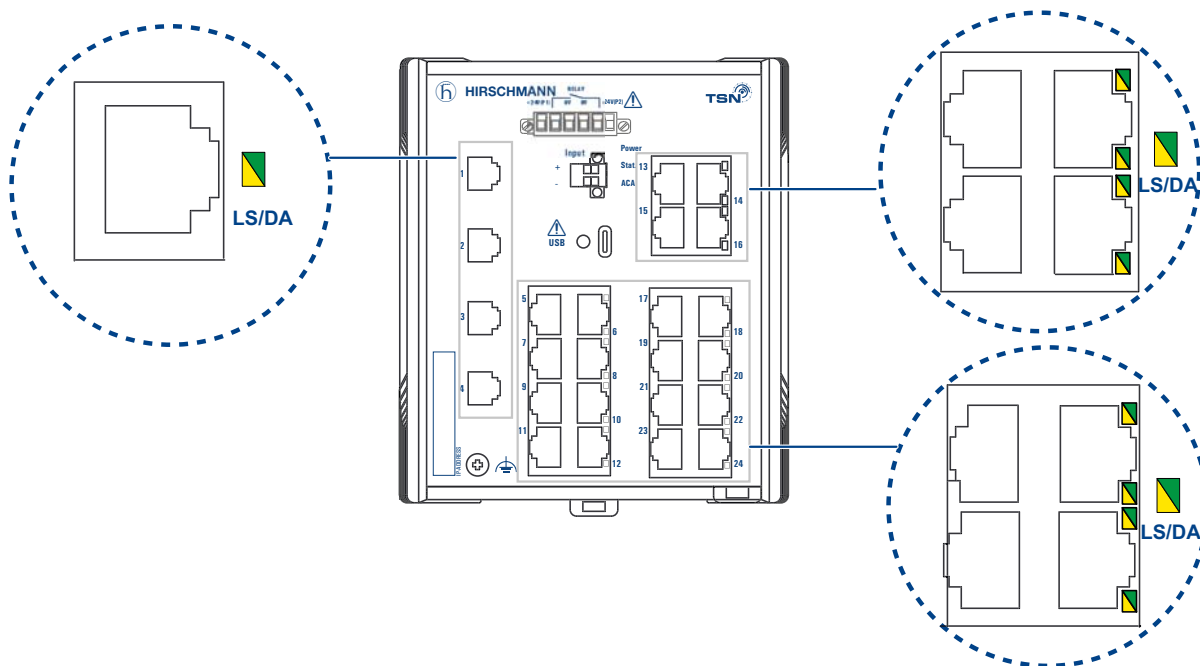


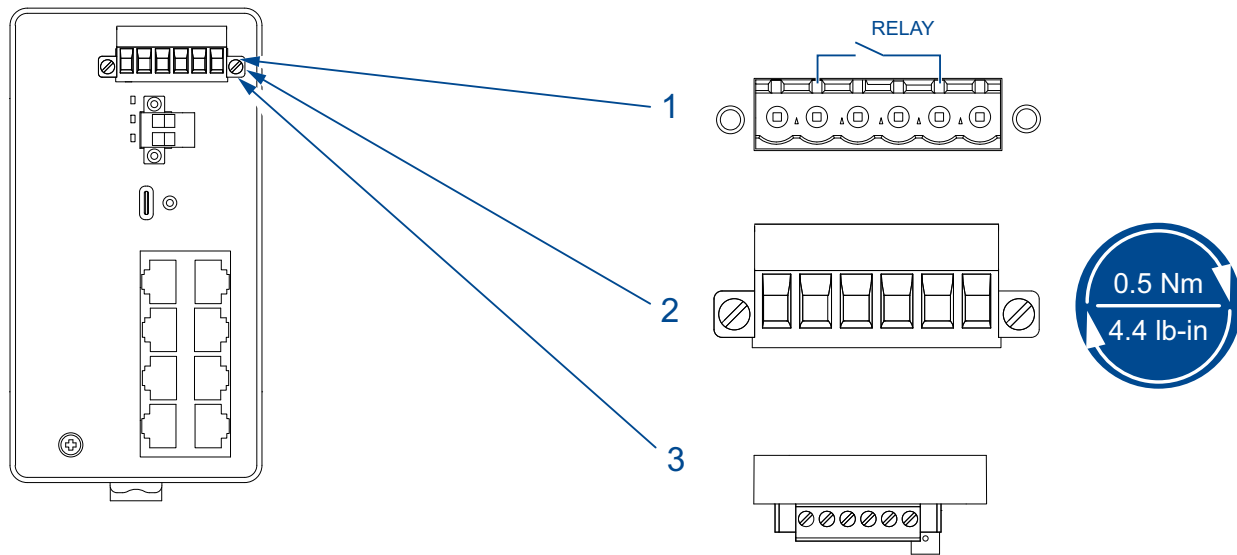
Figure 5: LED display elements for a high port device variant with SFP slots and 20 x RJ45 sockets

Display	Color	Activity	Meaning
L/D	—	none	Device detects an invalid or missing link
Link status Data traffic	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 6: (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

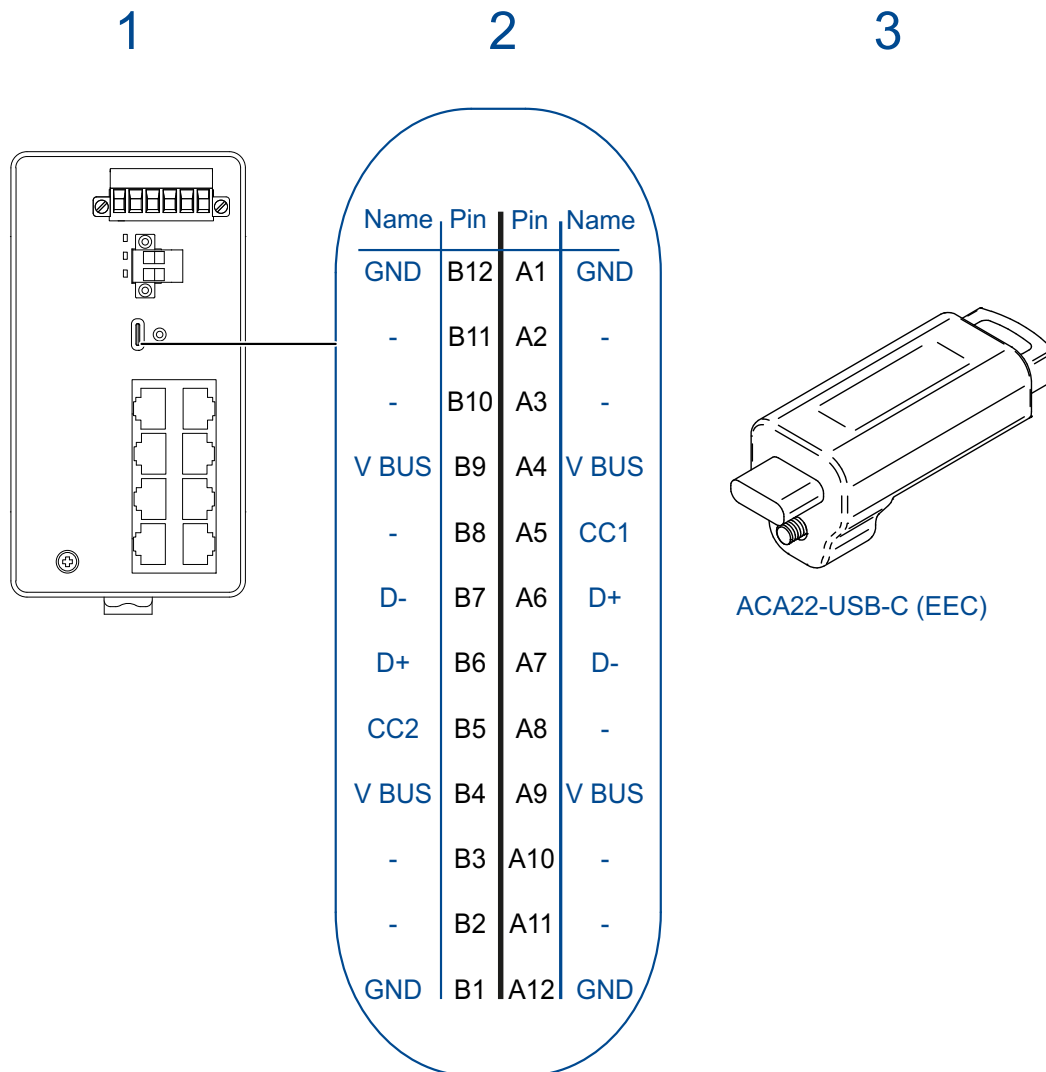


Figure 7: (1) Position of the USB-C interface on the device, (2) pin assignment of the USB-C interface, (3) view of the ACA22-USB-C (EEC).

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:

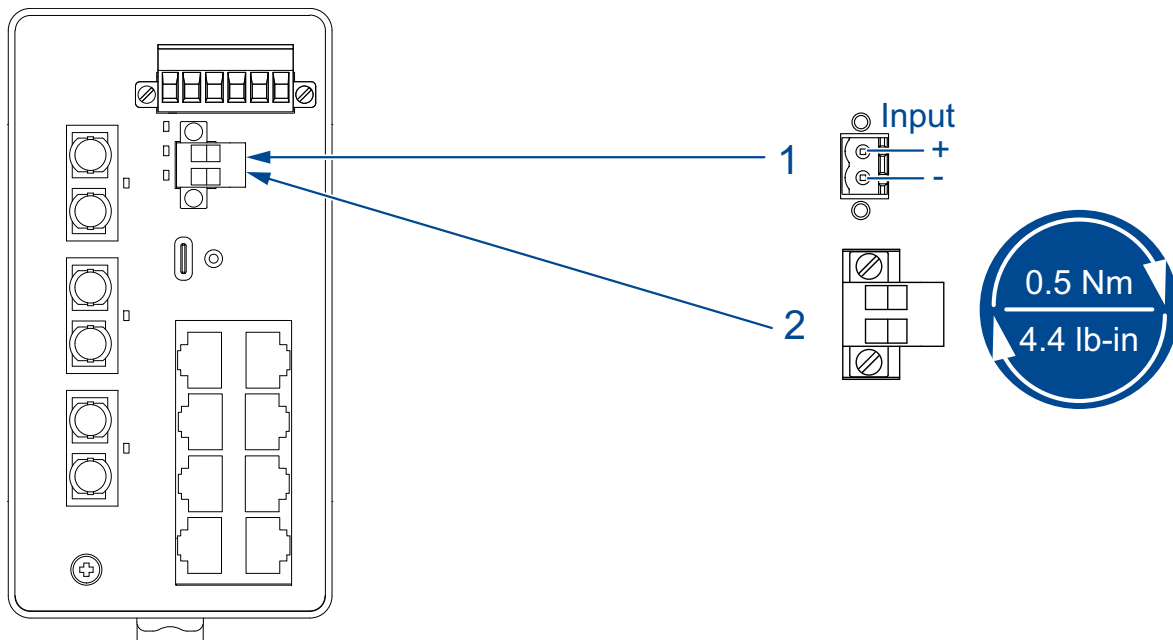
- ▶ Supports the USB master mode and slave
- ▶ Supports USB 2.0 (data rate max. 480 Mbit/s)
- ▶ Connector: type C
- ▶ Supplies current of max. 500 mA

- ▶ 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 8: (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 63.

## 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 91](#).
- ☐ 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:**

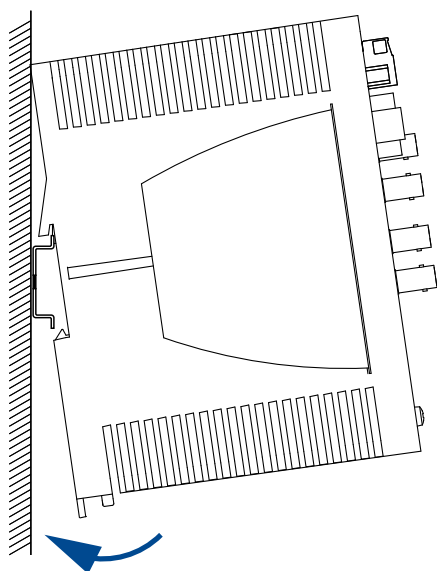
- ☐ Verify that the minimum clearance at the ventilation slots is maintained to meet the climatic conditions during operation:  
Minimum clearance at the ventilation slots: 5 cm (2 in).

**Note:** Decreasing the minimum clearance reduces the specified maximum operating temperature.

[See table 6 on page 46.](#)

Mounting	Minimum clearance at the ventilation slots	Temperature derating
Standard mounting (vertical)	5 cm (2 in)	0 °C (0 °F)
	2 cm (0.8 in)	3 °C (5 °F)
	0 cm (0 in)	15 °C (27 °F)
90° rotated mounting (horizontal)	0 cm (0 in)	15 °C (27 °F)

*Table 6: Derating for different mounting positions*



*Figure 9: 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

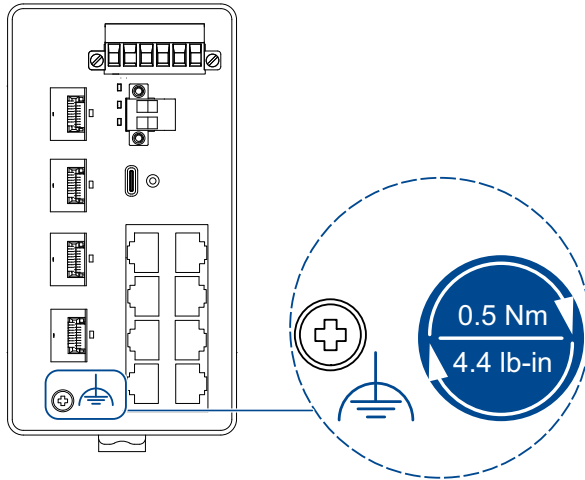


Figure 10: Position of the ground connection on the device; tightening torque.

