![HIRSCHMANN — A BELDEN BRAND]

User Manual

Installation
Industrial Ethernet Rail Switch Rugged
RSR20/RSR30 Family

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

Safety instructions

⚠ **WARNING**
UNCONTROLLED MACHINE ACTIONS To avoid uncontrolled machine actions caused by data loss, configure all the data transmission devices individually. Before you start any machine which is controlled via data transmission, be sure to complete the configuration of all data transmission devices. **Failure to follow this instruction can result in death, serious injury, or equipment damage.**

■ **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 the device, turn off the supply voltage and return the device to Hirschmann for inspection.

■ **Intended 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 "General technical data" on page 53.
  ☐ Connect to the product only components suitable for the requirements of the specific application case.

◼ 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.

◼ Installation site requirements
☐ Install the device in a fire enclosure according to EN 60950-1.
☐ Install this device only in a switch cabinet or in an operating site with restricted access, to which maintenance staff have exclusive access.

◼ Device casing
Only technicians authorized by the manufacturer are permitted to open the casing.
☐ Never insert pointed objects (narrow screwdrivers, wires, etc.) into the device or into the connection terminals for electric conductors. Do not touch the connection terminals.
☐ Keep the ventilation slits free to ensure good air circulation.
See "General technical data" on page 53.
☐ Mount the device in the vertical position.
☐ At ambient air temperatures > 140 °F (+60 °C):
The surfaces of the device housing may become hot. Avoid touching the device while it is operating.

◼ 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.

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

■ Grounding the device
The device is grounded by the separate ground screw on the front panel.
- ☐ Use a wire diameter for the ground conductor that is no smaller than the diameter of the supply voltage connection, however of at least 0.75 mm² (AWG18).
- ☐ Ground the device before connecting any other cables.
- ☐ Disconnect the grounding only after disconnecting all other cables.

■ Shielding ground
The overall shield of a connected shielded twisted pair cable is connected to the grounding connector on the front panel as a conductor.
- ☐ Beware of possible short circuits when connecting a cable section with conductive shielding braiding.

■ Supply voltage
The supply voltage is electrically isolated from the housing.
- ☐ The devices are designed for operation with safety extra-low voltage. Connect only safety extra-low voltage circuits with voltage restrictions in line with IEC/EN 60950-1 to the supply voltage connections and signal contacts.
- ☐ Exclusively connect a supply voltage that corresponds to the type plate of your device.
- ☐ Ground the device before connecting any other cables.

- ☐ Exclusively for device variants featuring supply voltage with characteristic value C:
  - ▶ The power supply is Class 2 compliant.
  - ▶ The power supply conforms to overvoltage category I or II.
  - ▶ The power supply has an easily accessible disconnecting device (for example a switch or a plug). This disconnecting device is clearly identified. So in the case of an emergency, it is clear which disconnecting device belongs to which power supply cable.
  - ▶ The electrical wires are voltage-free.
  - ▶ A fuse suitable for DC voltage is located in the plus conductor of the power supply.
    The minus conductor is on ground potential. Otherwise, a fuse is also located in the minus conductor.
    Regarding the properties of this fuse:
    See "General technical data" on page 53.
  - ▶ The wire diameter of the power supply cable is at least 0.75 mm² (North America: AWG18) on the supply voltage input.

▶ The cables used are permitted for the temperature range of the application case.

▶ Relevant for North America:
The power supply cables are suitable for ambient air temperatures of at least 167 °F (75 °C). The power supply cable wires are made of copper.

Note: If you connect 2 independent power sources, verify that the minus terminal is grounded. Failure to follow this instruction can result in equipment damage.

Start connecting the electrical wires only if **all** the above safety requirements are fulfilled.

☐ Internal fuses are triggered only in the case of a detected error in the device. In case of damage or malfunction of the device, turn off the supply voltage and return the device to the plant for inspection.

☐ For supply voltage connections with protective conductor connection:
First connect the protective conductor before connecting the wires for the supply voltage.
If your device comprises a 2nd supply voltage connection of this type:
First connect the protective conductor before connecting the wires for the supply voltages.

☐ Enable the supply voltage for the device only when the following requirements are fulfilled:
  ▶ the housing is closed
  ▶ the terminal blocks are wired correctly
  ▶ the terminal blocks for the power supply are connected

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

SUITABLE FOR USE IN CLASS I, DIVISION 2, GROUPS A, B, C AND D HAZARDOUS LOCATIONS, OR NONHAZARDOUS LOCATIONS ONLY.
Replacing components of any kind can affect the suitability for Class I, Division 2.
The USB connector is for temporary connection only. Do not use, connect, or disconnect unless area is known to be non-hazardous. Connection or disconnection in an explosive atmosphere could result in an explosion.
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.

