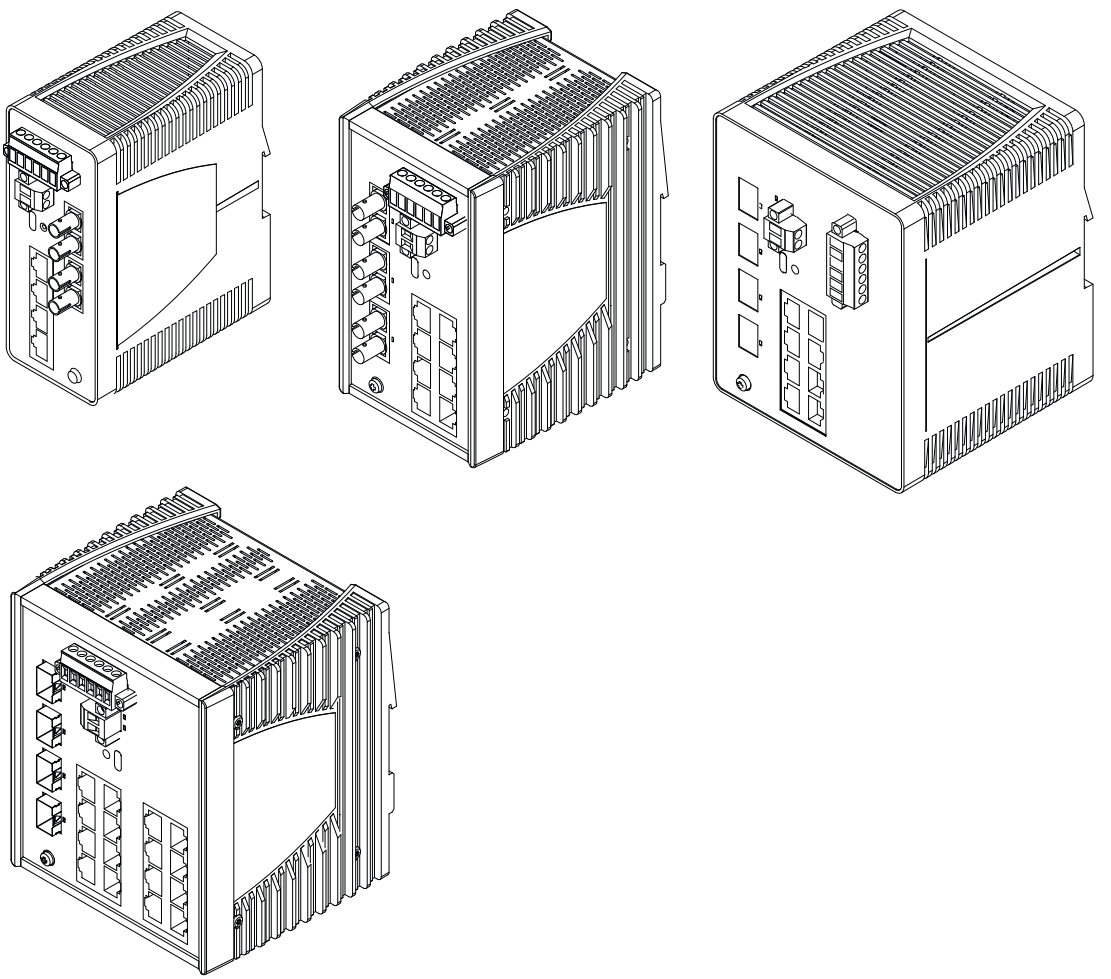
HIRSCHMANN
A BELDEN BRAND

# User Manual

## Installation
## Industrial Ethernet BOBCAT Rail Switch
## BRS Family



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# Contents

# 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 |
| --- |
| **NOTICE** provides information about procedures that do not involve the risk of injury. |

## ⚠ WARNING

**UNCONTROLLED MACHINE ACTIONS**

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

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

### General safety instructions

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

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

### Certified usage

- ☐ Use the product only for the application cases described in the Hirschmann product information, including this manual.
- ☐ Operate the product only according to the technical specifications. See “Technical data” on page 65.
- ☐ 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 65.

## 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.

## 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 82.

☐ 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 switched voltage complies with the requirements for a safety extra-low voltage (SELV) according to IEC 60950-1 or ES1 according to IEC/EN 62368-1.<br>▶ 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 65. |

## 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.<br>▶ 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.<br>▶ 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.<br>▶ The wire diameter of the power supply cable is at least 0.75 mm² (North America: AWG18) on the supply voltage input. The wire diameter of the power supply cable is at least 1 mm² (North America: AWG16) on the supply voltage input for PoE device variants.<br>▶ The cross-section of the ground conductor is the same size as or bigger than the cross-section of the power supply cables. | |
| Depending on the voltage input used (characteristic value F, T, U, P) and the supply voltage used (DC, AC), the following additional requirements apply: | |
| Device variants featuring supply voltage with characteristic value F, T, U | **All** of the following requirements are complied with:<br>Supply with DC voltage:<br>▶ There are fuses suitable for DC voltage in the positive conductors of the supply lines, or the voltage sources are appropriately current-limited. Regarding the properties of this fuse: See “Technical data” on page 65.<br>▶ The negative conductors of the voltage inputs are on ground potential. |
| Device variants featuring supply voltage with characteristic value F | **All** of the following requirements are complied with:<br>Supply with AC voltage:<br>▶ There are fuses in the supply lines, or the voltage sources are appropriately current-limited. Regarding the properties of this fuse: See “Technical data” on page 65.<br>▶ The power sources are electrically isolated from the ground potential. |
| Device variants featuring supply voltage with characteristic value P | **All** of the following requirements are complied with:<br>▶ There are fuses suitable for DC voltage in the positive conductors of the supply lines, or the voltage sources are appropriately current-limited. Regarding the properties of this fuse: See “Technical data” on page 65.<br>▶ The power sources are electrically isolated from the ground potential. According to specification IEEE 802.3, the insulation voltage must be 1500 V AC or 2250 V DC. |

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

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

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

- National and international safety regulations
  Verify that the electrical installation meets local or nationally applicable safety regulations.

- Relevant for use in explosion hazard areas (Hazardous Locations, Class I, Division 2)
  This equipment is exclusively suitable for use in Class I, Division 2, Groups A, B, C, and D or non-hazardous locations.

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

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

  WARNING – EXPLOSION HAZARD – DO NOT DISCONNECT EQUIPMENT UNLESS POWER HAS BEEN SWITCHED OFF OR THE AREA IS KNOWN TO BE NON-HAZARDOUS.
  **Avertissement** - Risque d'explosion - Ne pas débrancher tant que le circuit est sous tension à moins que l'emplacement soit connu pour ne contenir aucune concentration de gaz inflammable.

  WARNING - EXPLOSION HAZARD - SUBSTITUTION OF ANY COMPONENT MAY IMPAIR SUITABILITY FOR CLASS I, DIVISION 2.
  **Avertissement** - Risque d'explosion - La substitution de tout composant peut rendre ce matériel incompatible pour une utilisation en classe I, division 2.

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

  In hazardous areas, exclusively operate the ACA22-USB-C (EEC) on the USB interface.

En environnement explosible, seul l'ACA22-USB-C (EEC) peut être utilisé sur l'interface USB-C.

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

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

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

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

BRS - Industrial Ethernet
BOBCAT Rail Switch

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

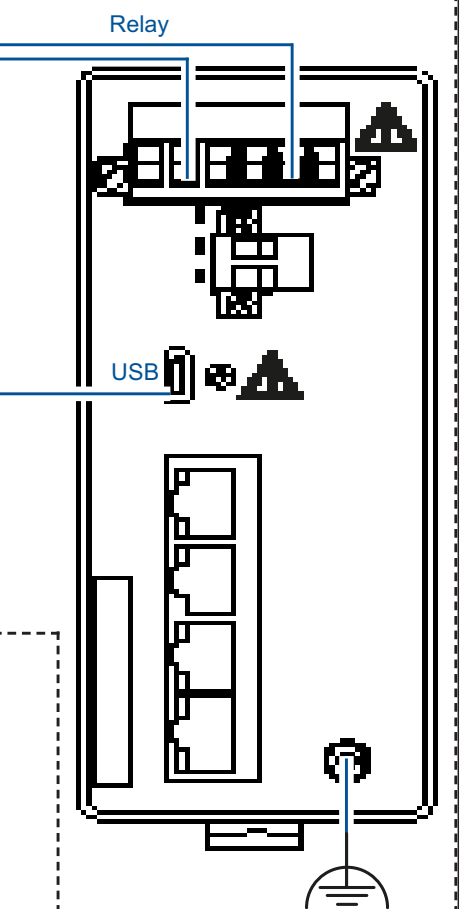
The relay terminals are dependent upon the following entity parameters (*):

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

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

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

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




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

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

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

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

| Control Drawing for BRS devices according to Class I, Division 2 Hazardous Locations | | |
|---|---|---|
| Rev.: 4 | Document No.: 000217023DNR | Page 1/2 |

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

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

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

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

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

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

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

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

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 ≤ Ta ≤ +60 °C (+32 °F ≤ Ta ≤ +140 °F) for device types “S” or “C”**
(Position 16 of the product code) or
**T4: -40 °C ≤ Ta ≤ +70 °C (-40 °F ≤ Ta ≤ +158 °F) for device types “T“, “E“ or “G”**
(Position 16 of the product code)

☐ 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 ACA22-USB-C (EEC) on the USB interface, verify that the ACA22-USB-C (EEC) is mechanically secured with the fastening screw. Exclusively connect or disconnect the ACA22-USB-C (EEC) when it is voltage-free. In hazardous areas, exclusively operate the ACA22-USB-C (EEC) on the USB interface.

## 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. In hazardous areas, exclusively operate the ACA22-USB-C (EEC) on the USB interface.

## 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 ≤ Ta ≤ +60 °C (+32 °F ≤ Ta ≤ +140 °F) for device types “S“ or “C“**
(Position 16 of the product code) or
**T4: -40 °C ≤ Ta ≤ +70 °C (-40 °F ≤ Ta ≤ +158 °F) for device types “T“, “E“ or “G”**
(Position 16 of the product code)

☐ 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 ACA22-USB-C (EEC) on the USB interface, verify that the ACA22-USB-C (EEC) is mechanically secured with the fastening screw. ACA22-USB-C (EEC) Exclusively connect or disconnect the ACA22-USB-C (EEC) when it is voltage-free. In hazardous areas, exclusively operate the ACA22-USB-C (EEC) on the USB interface.

## 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 16.

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 65

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 No. 1091**
  Electromagnetic Compatibility Regulations 2016
- **S.I. 2016 No. 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 17.


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
BRS Family

**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 |
| | | 1 | Standard + MACSec |
| | | 2 | PoE |
| | | 3 | Standard + MACSec + PoE |
| 6 | (hyphen) | – | |
| 7 ... 8 | Number:<br>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 Mbit/s ports and 1000/ 2500 Mbit/s ports | 00 | 0 × | 100/1000 Mbit/s ports |
| | | 04 | 4 × | 100/1000 Mbit/s ports |
| | | 08 | 8 × | 100/1000 Mbit/s ports |
| | | 12 | 12 × | 100/1000 Mbit/s ports |
| | | 12 | 12 × | 8 × 100/1000-Mbit/s-Ports + 4 × 1000/ 2500 Mbit/s |
| | | 16 | 16 × | 100/1000 Mbit/s ports |
| | | 20 | 20 × | 100/1000 Mbit/s ports |
| | | 20 | 20 × | 16 × 100/1000-Mbit/s ports + 4 × 1000/ 2500 Mbit/s ports |
| | | 24 | 24 × | 100/1000 Mbit/s ports |
| | | 24 | 24 × | 20 × 100/1000-Mbit/s ports + 4 × 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<br>▶ Standard ports for BRS20/22: 10/100 Mbit/s<br>▶ Standard ports for BRS40/42: 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<br>▶ Standard ports for BRS20/22: 10/100 Mbit/s<br>▶ Standard ports for BRS40/42: 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[a] Part A | Z | CE, FCC, EN 61131-2, EN 62368-1, (NEMA TS2[b]) |
| | | Y | Z + cUL 61010 |
| | | X | Z + cUL 61010 + ANSI/UL 121201 |
| | | V | Z + IEC 61850-3 |
| | | U | Z + DNV |
| | | W | Z + ATEX/IECEx |
| | | S | Z + DNV+ 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 | DNV+ 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 |

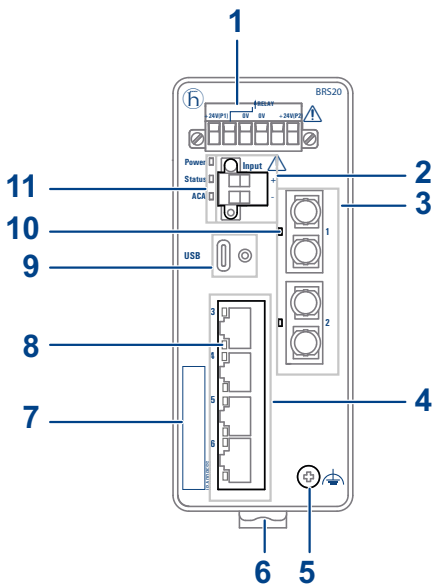
*Table 1: Device name and product code*

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
b. Applies exclusively to device variants with extended temperature range.

# 1.3 Device views

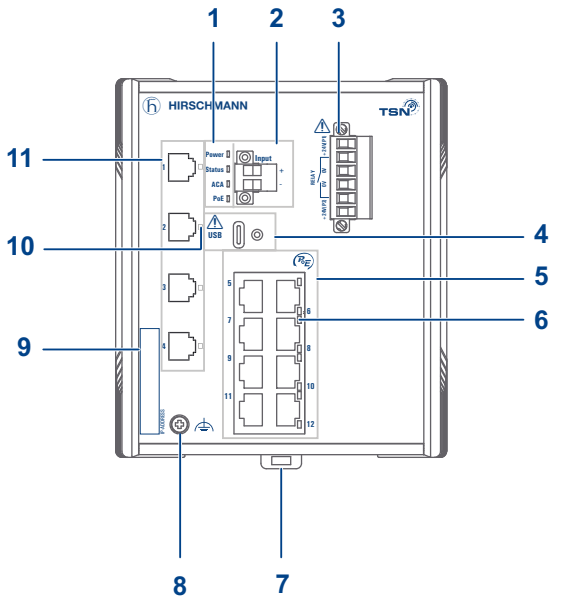
## 1.3.1 Front view

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



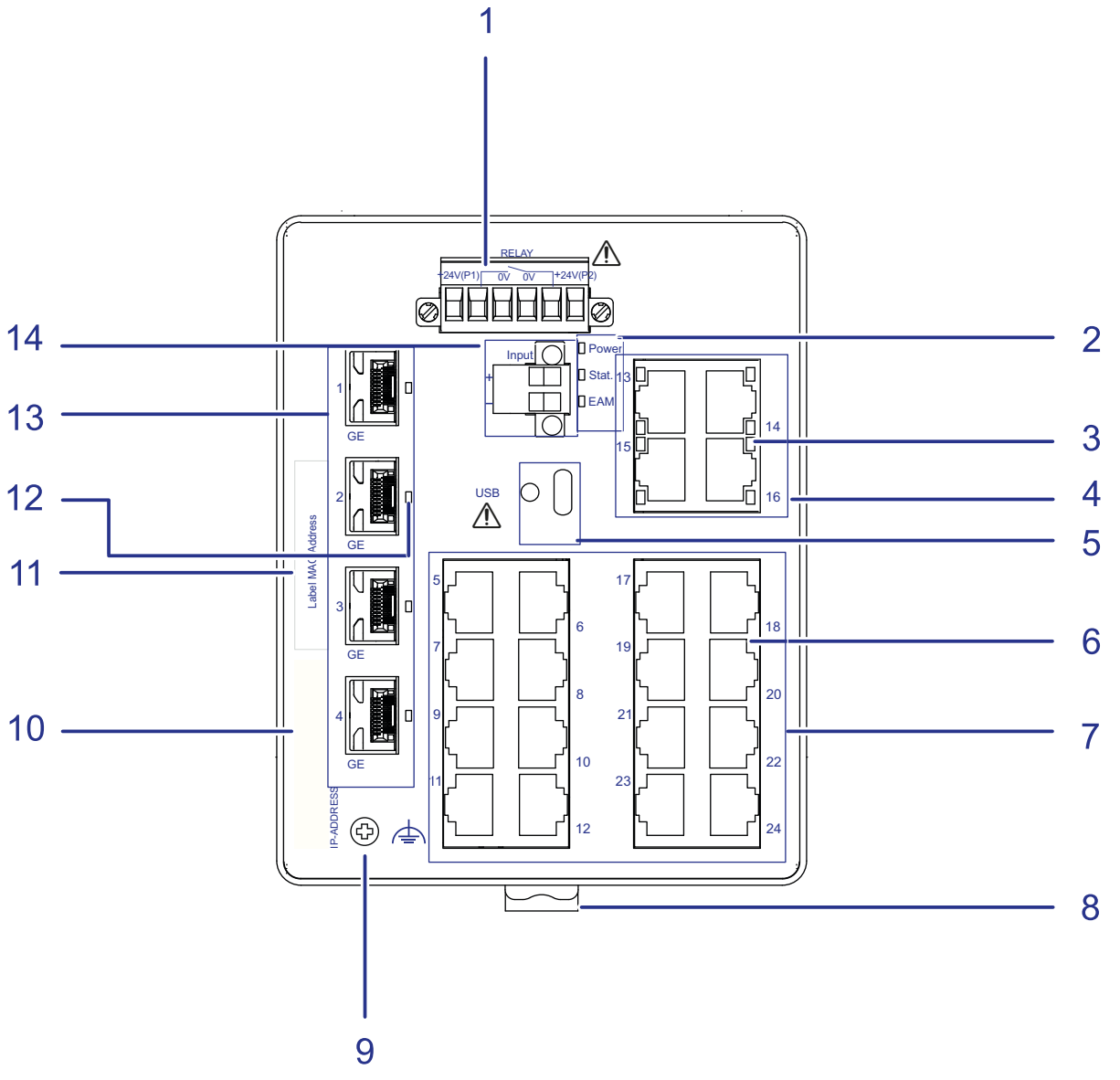

| | |
|---|---|
| 1 | 6-pin terminal block with screw lock for redundant power supply and signal contact |
| 2 | 2-pin terminal block with screw lock for the digital input |
| 3 | depending on device variant<br>▶ SFP slot for 100 Mbit/s F/O connections<br>▶ DSC or DST singlemode socket for 100 Mbit/s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