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 5 cm (2 in)).

## 2.3 Installing an SFP transceiver (optional)

### Prerequisites:

Exclusively use Hirschmann SFP transceivers.

See [“Accessories” on page 92](#).

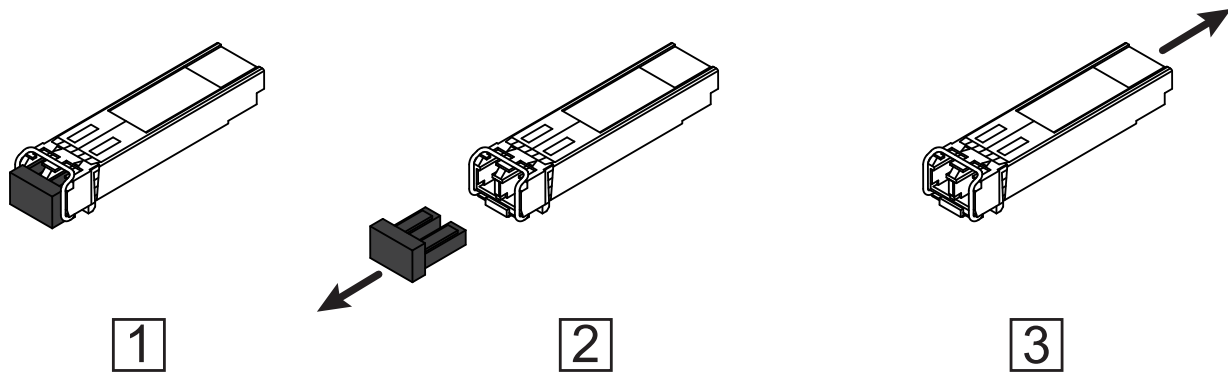


Figure 11: Installing SFP transceivers: Installation sequence

### Perform the following work steps:

- ☐ 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

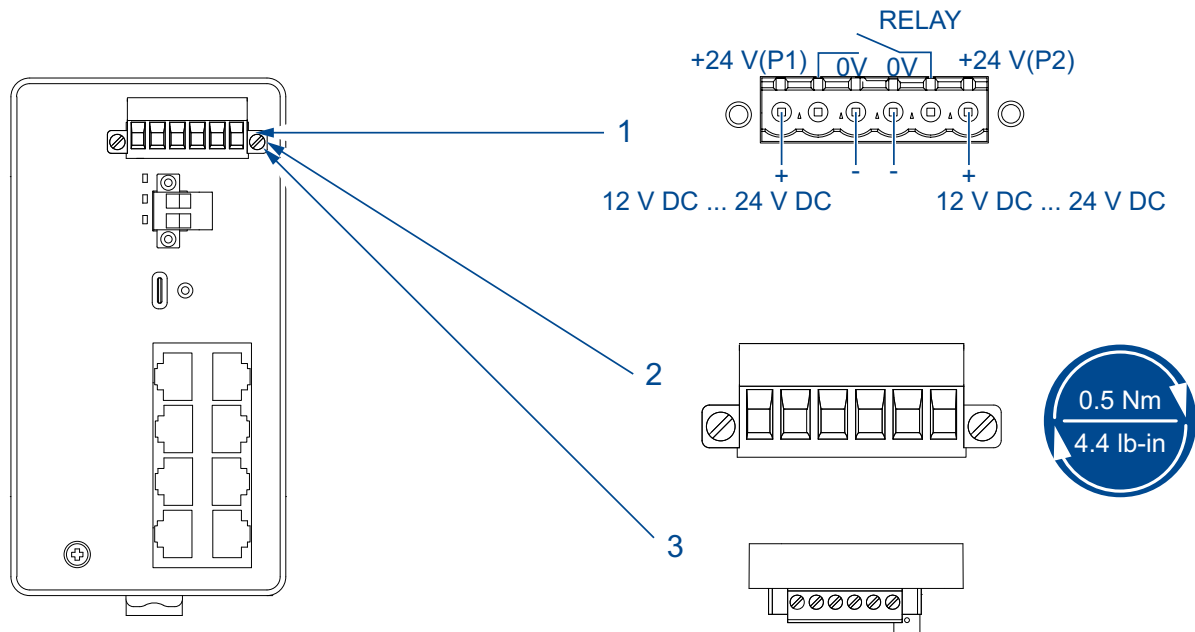


Figure 12: (1) DC voltage connection on the device, (2) terminal block mounted on the device (front view), tightening torque, (3) terminal block mounted on the device (view from above).

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	+24 V Plus terminal of the supply voltage
	Voltage range DC incl. maximum tolerances: 9.6 V DC ... 32 V DC	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

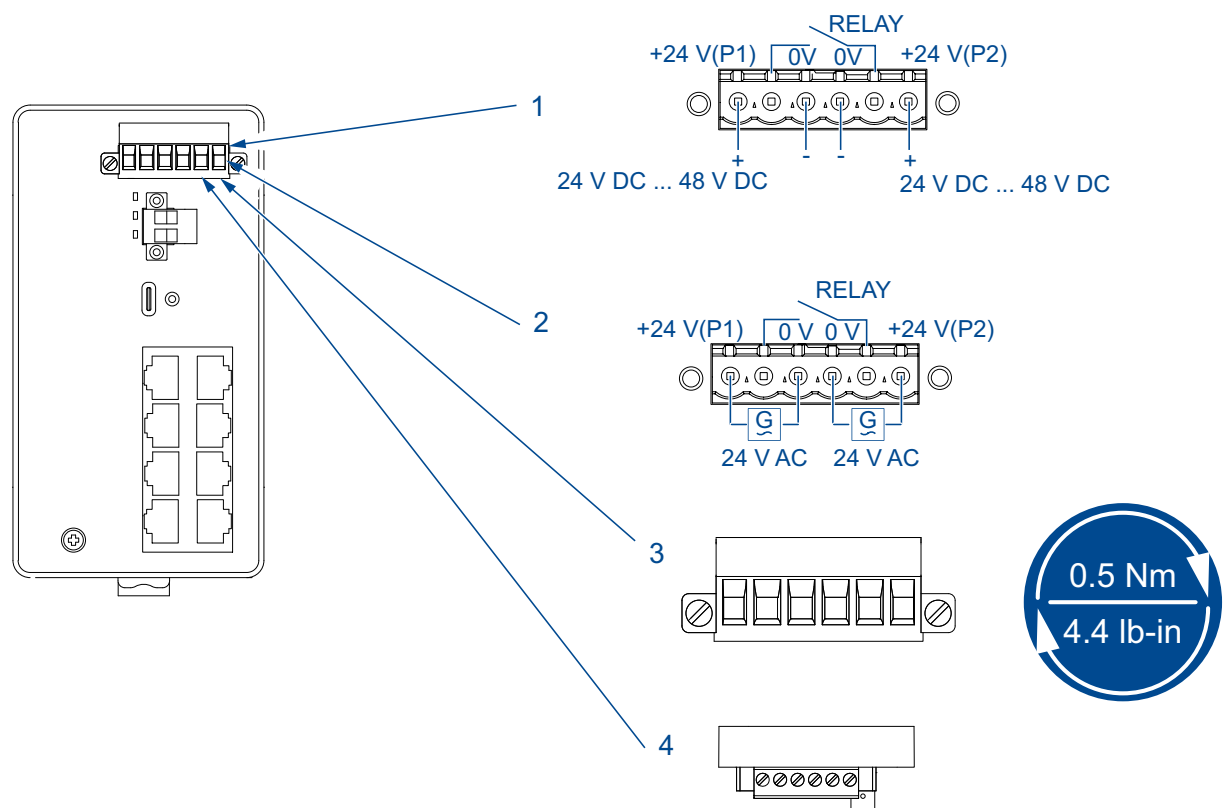


Figure 13: (1) DC voltage connection on the device, (2) AC voltage connection on the device, (3) terminal block mounted on the device (front view), tightening torque, (4) terminal block mounted on the device (view from above).

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

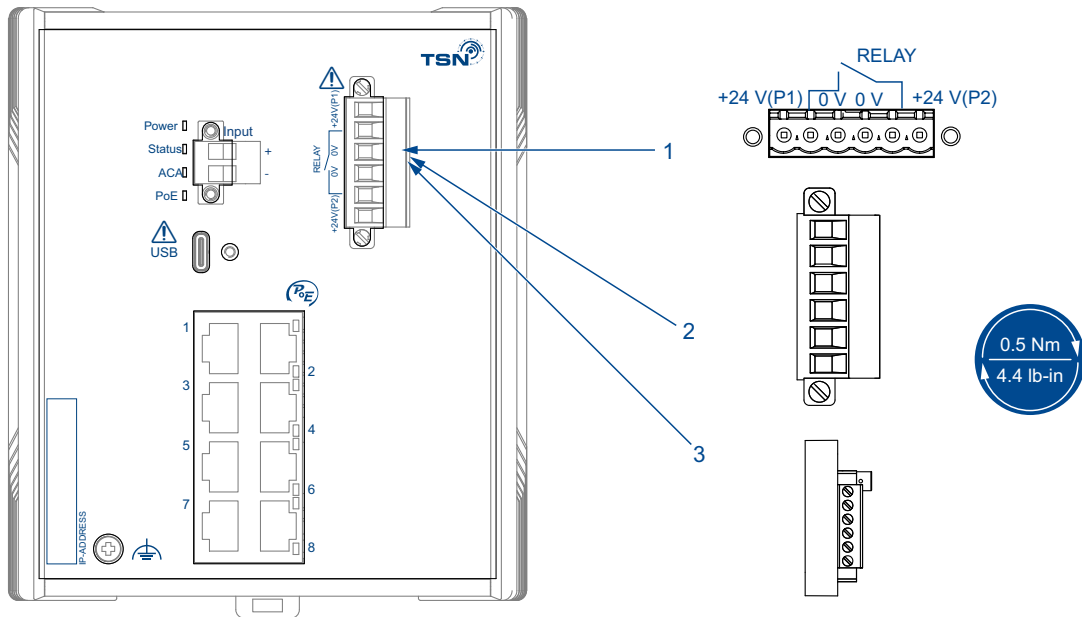


Figure 14: (1) DC voltage connection on the device, (2) terminal block mounted on the device (front view), tightening torque, (3) terminal block mounted on the device (view from above).

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

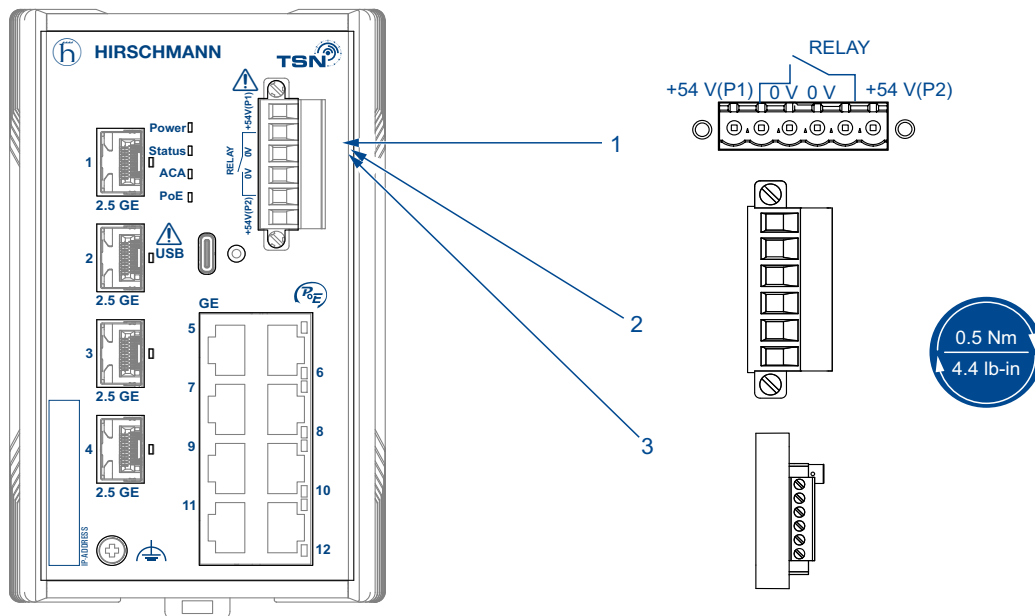


Figure 15: (1) DC voltage connection on the device, (2) terminal block mounted on the device (front view), tightening torque, (3) terminal block mounted on the device (view from above).