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

Non-Hazardous Location

Hazardous Location

Power supply (redundant)
Type "C": 24–48 V DC

Fault contacts. Equipment with nonincendive field wiring parameters:

$V < 30$ V $I < 90$ mA $L_i < 0.5$ μH $C_i < 20$ pF

Data communication Ethernet Ports

ACA22 USB AutoConfiguration Adapter
For Maintenance only – See Installation Instructions

V.24 Interface (External Management)

Non Hazardous Location

P1
P2
Fault
Fault

U: 110 / 230 VAC
U: 60 / 110 / 250 VDC
P1
R1
U: 110 / 230 VAC
U: 60 / 110 / 250 VDC
P2
R2

V.24

P
R1   RM
R2
FAULT   Stand by

IP ADDRESS

Auf/Aktiv MAC Adresse

RSRxx

IP54 enclosure

HAZARDOUS LOCATION

Title:

Date: 2021-07-01

Document No.: 000240199DNR

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Control Drawing for RSR20 / RSR30 family

Rev.
2.0

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Notes:

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 parameter conditions are met.

$$C_a \geq C_i + C_{Cable} \; ; \; L_a \geq L_i + L_{Cable}$$

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

Nonincendive Field Wiring Parameters:

Entity Parameters for Class I, Division 2 Groups A, B, C, D	V_{max} [V]	I_{max} [mA]	C_i [pF]	L_i [µH]
Connector: **Contacts:**				
2 pole Fault contacts	30	90	20	0.5

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.

DO NOT OPEN WHEN ENERGIZED.

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Control Drawing for RSR20 / RSR30 family

Title:		
Date: 2021-07-01	Document No.: 0002401990NR	Rev. 2.0
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■ Housing

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

- ☐ Never insert pointed objects (narrow screwdrivers, wires, etc.) into the device or into the connection terminals for electric conductors. Do not touch the connection terminals.
- ☐ Keep the ventilation slits free to ensure good air circulation.
  See "General technical data" on page 53.
- ☐ Mount the device in the vertical position.
- ☐ At ambient air temperatures > 140 °F (+60 °C):
  The surfaces of the device housing may become hot. Avoid touching the device while it is operating.

■ CE marking

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

Device variant	Directive
All variants	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.
	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.

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

Hirschmann Automation and Control GmbH
Stuttgarter Str. 45-51
72654 Neckartenzlingen
You find the EU conformity declaration as PDF file for downloading on the Internet at: https://www.doc.hirschmann.com/certificates.html

The product can be used in the industrial sector.
- ▶ Interference immunity: EN 61000-6-2
- ▶ Emitted interference: EN 55032

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.

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

■ **FCC note**

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

Industrial Ethernet Rail Switch Rugged
RSR20/RSR30

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

You can choose from between a wide range of variants. You have the option to set up your device individually based on different criteria:
▶ Number of ports
▶ Transmission speed
▶ Types of connectors
▶ Temperature range
▶ Certifications
The RSR20/RSR30 devices are designed for the special requirements of industrial automation. They meet the relevant industry standards, provide very high operational reliability, even under extreme conditions, and also long-term reliability and flexibility.
The devices allow you to set up switched industrial Ethernet networks that conform to the IEEE 802.3 standard.
The devices work without a fan.

The voltage supply can be redundant if required.

The following installation options are available:
▶ Mounting on the DIN rail
▶ Mounting on a flat surface
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

The ring redundancy concept allows the network to be reconfigured quickly after a failure.

Product configuration data can be provided by:
▶ diagnosis displays
▶ Display of the operating parameters
▶ Label area for IP address

There are convenient options for managing the device. Manage your devices via:
▶ Web browser
▶ Telnet
▶ SSH
▶ HiDiscovery (software for putting the device into operation)

▶ V.24 interface (locally on the device)
▶ Network management software (for example Industrial HiVision)

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

1.2 Description of the device variants

The RSR30 device variants are Rugged Rail Switches with 2 to 3 Gigabit Ethernet ports (1000 Mbit/s) and 6 to 8 Fast Ethernet ports (10/100 Mbit/s). The RSR20 device variants are Rugged Rail Switches with 8 to 9 Fast Ethernet ports (10/100 Mbit/s).