## Example of a 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<br>**BRS22/32**<br>▶ RJ45 socket for 10/100 Mbit/s Twisted pair connections<br>▶ RJ45 socket with PoE support<br>**BRS42/52**<br>▶ RJ45 socket for 10/100/1000 Mbit/s Twisted Pair connections<br>▶ RJ45 socket with PoE support |
| 6, 10 | LED display elements for port status |
| 7 | Rail lock slide for DIN rail mounting |
| 8 | Grounding screw |
| 9 | Label area for IP address |
| 11 | depending on the device variants<br>**BRS22**<br>▶ SFP slot for 100 Mbit/s F/O connections<br>▶ Not present<br>**BRS32**<br>▶ SFP slot for 100/1000 Mbit/s fiber optic connections<br>▶ RJ45 socket for 10/100/1000 Mbit/s Twisted Pair connections<br>**BRS42**<br>▶ SFP slot for 100/1000 Mbit/s fiber optic connections<br>▶ RJ45 socket for 10/100/1000 Mbit/s Twisted Pair connections<br>▶ Not present<br>**BRS52**<br>▶ SFP slot for 100/1000/2500 Mbit/s fiber optic connections |

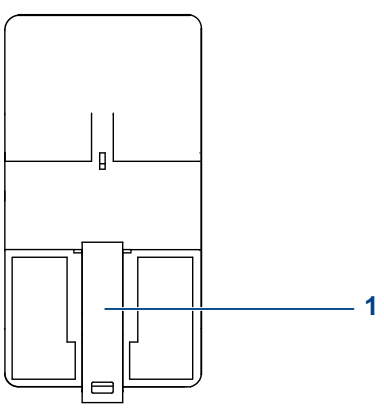
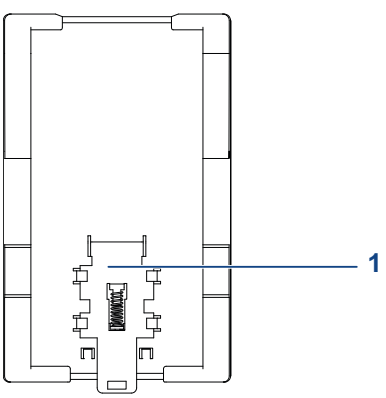
## Example of a device variant with 8 ... 24 ports without PoE




| | |
|---|---|
| 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<br>▶ **BRS20/30**<br>4 × RJ45 socket for 10/100 Mbit/s twisted pair connections<br>These ports support full duplex only.<br>▶ **BRS40/50**<br>4 × RJ45 socket for 10/100/1000 Mbit/s twisted pair connections<br>These ports support full duplex only.<br>▶ Not present |
| 5 | USB-C interface |
| 6 | LED display elements for port status |

| | |
|---|---|
| 7 | depending on the device variants<br>**BRS20/30**<br>▶ 8 × RJ45 socket for 10/100 Mbit/s twisted pair connections<br>▶ 16 × RJ45 socket for 10/100 Mbit/s twisted pair connections<br>**BRS40/50**<br>▶ 8 × RJ45 socket for 10/100/1000 Mbit/s twisted pair connections<br>▶ 16 × RJ45 socket for 10/100/1000 Mbit/s twisted pair connections |
| 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<br>**BRS20**<br>▶ SFP slot for 100 Mbit/s F/O connections<br>▶ DSC or DST singlemode socket for 100 Mbit/s fiber optic connections<br>▶ DSC or DST multimode socket for 100 Mbit/s fiber optic connections<br>▶ RJ45 socket for 10/100 Mbit/s Twisted pair connections<br>These ports support full duplex only.<br>▶ Not present<br>**BRS30**<br>▶ RJ45 socket for 10/100/1000 Mbit/s Twisted Pair connections<br>These ports support full duplex only.<br>▶ SFP slot for 100/1000 Mbit/s F/O connections<br>**BRS40**<br>▶ SFP slot for 100/1000 Mbit/s F/O connections<br>▶ RJ45 socket for 10/100/1000 Mbit/s Twisted Pair connections<br>These ports support full duplex only.<br>**BRS50**<br>▶ SFP slot for 100/1000/2500 Mbit/s fiber optic connections |
| 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 51.

### 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 52.

### 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 53.

### 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 54.
  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 32.

### 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 32.

### 1.5.3 100/1000/2500 Mbit/s twisted pair port

This port is an RJ45 socket.

The 100/1000/2500 Mbit/s twisted pair port allows you to connect network components according to the IEEE 802.3 100BASE-TX/1000BASE-T and IEEE 802.3bz 2.5GBASE-T standards.
This port supports:
- Autonegotiation
- Autopolarity
- Autocrossing (if autonegotiation is activated)
- 100/1000/2500 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.

### Pin assignment

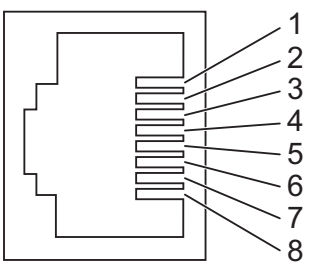
| RJ45 | Pin | 10/100 Mbit/s | 1000/2500 Mbit/s | PoE |
|---|---|---|---|---|
|  | **MDI mode** | | | |
| | 1 | TX+ | BI_DA+ | Negative $V_{PSE}$ |
| | 2 | TX− | BI_DA− | Negative $V_{PSE}$ |
| | 3 | RX+ | BI_DB+ | Positive $V_{PSE}$ |
| | 4 | — | BI_DC+ | — |
| | 5 | — | BI_DC− | — |
| | 6 | RX− | BI_DB− | Positive $V_{PSE}$ |
| | 7 | — | BI_DD+ | — |
| | 8 | — | BI_DD− | — |
| | **MDI-X mode** | | | |
| | 1 | RX+ | BI_DB+ | Negative $V_{PSE}$ |
| | 2 | RX− | BI_DB− | Negative $V_{PSE}$ |
| | 3 | TX+ | BI_DA+ | Positive $V_{PSE}$ |
| | 4 | — | BI_DD+ | — |
| | 5 | — | BI_DD− | — |
| | 6 | TX− | BI_DA− | Positive $V_{PSE}$ |
| | 7 | — | BI_DC+ | — |
| | 8 | — | BI_DC− | — |



*Table 2: Pin assignment 10/100/1000/2500 Mbit/s twisted pair port, RJ45 socket, MDI and MDI-X mode*

## 1.5.4 100 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 Transceiver

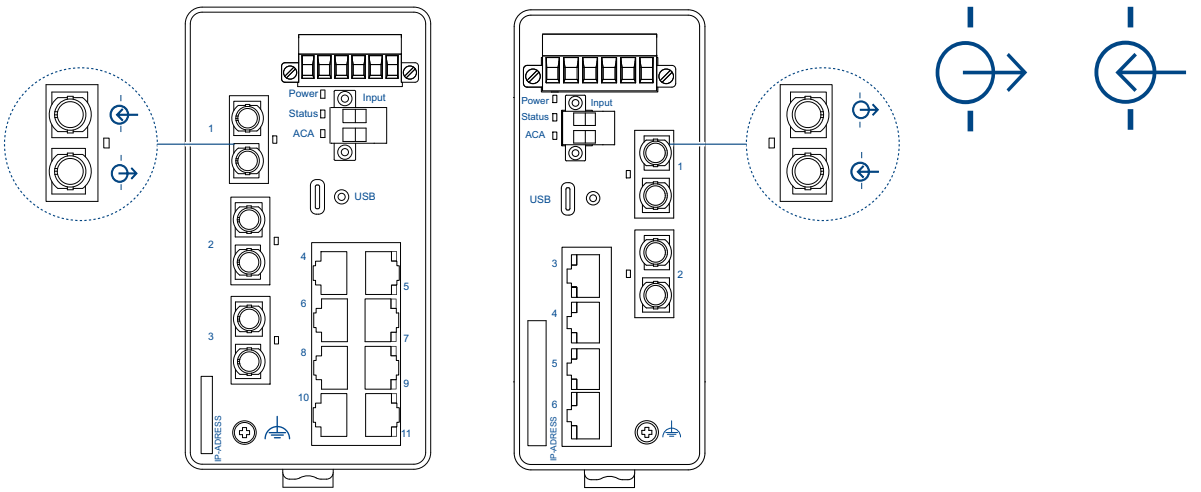
| Example: | Sending direction | Receiving direction |
|---|---|---|
|  | | |

*Table 3: Sending and receiving directions*

### 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 30.

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 65.

**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 status

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

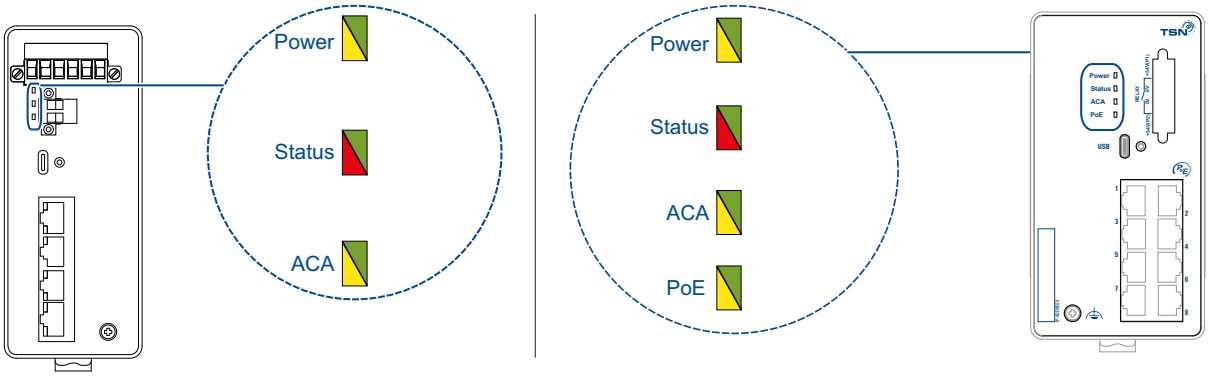



*Figure 1: LED display elements for device status*

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

*Table 4: Meaning of the device display elements*

### 1.6.2 Port status

These LEDs display port-related information.

- For the position of the port display elements on the device variants with 4 × RJ45 sockets see figure 2.
  For the meaning of the port display elements see table 5.

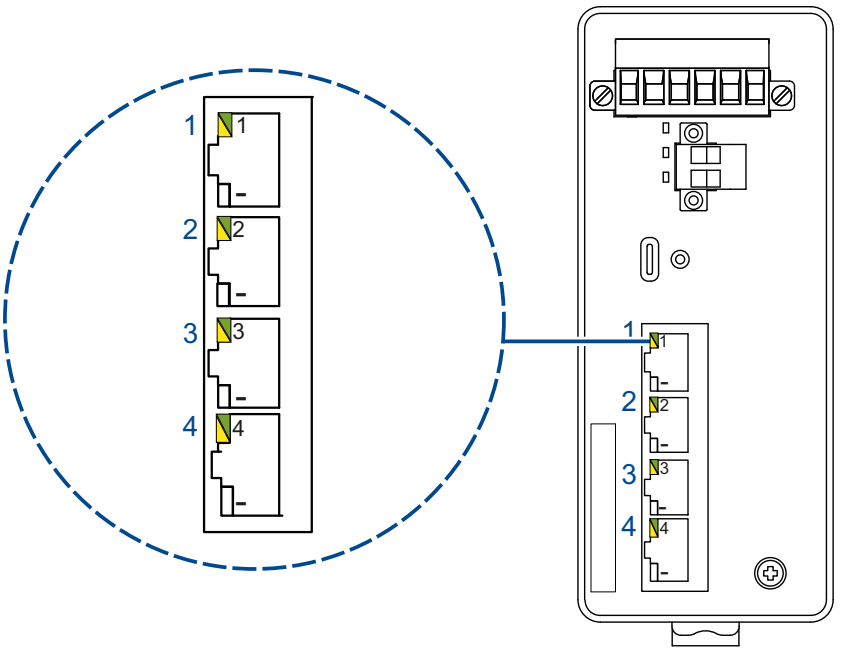



*Figure 2: Position of the port display elements on the device variants with 4 × RJ45 sockets*

- For the position of the port display elements on the device variants with 8 × RJ45 sockets see figure 3.
  For the meaning of the port display elements see table 5.

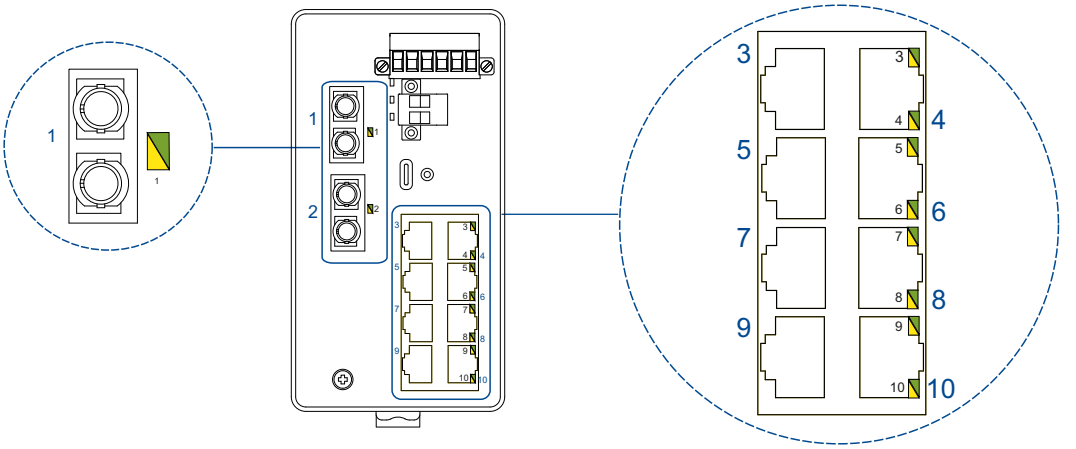



*Figure 3: Position of the port display elements on the device variants with 8 × RJ45 sockets*

- For the position of the port display elements on the device variants with 20 × RJ45 sockets see figure 4.
  For the meaning of the port display elements see table 5.