Type of the voltages that can be connected	Specification of the supply voltage	Pin assignment	
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

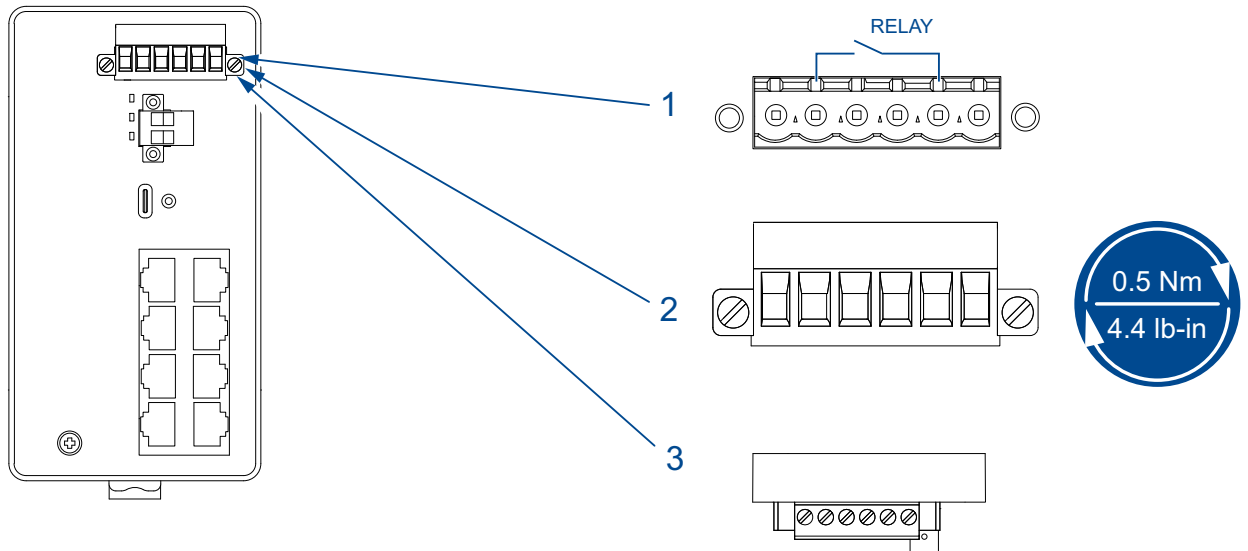
Table 10: Supply voltage with characteristic value P: type and specification of the supply voltage, pin assignment

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 16: (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)

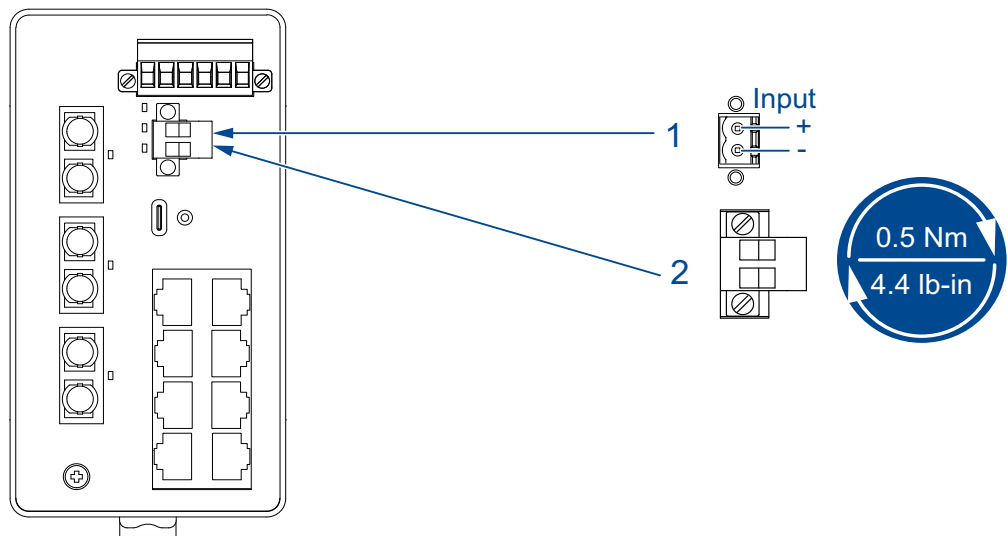


Figure 17: (1) Connection on the device, (2) terminal block mounted on the device (front view), tightening torque.

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

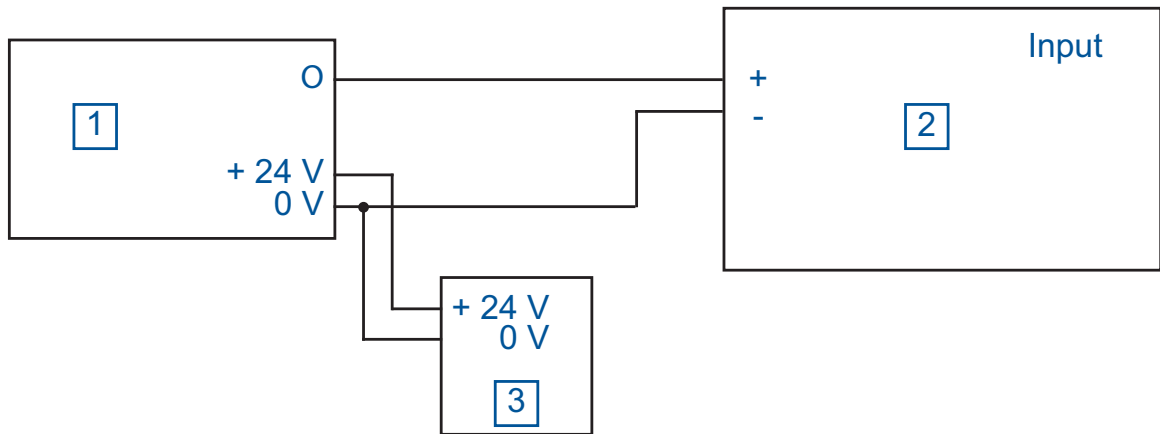


Figure 18: Connection of a sensor (3 pin) with separate power supply

1 - Sensor

2 - BRS20/22/30/32/40/42/50/52I

3 - Separate power supply for sensor

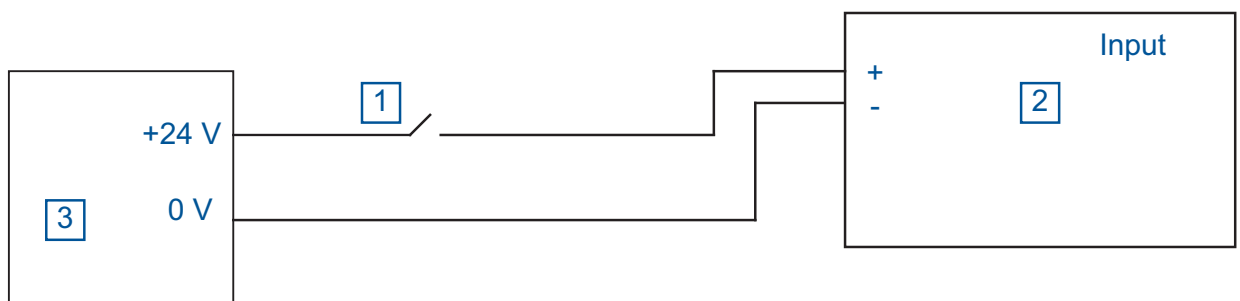


Figure 19: Connection of a sensor (2 pin) with separate power supply

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 80.](#)
- ☐ Connect the data cables according to your requirements.  
[See “Ethernet ports” on page 34.](#)

## 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 72.](#)

The ambient air temperature is the temperature of the air at a distance of 5 cm (2 in) 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 (Command Line Interface) and the GUI (Graphical User Interface) 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.

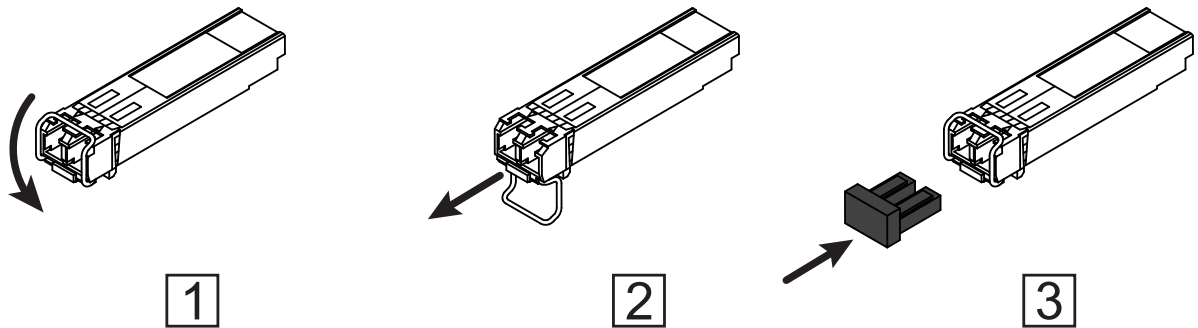
## 5 Maintenance and service

- ▶ 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)

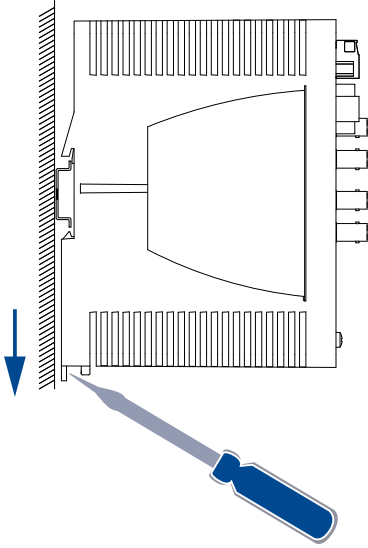


*Figure 20: De-installing SFP transceivers: De-installation sequence*

**Perform the following work steps:**

- ☐ 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 21: 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 See “Dimension drawings” on page 74.	Degree of protection (Plastic casing)	Degree of protection (Metal casing)	Digital input available
BRS20-0400...	380 g (12.22 oz)	30.69 oz (870 g)	narrow	IP30	IP40	Yes
BRS20-0500...	420 g (14.82 oz)	910 g (32.09 oz)	narrow	IP30	IP40	Yes
BRS20-0600...	420 g (14.82 oz)	910 g (32.09 oz)	narrow	IP30	IP40	Yes
BRS20-08009999-S;C...	420 g (14.82 oz)	1020 g (35.98 oz)	medium	IP30	IP40	Yes
BRS20-08009999-T;E;G...	500 g (17.64 oz)	1020 g (35.98 oz)	medium	IP30	IP40	Yes
BRS20-0900....S;C...	500 g (17.64 oz)	1090 g (38.45 oz)	medium	IP30	IP40	Yes
BRS20-0900....T;E;G...	570 g (20.10 oz)	1090 g (38.45 oz)	medium	IP30	IP40	Yes
BRS20-1000....S;C...	500 g (17.64 oz)	1090 g (38.45 oz)	medium	IP30	IP40	Yes
BRS20-1000....T;E;G...	570 g (20.10 oz)	1090 g (38.45 oz)	medium	IP30	IP40	Yes
BRS20-1100....S;C...	500 g (17.64 oz)	1090 g (38.45 oz)	medium	IP30	IP40	Yes
BRS20-1100....T;E;G...	570 g (20.10 oz)	1090 g (38.45 oz)	medium	IP30	IP40	Yes
BRS20-12009999-S;C...	600 g (21.16 oz)	1260 g (44.4 oz)	medium	IP30	IP40	Yes
BRS20-12009999-T;E;G...	700 g (24.69 oz)	1260 g (44.4 oz)	medium	IP30	IP40	Yes
BRS20-1200ZZZZ-S;C...	500 g (17.64 oz)	1090 g (38.45 oz)	medium	IP30	IP40	Yes
BRS20-1200ZZZZ-T;E;G...	570 g (20.10 oz)	1090 g (38.45 oz)	medium	IP30	IP40	Yes
BRS20-16009999-S;C...	880 g (31.04 oz)	1450 g (51.14 oz)	wide	IP30	IP40	Yes
BRS20-16009999-T;E;G...	not available	1450 g (51.14 oz)	wide	not available	IP30	Yes
BRS20-20009999-S;C...	1060 g (37.3 oz)	1700 g (60 oz)	wide	IP30	IP40	Yes