1.2.1 Combination options RSR20/RSR30

The product designation of your device is made from combining the desired product characteristics in accordance with the following table. The short designation is in column 3.
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.

Position	Characteristic	Characteristic value	Property
1 to 5	Product	RSR20	Rail Switch Rugged without gigabit ports
		RSR30	Rail Switch Rugged with gigabit ports
6	- (hyphen)	-	
7 to 8	Number of 100 Mbit/s ports	06	6 × 100 Mbit/s Ethernet
		08	8 × 100 Mbit/s Ethernet
		09	9 × 100 Mbit/s Ethernet
9 and 10	Number of 1000 Mbit/s ports	00	0 × 1000 Mbit/s Ethernet
		02	2 × 1000 Mbit/s Ethernet
		03	3 × 1000 Mbit/s Ethernet

Table 1:   Combination options for the RSR20/RSR30 device variants

Position	Characteristic	Characteristic value	Property
11 and 12	Port 1 and 2 or Port 1	CC	2 × Combo port 100/1000 Mbit/s Ethernet
		OO	2 × SFP slot 1000 Mbit/s Ethernet
		MM	2 × Multimode FX (DSC)
		JJ	2 × Multimode FX (MTRJ)
		NN	2 × Multimode FX (DST)
		VV	2 × Singlemode FX (DSC)
		UU	2 × Signlemode FX (DST)
		LL	2 × Singlemode Long Haul FX (DSC)
		GG	2 × Singlemode Long Haul FX (DSC) 124.27 mi (200 km)
		O7	1 × Combo port 100/1000 Mbit/s Ethernet
		O6	1 × SFP slot 1000 Mbit/s Ethernet
		T1	1 × Twisted Pair TX (RJ45 socket)
		M2	1 × Multimode FX (DSC)
		M3	1 × Multimode FX (MTRJ)
		M4	1 × Multimode FX (DST)
		S2	1 × Singlemode FX (DSC)
		S4	1 × Signlemode FX (DST)
		L2	1 × Singlemode Long Haul FX (DSC)
		G2	1 × Singlemode Long Haul FX (DSC) 124.27 mi (200 km)
13 and 14	Port 2 or Port 3 or Port 3 and 4	ZZ	2 × SFP slot (100 Mbit/s)
		O7	1 × Combo port 100/1000 Mbit/s Ethernet
		O6	1 × SFP slot 1000 Mbit/s Ethernet
		T1	1 × Twisted Pair TX (RJ45 socket)
		M2	1 × Multimode FX (DSC)
		M3	1 × Multimode FX (MTRJ)
		M4	1 × Multimode FX (DST)
		S2	1 × Singlemode FX (DSC)
		S4	1 × Signlemode FX (DST)
		L2	1 × Singlemode Long Haul FX (DSC)
		G2	1 × Singlemode Long Haul FX (DSC) 124.27 mi (200 km)
15 and 16	Remaining ports	T1	1 × Twisted Pair TX (RJ45 socket)
17	Temperature range	S	Standard +32 °F to +140 °F (0 °C to +60 °C)
		U	Extended −40 °F to +185 °F (−40 °C to +85 °C)
		F	Extended −40 °F to +185 °F (−40 °C to +85 °C) and Conformal Coating
18	Voltage range 1	C	See "General technical data" on page 53.
19	Voltage range 2	C	See "General technical data" on page 53.
20	Approvals	H	CE; UL508; GL; IEC61850; IEEE 1613 substation; EN 50121-4 railway (along track)
		C	CE; UL508; GL; IEC61850; IEEE 1613 substation; EN 50121-4 railway (along track)
21	Software variant	P	Professional

Table 1:   Combination options for the RSR20/RSR30 device variants

1.2.2　Port number and media for RSR20-…

To put together your personal RSR20 device in the above table (see table 1), you have the following combination options
("?" = any value from the "Characteristic value" column):

Position 1 to 10	Position 11 to 12	Position 13 to 14	Position 15 to 16	Position 17	Position 18 to 19	Position 20 to 21
RSR20-0900	JJ	M3	T1	?	CC	?P
-"-	MM	M2, M4, S2, S4, L2, G2	-"-	-"-	-"-	-"-
-"-	NN	-"-	-"-	-"-	-"-	-"-
-"-	VV	-"-	-"-	-"-	-"-	-"-
-"-	UU	-"-	-"-	-"-	-"-	-"-
-"-	LL	-"-	-"-	-"-	-"-	-"-
-"-	GG	-"-	-"-	-"-	-"-	-"-

Table 2:　Combination options for RSR20-0900...