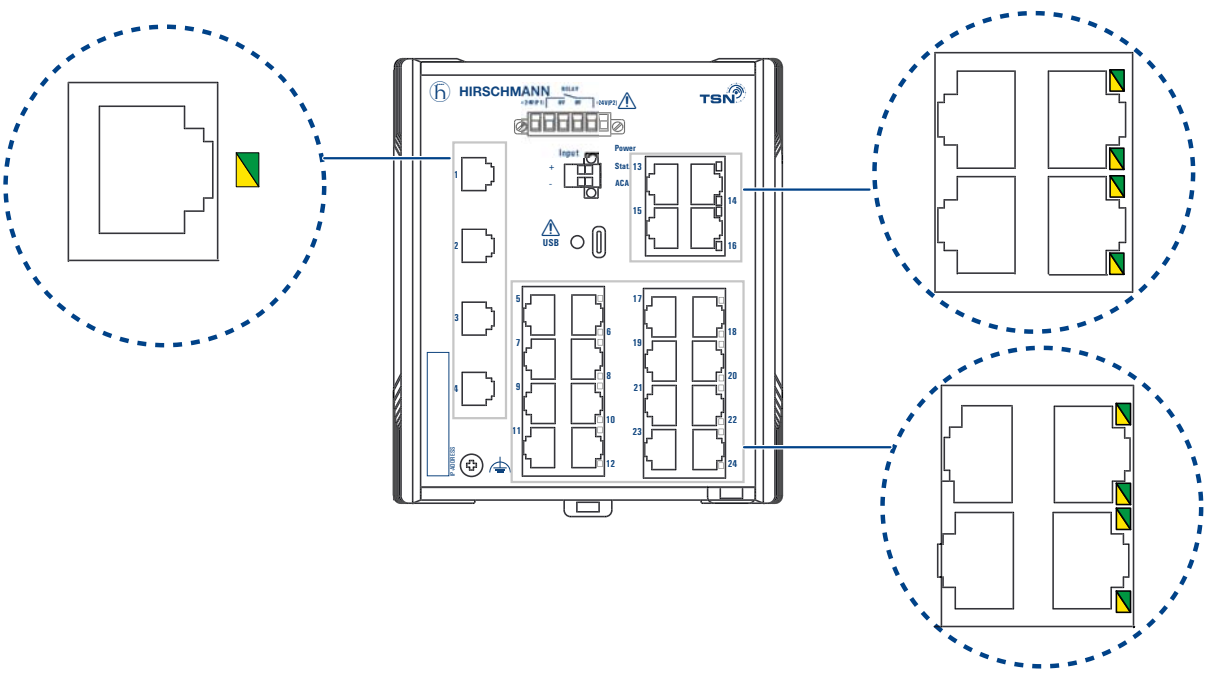



*Figure 4: Position of the port display elements on the device variants with 20 × RJ45 sockets*

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

*Table 5: Meaning of the port display elements*

### 1.6.3 PoE status

**Note:** Only PoE ports have these LEDs.

| LED | Display | Color | Activity | Meaning |
|---|---|---|---|---|
| PoE | PoE status | — | none | No powered device connected |
| | | green | lights up | Powered device is supplied with PoE voltage. |
| | | yellow | flashes 1 × a period | Output budget has been exceeded<br>Device has detected a connected powered device |
| | | | flashes 3 × a period | PoE administrator status deactivated |

*Table 6: PoE status*

## 1.7 Management interfaces

### 1.7.1 Signal contact

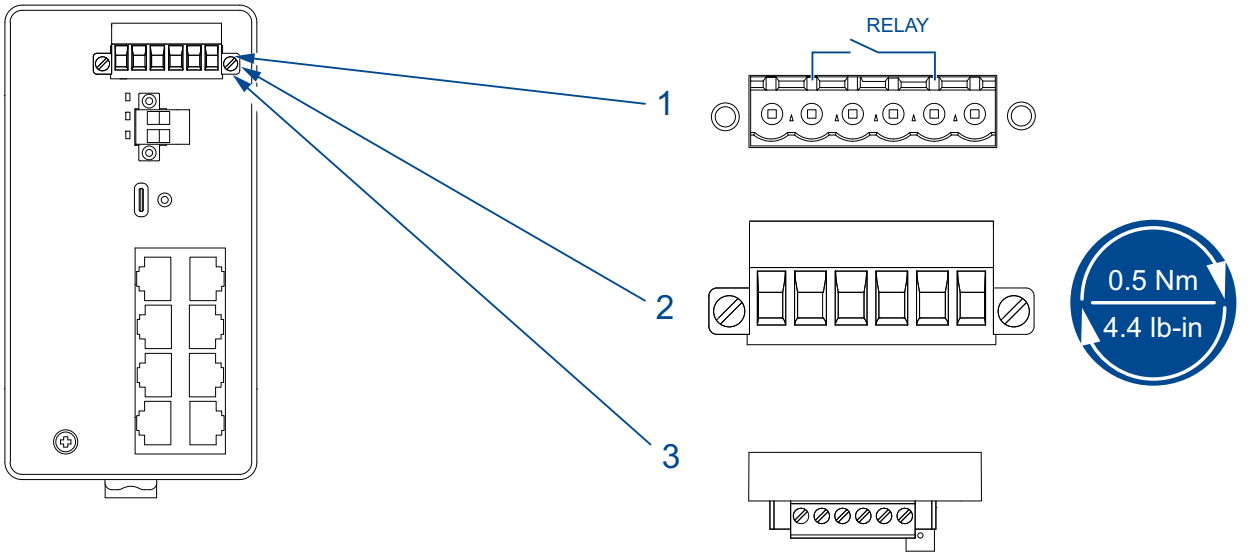



*Figure 5: (1) Connection on the device, (2) terminal block mounted on the device (front view), tightening torque, (3) terminal block mounted on the device (view from above).*

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

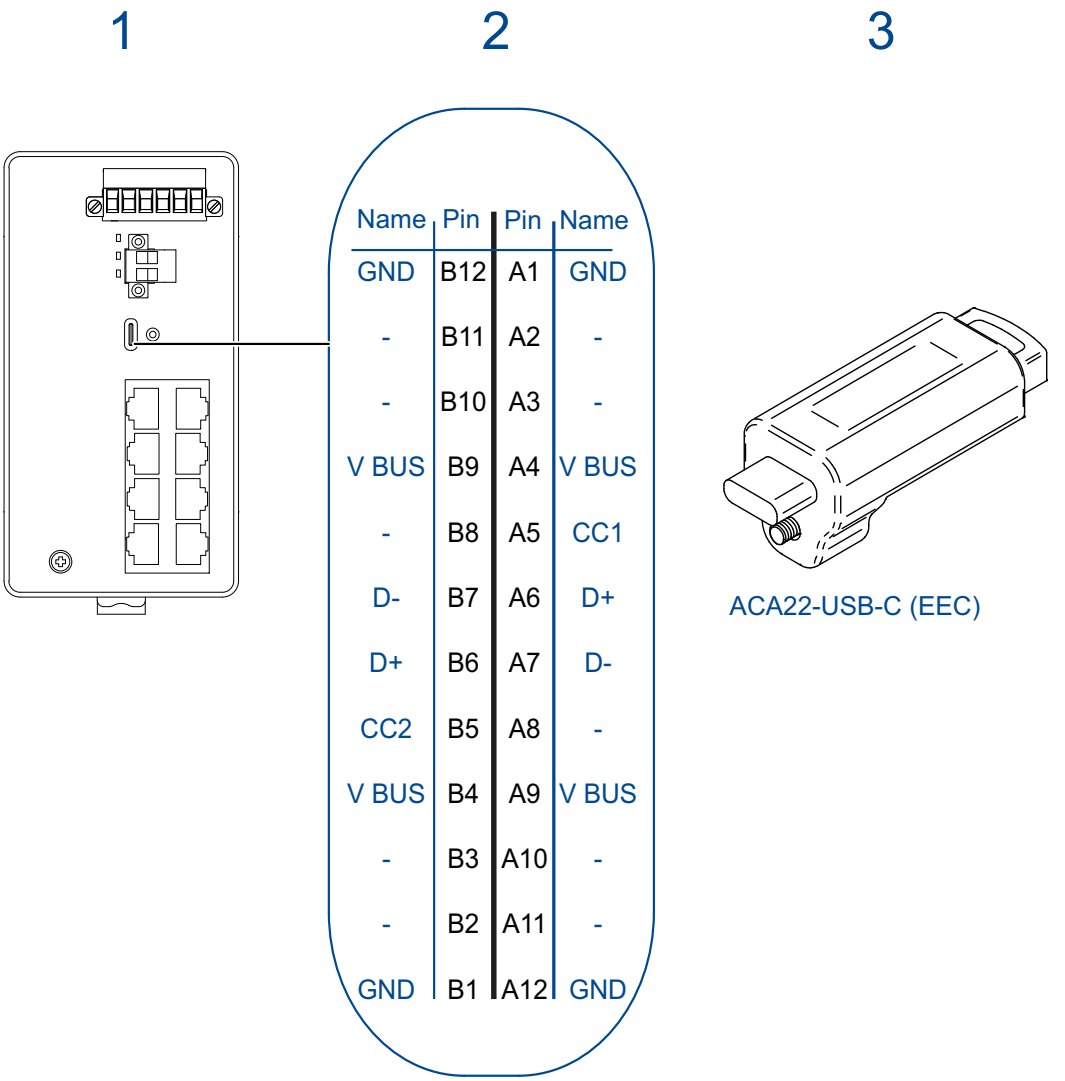



*Figure 6: (1) Position of the USB-C interface on the device, (2) pin assignment of the USB-C interface, (3) view of the ACA22-USB-C (EEC).*

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

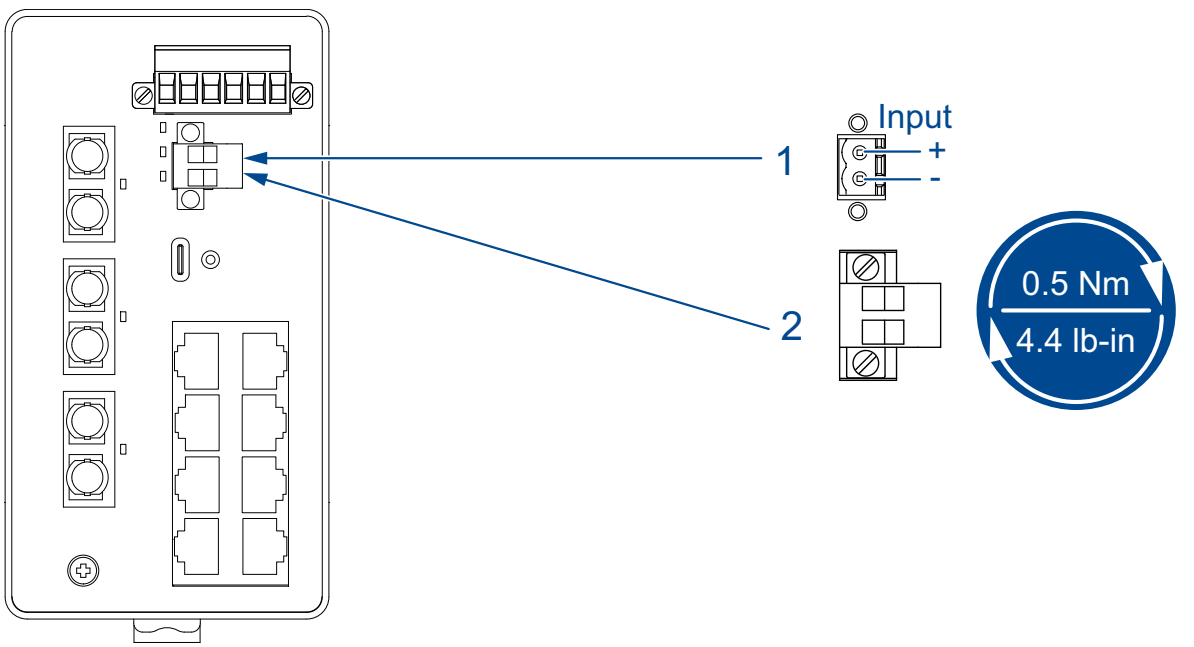



*Figure 7: (1) Connection on the device, (2) terminal block mounted on the device (front view), tightening torque.*

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 65.

## 1.7.4 Hardware revision

### Hardware revision 2

BRS device variants marked as "HW: Rev. 2" only support SW versions as of 08.7.02. You find the revision marking of your device on the side label of your device.

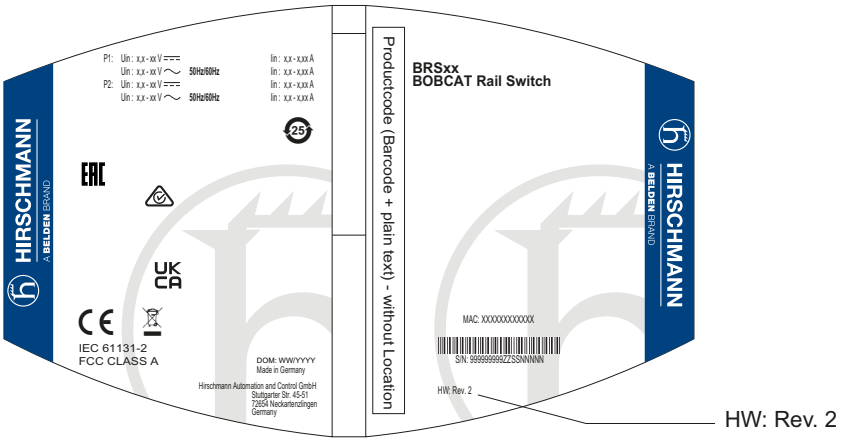



*Figure 8: Revision marking on the side label*

### Hardware revision 3

BRS device variants marked as "HW: Rev. 3" only support SW versions as of 08.7.04. You find the revision marking of your device on the side label of your device.

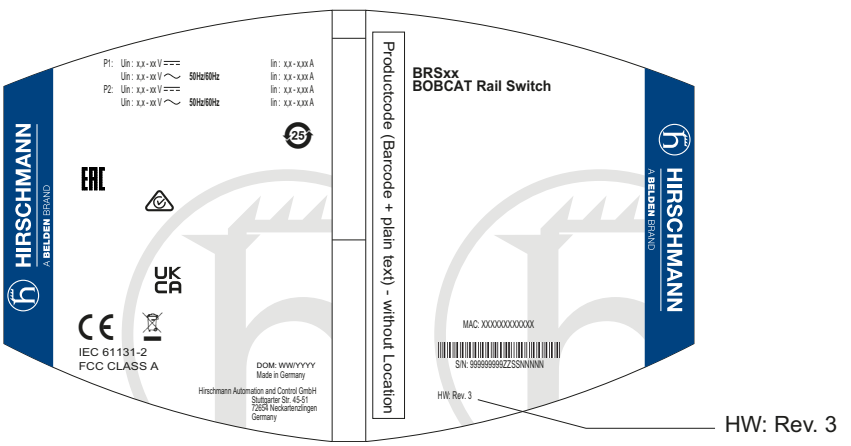



*Figure 9: Revision marking on the side label*

# 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 100.
☐ 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 7 on page 48.

| 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 7: Derating for different mounting positions*

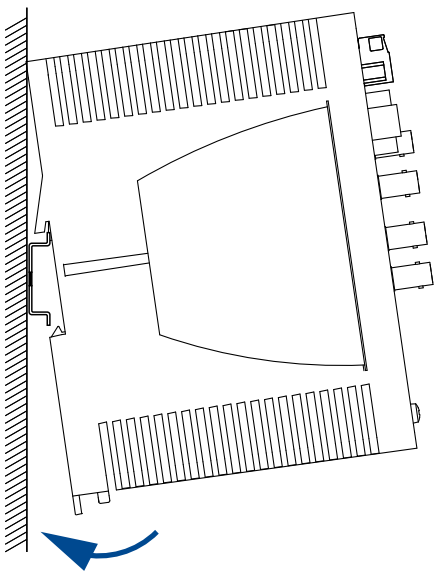


*Figure 10: Mounting on the DIN rail*

**Perform the following work steps:**

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

### 2.2.2 Grounding the device

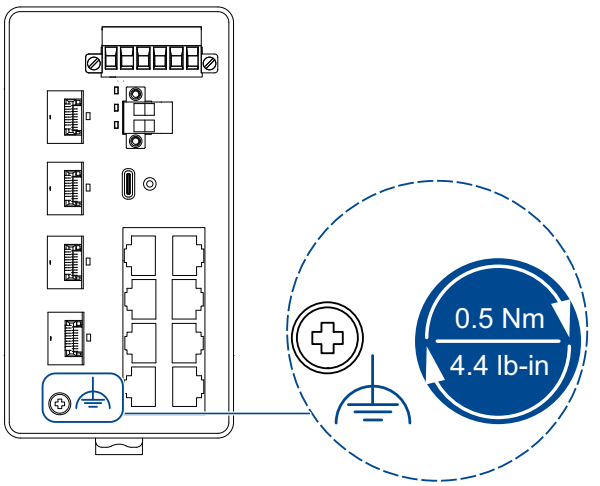



*Figure 11: Position of the ground connection on the device; tightening torque.*

All device variants have a functional ground connection.

**Perform the following work steps:**

☐ 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.

**Perform the following work steps:**

☐ 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 101.

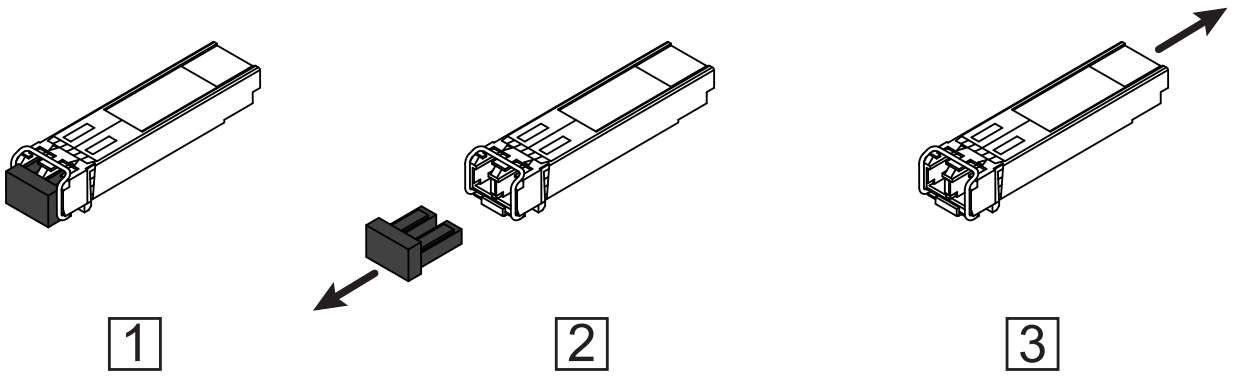



*Figure 12: Installing SFP transceivers: Installation sequence*

**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

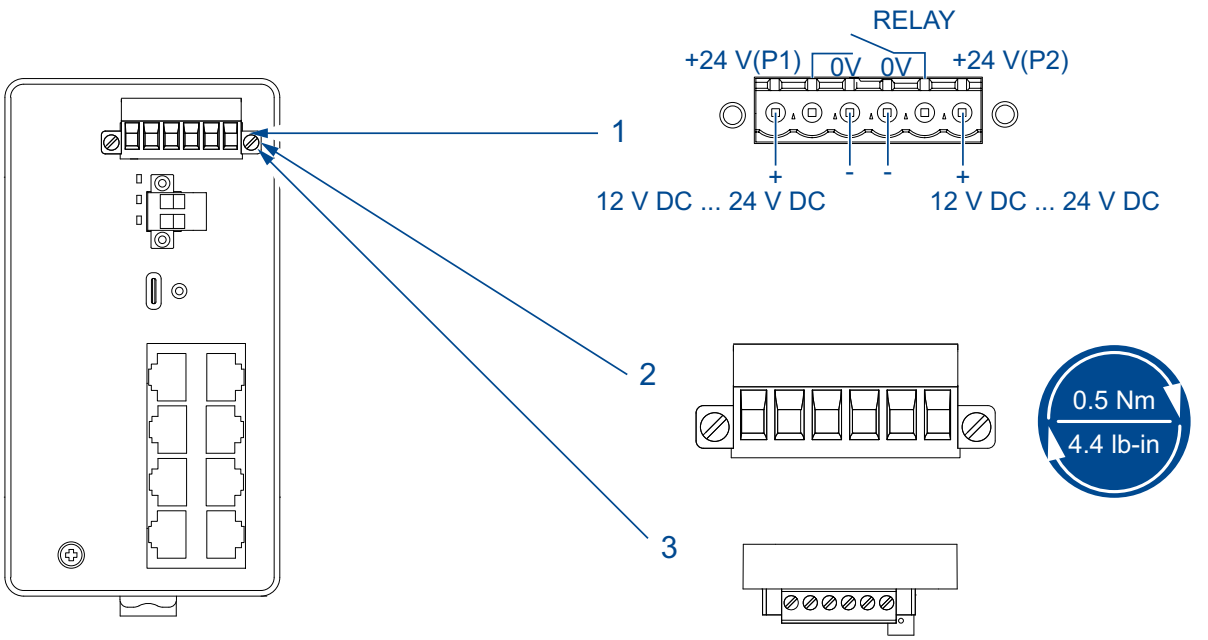



*Figure 13: (1) DC voltage connection on the device, (2) terminal block mounted on the device (front view), tightening torque, (3) terminal block mounted on the device (view from above).*

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

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

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

☐ Remove the terminal connector from the device.