Table 12: General data

Product name	Weight (Plastic casing)	Weight (Metal casing)	Casing width See “Dimension drawings” on page 74.	Degree of protection (Plastic casing)	Degree of protection (Metal casing)	Digital input available
BRS20-20009999-T;E;G...	not available	1700 g (60 oz)	wide	not available	IP30	Yes
BRS20-2000ZZZZ-S;C...	950 g (33.51 oz)	1520 g (53.61 oz)	wide	IP30	IP40	Yes
BRS20-2000ZZZZ-T;E;G...	not available	1520 g (53.61 oz)	wide	not available	IP30	Yes
BRS20-24009999-S;C...	1160 g (41 oz)	1800 g (63.4 oz)	wide	IP30	IP40	Yes
BRS20-24009999-T;E;G...	not available	1800 g (63.4 oz)	wide	not available	IP30	Yes
BRS20-2400ZZZZ-S;C...	1050 g (37 oz)	1620 g (57.14 oz)	wide	IP30	IP40	Yes
BRS20-2400ZZZZ-T;E;G...	not available	1620 g (57.14 oz)	wide	not available	IP30	Yes
BRS30-08042T2T...	700 g (24.69 oz)	1260 g (44.4 oz)	medium	IP30	IP40	Yes
BRS30-0804OOOO...	570 g (20.10 oz)	1090 g (38.45 oz)	medium	IP30	IP40	Yes
BRS30-16042T2T-S;C...	1060 g (37.3 oz)	1700 g (60 oz)	wide	IP30	IP40	Yes
BRS30-16042T2T-T;E;G...	not available	1700 g (60 oz)	wide	not available	IP30	Yes
BRS30-1604OOOO-S;C...	950 g (33.51 oz)	1520 g (53.61 oz)	wide	IP30	IP40	Yes
BRS30-1604OOOO-T;E;G...	not available	1520 g (53.61 oz)	wide	not available	IP30	Yes
BRS30-20042T2T-S;C...	1060 g (37.3 oz)	1800 g (63.4 oz)	wide	IP30	IP40	Yes
BRS30-20042T2T-T;E;G...	not available	1800 g (63.4 oz)	wide	not available	IP30	Yes
BRS30-2004OOOO-S;C...	1050 g (37 oz)	1620 g (57.14 oz)	wide	IP30	IP40	Yes
BRS30-2004OOOO-T;E;G...	not available	1620 g (57.14 oz)	wide	not available	IP30	Yes
BRS40-00089999...	500 g (17.64 oz)	1020 g (35.98 oz)	medium	IP30	IP40	Yes
BRS40-00129999...	700 g (24.69 oz)	1260 g (44.4 oz)	medium	IP30	IP40	Yes
BRS40-0012OOOO...	570 g (20.10 oz)	1090 g (38.45 oz)	medium	IP30	IP40	Yes
BRS40-00169999-S;C...	880 g (31.04 oz)	1450 g (51.14 oz)	wide	IP30	IP40	Yes
BRS40-00169999-T;E;G...	not available	1450 g (51.14 oz)	wide	not available	IP30	Yes
BRS40-00209999-S;C...	1060 g (37.3 oz)	1700 g (60 oz)	wide	IP30	IP40	Yes
BRS40-00209999-T;E;G...	not available	1700 g (60 oz)	wide	not available	IP30	Yes
BRS40-0020OOOO-S;C...	950 g (33.51 oz)	1520 g (53.61 oz)	wide	IP30	IP40	Yes

Table 12: General data



Product name	Weight (Plastic casing)	Weight (Metal casing)	Casing width See "Dimension drawings" on page 74.	Degree of protection (Plastic casing)	Degree of protection (Metal casing)	Digital input available
BRS40-0020OOOO-T;E;G...	not available	1520 g (53.61 oz)	wide	not available	IP30	Yes
BRS40-00249999-S;C...	1160 g (41 oz)	1800 g (63.4 oz)	wide	IP30	IP40	Yes
BRS40-00249999-T;E;G...	not available	1800 g (63.4 oz)	wide	not available	IP30	Yes
BRS40-0024OOOO-S;C...	1050 g (37 oz)	1620 g (57.14 oz)	wide	IP30	IP40	Yes
BRS40-0024OOOO-T;E;G...	not available	1620 g (57.14 oz)	wide	not available	IP30	Yes
BRS50-0012QTQT...	not available	not available	medium	IP30	IP40	Yes
BRS50-00122Q2Q...	570 g (20.10 oz)	1090 g (38.45 oz)	medium	IP30	IP40	Yes
BRS50-0020QTQT-S,C...	not available	not available	wide	IP30	IP40	Yes
BRS50-0020QTQT-T,E,G...	not available	not available	wide	not available	IP30	Yes
BRS50-00202Q2Q-S,C...	950 g (33.51 oz)	1520 g (53.61 oz)	wide	IP30	IP40	Yes
BRS50-00202Q2Q-T;E;G...	not available	1520 g (53.61 oz)	wide	not available	IP30	Yes
BRS50-0024QTQT-S;C...	not available	not available	wide	IP30	IP40	Yes
BRS50-0024QTQT-T;E;G...	not available	not available	wide	not available	IP30	Yes
BRS50-00242Q2Q-S;C...	1050 g (37 oz)	1620 g (57.14 oz)	wide	IP30	IP40	Yes
BRS50-00242Q2Q-T;E;G...	not available	1620 g (57.14 oz)	wide	not available	IP30	Yes
PoE device variants						
Supply voltage with characteristic value U						
BRS22-08009999-S;C...	750 g (24.46 oz)	1400 g (49.38 oz)	wide	IP30	IP40	Yes
BRS22-08009999-T;E;G...	not available	1400 g (49.38 oz)	wide	not available	IP30	Yes
BRS32-08042T2T-S;C...	930 g (32.80 oz)	1620 g (57.14 oz)	wide	IP30	IP40	Yes
BRS32-08042T2T-T,E,G...	not available	1620 g (57.14 oz)	wide	not available	IP30	Yes
BRS32-0804OOOO-S;C...	800 g (28.21 oz)	1450 g (51.14 oz)	wide	IP30	IP40	Yes
BRS32-0804OOOO-T;E;G...	not available	1450 g (51.14 oz)	wide	not available	IP30	Yes
BRS42-00089999-S;C...	750 g (24.46 oz)	1400 g (49.38 oz)	wide	IP30	IP40	Yes
BRS42-0008....T;E;G...	not available	1400 g (49.38 oz)	wide	not available	IP30	Yes
BRS42-00129999-S;C...	930 g (32.80 oz)	1620 g (57.14 oz)	wide	IP30	IP40	Yes

Table 12: General data

Product name	Weight (Plastic casing)	Weight (Metal casing)	Casing width See “Dimension drawings” on page 74.	Degree of protection (Plastic casing)	Degree of protection (Metal casing)	Digital input available
BRS42-00129999-T;E;G...	not available	1620 g (57.14 oz)	wide	not available	IP30	Yes
BRS42-00120000-S;C...	800 g (28.21 oz)	1450 g (51.14 oz)	wide	IP30	IP40	Yes
BRS42-00120000-T;E;G...	not available	1450 g (51.14 oz)	wide	not available	IP30	Yes
BRS52-0012QTQT-S;C...	not available	not available	wide	IP30	IP40	Yes
BRS52-0012QTQT-T;E;G...	not available	not available	wide	not available	IP30	Yes
BRS52-00122Q2Q-S;C...	800 g (28.21 oz)	1450 g (51.14 oz)	wide	IP30	IP40	Yes
BRS52-00122Q2Q-T;E;G...	not available	1450 g (51.14 oz)	wide	not available	IP30	Yes
PoE device variants						
Supply voltage with characteristic value P						
BRS22-08009999-S;C...	500 g (17.64 oz)	1100 g (38.80 oz)	medium	IP30	IP40	No
BRS22-08009999-T;E;G...	not available	1250 g (44 oz)	wide	not available	IP30	Yes
BRS32-08042T2T-S;C...	680 g (24 oz)	1320 g (46.56 oz)	medium	IP30	IP40	No
BRS32-08042T2T-T,E,G...	not available	1470 g (52 oz)	wide	not available	IP30	Yes
BRS32-08040000-S;C...	550 g (19.4 oz)	1150 g (40.56 oz)	medium	IP30	IP40	No
BRS32-08040000-T,E,G...	not available	1300 g (45.85 oz)	wide	not available	IP30	Yes
BRS42-00089999-S;C...	500 g (17.64 oz)	1100 g (38.80 oz)	medium	IP30	IP40	No
BRS42-00089999-T;E;G...	not available	1250 g (44 oz)	wide	not available	IP30	Yes
BRS42-00129999-S;C...	680 g (24 oz)	1320 g (46.56 oz)	medium	IP30	IP40	No
BRS42-00129999-T;E;G...	not available	1470 g (52 oz)	wide	not available	IP30	Yes
BRS42-00120000-S;C...	550 g (19.4 oz)	1150 g (40.56 oz)	medium	IP30	IP40	No
BRS42-00120000-T;E;G...	not available	1300 g (45.85 oz)	wide	not available	IP30	Yes
BRS52-0012QTQT-S;C...	not available	not available	medium	IP30	IP40	No
BRS52-0012QTQT-T;E;G...	not available	not available	wide	not available	IP30	Yes
BRS52-00122Q2Q-S;C...	550 g (19.4 oz)	1150 g (40.56 oz)	medium	IP30	IP40	No
BRS52-00122Q2Q-T;E;G...	not available	1300 g (45.85 oz)	wide	not available	IP30	Yes

Table 12: General data

General data	
Dimensions W × H × D	See “Dimension drawings” on page 74.
Mounting	See “Installing the device onto the DIN rail” on page 45.
Pollution degree	2
Degree of protection	IP30
	See “General data” on page 63.
	IP40
	See “General data” on page 63.
	<b>Note:</b> 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 0.5 Nm (4.4 lb-in)
	min. conductor diameter 0.75 mm <sup>2</sup> (AWG18)
	max. conductor diameter 2.5 mm <sup>2</sup> (AWG12)
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 I <sup>2</sup> t	<1 A <sup>2</sup> s
Connection for functional ground	See “Grounding the device” on page 47.

Table 14: Supply voltage with characteristic value T

Supply voltage with characteristic value F	
Rated voltage range DC:	24 V DC ... 48 V DC
Rated voltage AC:	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
Connection type	6-pin terminal block with screw lock
	Tightening torque 0.5 Nm (4.4 lb-in)
	min. conductor diameter 0.75 mm <sup>2</sup> (AWG18)
	max. conductor diameter 2.5 mm <sup>2</sup> (AWG12)

Table 15: Supply voltage with characteristic value F

Supply voltage with characteristic value F		
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 $I^2t$	<1 A <sup>2</sup> s at 24 V DC	
Connection for functional ground	<a href="#">See "Grounding the device" on page 47.</a>	

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	< +60 °C (+140 °F) ambient air temperature
	60 W	+60 °C ... +70 °C (+140 °F ... +158 °F) ambient temperature
Connection type	6-pin terminal block with screw lock	
	Tightening torque	0.5 Nm (4.4 lb-in)
	min. conductor diameter	1 mm <sup>2</sup> (AWG16)
	max. conductor diameter	2.5 mm <sup>2</sup> (AWG12)
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 $I^2t$	<36 A <sup>2</sup> s	
Connection for functional ground	<a href="#">See "Grounding the device" on page 47.</a>	

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
Max. PoE power	240 W	0 ° ... +50 °C (+32 °F ... +122 °F) ambient air temperature <sup>a</sup>
	180 W	> +50 °C ... +55 °C (+122 °F ... +131 °F) <sup>a</sup> ambient air temperature
	120 W	> +55 °C ... +60 °C (+131 °F ... +140 °F) <sup>a</sup> ambient air temperature

Table 17: Supply voltage with characteristic value P

Supply voltage with characteristic value P	
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 0.5 Nm (4.4 lb-in)
	min. conductor diameter 0.75 mm <sup>2</sup> (AWG18)
	max. conductor diameter 2.5 mm <sup>2</sup> (AWG12)
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 <sup>2</sup> t	<25 A <sup>2</sup> s
Insulation requirement	2250 V DC to casing ground/functional ground for at least 60 seconds
Connection for functional ground	<a href="#">See "Grounding the device" on page 47.</a>

*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
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

*Table 18: Power consumption/power output*

Device name	Total power consumption	Thermal power output	PoE power output
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
BRS32-08040000U...	107 W	58 Btu (IT)/h	90 W
BRS32-08040000P...	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
BRS42-00120000U...	109 W	65 Btu (IT)/h	90 W
BRS42-00120000P...	252 W	41 Btu (IT)/h	240 W
BRS52-00122Q2QU...	110 W	68 Btu (IT)/h	90 W
BRS52-00122Q2QP...	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 0.5 Nm (4.4 lb-in)
	min. conductor diameter 0.08 mm <sup>2</sup> (AWG 28)
	max. conductor diameter 2.5 mm <sup>2</sup> (AWG12)
Nominal value	I <sub>max</sub> = 1 A at U <sub>max</sub> = 30 V AC (resistive load)
	I <sub>max</sub> = 1 A at U <sub>max</sub> = 60 V DC (resistive load)
	<b>according to the UL Standards:</b>
	I <sub>max</sub> = 0.5 A at U <sub>max</sub> = 30 V AC (resistive load)
	I <sub>max</sub> = 1 A at U <sub>max</sub> = 30 V DC (resistive load)
	<b>as per ANSI/UL 121201:</b> See control drawing in chapter <a href="#">“Relevant for use in explosion hazard areas (Hazardous Locations, Class I, Division 2)” on page 12</a>

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

<b>Signal contact</b>	
<b>Device variants featuring supply voltage with characteristic value U</b>	
Connection type	6-pin terminal block with screw lock
Tightening torque	0.5 Nm (4.4 lb-in)
min. conductor diameter	0.08 mm <sup>2</sup> (AWG 28)
max. conductor diameter	2.5 mm <sup>2</sup> (AWG12)
I <sub>max</sub> = 1 A at U <sub>max</sub> = 30 V AC (resistive load)	
I <sub>max</sub> = 0.5 A at U <sub>max</sub> = 60 V DC (resistive load)	
I <sub>max</sub> = 1 A at U <sub>max</sub> = 30 V DC (resistive load)	
<b>according to the UL Standards:</b>	
I <sub>max</sub> = 0.5 A at U <sub>max</sub> = 30 V AC (resistive load)	
I <sub>max</sub> = 1 A at U <sub>max</sub> = 30 V DC (resistive load)	
<b>as per ANSI/UL 121201:</b>	
See control drawing in chapter <a href="#">“Relevant for use in explosion hazard areas (Hazardous Locations, Class I, Division 2)”</a> on <a href="#">page 12</a>	