Position 1 to 10	Position 11 to 12	Position 13 to 14	Position 15 to 16	Position 17	Position 18 to 19	Position 20 to 21
RSR20-0800	T1	T1	T1	?	CC	?P
-"-	M2	M2, M4, S2, S4, L2, G2	-"-	-"-	-"-	-"-
-"-	M4	-"-	-"-	-"-	-"-	-"-
-"-	S2	-"-	-"-	-"-	-"-	-"-
-"-	S4	-"-	-"-	-"-	-"-	-"-
-"-	L2	-"-	-"-	-"-	-"-	-"-
-"-	G2	-"-	-"-	-"-	-"-	-"-

Table 3:　Combination options for RSR20-0800...

1	Supply voltage connection 1			
	Product code Position 18	C	2-pin terminal block	
			Voltage range: See "General technical data" on page 53.	
2	LED display elements for device status			
3	USB interface			
4	Connection for signal contact 1			
5	V.24 connection for external management			
6	Supply voltage connection 2			
	Product code Position 19	C	2-pin terminal block	
			Voltage range: See "General technical data" on page 53.	
7	Connection for signal contact 2			
8	Grounding screw			
9	LED display elements for port status			
10	port 4 to 9	(LAN only) Twisted pair	Standard	IEEE 802.3 10BASE-T/100BASE-TX
			Connection type	RJ45 socket
11	Ports 1 to 3	LAN port for Fiber optic cable	Standard	IEEE 802.3 100BASE-FX
			Connection type	depending on device variant	DSC
					DST

Table 4:   RSR20 device variants with 3 fiber optic ports (DSC/DST) and 6 twisted pair ports (RJ45)
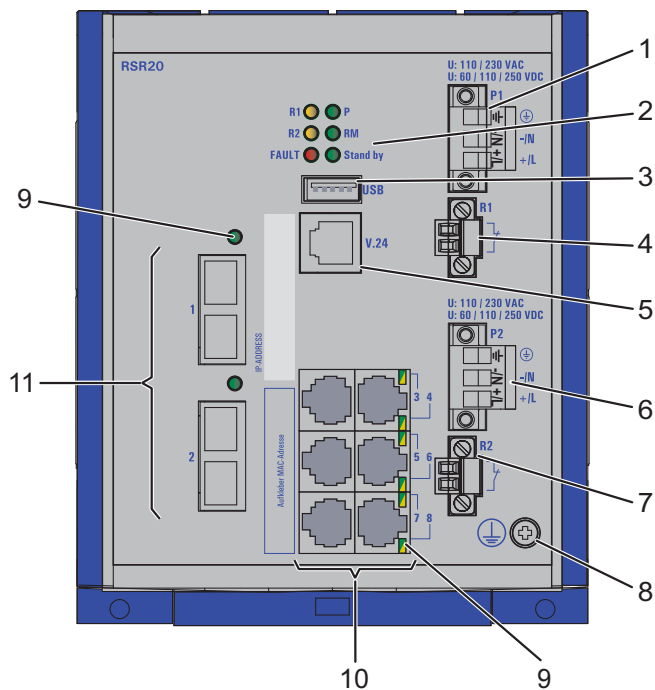
1 to 9	See table 4 on page 22.			
10	port 3 to 8	LAN port for Twisted pair	Standard	IEEE 802.3 10BASE-T/100BASE-TX
			Connection type	RJ45 socket
11	port 1 to 2	LAN port for Fiber optic cable	Standard	IEEE 802.3 100BASE-FX
			Connection type	depending on device variant	DSC
					DST