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

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

## Supply voltage with characteristic value F

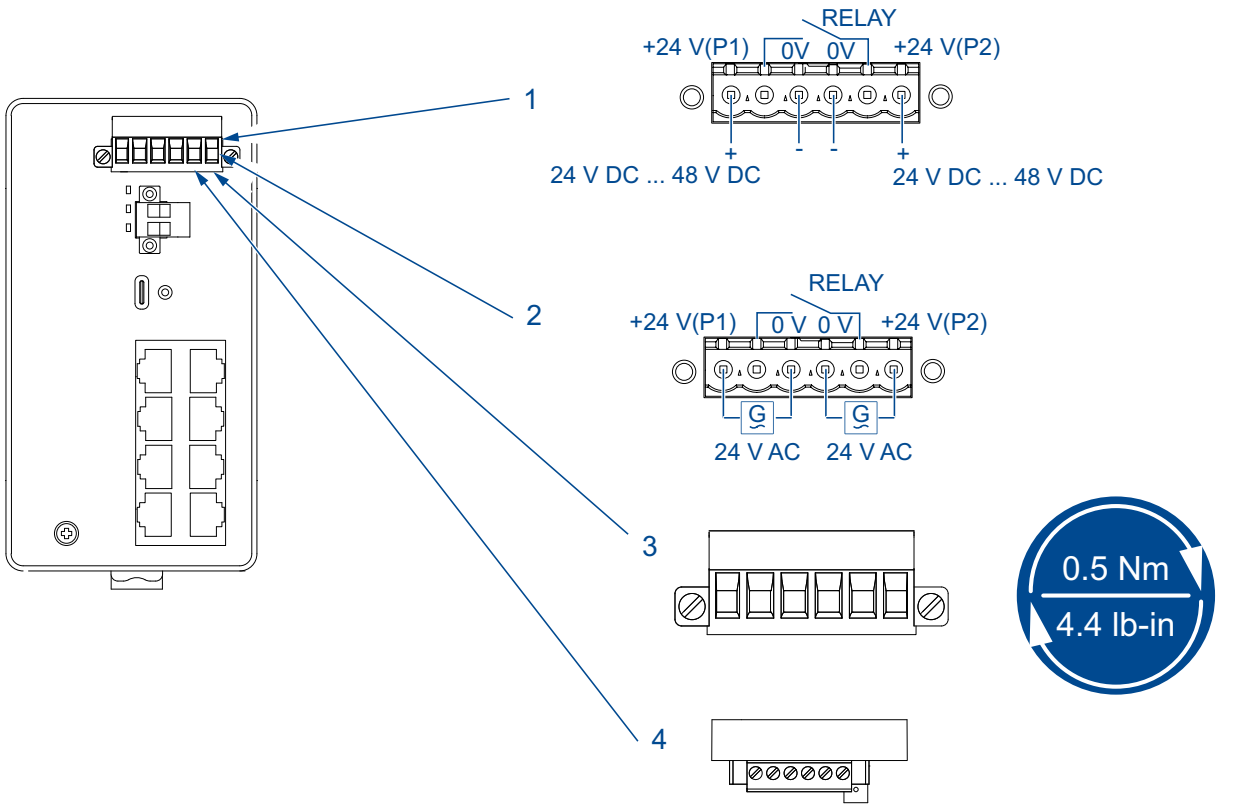



*Figure 14: (1) DC voltage connection on the device, (2) AC voltage connection on the device, (3) terminal block mounted on the device (front view), tightening torque, (4) terminal block mounted on the device (view from above).*

| Type of the voltages that can be connected | Specification of the supply voltage | Pin assignment | |
|---|---|---|---|
| DC voltage | Rated voltage range DC:<br>24 V DC ... 48 V DC<br>Voltage range DC incl. maximum tolerances:<br>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:<br>24 V AC<br>Voltage range AC incl. maximum tolerances:<br>18 V AC ... 30 V AC, 50 Hz ... 60 Hz | | |

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

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

☐ Remove the terminal connector from the device.

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

☐ Fasten the wires in the terminal block by tightening the terminal screws.

☐ Mount the terminal block on the device using screws.

## Supply voltage with characteristic value U

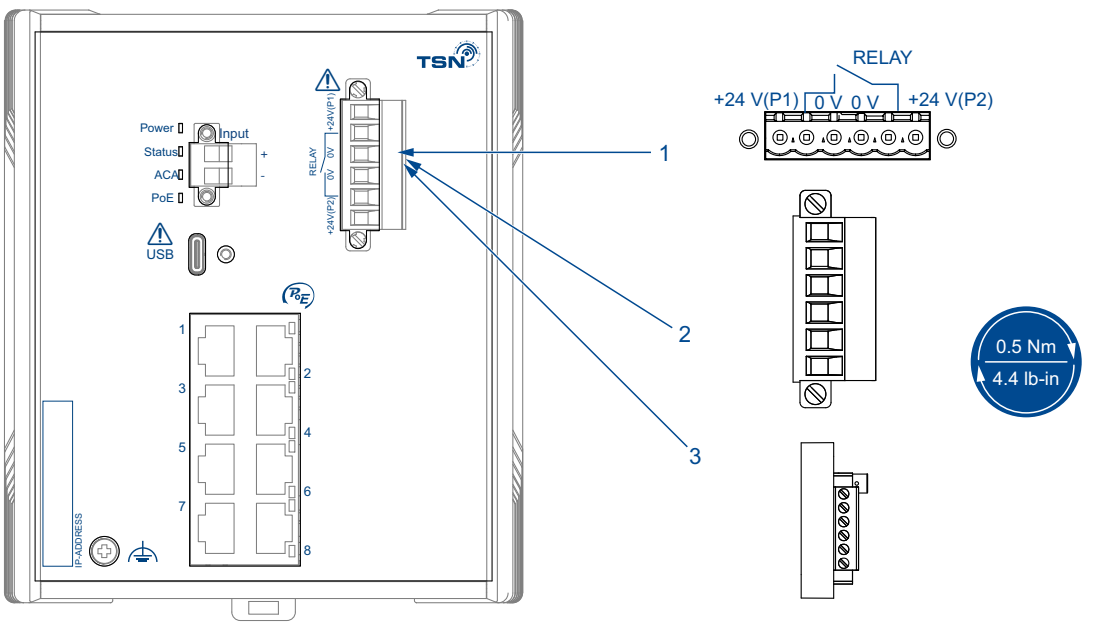



*Figure 15: (1) DC voltage connection on the device, (2) terminal block mounted on the device (front view), tightening torque, (3) terminal block mounted on the device (view from above).*

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

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

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

☐ Remove the terminal connector from the device.

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

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

## Supply voltage with characteristic value P

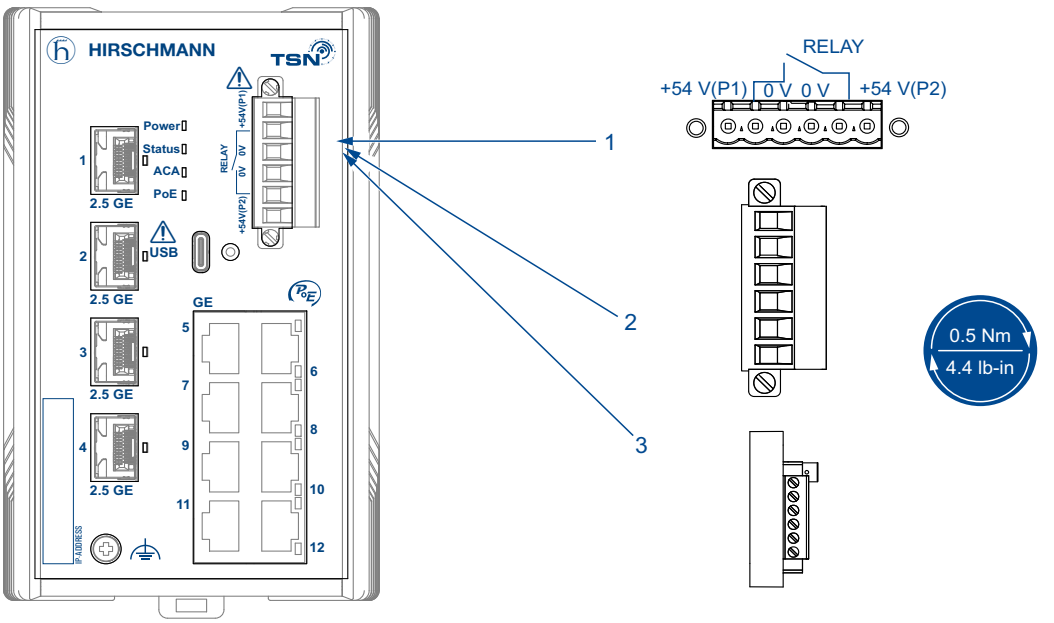



*Figure 16: (1) DC voltage connection on the device, (2) terminal block mounted on the device (front view), tightening torque, (3) terminal block mounted on the device (view from above).*

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

*Table 11: Supply voltage with characteristic value P: type and specification of the supply voltage, pin assignment*

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

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

### 2.4.2 Signal contact (optional)

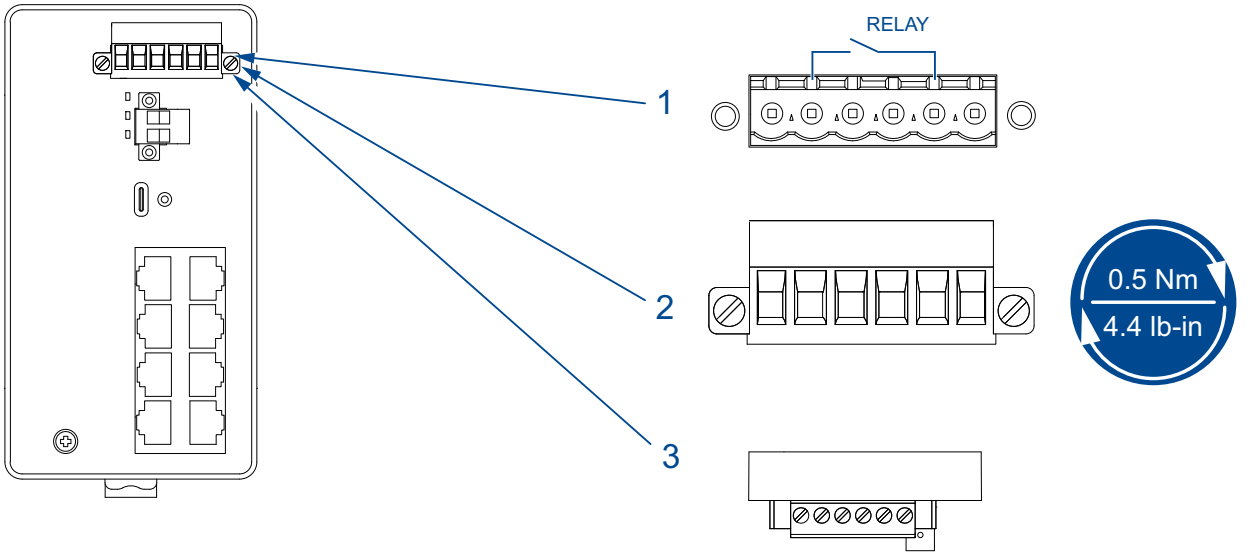



*Figure 17: (1) Connection on the device, (2) terminal block mounted on the device (front view), tightening torque, (3) terminal block mounted on the device (view from above).*

**Perform the following work steps:**

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

### 2.4.3 Digital input (optional)

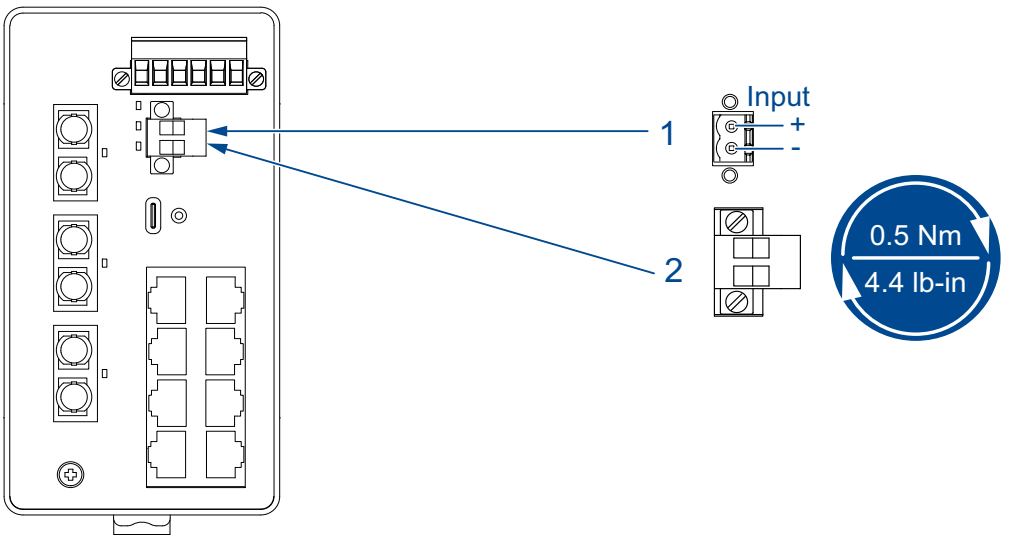



*Figure 18: (1) Connection on the device, (2) terminal block mounted on the device (front view), tightening torque.*

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

*Table 12: Digital input: pin assignment*

**Perform the following work 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.

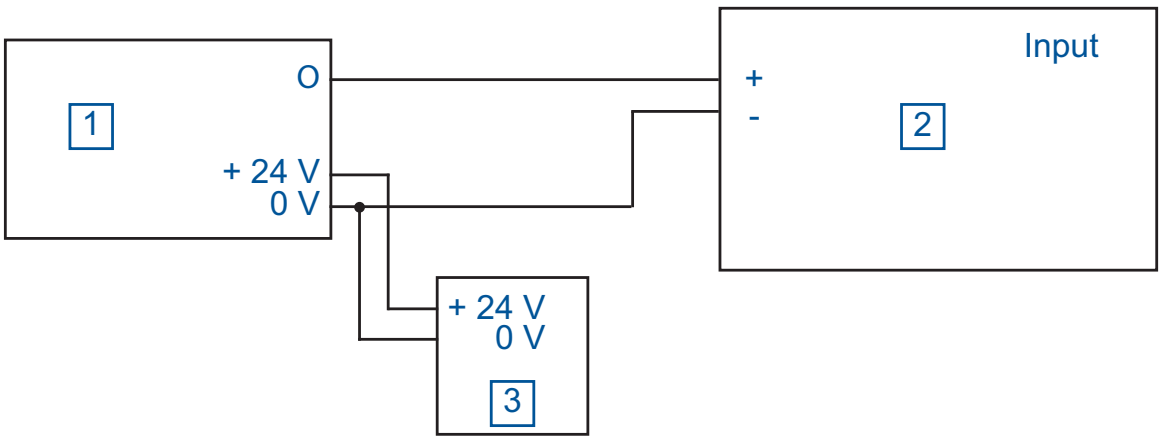



*Figure 19: Connection of a sensor (3 pin) with separate power supply*
*1 - Sensor*
*2 - BRS Familyl*
*3 - Separate power supply for sensor*

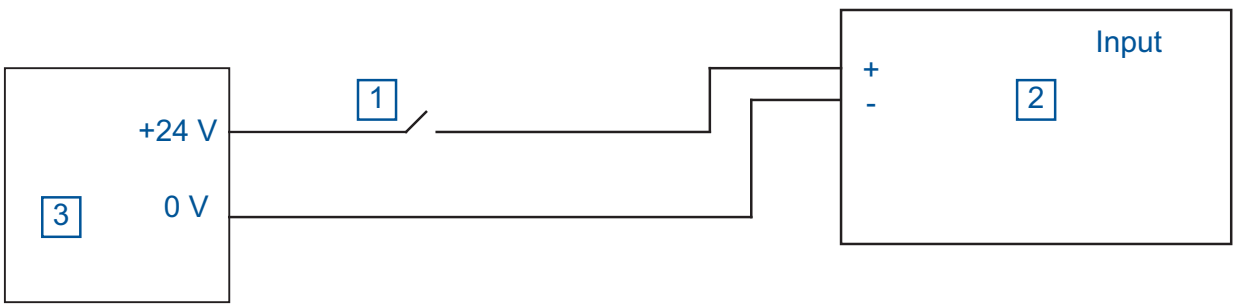



*Figure 20: Connection of a sensor (2 pin) with separate power supply*
*1 - Sensor (2 pin sensor)*
*2 - BRS Familyl*
*3 - Separate power supply for sensor*

## 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 88.
- ☐ Connect the data cables according to your requirements.
  See “Ethernet ports” on page 35.
- ☐ Use CAT5e cable or higher for twisted pair connections.