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

## 7.5 Digital input

<b>Digital input</b>	
Connection type	2-pin terminal block with screw lock
Tightening torque	0.5 Nm (4.4 lb-in)
min. conductor diameter	0.08 mm <sup>2</sup> (AWG 28)
max. conductor diameter	2.5 mm <sup>2</sup> (AWG12)
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
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 <a href="#">“Installing the device onto the DIN rail” on page 45.</a>
Ambient air temperature <sup>a</sup>	<div>Standard</div> <div> <ul style="list-style-type: none"> <li>▶ up to 2000 m ASL 0 °C ... +60 °C (+32 °F ... +140 °F) (6562 ft ASL)</li> <li>▶ 2000 m ASL ... 3000 m ASL 0 °C ... +50 °C (+32 °F ... +122 °F) (6560 ft ASL ... 9842 ft ASL)</li> <li>▶ 3000 m ASL ... 4000 m ASL 0 °C ... +45 °C (+32 °F ... +113 °F) (9842 ft ASL ... 13123 ft ASL)</li> <li>▶ 4000 m ASL ... 4500 m ASL 0 °C ... +40 °C (+32 °F ... +104 °F) (13123 ft ASL ... 14763 ft ASL)</li> <li>▶ 4500 m ASL ... 5000 m ASL 0 °C ... +35 °C (+32 °F ... +95 °F) (14763 ft ASL ... 16404 ft ASL)</li> </ul> </div> <div>Extended</div> <div> <ul style="list-style-type: none"> <li>▶ up to 2000 m ASL -40 °C ... +70 °C (-40 °F ... +158 °F) (6562 ft ASL)</li> <li>▶ 2000 m ASL ... 3000 m ASL -40 °C ... +60 °C (-40 °F ... +140 °F) (6560 ft ASL ... 9842 ft ASL)</li> <li>▶ 3000 m ASL ... 4000 m ASL -40 °C ... +55 °C (-40 °F ... +131 °F) (9842 ft ASL ... 13123 ft ASL)</li> <li>▶ 4000 m ASL ... 4500 m ASL -40 °C ... +50 °C (-40 °F ... +122 °F) (13123 ft ASL ... 14763 ft ASL)</li> <li>▶ 4500 m ASL ... 5000 m ASL 0 °C ... +45 °C (+32 °F ... +113 °F) (14763 ft ASL ... 16404 ft ASL)</li> </ul> </div> <div> <p><b>Note:</b> Note the following de-ratings due to:</p> <ul style="list-style-type: none"> <li>▶ Mounting: <a href="#">See table 6 on page 46.</a></li> <li>▶ PoE power output: <a href="#">See table 16 on page 68.</a> <a href="#">See table 17 on page 68.</a></li> <li>▶ SFP transceiver <a href="#">See “Derating due to SFP transceiver” on page 87.</a></li> </ul> </div>

Table 22: Climatic conditions during operation



### Climatic conditions during operation

Maximum inner temperature of device (guideline)

- ▶ Device variants in plastic casing with extended temperature range: BRSXX-XXXXXXX-**T/E/GxC** ... 85 °C (185 °F)  
See "Device name and product code" on page 24.
- ▶ Device variants in metal casing with standard temperature range: BRSXX-XXXXXXX-**S/CxD**... 80 °C (176 °F)  
See "Device name and product code" on page 24.
- ▶ Device variants in metal casing with extended temperature range: BRSXX-XXXXXXX-**T/E/GxD/E** ... 85 °C (185 °F)  
See "Device name and product code" on page 24.

Humidity	1 % ... 95 % (non-condensing)
Air pressure	Without derating
	▶ min. 795 hPa (+2000 m ASL; +6562 ft ASL)
	▶ max. 1060 hPa (-400 m ASL; -1312 ft ASL)
	With derating
	▶ min. 540 hPa (+4000 m ASL; +13123 ft ASL)
	▶ max. 1060 hPa (-400 m ASL; -1312 ft ASL)

Table 22: Climatic conditions during operation

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

## 7.7 Climatic conditions during storage

### Climatic conditions during storage

Ambient temperature	-40 °C ... +85 °C (-40 °F ... +185 °F)	up to 3 months
	-40 °C ... +70 °C (-40 °F ... +158 °F)	up to 1 year
	-40 °C ... +50 °C (-40 °F ... +122 °F)	up to 2 years
	0 °C ... +30 °C (+32 °F ... +86 °F)	up to 10 years
Humidity	1 % ... 95 % (non-condensing)	
Air pressure	▶ min. 540 hPa (+4000 m ASL; +13123 ft ASL)	
	▶ max. 1060 hPa (-400 m ASL; -1312 ft ASL)	