Table 5:   RSR20 device variants with 2 fiber optic ports (DSC/DST) and 6 twisted pair ports (RJ45)
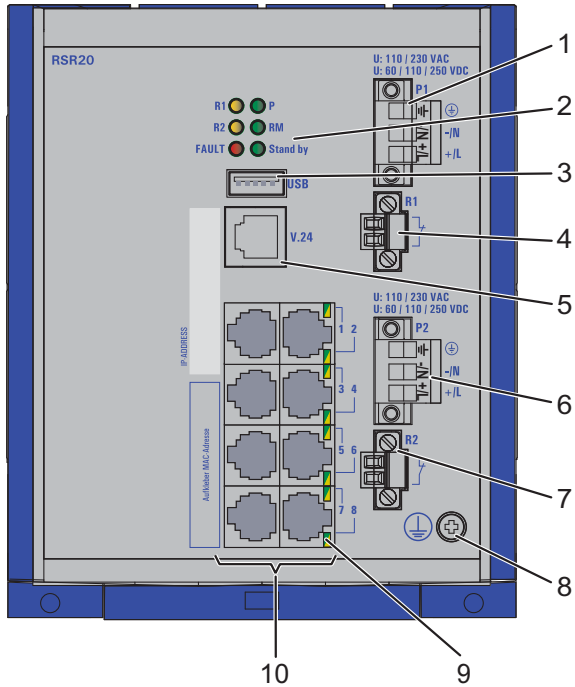
1 to 9	See table 4 on page 22.			
10	port 1 to 8	LAN port for Twisted pair	Standard	IEEE 802.3 10BASE-T/100BASE-TX
			Connection type	RJ45 socket

Table 6: RSR20 device variants with 8 twisted pair ports (RJ45)
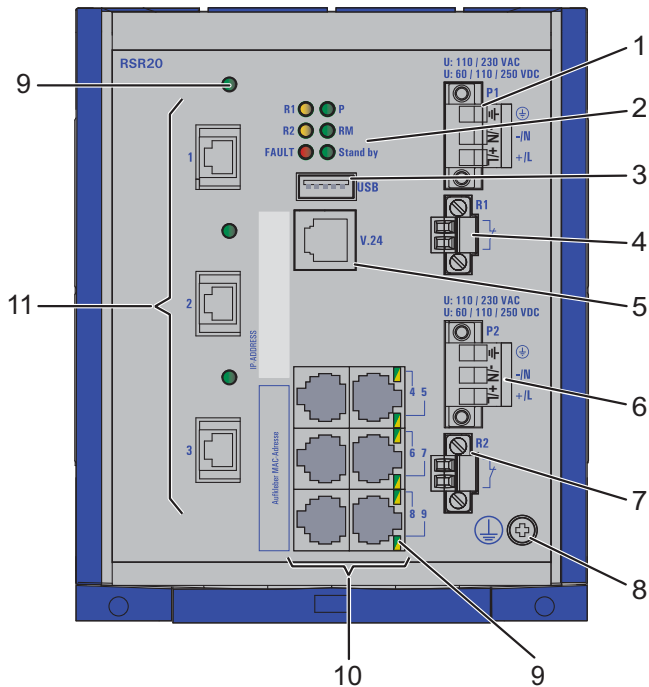
Table 7: RSR20 device variants with 3 fiber optic ports (MTRJ) and 6 twisted pair ports (RJ45)

10	port 4 to 9	LAN port for Twisted pair	Standard	IEEE 802.3 10BASE-T/100BASE-TX
			Connection type	RJ45 socket
11	Ports 1 to 3	LAN port for Fiber optic cable	Type of fiber	Multimode
			Standard	IEEE 802.3 100BASE-FX
			Connection type	MTRJ

Table 7:   RSR20 device variants with 3 fiber optic ports (MTRJ) and 6 twisted pair ports (RJ45)

1.2.3   Port number and media for RSR30-…

To put together your personal RSR30 device in the above table 1, you have the following combination options
("?" = any value from the "Characteristic value" column):

Position 1 to 10	Position 11 to 12	Position 13 to 14	Position 15 to 16	Position 17	Position 18 to 19	Position 20 to 21
RSR30-0603	CC	O7	T1	?	CC	?P

Table 8:   Combination options for RSR30-0603...

Position 1 to 10	Position 11 to 12	Position 13 to 14	Position 15 to 16	Position 17	Position 18 to 19	Position 20 to 21
RSR30-0802	CC	ZZ	T1	?	CC	?P
-"-	O7	O7	-"-	-"-	-"-	-"-
-"-	OO	ZZ	-"-	-"-	-"-	-"-
-"-	O6	O6	-"-	-"-	-"-	-"-

Table 9:   Combination options for RSR30-0802...