## 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 80.

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)

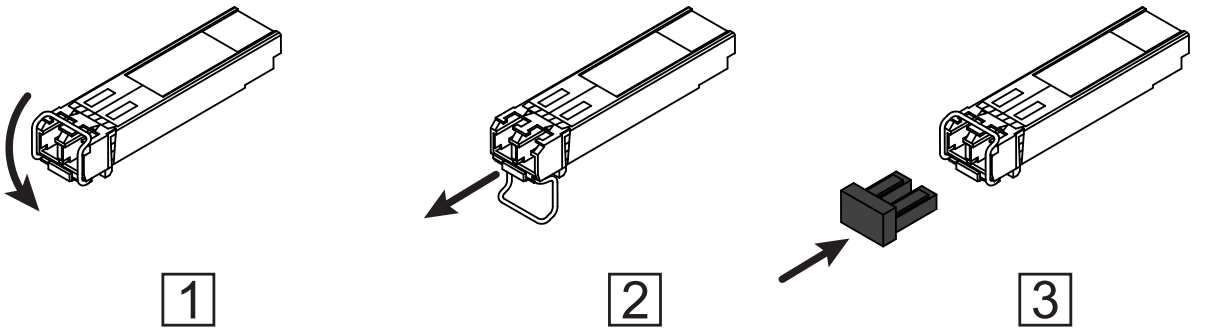



*Figure 21: De-installing SFP transceivers: De-installation sequence*

**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

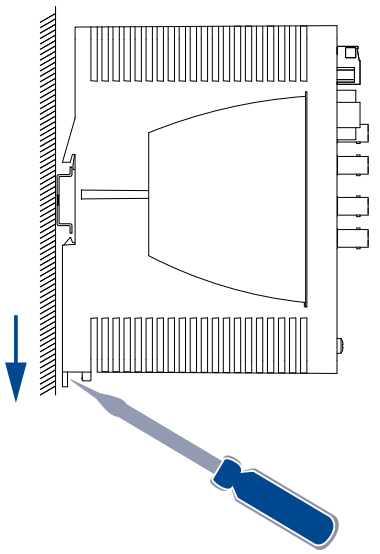


*Figure 22: Removal from the DIN rail*

**Perform the following work steps:**

☐ 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 82. | Degree of protection (Plastic casing) | Degree of protection (Metal casing) | Digital input available |
|---|---|---|---|---|---|---|
| **BRS20 device variants** | | | | | | |
| 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 |

*Table 13: General data*

| Product name | Weight (Plastic casing) | Weight (Metal casing) | Casing width See “Dimension drawings” on page 82. | Degree of protection (Plastic casing) | Degree of protection (Metal casing) | Digital input available |
|---|---|---|---|---|---|---|
| BRS20-20009999-S;C... | 1060 g (37.3 oz) | 1700 g (60 oz) | wide | IP30 | IP40 | Yes |
| 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 |
| **BRS21 device variants** | | | | | | |
| BRS21-1200ZZZZ-S;C... | 630 g (22.22 oz) | 1250 g (44 oz) | medium | IP30 | IP40 | Yes |
| BRS21-1200ZZZZ-T;E;G... | not available | 1250 g (44 oz) | medium | not available | IP40 | Yes |
| BRS21-2000ZZZZ-S;C... | 1080 g (38.09 oz) | 1680 g (59.26 oz) | wide | IP30 | IP40 | Yes |
| BRS21-2000ZZZZ-T;E;G... | not available | 1680 g (59.26 oz) | wide | not available | IP30 | Yes |
| BRS21-2400ZZZZ-S;C... | 1180 g (41.62 oz) | 1780 g (62.78 oz) | wide | IP30 | IP40 | Yes |
| BRS21-2400ZZZZ-T;E;G... | not available | 1780 g (62.78 oz) | wide | not available | IP30 | Yes |
| **BRS22 PoE device variants featuring 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 |
| **BRS22 PoE device variants featuring 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 |
| **BRS30 device variants** | | | | | | |
| 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 |

*Table 13: General data*

| Product name | Weight (Plastic casing) | Weight (Metal casing) | Casing width See “Dimension drawings” on page 82. | Degree of protection (Plastic casing) | Degree of protection (Metal casing) | Digital input available |
|---|---|---|---|---|---|---|
| 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... | 1160 g (41 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 |
| **BRS31 device variants** | | | | | | |
| BRS31-0804OOOO-S;C... | 700 g (24.69 oz) | 1250 g (44.09 oz) | medium | IP30 | IP40 | Yes |
| BRS31-0804OOOO-T;E;G... | not available | 1250 g (44.09 oz) | medium | not available | IP40 | Yes |
| BRS31-1604OOOO-S;C... | 1080 g (38.09 oz) | 1680 g (59.26 oz) | wide | IP30 | IP40 | Yes |
| BRS31-1604OOOO-T;E;G... | not available | 1680 g (59.26 oz) | wide | not available | IP30 | Yes |
| BRS31-2004OOOO-S;C... | 1180 g (41.62 oz) | 1780 g (62.78 oz) | wide | IP30 | IP40 | Yes |
| BRS31-2004OOOO-T;E;G... | not available | 1780 g (62.78 oz) | wide | not available | IP30 | Yes |
| **BRS32 PoE device variants featuring supply voltage with characteristic value U** | | | | | | |
| 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 |
| **BRS32 PoE device variants featuring supply voltage with characteristic value P** | | | | | | |
| 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 |
| BRS32-0804OOOO-S;C... | 550 g (19.4 oz) | 1150 g (40.56 oz) | medium | IP30 | IP40 | No |

*Table 13: General data*

| Product name | Weight (Plastic casing) | Weight (Metal casing) | Casing width See “Dimension drawings” on page 82. | Degree of protection (Plastic casing) | Degree of protection (Metal casing) | Digital input available |
|---|---|---|---|---|---|---|
| BRS32-0804OOOO-T;E;G... | not available | 1300 g (45.85 oz) | wide | not available | IP30 | Yes |
| **BRS33 PoE device variants featuring supply voltage with characteristic value U** | | | | | | |
| BRS33-0804OOOO-S;C | 930 g (32.80 oz) | 1610 g (56.79 oz) | wide | IP30 | IP40 | Yes |
| BRS33-0804OOOO-T;E;G... | not available | 1610 g (56.79 oz) | wide | not available | IP30 | Yes |
| **BRS33 PoE device variants featuring supply voltage with characteristic value P** | | | | | | |
| BRS33-0804OOOO-S;C | 550 g (19.4 oz) | 46.21 oz (1310 g) | medium | IP30 | IP40 | No |
| BRS33-0804OOOO-T;E;G... | not available | 1460 g (51.49 oz) | wide | not available | IP30 | Yes |
| **BRS40 device variants** | | | | | | |
| 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 |
| 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 |
| **BRS41 device variants** | | | | | | |
| BRS41-0012OOOO-S;C... | 700 g (24.69 oz) | 1250 g (44 oz) | medium | IP30 | IP40 | Yes |
| BRS41-0012OOOO-T;E;G... | not available | 1250 g (44 oz) | medium | not available | IP40 | Yes |
| BRS41-0020OOOO-S;C... | 1080 g (38.09 oz) | 1680 g (59.26 oz) | wide | IP30 | IP40 | Yes |

*Table 13: General data*

| Product name | Weight (Plastic casing) | Weight (Metal casing) | Casing width See "Dimension drawings" on page 82. | Degree of protection (Plastic casing) | Degree of protection (Metal casing) | Digital input available |
|---|---|---|---|---|---|---|
| BRS41-0020OOOO-T;E;G... | not available | 1680 g (59.26 oz) | wide | not available | IP30 | Yes |
| BRS41-0024OOOO-S;C... | 1180 g (41.62 oz) | 1780 g (62.78 oz) | wide | IP30 | IP40 | Yes |
| BRS41-0024OOOO-T;E;G... | not available | 1780 g (62.78 oz) | wide | not available | IP30 | Yes |
| **BRS42 PoE device variants featuring supply voltage with characteristic value U** | | | | | | |
| 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 |
| BRS42-00129999-T;E;G... | not available | 1620 g (57.14 oz) | wide | not available | IP30 | Yes |
| BRS42-0012OOOO-S;C... | 800 g (28.21 oz) | 1450 g (51.14 oz) | wide | IP30 | IP40 | Yes |
| BRS42-0012OOOO-T;E;G... | not available | 1450 g (51.14 oz) | wide | not available | IP30 | Yes |
| **BRS42 PoE device variants featuring supply voltage with characteristic value P** | | | | | | |
| 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 |
| BRS42-0012OOOO-S;C... | 550 g (19.4 oz) | 1150 g (40.56 oz) | medium | IP30 | IP40 | No |
| BRS42-0012OOOO-T;E;G... | not available | 1300 g (45.85 oz) | wide | not available | IP30 | Yes |
| **BRS43 PoE device variants featuring supply voltage with characteristic value U** | | | | | | |
| BRS43-0012OOOO-S;C... | 930 g (32.80 oz) | 1610 g (56.79 oz) | wide | IP30 | IP40 | Yes |
| BRS43-0012OOOO-T;E;G... | not available | 1610 g (56.79 oz) | wide | not available | IP30 | Yes |
| **BRS43 PoE device variants featuring supply voltage with characteristic value P** | | | | | | |
| BRS43-0012OOOO-S;C... | 550 g (19.4 oz) | 46.21 oz (1310 g) | medium | IP30 | IP40 | No |
| BRS43-0012OOOO-T;E;G... | not available | 1460 g (51.49 oz) | wide | not available | IP30 | Yes |
| **BRS50 device variants** | | | | | | |
| BRS50-00122Q2Q… | 570 g (20.10 oz) | 1090 g (38.45 oz) | medium | IP30 | IP40 | Yes |

*Table 13: General data*

| Product name | Weight (Plastic casing) | Weight (Metal casing) | Casing width See “Dimension drawings” on page 82. | Degree of protection (Plastic casing) | Degree of protection (Metal casing) | Digital input available |
|---|---|---|---|---|---|---|
| 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 |
| BRS50-00242Q2Q-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 |
| **BRS52 PoE device variants featuring supply voltage with characteristic value U** | | | | | | |
| 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 |
| **BRS52 PoE device variants featuring supply voltage with characteristic value P** | | | | | | |
| 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 13: General data*

| General data | |
|---|---|
| Dimensions W × H × D | See “Dimension drawings” on page 82. |
| Mounting | See “Installing the device onto the DIN rail” on page 47. |
| Pollution degree | 2 |
| Degree of protection | IP30<br>See “General data” on page 65. |
| | IP40<br>See “General data” on page 65. |
| | **Note:** IP protection is not evaluated by UL. |
| Laser protection | Class 1 in compliance with IEC 60825-1 |

*Table 14: General data*

## 7.2 Temperature ranges

Note the following deratings:

- Mounting: See “Installing and grounding the device” on page 47.
- SFP transceiver:See “Derating due to SFP transceiver” on page 96.
- PoE power: See “Supply voltage with characteristic value U” on page 75. and “Supply voltage with characteristic value P” on page 75
- See “Climatic conditions during operation” on page 80.

| Product name | Temperature range Characteristic value S, C | Temperature range Characteristic value T, E, G |
|---|---|---|
| **BRS20 device variants** | | |
| BRS20-0400... | 0 °C ... +60 °C (+32 °F ... +140 °F) | -40 °C ... +70 °C (-40 °F ... +158 °F) |
| BRS20-0500... | 0 °C ... +60 °C (+32 °F ... +140 °F) | -40 °C ... +70 °C (-40 °F ... +158 °F) |
| BRS20-0600... | 0 °C ... +60 °C (+32 °F ... +140 °F) | -40 °C ... +70 °C (-40 °F ... +158 °F) |
| BRS20-0800... | 0 °C ... +60 °C (+32 °F ... +140 °F) | -40 °C ... +70 °C (-40 °F ... +158 °F) |
| BRS20-0900... | 0 °C ... +60 °C (+32 °F ... +140 °F) | -40 °C ... +70 °C (-40 °F ... +158 °F) |
| BRS20-1000... | 0 °C ... +60 °C (+32 °F ... +140 °F) | -40 °C ... +70 °C (-40 °F ... +158 °F) |
| BRS20-1100... | 0 °C ... +60 °C (+32 °F ... +140 °F) | -40 °C ... +70 °C (-40 °F ... +158 °F) |
| BRS20-1200... | 0 °C ... +60 °C (+32 °F ... +140 °F) | -40 °C ... +70 °C (-40 °F ... +158 °F) |
| BRS20-1600... | 0 °C ... +60 °C (+32 °F ... +140 °F) | -40 °C ... +70 °C (-40 °F ... +158 °F) |
| BRS20-2000... | 0 °C ... +60 °C (+32 °F ... +140 °F) | -40 °C ... +70 °C (-40 °F ... +158 °F) |
| BRS20-2400... | 0 °C ... +60 °C (+32 °F ... +140 °F) | -40 °C ... +70 °C (-40 °F ... +158 °F) |
| **BRS21 device variants** | | |
| BRS21-1200... | 0 °C ... +50 °C (+32 °F ... +122 °F) | -40 °C ... +60 °C (-40 °F ... +140 °F) |
| BRS21-2000... | 0 °C ... +50 °C (+32 °F ... +122 °F) | -40 °C ... +60 °C (-40 °F ... +140 °F) |
| BRS21-2400... | 0 °C ... +50 °C (+32 °F ... +122 °F) | -40 °C ... +60 °C (-40 °F ... +140 °F) |
| **BRS22 PoE device variantsfeaturing supply voltage with characteristic value U** | | |
| BRS22-0800... | 0 °C ... +60 °C (+32 °F ... +140 °F) | ▶ -40 °C ... +70 °C (-40 °F°... +158 °F) with maximum 60 W PoE power<br>▶ < +60 °C (+140 °F) at 60 W ... 90 W PoE power |
| **BRS22 PoE device variants featuring supply voltage with characteristic value P** | | |
| BRS22-0800... | ▶ 0 °C ... +60 °C (+32 °F ... +140 °F)<br>Metal casing: maximum 240 W PoE power<br>Plastic casing: maximum 120 W PoE power<br>▶ < +55 °C (+131 °F) at 120 W ... 180 W PoE power<br>▶ < +50 °C (+122 °F) at 180 W ... 240 W PoE power | -40 °C ... +70 °C (-40 °F ... +158 °F) |
| **BRS30 device variants** | | |
| BRS30-0804... | 0 °C ... +60 °C (+32 °F ... +140 °F) | -40 °C ... +70 °C (-40 °F ... +158 °F) |
| BRS30-1604... | 0 °C ... +60 °C (+32 °F ... +140 °F) | -40 °C ... +70 °C (-40 °F ... +158 °F) |