Table 23: Climatic conditions during storage

7.8 Dimension drawings

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

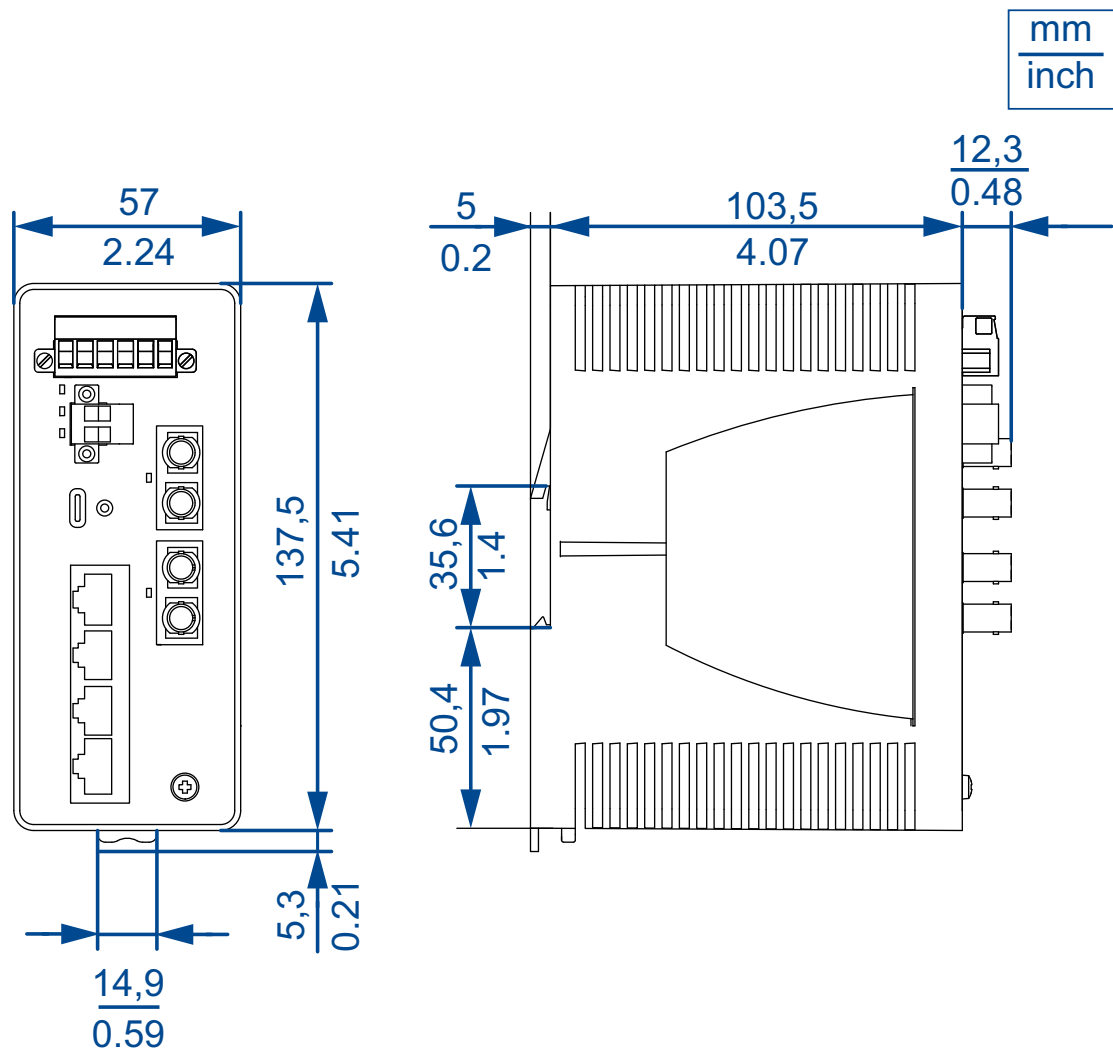


Figure 22: Device variants in narrow plastic casing

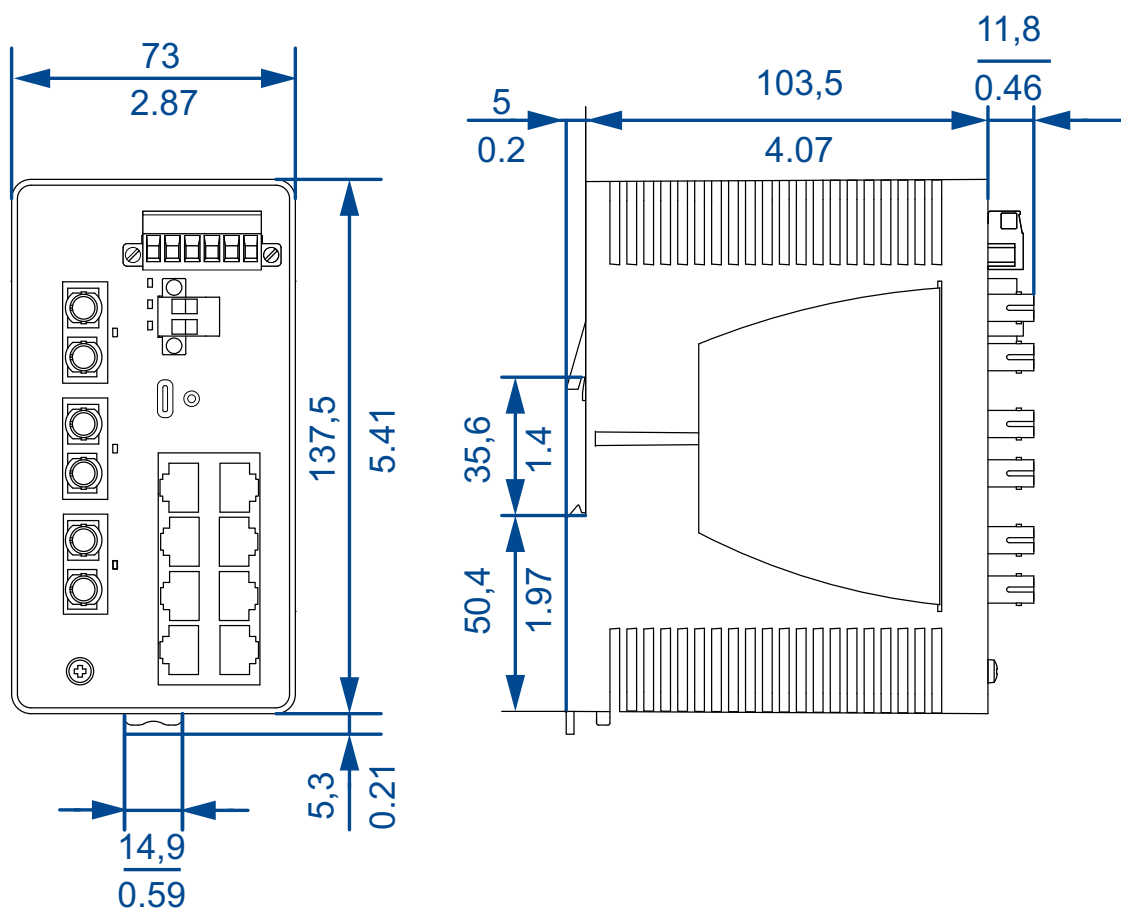


Figure 23: Device variants in medium plastic casing

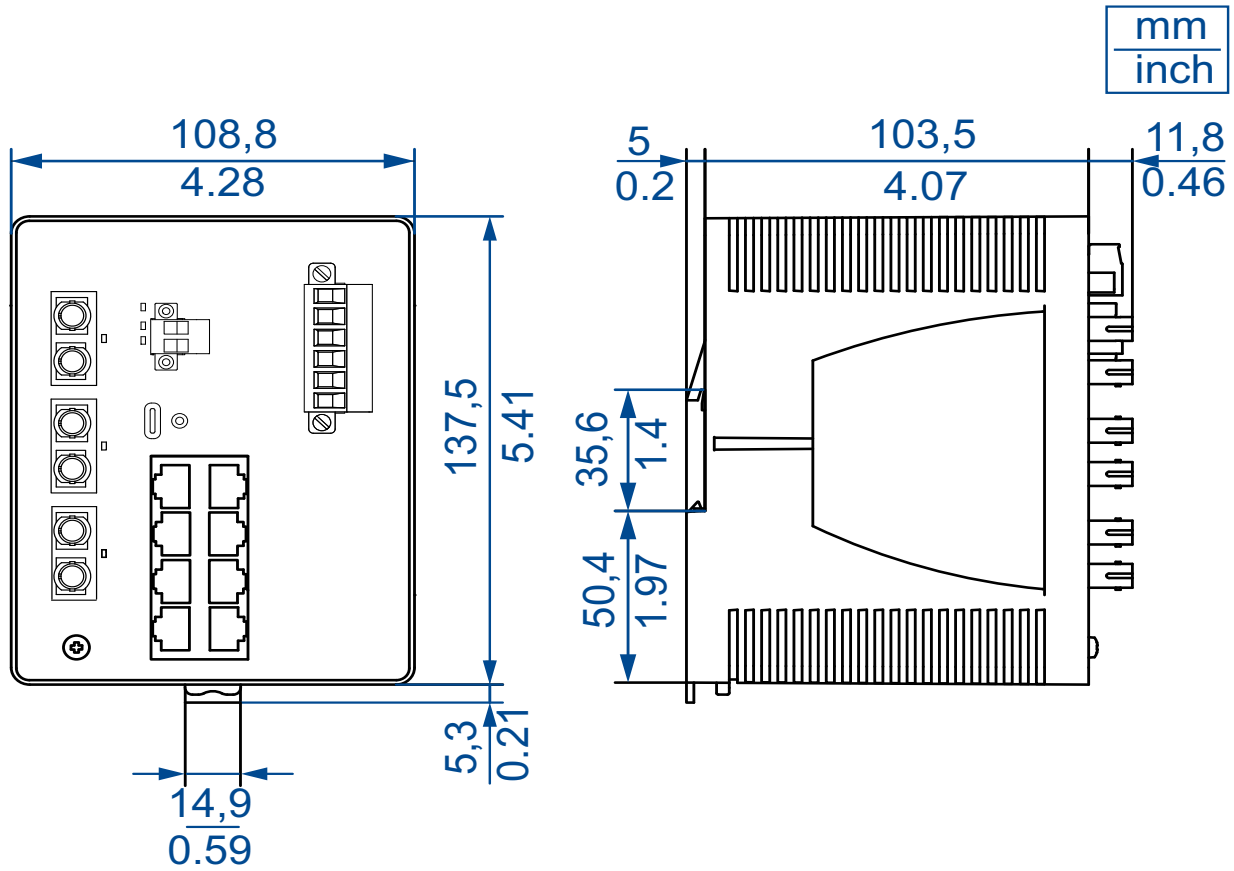


Figure 24: Device variants in wide plastic casing

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

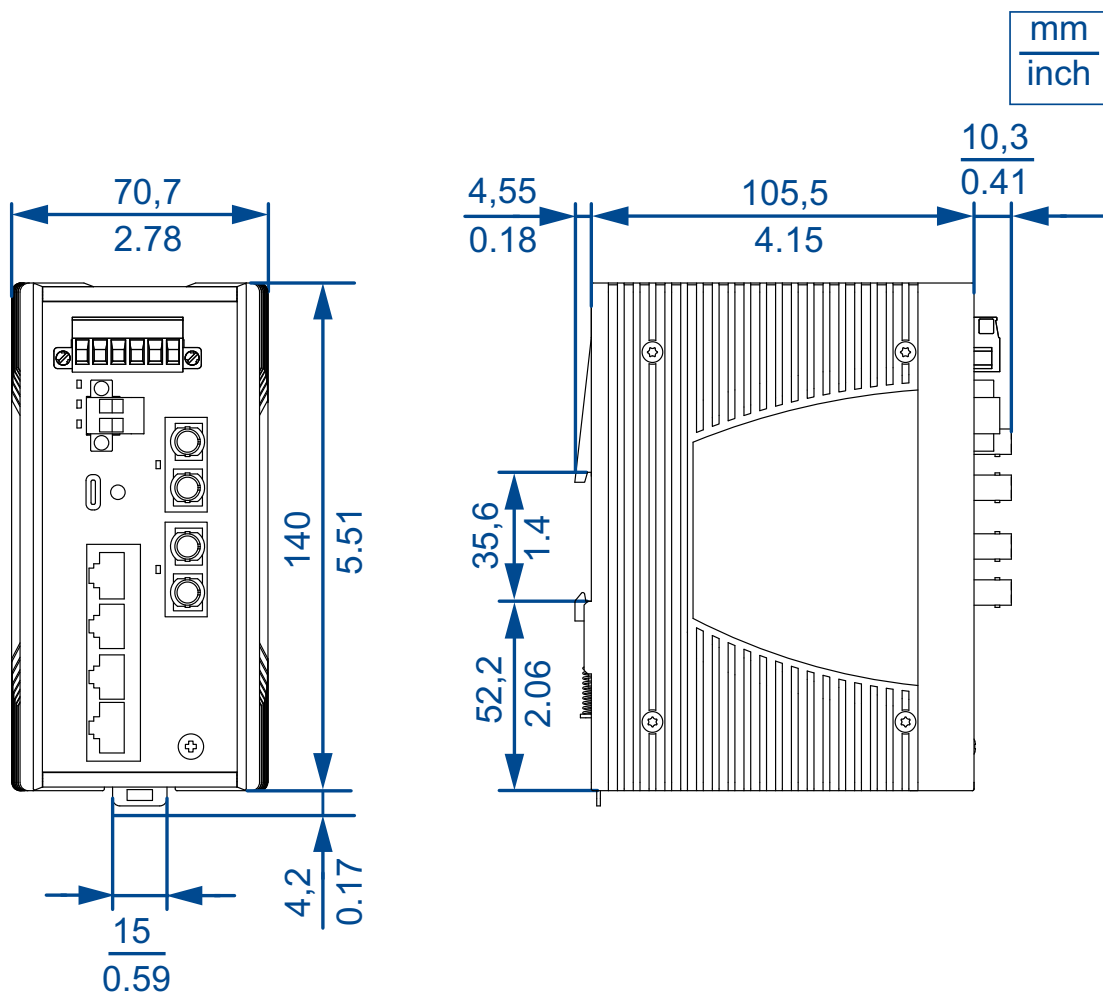


Figure 25: Device variants in narrow metal casing

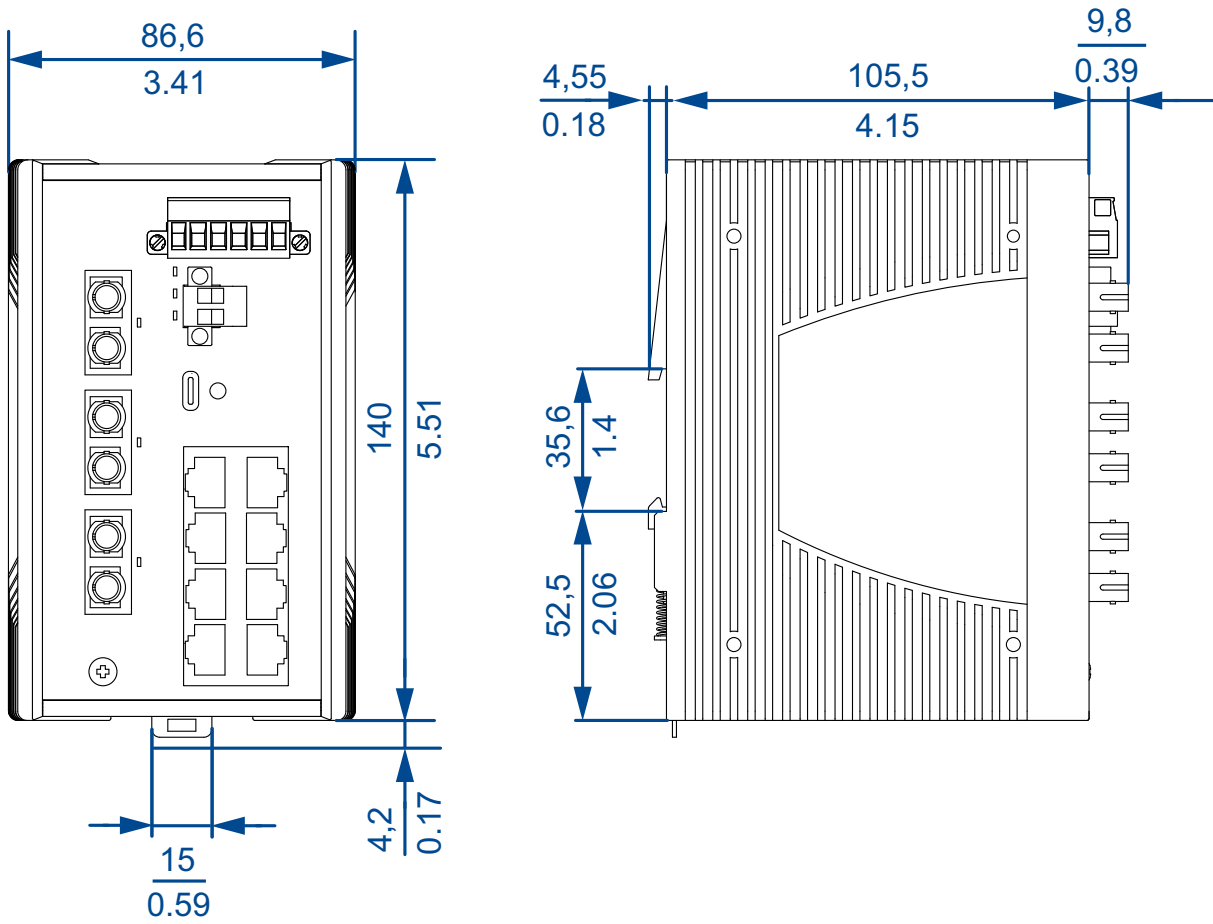


Figure 26: Device variants in medium metal casing

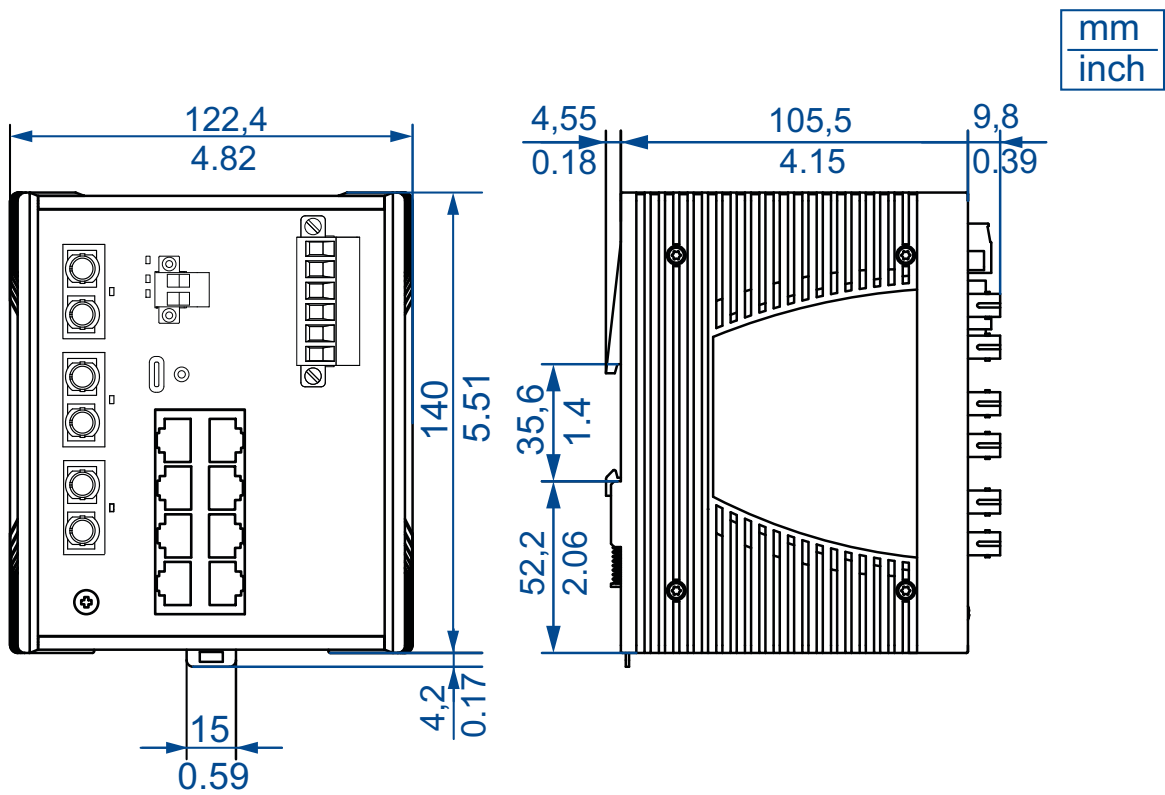


Figure 27: Device variants in wide metal casing

## 7.9 Immunity

Immunity		Standard applications <sup>a</sup>	Navy applications	Railway applications (trackside) as per EN 50121-4
IEC 60068-2-6, test Fc	Vibration	5 Hz ... 8.4 Hz with 3.5 mm (0.14 in) amplitude	2 Hz ... 13.2 Hz with 1 mm (0.04 in) 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 <sup>a</sup>	Navy applications	Railway applications (trackside) as per EN 50121-4
EN 55032	Class A	—	—
DNV 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 <sup>a</sup>	Navy applications	Railway applications (trackside) as per EN 50121-4
<b>Electrostatic discharge</b>				
EN 61000-4-2	Contact discharge	±4 kV	±6 kV	±6 kV
EN 61000-4-2	Air discharge	±8 kV	±8 kV	±8 kV
<b>Electromagnetic field</b>				
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
<b>Fast transients (burst) – power supply connection</b>				
EN 61000-4-4		±2 kV	±2 kV	±2 kV
<b>Fast transients (burst) – data line</b>				
EN 61000-4-4		±1 kV	±1 kV	±2 kV
<b>Voltage surges – power supply connection</b>				
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
<b>Voltage surges - data line</b>				
EN 61000-4-5	line/ground	±1 kV	—	±2 kV
<b>Conducted disturbances</b>				
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. 100 m (328 ft) (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 <sup>a</sup>	Wave length	Fiber	System attenuation	Example for F/O cable length <sup>b</sup>	Fiber attenuation	BLP/Dispersion
M-FAST-SFP-MM/LC...	MM	1310 nm	50/125 μm	0 dB ... 8 dB	0 km ... 5 km (0 mi ... 3.11 mi)	1.0 dB/km	800 MHz×km
M-FAST-SFP-MM/LC...	MM	1310 nm	62.5/125 μm	0 dB ... 11 dB	0 km ... 4 km (0 mi ... 2.49 mi)	1.0 dB/km	500 MHz×km
M-FAST-SFP-SM/LC...	SM	1310 nm	9/125 μm	0 dB ... 13 dB	0 km ... 25 km (0 mi ... 15.53 mi)	0.4 dB/km	3.5 ps/(nm×km)
M-FAST-SFP-SM+/LC...	SM	1310 nm	9/125 μm	10 dB ... 29 dB	25 km ... 65 km (15.53 mi ... 40.39 mi)	0.4 dB/km	3.5 ps/(nm×km)
M-FAST-SFP-LH/LC...	SM	1550 nm	9/125 μm	10 dB ... 29 dB	47 km ... 104 km (29.20 mi ... 64.62 mi)	0.25 dB/km	19 ps/(nm×km)
M-FAST-SFP-LH/LC...	SM	1550 nm	9/125 μm	10 dB ... 29 dB	55 km ... 140 km (14.29 mi ... 86.99 mi)	0.18 dB/km <sup>c</sup>	18 ps/(nm×km)
SFP-FAST-MM/LC	MM	1310 nm	50/125 μm	0 dB ... 8 dB	0 km ... 5 km (0 mi ... 3.11 mi)	1.0 dB/km	800 MHz×km
SFP-FAST-MM/LC EEC	MM	1310 nm	62.5/125 μm	0 dB ... 11 dB	0 km ... 4 km (0 mi ... 2.49 mi)	1.0 dB/km	500 MHz×km
SFP-FAST-SM/LC	SM	1310 nm	9/125 μm	0 dB ... 13 dB	0 km ... 25 km (0 mi ... 15.53 mi)	0.4 dB/km	3.5 ps/(nm×km)
SFP-FAST-SM/LC EEC	SM	1310 nm	9/125 μm	0 dB ... 13 dB	0 km ... 25 km (0 mi ... 15.53 mi)	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.

Product code	Mode <sup>a</sup>	Wave length	Fiber	System attenuation	Example for F/O cable length <sup>b</sup>	Fiber attenuation	BLP/Dispersion
-M2, -MM	MM	1300 nm	50/125 µm	0 dB ... 8 dB	0 km ... 5 km (0 mi ... 3.11 mi)	1.0 dB/km	800 MHz×km
-M2, -MM	MM	1300 nm	62.5/125 µm	0 dB ... 11 dB	0 km ... 4 km (0 mi ... 2.49 mi)	1.0 dB/km	500 MHz×km
-M4, -NN	SM	1300 nm	62.5/125 µm	0 dB ... 11 dB	0 km ... 4 km (0 mi ... 2.49 mi)	1.0 dB/km	500 MHz×km
-S2, -VV	SM	1300 nm	9/125 µm	0 dB ... 16 dB	0 km ... 30 km (0 mi ... 18.64 mi)	0.4 dB/km	3.5 ps/(nm×km)
-S4, -UU	SM	1300 nm	9/125 µm	0 dB ... 16 dB	0 km ... 30 km (0 mi ... 18.64 mi)	0.4 dB/km	3.5 ps/(nm×km)
-E2, EE	SM+	1300 nm	9/125 µm	7 dB ... 29 dB	25 km ... 65 km (12.43 mi ... 40.39 mi)	0.4 dB/km	3.5 ps/(nm×km)
-L2, -LL	LH	1550 nm	9/125 µm	3 dB ... 29 dB	14 km ... 104 km (8.70 mi ... 64.62 mi)	0.25 dB/km	19 ps/(nm×km)
-G2, -GG	LH+	1550 nm	9/125 µm	14 dB ... 47 dB	67 km ... 176 km (41.63 mi ... 109.36 mi)	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	Mode <sup>a</sup>	Wave length	Fiber	System attenuation	Example for F/O cable length <sup>b</sup>	Fiber attenuation	BLP <sup>c</sup> / Dispersion
<b>M-SFP-...</b>							
-SX/LC...	MM	850 nm	50/125 µm	0 dB ... 7.5 dB	0 km ... 0.55 km (0 mi ... 0.34 mi)	3.0 dB/km	400 MHz×km
-SX/LC...	MM	850 nm	62.5/125 µm	0 dB ... 7.5 dB	0 km ... 0.275 km (0 mi ... 0.17 mi)	3.2 dB/km	200 MHz×km
-MX/LC...	MM	1310 nm	50/125 µm	0 dB ... 12 dB	0 km ... 1.5 km (0 mi ... 0.93 mi)	1.0 dB/km	800 MHz×km
-MX/LC...	MM	1310 nm	62.5/125 µm	0 dB ... 12 dB	0 km ... 0.50 km (0 mi ... 0.31 mi)	1.0 dB/km	500 MHz×km
-LX/LC...	MM	1310 nm <sup>d</sup>	50/125 µm	0 dB ... 10.5 dB	0 km ... 0.55 km (0 mi ... 0.34 mi)	1.0 dB/km	800 MHz×km
-LX/LC...	MM	1310 nm <sup>e</sup>	62.5/125 µm	0 dB ... 10.5 dB	0 km ... 0.55 km (0 mi ... 0.34 mi)	1.0 dB/km	500 MHz×km
-LX/LC...	SM	1310 nm	9/125 µm	0 dB ... 10.5 dB	0 km ... 20 km (0 mi ... 12.43 mi) <sup>f</sup>	0.4 dB/km	3.5 ps/(nm×km)
-LX+/LC...	SM	1310 nm	9/125 µm	5 dB ... 20 dB	14 km ... 42 km (8.70 mi ... 26.10 mi)	0.4 dB/km	3.5 ps/(nm×km)
-LH/LC...	LH	1550 nm	9/125 µm	5 dB ... 22 dB	23 km ... 80 km (14.29 mi ... 49.71 mi)	0.25 dB/km	19 ps/(nm×km)

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

Product code M-SFP-...	Mode <sup>a</sup>	Wave length	Fiber	System attenuation	Example for F/O cable length <sup>b</sup>	Fiber attenuation	BLP <sup>c</sup> / Dispersion
-LH+/LC	LH	1550 nm	9/125 µm	15 dB ... 30 dB	71 km ... 108 km (44.12 mi ... 67.11 mi)	0.25 dB/km	19 ps/(nm×km)