For device variants with combo ports:
▶ Connections through optical fiber: 100/1000 Mbit/s
▶ Connections through twisted pair: 10/100/1000 MBit/s
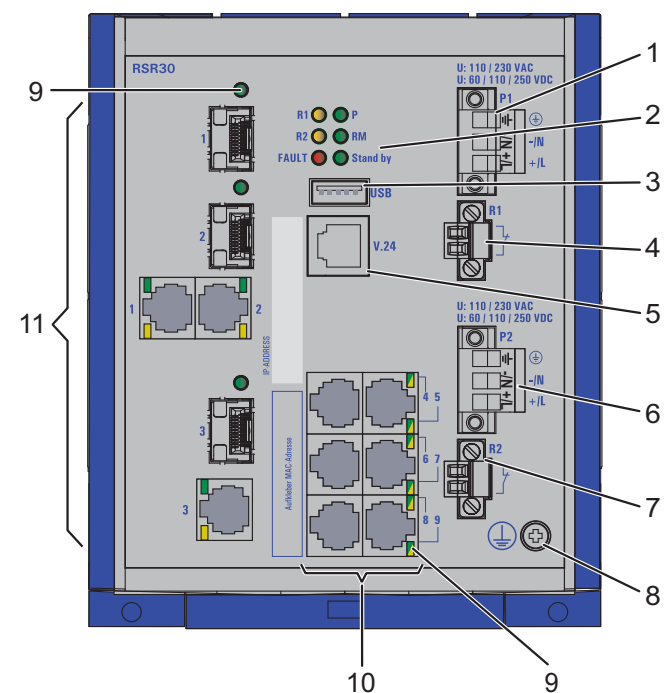
1 to 9	See table 4 on page 22.			
10	port 4 to 9	LAN port for Twisted pair	Standard	IEEE 802.3 10BASE-T/100BASE-TX
			Connection type	RJ45 socket
11	Ports 1 to 3 (combo ports)	LAN port for Fiber optic cable	Standard	IEEE 802.3 100BASE-FX
				ISO/IEC 8802-03 1000BASE-SX/LX
			Connection type	SFP slot
		LAN port for Twisted pair	Standard	ISO/IEC 8802-03 10BASE-T/ 100BASE-TX/1000BASE-T
			Connection type	RJ45 socket

Table 10: RSR30 device variants with 3 combo ports and 6 twisted pair ports (RJ45)

1 to 9	See table 4 on page 22.			
10	port 5 to 10	LAN port for Twisted pair	Standard	IEEE 802.3 10BASE-T/100BASE-TX
			Connection type	RJ45 socket
11	port 3 to 4	LAN port for Fiber optic cable	Standard	IEEE 802.3 100BASE-FX
			Connection type	SFP slot
12	port 1 to 2 (combo ports)	LAN port for Fiber optic cable	Standard	IEEE 802.3 100BASE-FX
				ISO/IEC 8802-03 1000BASE-SX/LX
			Connection type	SFP slot
		LAN port for Twisted pair	Standard	ISO/IEC 8802-03 10BASE-T/ 100BASE-TX/1000BASE-T
			Connection type	RJ45 socket

Table 11: RSR30 device variants with 2 combo ports, 2 SFP slots and 6 twisted pair ports (RJ45)
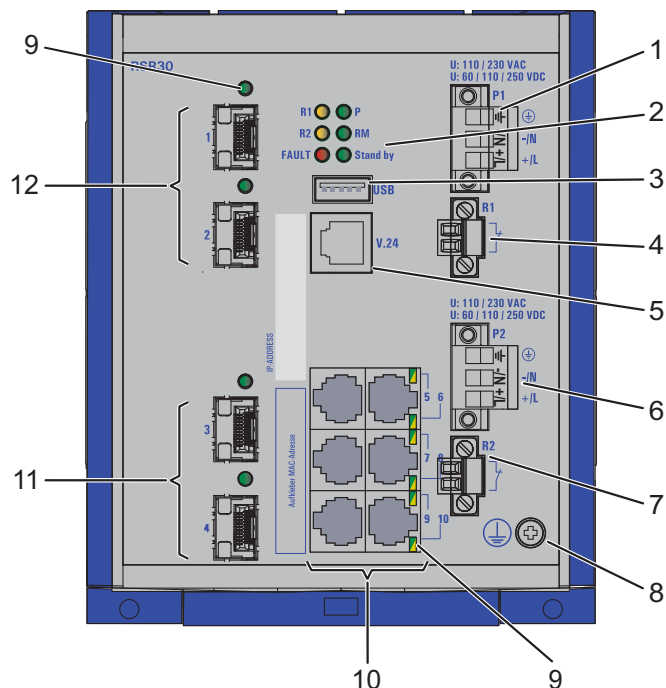
1 to 9	See table 4 on page 22.			
10	port 5 to 10	LAN port for Twisted pair	Standard	IEEE 802.3 10BASE-T/100BASE-TX
			Connection type	RJ45 socket
11	port 3 to 4	LAN port for Fiber optic cable	Standard	IEEE 802.3 100BASE-FX
			Connection type	SFP slot
12	port 1 to 2	LAN port for Fiber optic cable	Standard	ISO/IEC 8802-03 1000BASE-SX/LX
			Connection type	SFP slot