*Table 15: Temperature ranges of BRS device variants including deratings*

| Product name | Temperature range<br>Characteristic value S, C | Temperature range<br>Characteristic value T, E, G |
|---|---|---|
| BRS30-2004... | 0 °C ... +60 °C (+32 °F ... +140 °F) | -40 °C ... +70 °C (-40 °F ... +158 °F) |
| **BRS31 device variants** | | |
| BRS31-0804... | 0 °C ... +50 °C (+32 °F ... +122 °F) | -40 °C ... +60 °C (-40 °F ... +140 °F) |
| BRS31-1604... | 0 °C ... +50 °C (+32 °F ... +122 °F) | -40 °C ... +60 °C (-40 °F ... +140 °F) |
| BRS31-2004... | 0 °C ... +50 °C (+32 °F ... +122 °F) | -40 °C ... +60 °C (-40 °F ... +140 °F) |
| **BRS32 PoE device variants featuring supply voltage with characteristic value U** | | |
| BRS32-0804... | 0 °C ... +60 °C (+32 °F ... +140 °F) | ▶ -40 °C ... +70 °C (-40 °F°...°+158 °F) with maximum 60 W PoE power<br>▶ < +60 °C (+140 °F) at 60 W ... 90 W PoE power |
| **BRS32 PoE device variants featuring supply voltage with characteristic value P** | | |
| BRS32-0804... | ▶ 0 °C ... +60 °C (+32 °F ... +140 °F)<br>Metal casing: maximum 240 W PoE power<br>Plastic casing: maximum 120 W PoE power<br>▶ < +55 °C (+131 °F) at 120 W ... 180 W PoE power<br>▶ < +50 °C (+122 °F) at 180 W ... 240 W PoE power | -40 °C ... +70 °C (-40 °F ... +158 °F) |
| **BRS33 PoE device variants featuring supply voltage with characteristic value U** | | |
| BRS33-0804... | 0 °C ... +60 °C (+32 °F ... +140 °F) | ▶ -40 °C ... +70 °C (-40 °F°...°+158 °F) with maximum 60 W PoE power<br>▶ < +60 °C (+140 °F) at 60 W ... 90 W PoE power |
| **BRS33 PoE device variants featuring supply voltage with characteristic value P** | | |
| BRS33-0804... | ▶ 0 °C ... +50 °C (+32 °F ... +122 °F)<br>Metal casing: maximum 240 W PoE power<br>Plastic casing: maximum 120 W PoE power<br>▶ < +45 °C (+113 °F) at 120 W ... 180 W PoE power<br>▶ < +40 °C (+104 °F) at 180 W ... 240 W | -40 °C ... +60 °C (-40 °F ... +140 °F) |
| **BRS40 device variants** | | |
| BRS40-0008... | 0 °C ... +60 °C (+32 °F ... +140 °F) | -40 °C ... +70 °C (-40 °F ... +158 °F) |
| BRS40-0012... | 0 °C ... +60 °C (+32 °F ... +140 °F) | -40 °C ... +70 °C (-40 °F ... +158 °F) |
| BRS40-0016... | 0 °C ... +60 °C (+32 °F ... +140 °F) | -40 °C ... +70 °C (-40 °F ... +158 °F) |
| BRS40-0020... | 0 °C ... +60 °C (+32 °F ... +140 °F) | -40 °C ... +70 °C (-40 °F ... +158 °F) |
| BRS40-0024... | 0 °C ... +60 °C (+32 °F ... +140 °F) | -40 °C ... +70 °C (-40 °F ... +158 °F) |
| **BRS41 device variants** | | |
| BRS41-0012... | 0 °C ... +50 °C (+32 °F ... +122 °F) | -40 °C ... +60 °C (-40 °F ... +140 °F) |
| BRS41-0020... | 0 °C ... +50 °C (+32 °F ... +122 °F) | -40 °C ... +60 °C (-40 °F ... +140 °F) |
| BRS41-0024... | 0 °C ... +50 °C (+32 °F ... +122 °F) | -40 °C ... +60 °C (-40 °F ... +140 °F) |

*Table 15: Temperature ranges of BRS device variants including deratings*

| Product name | Temperature range Characteristic value S, C | Temperature range Characteristic value T, E, G |
|---|---|---|
| **BRS42 PoE device variants featuring supply voltage with characteristic value U** | | |
| BRS42-00XX... | 0 °C ... +60 °C (+32 °F ... +140 °F) | ▶ -40 °C ... +70 °C (-40 °F°... +158 °F) with maximum 60 W PoE power<br>▶ < +60 °C (+140 °F) at 60 W ... 90 W PoE power |
| **BRS42 PoE device variants featuring supply voltage with characteristic value P** | | |
| BRS42-00XX... | ▶ 0 °C ... +60 °C (+32 °F ... +140 °F)<br>Metal casing: maximum 240 W PoE power<br>Plastic casing: maximum 120 W PoE power<br>▶ < +55 °C (+131 °F) at 120 W ... 180 W PoE power<br>▶ < +50 °C (+122 °F) at 180 W ... 240 W PoE power | -40 °C ... +70 °C (-40 °F ... +158 °F) |
| **BRS43 PoE device variants featuring supply voltage with characteristic value U** | | |
| BRS43-0012... | 0 °C ... +50 °C (+32 °F ... +122 °F) | ▶ -40 °C ... +60 °C (-40 °F°... +140 °F) with maximum 60 W PoE power<br>▶ < +50 °C (+122 °F) at 60 W ... 90 W PoE power |
| **BRS43 PoE device variants featuring supply voltage with characteristic value P** | | |
| BRS43-0012... | ▶ 0 °C ... +50 °C (+32 °F ... +122 °F)<br>Metal casing: maximum 240 W PoE power<br>Plastic casing: maximum 120 W PoE power<br>▶ < +45 °C (+113 °F) at 120 W ... 180 W PoE power<br>▶ < +40 °C (+104 °F) at 180 W ... 240 W | -40 °C ... +60 °C (-40 °F ... +140 °F) |
| **BRS50 device variants** | | |
| BRS50-00122Q2Q... | 0 °C ... +60 °C (+32 °F ... +140 °F) | -40 °C ... +70 °C (-40 °F ... +158 °F) |
| BRS50-00202Q2Q... | 0 °C ... +60 °C (+32 °F ... +140 °F) | -40 °C ... +70 °C (-40 °F ... +158 °F) |
| BRS50-00242Q2Q... | 0 °C ... +60 °C (+32 °F ... +140 °F) | -40 °C ... +70 °C (-40 °F ... +158 °F) |
| **BRS52 PoE device variants featuring supply voltage with characteristic value U** | | |
| BRS52-00122Q2Q... | 0 °C ... +60 °C (+32 °F ... +140 °F) | ▶ -40 °C ... +70 °C (-40 °F°... +158 °F) with maximum 60 W PoE power<br>▶ < +60 °C (+140 °F) at 60 W ... 90 W PoE power |

*Table 15: Temperature ranges of BRS device variants including deratings*

| Product name | Temperature range<br>Characteristic value S, C | Temperature range<br>Characteristic value T, E, G |
|---|---|---|
| **BRS52 PoE device variants featuring supply voltage with characteristic value P** | | |
| BRS52-00122Q2Q... | ▶ 0 °C ... +60 °C (+32 °F ... +140 °F)<br>Metal casing: maximum 240 W PoE power<br>Plastic casing: maximum 120 W PoE power<br>▶ < +55 °C (+131 °F) at 120 W ... 180 W PoE power<br>▶ < +50 °C (+122 °F) at 180 W ... 240 W PoE power | -40 °C ... +70 °C (-40 °F ... +158 °F) |

*Table 15: Temperature ranges of BRS device variants including deratings*

## 7.3 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 mm² (AWG18) |
| | max. conductor diameter | 2.5 mm² (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 I²t | <1 A²s | |
| Connection for functional ground | See “Grounding the device” on page 49. | |

*Table 16: Supply voltage with characteristic value T*

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

*Table 17: Supply voltage with characteristic value F*

| Supply voltage with characteristic value F | | |
|---|---|---|
| Connection type | 6-pin terminal block with screw lock | |
| | Tightening torque | 0.5 Nm (4.4 lb-in) |
| | min. conductor diameter | 0.75 mm² (AWG18) |
| | max. conductor diameter | 2.5 mm² (AWG12) |
| Power loss buffer | >10 ms at 20.4 V DC ... 48 V DC and 24 V AC | |
| Overload current protection on the device | Non-replaceable fuse | |
| Back-up fuse for each voltage input | Nominal rating: | 2 A ... 10 A |
| | Characteristic: | slow blow |
| Current integral I²t | <1 A²s at 24 V DC | |
| Connection for functional ground | See “Grounding the device” on page 49. | |

*Table 17: 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 mm² (AWG16) |
| | max. conductor diameter | 2.5 mm² (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 I²t | <36 $A^2s$ | |
| Connection for functional ground | See “Grounding the device” on page 49. | |

*Table 18: Supply voltage with characteristic value U*

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

*Table 19: Supply voltage with characteristic value P*

| Supply voltage with characteristic value P | | |
|---|---|---|
| Max. PoE power | 240 W | 0 °C ... +50 °C (+32 °F ... +122 °F) ambient air temperature[a] Ambient air temperature |
| | 180 W | > +50 °C ... +55 °C (+122 °F ... +131 °F) [a] ambient air temperature |
| | 120 W | > +55 °C ... +60 °C (+131 °F ... +140 °F) [a] ambient air temperature |
| Voltage range DC incl. maximum tolerances: | When using PoE: | 46 V DC ... 57 V DC |
| | When using PoE+: | 52 V DC ... 57 V DC |
| | Without using PoE or PoE+: | 19 V DC ... 60 V DC |
| Connection type | 6-pin terminal block with screw lock | |
| | Tightening torque | 0.5 Nm (4.4 lb-in) |
| | min. conductor diameter | 0.75 mm² (AWG18) |
| | max. conductor diameter | 2.5 mm² (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 $I^2t$ | <25 $A^2s$ | |
| Insulation requirement | 2250 V DC to casing ground/functional ground for at least 60 seconds | |
| Connection for functional ground | See “Grounding the device” on page 49. | |

*Table 19: 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.

## 7.4 Power consumption/power output

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

*Table 20: Power consumption/power output*

| Device name | Total power consumption | Thermal power output | PoE power output |
|---|---|---|---|
| BRS20-1200... | 9 W | 31 Btu (IT)/h | 0 W |
| BRS20-1600... | 10 W | 34 Btu (IT)/h | 0 W |
| BRS20-2000... | 15 W | 51 Btu (IT)/h | 0 W |
| BRS20-2400... | 16 W | 55 Btu (IT)/h | 0 W |
| BRS30-0804... | 9 W | 31 Btu (IT)/h | 0 W |
| BRS30-1604... | 15 W | 51 Btu (IT)/h | 0 W |
| BRS30-2004... | 16 W | 55 Btu (IT)/h | 0 W |
| BRS40-0008... | 8 W | 27 Btu (IT)/h | 0 W |
| BRS40-0012... | 11 W | 38 Btu (IT/h) | 0 W |
| BRS40-0016... | 14 W | 48 Btu (IT/h) | 0 W |
| BRS40-0020... | 17 W | 58 Btu (IT)/h | 0 W |
| BRS40-0024... | 19 W | 65 Btu (IT)/h | 0 W |
| BRS50-0012... | 12 W | 41 Btu (IT)/h | 0 W |
| BRS50-0020... | 17 W | 58 Btu (IT)/h | 0 W |
| BRS50-0024... | 20 W | 68 Btu (IT)/h | 0 W |
| BRS22-08009999U... | 104 W | 48 Btu (IT/h) | 90 W |
| BRS22-08009999P... | 247 W | 24 Btu (IT)/h | 240 W |
| BRS32-0804OOOOU... | 107 W | 58 Btu (IT)/h | 90 W |
| BRS32-0804OOOOP... | 250 W | 34 Btu (IT)/h | 240 W |
| BRS42-00089999U... | 106 W | 55 Btu (IT)/h | 90 W |
| BRS42-00089999P... | 249 W | 31 Btu (IT)/h | 240 W |
| BRS42-0012OOOOU... | 109 W | 65 Btu (IT)/h | 90 W |
| BRS42-0012OOOOP... | 252 W | 41 Btu (IT)/h | 240 W |
| BRS52-00122Q2QU... | 110 W | 68 Btu (IT)/h | 90 W |
| BRS52-00122Q2QP... | 253 W | 44 Btu (IT)/h | 240 W |

*Table 20: Power consumption/power output*

## 7.5 Signal contact

| Signal contact<br>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 $mm^2$ (AWG 28) |
| | max. conductor diameter | 2.5 mm² (AWG12) |

*Table 21: Signal contact: device variants featuring supply voltage with characteristic value F, P and T*

| Signal contact<br>Device variants featuring supply voltage with characteristic value F, P and T | |
|---|---|
| Nominal value | $I_{max}$ = 1 A at $U_{max}$ = 30 V AC (resistive load)<br>$I_{max}$ = 1 A at $U_{max}$ = 60 V DC (resistive load) |
| | **according to the UL Standards:**<br>$I_{max}$ = 0.5 A at $U_{max}$ = 30 V AC (resistive load)<br>$I_{max}$ = 1 A at $U_{max}$ = 30 V DC (resistive load) |
| | **as per ANSI/UL 121201:**<br>See control drawing in chapter “Relevant for use in explosion hazard areas (Hazardous Locations, Class I, Division 2)” on page 12 |

*Table 21: Signal contact: device variants featuring supply voltage with characteristic value F, P and T*

| Signal contact<br>Device variants featuring supply voltage with characteristic value U | | |
|---|---|---|
| Connection type | 6-pin terminal block with screw lock | |
| | Tightening torque | 0.5 Nm (4.4 lb-in) |
| | min. conductor diameter | 0.08 $mm^2$ (AWG 28) |
| | max. conductor diameter | 2.5 mm² (AWG12) |
| | $I_{max}$ = 1 A at $U_{max}$ = 30 V AC (resistive load)<br>$I_{max}$ = 0.5 A at $U_{max}$ = 60 V DC (resistive load)<br>$I_{max}$ = 1 A at $U_{max}$ = 30 V DC (resistive load) | |
| | **according to the UL Standards:**<br>$I_{max}$ = 0.5 A at $U_{max}$ = 30 V AC (resistive load)<br>$I_{max}$ = 1 A at $U_{max}$ = 30 V DC (resistive load) | |
| | **as per ANSI/UL 121201:**<br>See control drawing in chapter “Relevant for use in explosion hazard areas (Hazardous Locations, Class I, Division 2)” on page 12 | |

*Table 22: Signal contact: device variants featuring supply voltage with characteristic value U*

# 7.6 Digital input

| Digital input | | |
|---|---|---|
| Connection type | 2-pin terminal block with screw lock | |
| | Tightening torque | 0.5 Nm (4.4 lb-in) |
| | min. conductor diameter | 0.08 $mm^2$ (AWG 28) |
| | max. conductor diameter | 2.5 mm² (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 23: Digital input*

# 7.7 Climatic conditions during operation

| Climatic conditions during operation | |
|---|---|
| Minimum clearance at the ventilation slots | See “Installing the device onto the DIN rail” on page 47. |
| Ambient air temperature[a] | Standard<br>▶ up to 2000 m ASL (6562 ft ASL): 0 °C ... +60 °C (+32 °F ... +140 °F)<br>▶ 2000 m ASL ... 3000 m ASL (6560 ft ASL ... 9842 ft ASL): 0 °C ... +50 °C (+32 °F ... +122 °F)<br>▶ 3000 m ASL ... 4000 m ASL (9842 ft ASL ... 13123 ft ASL): 0 °C ... +45 °C (+32 °F ... +113 °F)<br>▶ 4000 m ASL ... 4500 m ASL (13123 ft ASL ... 14763 ft ASL): 0 °C ... +40 °C (+32 °F ... +104 °F)<br>▶ 4500 m ASL ... 5000 m ASL (14763 ft ASL ... 16404 ft ASL): 0 °C ... +35 °C (+32 °F ... +95 °F)<br>Extended<br>▶ up to 2000 m ASL (6562 ft ASL): -40 °C ... +70 °C (-40 °F ... +158 °F)<br>▶ 2000 m ASL ... 3000 m ASL (6560 ft ASL ... 9842 ft ASL): -40 °C ... +60 °C (-40 °F ... +140 °F)<br>▶ 3000 m ASL ... 4000 m ASL (9842 ft ASL ... 13123 ft ASL): -40 °C ... +55 °C (-40 °F ... +131 °F)<br>▶ 4000 m ASL ... 4500 m ASL (13123 ft ASL ... 14763 ft ASL): -40 °C ... +50 °C (-40 °F ... +122 °F)<br>▶ 4500 m ASL ... 5000 m ASL (14763 ft ASL ... 16404 ft ASL): 0 °C ... +45 °C (+32 °F ... +113 °F)<br>**Note:** Note the following de-ratings due to:<br>▶ Mounting:<br>See table 7 on page 48.<br>▶ PoE power output:<br>See table 18 on page 75.<br>See table 19 on page 75.<br>▶ SFP transceiver<br>See “Derating due to SFP transceiver” on page 96. |

*Table 24: Climatic conditions during operation*

| Climatic conditions during operation | |
|---|---|
| Maximum inner temperature of device (guideline) | |
| ▶ Device variants in plastic casing with extended temperature range: BRSXX-XXXXXXXX-T/E/GxC ... See “Device name and product code” on page 25. | 85 °C (185 °F) |
| ▶ Device variants in metal casing with standard temperature range: BRSXX-XXXXXXXX-**S**/**C**x**D**... See “Device name and product code” on page 25. | 80 °C (176 °F) |
| ▶ Device variants in metal casing with extended temperature range: BRSXX-XXXXXXXX-T/E/GxD/E ... See “Device name and product code” on page 25. | 85 °C (185 °F) |
| Humidity | 1 % ... 95 % (non-condensing) |
| Air pressure | Without derating<br>▶ min. 795 hPa (+2000 m ASL; +6562 ft ASL)<br>▶ max. 1060 hPa (-400 m ASL; -1312 ft ASL)<br>With derating<br>▶ min. 540 hPa (+5000 m ASL; +16404 ft ASL)<br>▶ max. 1060 hPa (-400 m ASL; -1312 ft ASL) |

*Table 24: Climatic conditions during operation*

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

## 7.8 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 (+5000 m ASL; +16404 ft ASL)<br>▶ max. 1060 hPa (-400 m ASL; -1312 ft ASL) |