-LH+/LC	LH	1550 nm	9/125 µm	15 dB ... 30 dB	71 km ... 128 km (44.12 mi ... 79.54 mi)	0.21 dB/km (typically)	19 ps/(nm×km)
-LH+/LC...	LH	1550 nm	9/125 µm	13 dB ... 32 dB	62 km ... 116 km (38.52 mi ... 72.07 mi)	0.25 dB/km	19 ps/(nm×km)
-LH+/LC...	LH	1550 nm	9/125 µm	13 dB ... 32 dB	62 km ... 138 km (38.52 mi ... 85.75 mi)	0.21 dB/km (typically)	19 ps/(nm×km)
SFP-GIG-LX/LC...	MM	1310 nm <sup>g</sup>	50/125 µm	0 dB ... 10,5 dB	0 km ... 0.55 km (0 mi ... 0.34 mi)	1.0 dB/km	800 MHz×km
SFP-GIG-LX/LC...	MM	1310 nm <sup>h</sup>	62.5/125 µm	0 dB ... 10.5 dB	0 km ... 0.55 km (0 mi ... 0.34 mi)	1.0 dB/km	500 MHz×km
SFP-GIG-LX/LC...	SM	1310 nm	9/125 µm	0 dB ... 10,5 dB	0 km ... 20 km <sup>i</sup> (0 mi ... 12.43 mi)	0,4 dB/km	3,5 ps/(nm×km)

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

- MM = Multimode, SM = Singlemode, LH = Singlemode Longhaul
- Including 3 dB system reserve when compliance with the fiber data is observed.
- Using the bandwidth-length product is inappropriate for expansion calculations.
- With F/O adapter compliant with IEEE 802.3-2002 Clause 38 (single-mode fiber offset-launch mode conditioning patch cord).
- With F/O adapter compliant with IEEE 802.3-2002 Clause 38 (single-mode fiber offset-launch mode conditioning patch cord).
- Including 2.5 dB system reserve when compliance with the fiber data is observed.
- With F/O adapter compliant with IEEE 802.3-2002 Clause 38 (single-mode fiber offset-launch mode conditioning patch cord).
- With F/O adapter compliant with IEEE 802.3-2002 Clause 38 (single-mode fiber offset-launch mode conditioning patch cord).
- 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 <b>M-SFP-2.5-...</b>	Mode <sup>a</sup>	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	0.55 km (0.34 mi)	3.5 dB/km	2000 MHz×km (OM3)
MM/LC EEC	MM	850 nm	50/125 µm	0 dB ... 4 dB	0.4 km (0.25 mi)	3.5 dB/km	500 MHz×km (OM2)
MM/LC EEC	MM	850 nm	62.5/125 µm	0 dB ... 4 dB	0.17 km (0.11 mi)	3.5 dB/km	200 MHz×km (OM1)
SM-/LC EEC	SM	1310 nm	9/125 µm	0 dB ... 8.5 dB	5 km (3.11 mi)	0.4 dB/km	3.5 ps/(nm×km)
SM/LC EEC	SM	1310 nm	9/125 µm	0 dB ... 13 dB	20 km (12.43 mi)	0.4 dB/km	3.5 ps/(nm×km)
SM+/LC EEC	SM	1310 nm	9/125 µm	12 dB ... 25 dB	45 km (27.96 mi)	0.4 dB/km	3.5 ps/(nm×km)
LH/LC	SM	1551 nm	9/125 µm	14 dB ... 28 dB	80 km <sup>b</sup> (49.70 mi)	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 95 km (59 mi).

## 7.11.5 Bidirectional Fast Ethernet SFP transceiver

Product code <b>SFP-FAST-B...</b>	Mode <sup>a</sup>	Wave length TX	Wave length RX	Fiber	System attenuation	Example for F/O cable length <sup>b</sup>	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 km ... 2 km (0 mi ... 1.24 mi)	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 km ... 2 km (0 mi ... 1.24 mi)	1.0 dB/km	800 MHz×km 500 MHz×km
SFP-FAST-BA SM/LC EEC	SM	1310 nm	1550 nm	9/125 µm	0 dB ... 18 dB	0 km ... 20 km (0 km ... 12.43 mi)	0.4 dB/km	3.5 ps/(nm×km)

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

Product code SFP-FAST-B...	Mode <sup>a</sup>	Wave length TX	Wave length RX	Fiber	System attenuation	Example for F/O cable length <sup>b</sup>	Fiber attenuation	Dispersion
SFP-FAST-BB SM/LC EEC	SM	1550 nm	1310 nm	9/125 µm	0 dB ... 18 dB	0 km ... 20 km (0 km ... 12.43 mi)	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 km ... 60 km (0 mi ... 37.29 mi)	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 km ... 60 km (0 mi ... 37.29 mi)	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 <sup>a</sup>	Wave length TX	Wave length RX	Fiber	System attenuation	Example for F/O cable length <sup>b</sup>	Fiber attenuation	Dispersion
SFP-GIG-BA LX/ LC EEC	SM	1310 nm	1550 nm	9/125 µm	0 dB ... 15 dB	0 km ... 20 km (0 mi ... 12.43 mi)	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 ... 20 km (0 mi ... 12.43 mi)	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	12 km ... 40 km (7.45 mi ... 24.86 mi)	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	12 km ... 40 km (7.45 mi ... 24.86 mi)	0.25 dB/km	19 ps/(nm×km)
SFP-GIG-BA LH/ LC EEC	SM	1490 nm	1550 nm	9/125 µm	4 dB ... 24 dB	19 km ... 80 km (11.80 mi ... 49.71 mi)	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	19 km ... 80 km (11.80 mi ... 49.71 mi)	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	Derating for a device with operating temperature +60 °C (+140 °F) per SFP transceiver used	Derating for a device with operating temperature +70 °C (+158 °F) per SFP transceiver used	Order number
M-FAST SFP-MM/LC	0 K	<b>a</b>	943 865-001
M-FAST SFP-MM/LC EEC	0 K	0 K	943 945-001
M-FAST SFP-SM/LC	0 K	<b>a</b>	943 866-001
M-FAST SFP-SM/LC EEC	0 K	0 K	943 946-001
M-FAST SFP-SM+/LC	0 K	<b>a</b>	943 867-001
M-FAST SFP-SM+/LC EEC	0 K	0 K	943 947-001
M-FAST SFP-LH/LC	0 K	<b>a</b>	943 868-001
M-FAST SFP-LH/LC EEC	0 K	0 K	943 948-001
M-FAST SFP-TX/RJ45	0 K	<b>a</b>	942 098-001
M-FAST SFP-TX/RJ45 EEC	0 K	0 K	942 098-002
SFP-FAST-MM/LC	0 K	<b>a</b>	942 194-001
SFP-FAST-MM/LC EEC	0 K	0 K	942 194-002
SFP-FAST-SM/LC	0 K	<b>a</b>	942 195-001
SFP-FAST-SM/LC EEC	0 K	0 K	942 195-002

Table 34: Derating due to Fast Ethernet SFP transceiver

**a** - By using a SFP transceiver without EEC extension, the temperature of the device is reduced by 15°C (27 °F).

Product code	De-rating for a device with operating temperature +60 °C (+140 °F) per SFP transceiver used	De-rating for a device with operating temperature +70 °C (+158 °F) per SFP transceiver used	Order number
M-SFP-SX/LC	0 K	<b>a</b>	943 014-001
M-SFP-SX/LC EEC	0 K	0 K	943 896-001
M-SFP-LX/LC	0 K	<b>a</b>	943 015-001
M-SFP-LX/LC EEC	0 K	0 K	943 897-001
M-SFP-LH/LC	2 K	<b>a</b>	943 042-001
M-SFP-LH/LC EEC	0 K	2 K	943 898-001
M-SFP-LH+/LC	2 K	<b>a</b>	943 049-001
M-SFP-TX/RJ45	3 K	<b>a</b>	943 977-001
M-SFP-TX/RJ45 EEC	0 K	3 K	942 161-001
SFP-GIG-LX/LC	0 K	<b>a</b>	942 196-001
SFP-GIG-LX/LC EEC	0 K	0 K	942 196-002
M-SFP-LX+/LC	0 K	<b>a</b>	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°C (27 °F).