Table 12: RSR30 device variants with 4 SFP slots (100/1000 Mbit/s) and 6 twisted pair ports (RJ45)

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1 to 9	See table 4 on page 22.			
10	port 3 to 10	LAN port for Twisted pair	Standard	IEEE 802.3 10BASE-T/100BASE-TX
			Connection type	RJ45 socket
11	port 1 to 2 (combo ports)	LAN port for Fiber optic cable	Standard	IEEE 802.3 100BASE-FX
				ISO/IEC 8802-03 1000BASE-SX/LX
			Connection type	SFP slot
		LAN port for Twisted pair	Standard	ISO/IEC 8802-03 10BASE-T/ 100BASE-TX/1000BASE-T
			Connection type	RJ45 socket

Table 13: RSR30 device variants with 2 combo ports and 8 twisted pair ports (RJ45)

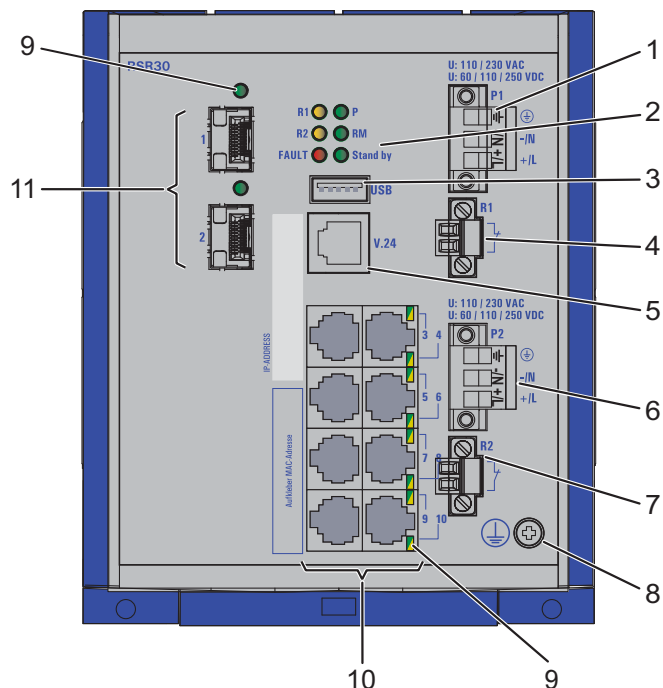| 1 to 9	See table 4 on page 22.			
10	port 3 to 10	LAN port for Twisted pair	Standard	IEEE 802.3 10BASE-T/100BASE-TX
			Connection type	RJ45 socket
11	port 1 to 2	LAN port for Fiber optic cable	Standard	ISO/IEC 8802-03 1000BASE-SX/LX
			Connection type	SFP slot

Table 14: RSR30 device variants with 2 SFP slots and 8 twisted pair ports (RJ45)

1.3   Power supply

You will find information on the characteristic values here:
"Combination options RSR20/RSR30" on page 19

1.3.1   Supply voltage with characteristic value C

A 2-pin terminal block is available to supply the device with power.

For further information see "Supply voltage with characteristic value C" on page 30.

1.4   Ethernet ports

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

1.4.1   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 (if autonegotiation is activated)
▶ 1000 Mbit/s full duplex
▶ 100 Mbit/s half-duplex mode, 100 Mbit/s full duplex mode
▶ 10 Mbit/s half-duplex mode, 10 Mbit/s full duplex mode
Delivery state: Autonegotiation activated
The port casing is electrically connected to the front panel.
The pin assignment corresponds to MDI-X.

1.4.2   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 (if autonegotiation is activated)
▶ 100 Mbit/s half-duplex mode, 100 Mbit/s full duplex mode
▶ 10 Mbit/s half-duplex mode, 10 Mbit/s full duplex mode
Default setting: Autonegotiation activated except for the HIPER-Ring ports: 100 Mbit/s, full duplex.
The port casing is electrically connected to the front panel.