*Table 25: Climatic conditions during storage*

## 7.9 Dimension drawings

### 7.9.1 Device variants with casing with characteristic value C (plastic casing)

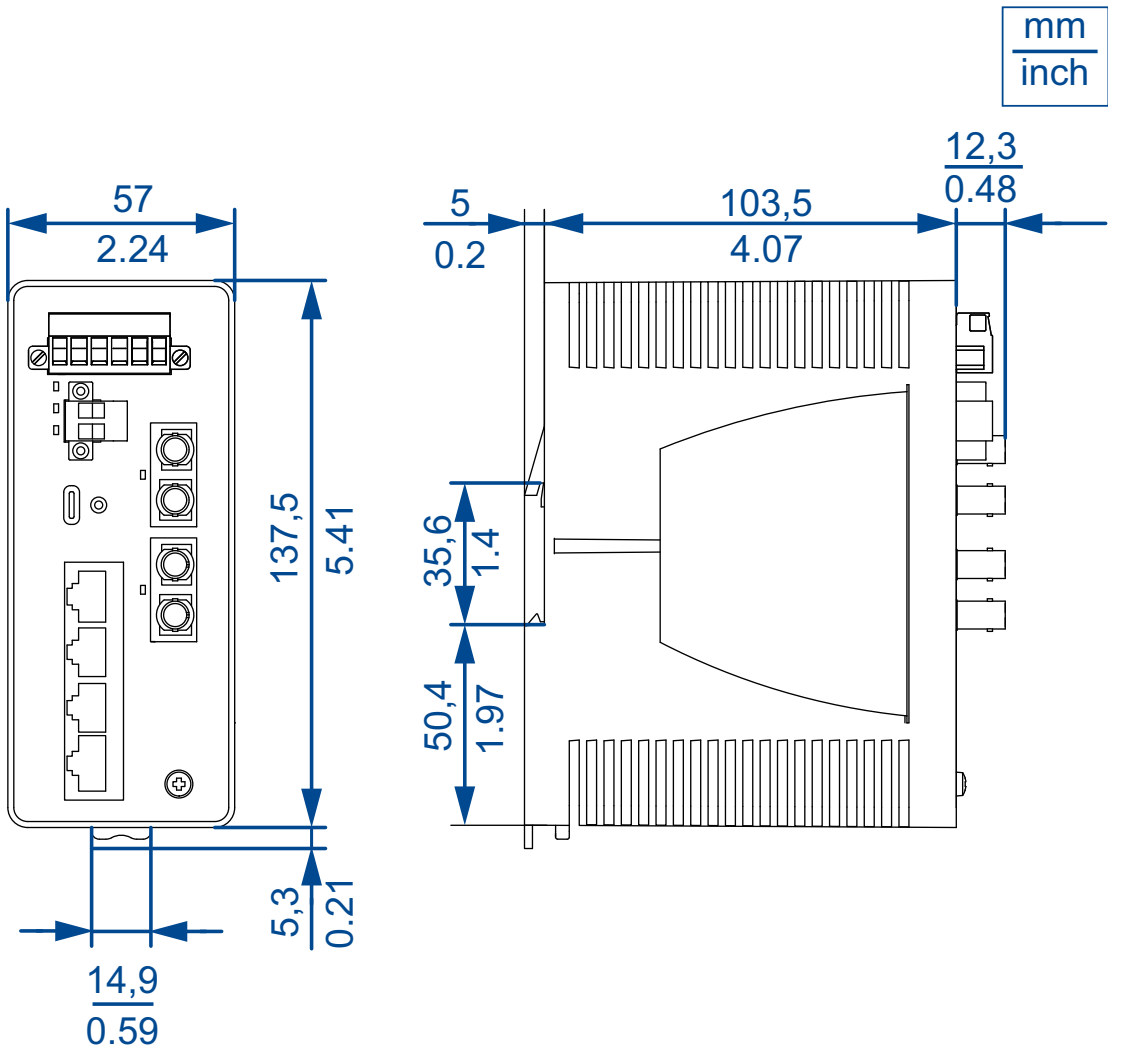



*Figure 23: Device variants in narrow plastic casing*

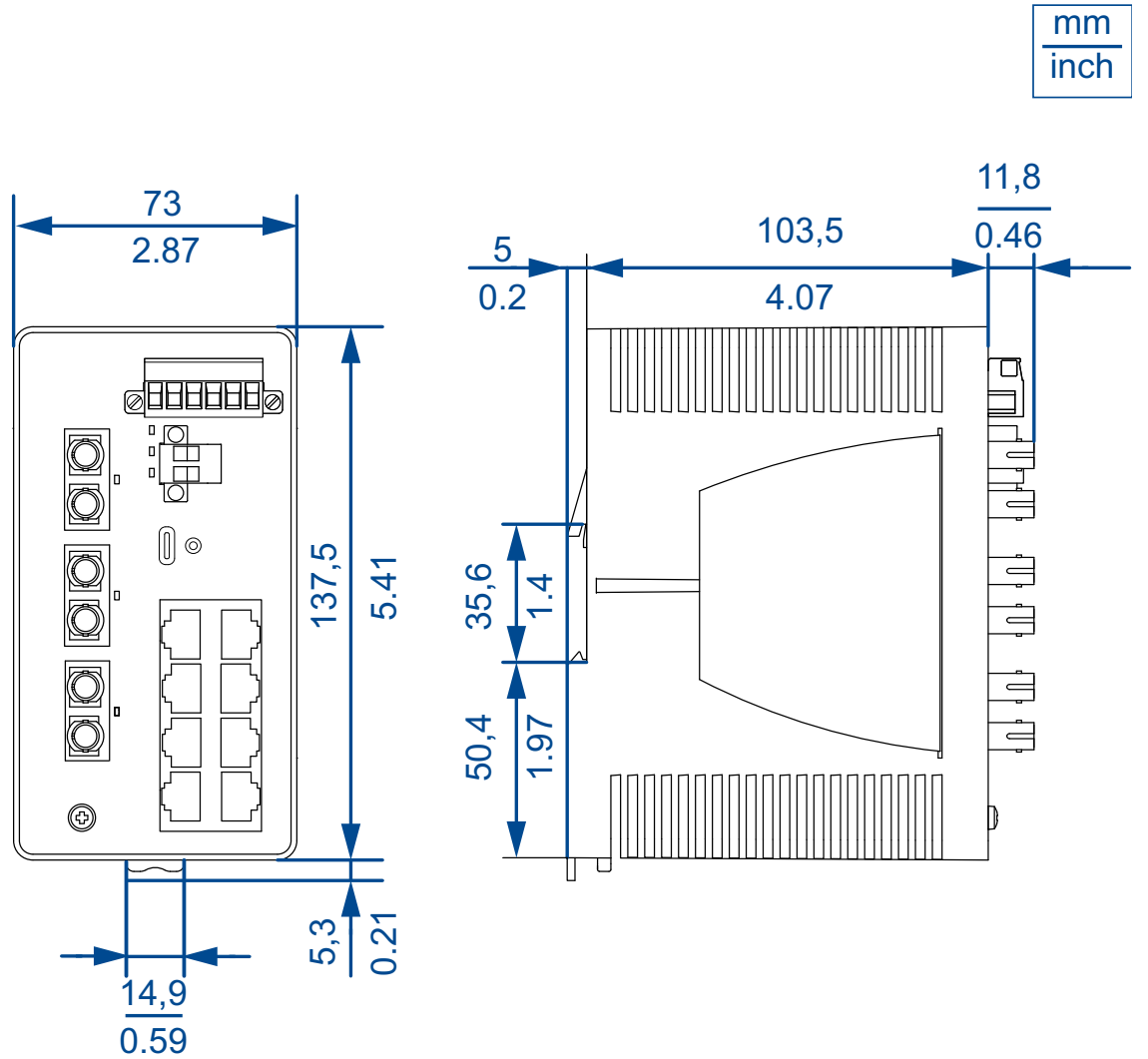



*Figure 24: Device variants in medium plastic casing*

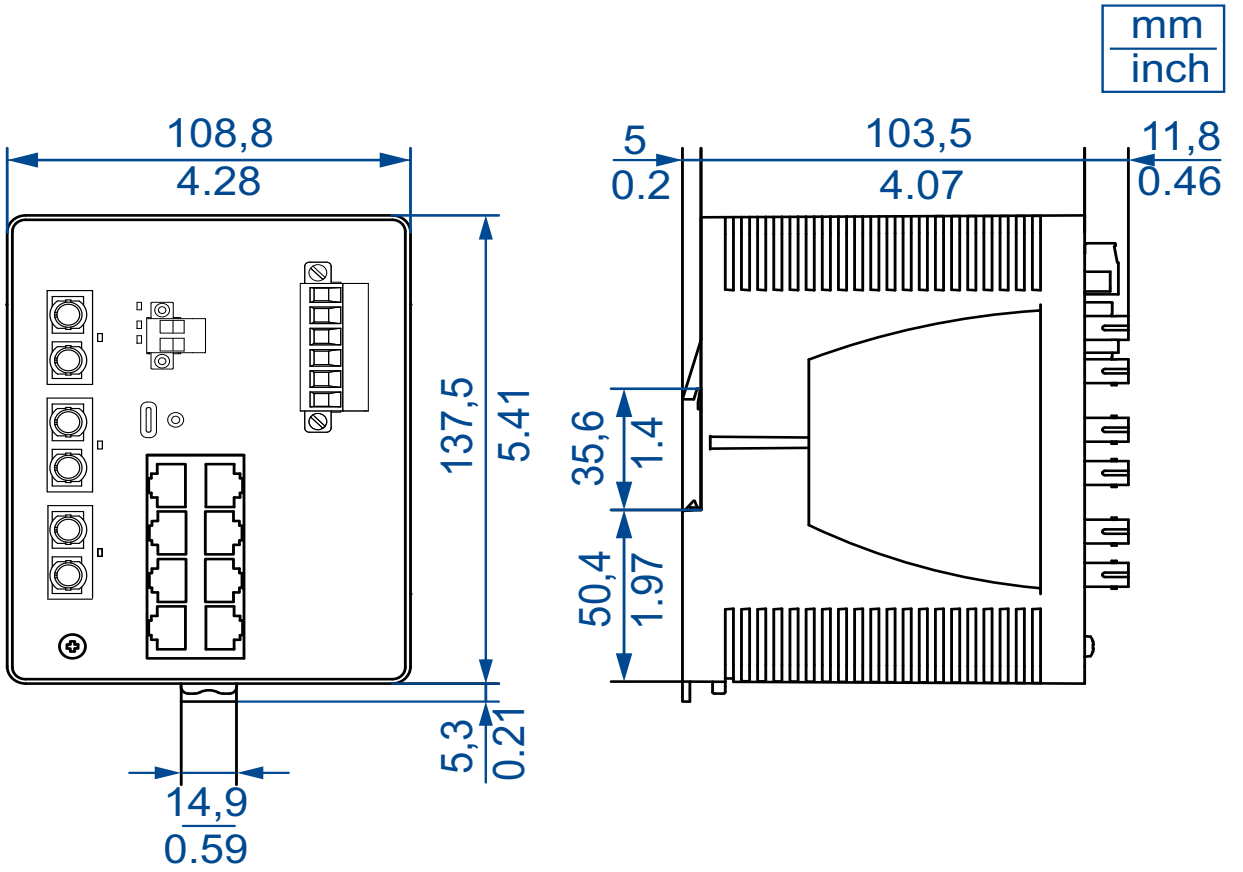



*Figure 25: Device variants in wide plastic casing*

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

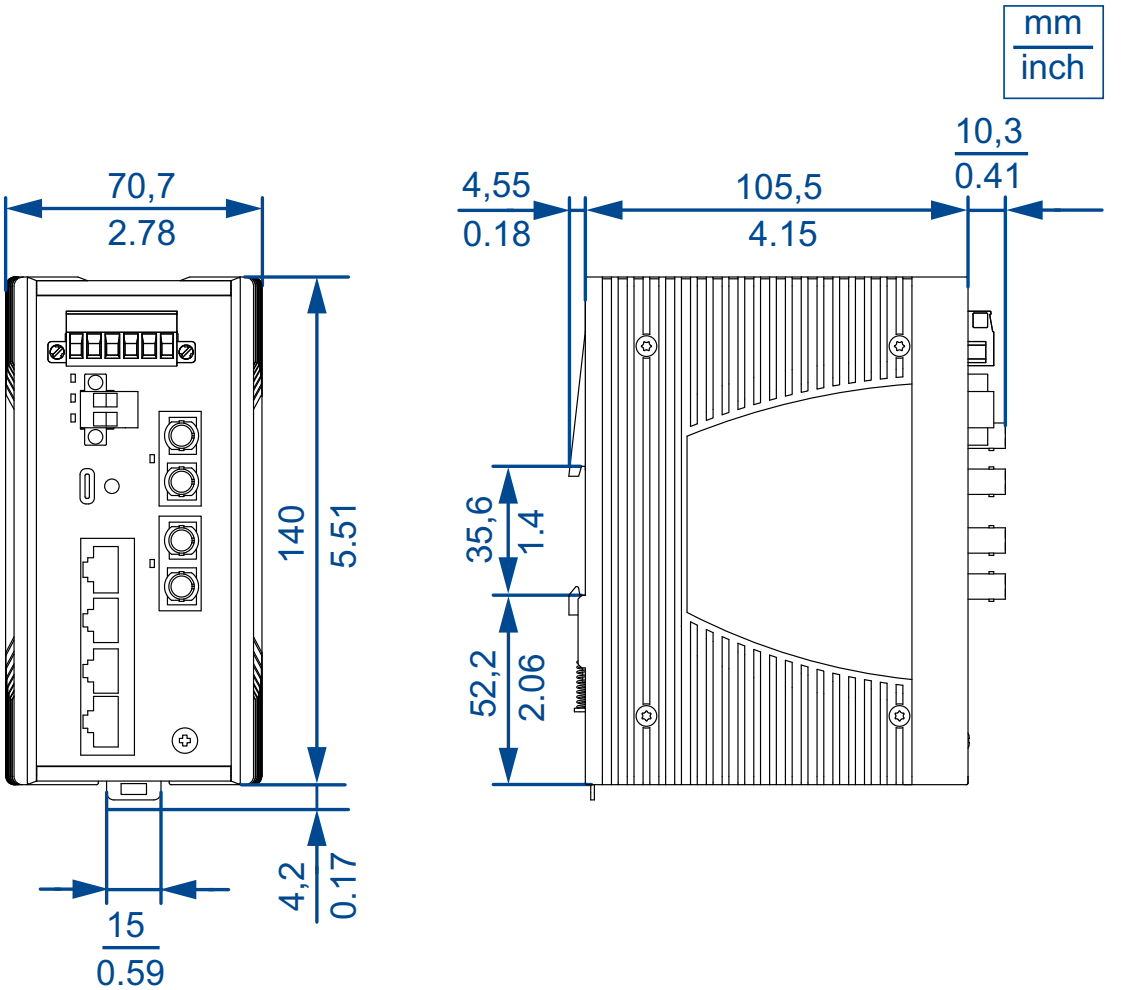



*Figure 26: Device variants in narrow metal casing*

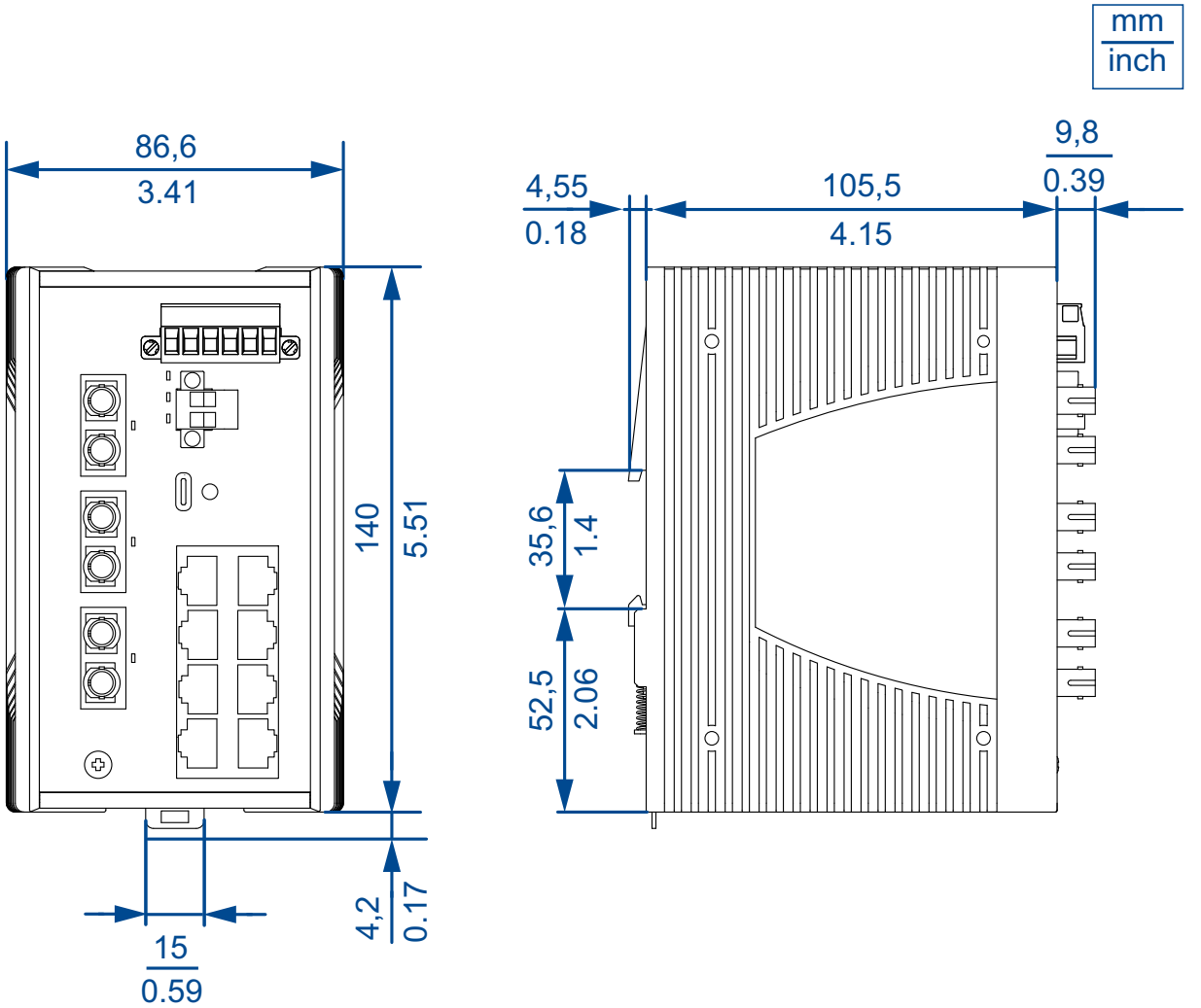



*Figure 27: Device variants in medium metal casing*

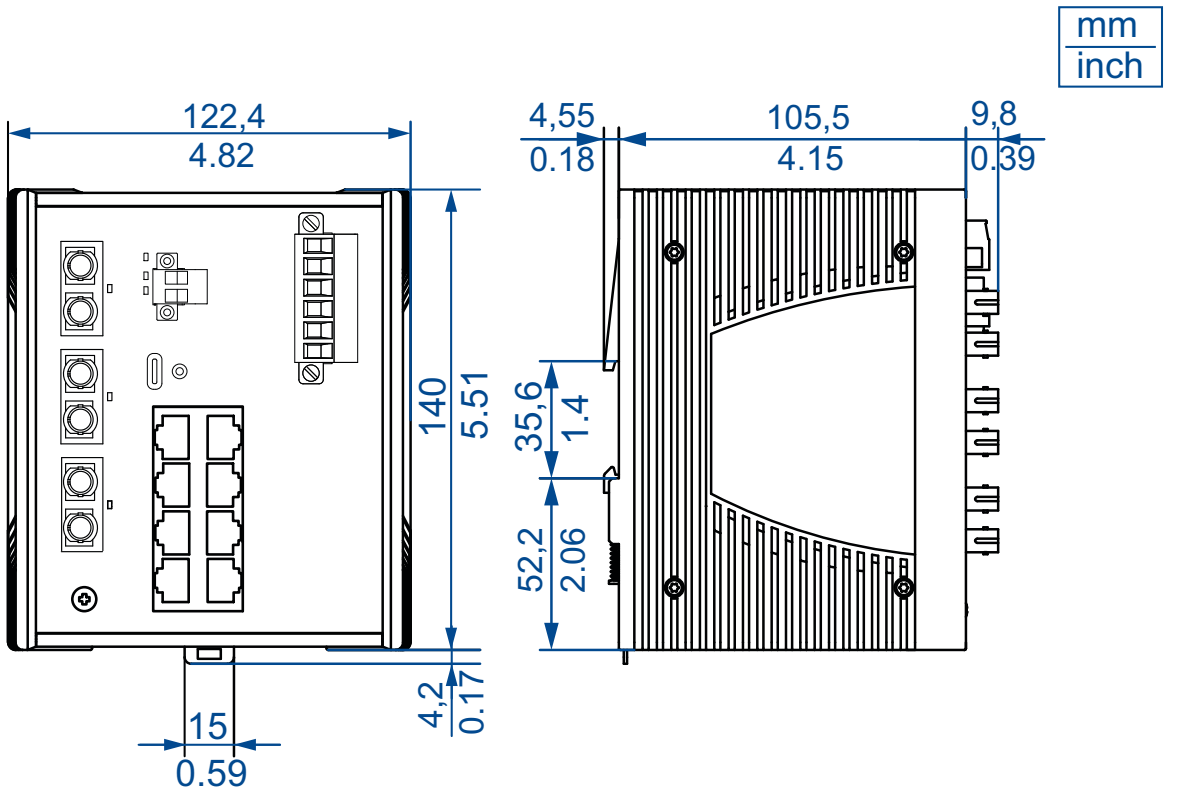



*Figure 28: Device variants in wide metal casing*

## 7.10 Immunity

| Immunity | | Standard applications[a] | Navy applications | Railway applications (trackside) as per EN 50121-4 |
|---|---|---|---|---|
| IEC 60068-2-6, test Fc | Vibration | 5 Hz ... 8.4 Hz with 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 26: Immunity*

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

## 7.11 Electromagnetic compatibility (EMC)

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

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

*Table 27: EMC interference emission*

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

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

*Table 28: EMC interference immunity*

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

## 7.12 Network range

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

### 7.12.1 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 29: Network range: 10/100/1000 Mbit/s twisted pair port*

### 7.12.2 Fast Ethernet SFP transceiver

| **Product code** | **Mode[a]** | **Wave length** | **Fiber** | **System attenuation** | **Example for F/O cable length[b]** | **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) |

*Table 30: F/O port 100BASE-FX (SFP Fiber Optic Fast Ethernet Transceiver)*

| Product code | Mode[a] | Wave length | Fiber | System attenuation | Example for F/O cable length[b] | Fiber attenuation | BLP/Dispersion |
|---|---|---|---|---|---|---|---|
| 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[c] | 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 |
| 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 30: 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[a] | Wave length | Fiber | System attenuation | Example for F/O cable length[b] | Fiber attenuation | BLP/Dispersion |
|---|---|---|---|---|---|---|---|
| -M2, -MM | MM | 1300 nm | 50/125 µm | 0 dB ... 8 dB | 0 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) |

*Table 31: F/O port 100BASE-FX (DSC/DST fiber optic Fast Ethernet Transceiver)*

| Product code | Mode[a] | Wave length | Fiber | System attenuation | Example for F/O cable length[b] | Fiber attenuation | BLP/Dispersion |
|---|---|---|---|---|---|---|---|
| -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 31: 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.

### 7.12.3 Gigabit Ethernet SFP transceiver

| Product code M-SFP-... | Mode[a] | Wave length | Fiber | System attenuation | Example for F/O cable length[b] | Fiber attenuation | BLP[c]/ Dispersion |
|---|---|---|---|---|---|---|---|
| -SX/LC... | MM | 850 nm | 50/125 µm | 0 dB ... 7.5 dB | 0 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 km ... 0.31 mi) | 1,0 dB/km | 500 MHz×km |
| -LX/LC... | MM | 1310 nm[d] | 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 |

*Table 32: F/O port 1000BASE-FX (SFP fiber optic Gigabit Ethernet Transceiver)*

| Product code M-SFP-... | Mode[a] | Wave length | Fiber | System attenuation | Example for F/O cable length[b] | Fiber attenuation | BLP[c]/ Dispersion |
|---|---|---|---|---|---|---|---|
| -LX/LC... | MM | 1310 nm[e] | 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)[f] | 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) |
| -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[g] | 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[h] | 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[i] (0 mi ... 12.43 mi) | 0,4 dB/km | 3,5 ps/(nm×km) |

*Table 32: F/O port 1000BASE-FX (SFP fiber optic Gigabit Ethernet Transceiver)*

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

e. With F/O adapter compliant with IEEE 802.3-2002 Clause 38 (single-mode fiber offset-launch mode conditioning patch cord).
f. Including 2.5 dB system reserve when compliance with the fiber data is observed.
g. With F/O adapter compliant with IEEE 802.3-2002 Clause 38 (single-mode fiber offset-launch mode conditioning patch cord).
h. With F/O adapter compliant with IEEE 802.3-2002 Clause 38 (single-mode fiber offset-launch mode conditioning patch cord).
i. Including 2.5 dB system reserve when compliance with the fiber data is observed.

### 7.12.4 2.5 Gigabit Ethernet SFP transceiver

| Product code M-SFP-2.5-... | Mode[a] | Wave length | Fiber | System attenuation | Example for F/O cable length | Fiber attenuation | BLP/dispersion |
|---|---|---|---|---|---|---|---|
| MM/LC EEC | MM | 850 nm | 50/125 µm | 0 dB ... 4 dB | 0.55 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[b] (49.70 mi) | 0.25 dB/km | 19 ps/(nm×km) |

*Table 33: 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).

### 7.12.5 Bidirectional Fast Ethernet SFP transceiver

| Product code SFP-FAST-B... | Mode[a] | Wave length TX | Wave length RX | Fiber | System attenuation | Example for F/O cable length[b] | Fiber attenuation | Dispersion |
|---|---|---|---|---|---|---|---|---|
| SFP-FAST-BA MM/LC EEC | MM | 1310 nm | 1550 nm | 50/125 µm<br>62.5/125 µm | 0 dB ... 16 dB | 0 km ... 2 km<br>(0 mi ... 1.24 mi) | 1.0 dB/km | 800 MHz×km<br>500 MHz×km |
| SFP-FAST-BB MM/LC EEC | MM | 1550 nm | 1310 nm | 50/125 µm<br>62.5/125 µm | 0 dB ... 16 dB | 0 km ... 2 km<br>(0 mi ... 1.24 mi) | 1.0 dB/km | 800 MHz×km<br>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<br>(0 km ... 12.43 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 ... 18 dB | 0 km ... 20 km<br>(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<br>(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<br>(0 mi ... 37.29 mi) | 0.25 dB/km | 19 ps/(nm×km) |

*Table 34: 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.

### 7.12.6 Bidirectional Gigabit Ethernet SFP transceiver

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

*Table 35: F/O port (bidirectional Gigabit Ethernet SFP transceiver)*

| Product code SFP-GIG-B... | Mode[a] | Wave length TX | Wave length RX | Fiber | System attenuation | Example for F/O cable length[b] | Fiber attenuation | Dispersion |
|---|---|---|---|---|---|---|---|---|
| SFP-GIG-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 35: 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.

## 7.13 Derating due to SFP transceiver

### 7.13.1 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 | **a** | 943 865-001 |
| M-FAST SFP-MM/LC EEC | 0 K | 0 K | 943 945-001 |