### 7.12.3 2.5 Gigabit Ethernet SFP transceiver

Product code	Derating for a device with operating temperature +60 °C (+140 °F) per SFP transceiver used	Derating for a device with operating temperature +70 °C (+158 °F) 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	<b>a</b>	942 220-001

Table 36: Derating due to 2.5 Gigabit Ethernet SFP transceiver

**a** - By using a SFP transceiver without EEC extension, the temperature of the device is reduced by 15°C (27 °F).

### 7.12.4 Bidirectional Fast Ethernet SFP transceiver

Product code	De-rating for a device with operating temperature +60 °C (+140 °F) per SFP transceiver used	De-rating for a device with operating temperature +70 °C (+158 °F) 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 +60 °C (+140 °F) per SFP transceiver used	De-rating for a device with operating temperature +70 °C (+158 °F) 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 <a href="#">See “Connecting the ferrite (optional)” on page 47.</a>

*Table 39: Scope of delivery*

## 9 Accessories

### 9.1 General accessories

<b>General accessories</b>	
You find more information on available accessories in the Belden Online Catalog <a href="https://catalog.belden.com">https://catalog.belden.com</a>	
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

<b>Name</b>	<b>Order number</b>
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
BRS20-16TX	942 170-053
BRS20-16TX-EEC	942 170-054
BRS20-16TX/4SFP	942 170-055
BRS20-16TX/4SFP-EEC	942 170-056
BRS20-20TX/4SFP	942 170-057
BRS20-20TX/4SFP-EEC	942 170-058
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
BRS30-16TX/4SFP	942 170-059
BRS30-16TX/4SFP-EEC	942 170-060
BRS30-20TX/4SFP	942 170-061
BRS30-20TX/4SFP-EEC	942 170-062
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
BRS40-16TX	942 170-063
BRS40-16TX-EEC	942 170-064
BRS40-16TX/4SFP	942 170-065
BRS40-16TX/4SFP-EEC	942 170-066
BRS40-20TX/4SFP	942 170-067
BRS40-20TX/4SFP-EEC	942 170-068
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
BRS50-16TX/4SFP	942 170-069
BRS50-16TX/4SFP-EEC	942 170-070
BRS50-20TX/4SFP	942 170-071
BRS50-20TX/4SFP-EEC	942 170-072
PoE device variants	
BRS32-8TX/4SFP	942 170-048
BRS32-8TX/4SFP-EEC	942 170-052
BRS42-8TX	942 170-047

*Table 41: Order numbers for standard variants in plastic casing*

Name	Order number
BRS42-8TX-EEC	942 170-051
BRS42-8TX/4SFP	942 170-046
BRS42-8TX/4SFP-EEC	942 170-050
BRS52-8TX/4SFP	942 170-045
BRS52-8TX/4SFP-EEC	942 170-049

Table 41: Order numbers for standard variants in plastic casing

## 9.3 Fast Ethernet SFP transceiver

Fast Ethernet SFP transceiver	Certification type <sup>a</sup>	Temperature range	Order number
M-FAST SFP-TX/RJ45	Standard level	0 °C ... +60 °C (+32 °F ... +140 °F)	942 098-001
M-FAST SFP-TX/RJ45 EEC	Standard level	0 °C ... +70 °C (+32 °F ... +158 °)	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	Standard level	0 °C ... +60 °C (+32 °F ... +140 °F)	943 865-001
M-FAST SFP-MM/LC EEC	Standard level	0 °C ... +70 °C (+32 °F ... +158 °)	943 945-001
M-FAST SFP-SM/LC	Standard level	0 °C ... +60 °C (+32 °F ... +140 °F)	943 866-001
M-FAST SFP-SM/LC EEC	Standard level	0 °C ... +70 °C (+32 °F ... +158 °F)	943 946-001
M-FAST SFP-SM+/LC	Standard level	0 °C ... +60 °C (+32 °F ... +140 °F)	943 867-001
M-FAST SFP-SM+/LC EEC	Standard level	0 °C ... +70 °C (+32 °F ... +158 °F)	943 947-001
M-FAST SFP-LH/LC	Standard level	0 °C ... +60 °C (+32 °F ... +140 °F)	943 868-001
M-FAST SFP-LH/LC EEC	Standard level	0 °C ... +70 °C (+32 °F ... +158 °F)	943 948-001
SFP-FAST-MM/LC	Entry level	0 °C ... +60 °C (+32 °F ... +140 °F)	942 194-001
SFP-FAST-MM/LC EEC <sup>a</sup>	Entry level	0 °C ... +70 °C (+32 °F ... +158 °F)	942 194-002
SFP-FAST-SM/LC <sup>a</sup>	Entry level	0 °C ... +60 °C (+32 °F ... +140 °F)	942 195-001
SFP-FAST-SM/LC EEC <sup>a</sup>	Entry level	0 °C ... +70 °C (+32 °F ... +158 °F)	942 195-002

Table 42: Accessory: Fast Ethernet SFP transceiver

- a. Use Entry level SFP transceivers for industrial applications that exclusively require the following approvals: CE, FCC or UL 61010-2-201.  
 Use Standard level SFP transceivers for industrial applications that exclusively require following approvals: CE, FCC, UL 61010-2-201, DNV, Lloyd's Register, Bureau Veritas, UL121201 (Hazardous Locations), IEC61850-3, EN 50121-4, ATEX or IECEx.

## 9.4 Gigabit Ethernet SFP transceiver

Gigabit Ethernet SFP transceiver	Certification type <sup>a</sup>	Temperature range	Order number
M-SFP-TX/RJ45	Standard level	0 °C ... +60 °C (+32 °F ... +140 °F)	943 977-001
M-SFP-TX/RJ45 EEC	Standard level	0 °C ... +70 °C (+32 °F ... +158 °F)	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	Standard level	0 °C ... +60 °C (+32 °F ... +140 °F)	943 014-001
M-SFP-SX/LC EEC	Standard level	0 °C ... +70 °C (+32 °F ... +158 °F)	943 896-001
M-SFP-MX/LC EEC	Standard level	0 °C ... +70 °C (+32 °F ... +158 °F)	942 108-001
M-SFP-LX/LC	Standard level	0 °C ... +60 °C (+32 °F ... +140 °F)	943 015-001
M-SFP-LX/LC EEC	Standard level	0 °C ... +70 °C (+32 °F ... +158 °F)	943 897-001
M-SFP-LX+/LC	Standard level	0 °C ... +60 °C (+32 °F ... +140 °F)	942 023-001
M-SFP-LX+/LC EEC	Standard level	0 °C ... +70 °C (+32 °F ... +158 °F)	942 024-001
M-SFP-LH/LC	Standard level	0 °C ... +60 °C (+32 °F ... +140 °F)	943 042-001
M-SFP-LH/LC EEC	Standard level	0 °C ... +70 °C (+32 °F ... +158 °F)	943 898-001
M-SFP-LH+/LC	Standard level	0 °C ... +60 °C (+32 °F ... +140 °F)	943 049-001
M-SFP-LH+/LC EEC	Standard level	0 °C ... +70 °C (+32 °F ... +158 °F)	942 119-001
SFP-GIG-LX/LC	Entry level	0 °C ... +60 °C (+32 °F ... +140 °F)	942 196-001
SFP-GIG-LX/LC EEC	Entry level	0 °C ... +70 °C (+32 °F ... +158 °F)	942 196-002

*Table 43: Accessory: Gigabit Ethernet SFP transceiver*

- a. Use Entry level SFP transceivers for industrial applications that exclusively require the following approvals: CE, FCC or UL 61010-2-20.  
Use Standard level SFP transceivers for industrial applications that exclusively require following approvals: CE, FCC, UL 61010-2-201, DNV, Lloyd's Register, Bureau Veritas, UL121201 (Hazardous Locations), IEC61850-3, EN 50121-4, ATEX or IECEx.

## 9.5 2.5 Gigabit Ethernet SFP transceiver

2.5 Gigabit Ethernet SFP transceiver	Certification type <sup>a</sup>	Temperature range	Order number
M-SFP-2.5-MM/LC EEC	Standard level	0 °C ... +70 °C (+32 °F ... +158 °F)	942 162-001
M-SFP-2.5-SM-/LC EEC	Standard level	0 °C ... +70 °C (+32 °F ... +158 °F)	942 163-001
M-SFP-2.5-SM/LC EEC	Standard level	0 °C ... +70 °C (+32 °F ... +158 °F)	942 164-001
M-SFP-2.5-SM+/LC EEC	Standard level	0 °C ... +70 °C (+32 °F ... +158 °F)	942 165-001
M-SFP-2.5-LH/LC	Standard level	0 °C ... +60 °C (+32 °F ... +140 °F)	942 220-001

*Table 44: Accessory: 2.5 Gigabit Ethernet SFP transceiver*

- a. Use Standard level SFP transceivers for industrial applications that exclusively require following approvals: CE, FCC, UL 61010-2-201, DNV, Lloyd's Register, Bureau Veritas, UL121201 (Hazardous Locations), IEC61850-3, EN 50121-4, ATEX or IECEx.

## 9.6 Bidirectional Fast Ethernet SFP transceiver

Bidirectional Fast Ethernet SFP transceiver	Certification type <sup>ab</sup>	Temperature range	Order number
SFP-FAST-BA MM/LC EEC	Entry level	0 °C ... +70 °C (+32 °F ... +158 °F)	942 204-001
SFP-FAST-BB MM/LC EEC	Entry level	0 °C ... +70 °C (+32 °F ... +158 °)	942 204-002
SFP-FAST-BA SM/LC EEC	Entry level	0 °C ... +70 °C (+32 °F ... +158 °)	942 205-001
SFP-FAST-BB SM/LC EEC	Entry level	0 °C ... +70 °C (+32 °F ... +158 °F)	942 205-002
SFP-FAST-BA SM+/LC EEC	Entry level	0 °C ... +70 °C (+32 °F ... +158 °F)	942 206-001
SFP-FAST-BB SM+/LC EEC	Entry level	0 °C ... +70 °C (+32 °F ... +158 °F)	942 206-002

*Table 45: Accessory: Bidirectional Fast Ethernet SFP transceiver*

- a. Use Entry level SFP transceivers for industrial applications that exclusively require the following approvals: CE, FCC or UL 61010-2-20.  
b.



## 9.7 Bidirectional Gigabit Ethernet SFP transceiver

Bidirectional Gigabit Ethernet SFP transceiver type <sup>a</sup>	Certification	Temperature range	Order number
SFP-GIG-BA LX/LC EEC	Entry level	0 °C ... +70 °C (+32 °F ... +158 °F)	942 207-001
SFP-GIG-BB LX/LC EEC	Entry level	0 °C ... +70 °C (+32 °F ... +158 °F)	942 207-002
SFP-GIG-BA LX+/LC EEC	Entry level	0 °C ... +70 °C (+32 °F ... +158 °F)	942 208-001
SFP-GIG-BB LX+/LC EEC	Entry level	0 °C ... +70 °C (+32 °F ... +158 °F)	942 208-002
SFP-GIG-BA LH/LC EEC	Entry level	0 °C ... +70 °C (+32 °F ... +158 °F)	942 209-001
SFP-GIG-BB LH/LC EEC	Entry level	0 °C ... +70 °C (+32 °F ... +158 °F)	942 209-002

*Table 46: Accessory: Bidirectional Gigabit Ethernet SFP transceiver*

- a. Use Entry level SFP transceivers for industrial applications that exclusively require the following approvals: CE, FCC or UL 61010-2-20.

# 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)
UL 61010-2-201	Safety requirements for electrical equipment for measurement, control, and laboratory use - Part 2-201: Particular requirements 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
IEC/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, 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](http://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.

## Customer Innovation Center

The Customer Innovation Center is ahead of its competitors on three counts with its complete range of innovative services:

- ▶ Consulting incorporates comprehensive technical advice, from system evaluation through network planning to project planning.
- ▶ Training offers you an introduction to the basics, product briefing and user training with certification.  
You find the training courses on technology and products currently available at <https://www.belden.com/solutions/customer-innovation-center>.
- ▶ Support ranges from the first installation through the standby service to maintenance concepts.

With the Customer Innovation Center, you decide against making any compromises in any case. Our client-customized package leaves you free to choose the service components you want to use.

Internet:

<https://www.belden.com/solutions/customer-innovation-center>



**HIRSCHMANN**

---

A **BELDEN** BRAND