| M-FAST SFP-SM/LC | 0 K | **a** | 943 866-001 |
| M-FAST SFP-SM/LC EEC | 0 K | 0 K | 943 946-001 |

*Table 36: Derating due to 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-SM+/LC | 0 K | **a** | 943 867-001 |
| M-FAST SFP-SM+/LC EEC | 0 K | 0 K | 943 947-001 |
| M-FAST SFP-LH/LC | 0 K | **a** | 943 868-001 |
| M-FAST SFP-LH/LC EEC | 0 K | 0 K | 943 948-001 |
| M-FAST SFP-TX/RJ45 | 0 K | **a** | 942 098-001 |
| M-FAST SFP-TX/RJ45 EEC | 0 K | 0 K | 942 098-002 |
| SFP-FAST-MM/LC | 0 K | **a** | 942 194-001 |
| SFP-FAST-MM/LC EEC | 0 K | 0 K | 942 194-002 |
| SFP-FAST-SM/LC | 0 K | **a** | 942 195-001 |
| SFP-FAST-SM/LC EEC | 0 K | 0 K | 942 195-002 |

*Table 36: 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).

### 7.13.2 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 |
|---|---|---|---|
| M-SFP-SX/LC | 0 K | **a** | 943 014-001 |
| M-SFP-SX/LC EEC | 0 K | 0 K | 943 896-001 |
| M-SFP-LX/LC | 0 K | **a** | 943 015-001 |
| M-SFP-LX/LC EEC | 0 K | 0 K | 943 897-001 |
| M-SFP-LH/LC | 2 K | **a** | 943 042-001 |
| M-SFP-LH/LC EEC | 0 K | 2 K | 943 898-001 |

*Table 37: De-rating due to Gigabit Ethernet SFP transceivers*

| 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-LH+/LC | 2 K | **a** | 943 049-001 |
| M-SFP-TX/RJ45 | 3 K | **a** | 943 977-001 |
| M-SFP-TX/RJ45 EEC | 0 K | 3 K | 942 161-001 |
| SFP-GIG-LX/LC | 0 K | **a** | 942 196-001 |
| SFP-GIG-LX/LC EEC | 0 K | 0 K | 942 196-002 |
| M-SFP-LX+/LC | 0 K | **a** | 942 023-001 |
| M-SFP-LX+/LC EEC | 0 K | 0 K | 942 024-001 |
| M-SFP-LH+/LC EEC | 0 K | 2 K | 942 119-001 |
| M-SFP-MX/LC EEC | 0 K | 2 K | 942 108-001 |

*Table 37: 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).

### 7.13.3 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 | **a** | 942 220-001 |

*Table 38: 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).

### 7.13.4 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 39: De-rating due to bidirectional Fast Ethernet SFP transceivers*

### 7.13.5 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 40: 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<br>depending on device variant |
| 2 × | Ferrites with key<br>depending on device variant<br>See “Connecting the ferrite (optional)” on page 49. |

*Table 41: Scope of delivery*

# 9 Accessories

## 9.1 General accessories

| General accessories<br>You find more information on available accessories in the Belden Online Catalog https://catalog.belden.com | |
|---|---|
| AutoConfiguration Adapter ACA22-USB-C (EEC) | 942-239-001 |
| 6-pin terminal block with screw lock (10 pieces) | 972 272-303 |
| 6-pin terminal block with screw lock (50 pieces) | 943 845-013 |
| 2-pin terminal block with screw lock (10 pieces) | 972 272-201 |
| 2-pin terminal block with screw lock (50 pieces) | 943 845-009 |
| Industrial HiVision Network Management Software | 943 156-xxx |
| Wall mounting bracket for BRS device variants (metal housing widths in narrow, medium and wide versions only) | 942-321-001 |

*Table 42: Accessories: General accessories*

## 9.2 Order numbers for standard variants

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

*Table 43: Order numbers for standard variants in plastic casing*

| Name | Order number |
|---|---|
| BRS20-8TX/2FX-SM-HL | 942 170-028 |
| BRS20-4TX/2SFP-HL | 942 170-029 |
| BRS20-4TX-EEC-HL | 942 170-034 |
| 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 | |

*Table 43: Order numbers for standard variants in plastic casing*

| Name | Order number |
|---|---|
| BRS32-8TX/4SFP | 942 170-048 |
| BRS32-8TX/4SFP-EEC | 942 170-052 |
| BRS42-8TX | 942 170-047 |
| 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 43: Order numbers for standard variants in plastic casing*

## 9.3 Fast Ethernet SFP transceiver

| Fast Ethernet SFP transceiver | Certification type[a] | Order number |
|---|---|---|
| M-FAST SFP-TX/RJ45 | Standard level | 942 098-001 |
| M-FAST SFP-TX/RJ45 EEC | Standard level | 942 098-002 |
| The following operating conditions apply to twisted pair transceivers:<br>▶ Longer RSTP switching times and link loss detection times compared to twisted pair ports provided by the device directly.<br>▶ It is currently not possible to set autocrossing manually. | | |
| M-FAST SFP-MM/LC | Standard level | 943 865-001 |
| M-FAST SFP-MM/LC EEC | Standard level | 943 945-001 |
| M-FAST SFP-SM/LC | Standard level | 943 866-001 |
| M-FAST SFP-SM/LC EEC | Standard level | 943 946-001 |
| M-FAST SFP-SM+/LC | Standard level | 943 867-001 |
| M-FAST SFP-SM+/LC EEC | Standard level | 943 947-001 |
| M-FAST SFP-LH/LC | Standard level | 943 868-001 |
| M-FAST SFP-LH/LC EEC | Standard level | 943 948-001 |
| SFP-FAST-MM/LC | Entry level | 942 194-001 |
| SFP-FAST-MM/LC EEC | Entry level | 942 194-002 |
| SFP-FAST-SM/LC | Entry level | 942 195-001 |
| SFP-FAST-SM/LC EEC | Entry level | 942 195-002 |

*Table 44: Accessory: Fast Ethernet SFP transceiver*

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

*Table 45: Accessory: Gigabit Ethernet SFP transceiver*

a. Use Entry level SFP transceivers for industrial applications that exclusively require thefollowing 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[a] | Order number |
|---|---|---|
| M-SFP-2.5-MM/LC EEC | Standard level | 942 162-001 |
| M-SFP-2.5-SM-/LC EEC | Standard level | 942 163-001 |
| M-SFP-2.5-SM/LC EEC | Standard level | 942 164-001 |
| M-SFP-2.5-SM+/LC EEC | Standard level | 942 165-001 |
| M-SFP-2.5-LH/LC | Standard level | 942 220-001 |

*Table 46: Accessory: 2.5 Gigabit Ethernet SFP transceiver*

a. 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[a] | Order number |
|---|---|---|
| SFP-FAST-BA MM/LC EEC | Entry level | 942 204-001 |
| SFP-FAST-BB MM/LC EEC | Entry level | 942 204-002 |
| SFP-FAST-BA SM/LC EEC | Entry level | 942 205-001 |
| SFP-FAST-BB SM/LC EEC | Entry level | 942 205-002 |
| SFP-FAST-BA SM+/LC EEC | Entry level | 942 206-001 |
| SFP-FAST-BB SM+/LC EEC | Entry level | 942 206-002 |

*Table 47: Accessory: Bidirectional Fast Ethernet SFP transceiver*

a. following approvals: CE, FCC or UL 61010-2-20.

## 9.7 Bidirectional Gigabit Ethernet SFP transceiver

| Bidirectional Gigabit Ethernet SFP transceiver | Certification type[a] | Order number |
|---|---|---|
| SFP-GIG-BA LX/LC EEC | Entry level | 942 207-001 |
| SFP-GIG-BB LX/LC EEC | Entry level | 942 207-002 |
| SFP-GIG-BA LX+/LC EEC | Entry level | 942 208-001 |
| SFP-GIG-BB LX+/LC EEC | Entry level | 942 208-002 |
| SFP-GIG-BA LH/LC EEC | Entry level | 942 209-001 |
| SFP-GIG-BB LH/LC EEC | Entry level | 942 209-002 |

*Table 48: Accessory: Bidirectional Gigabit Ethernet SFP transceiver*

a. 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 |
| DNV-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 49: 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 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.

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