1.4.3   100/1000 Mbit/s F/O port

This port is an SFP slot.
The 100/1000 Mbit/s F/O port allows you to connect network components according to the IEEE 802.3 100BASE-FX/1000BASE-SX/1000BASE-LX standard.
This port supports:
▶ 1000 Mbit/s full duplex
▶ 100 Mbit/s half-duplex mode, 100 Mbit/s full duplex mode
Delivery state:
▶ 100 Mbit/s full duplex when using a Fast Ethernet SFP transceiver
▶ 1000 Mbit/s full duplex when using a Gigabit Ethernet SFP transceiver

1.4.4   1000 Mbit/s F/O port

This port is an SFP slot.

The 1000 Mbit/s F/O port offers you the ability to connect network components according to the IEEE 802.3 100BASE-SX/1000BASE-LX standard.
This port supports:
▶ Autonegotiation
▶ Full duplex mode
Delivery state: Autonegotiation activated
Verify that you connect LH ports only with LH ports, SX ports only with SX ports, and LX ports only with LX ports.

1.4.5 100 Mbit/s F/O port

This port is an MTRJ, DST, or DSC socket.
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:
▶ Full or half duplex mode
Default setting: Full duplex

Note: Verify that the LH ports are connected only with LH ports, SM ports only with SM ports, and MM ports only with MM ports.

When connecting the data cables, note the sending and receiving directions.

Example:	Sending direction	Receiving direction

Table 15: Sending and receiving directions
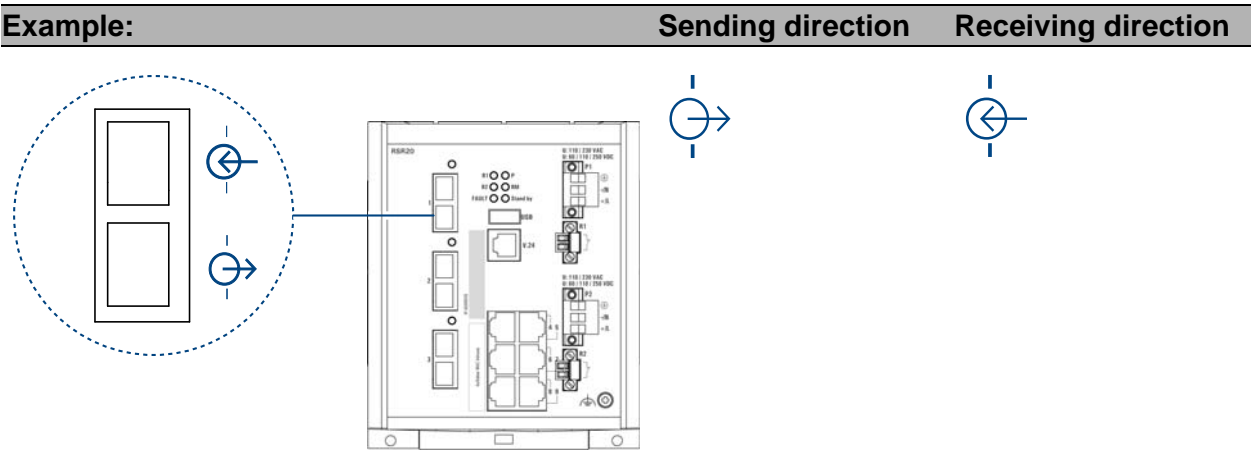
1.4.6 Gigabit combo port

You have the option of alternatively connecting a twisted pair cable via a RJ45 socket or an optical fiber via a SFP transceiver to a combo port.
You obtain appropriate SFP transceivers as an accessory.

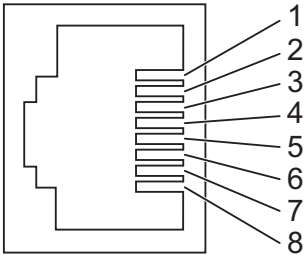By inserting a SFP transceiver, you deactivate automatically the corresponding twisted pair interface.

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Media type	Connection options		
Twisted pair cable		Technical standard	IEEE 802.3 10BASE-T/100BASE-TX/1000BASE-T
		Connection type	RJ45
Fiber optic cable	either	Technical standard	IEEE 802.3 100BASE-FX
		Connection type	Fast Ethernet SFP transceiver
	or	Technical standard	IEEE 802.3 1000BASE-SX/LX
		Connection type	1 Gigabit Ethernet SFP transceiver

Table 16: Combo ports: Connection options

■ **10/100/1000 Mbit/s twisted pair port**

■ **100/1000 Mbit/s F/O port**

1.4.7 Pin assignments

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

a. Phantom supply
b. Spare pair supply

1.5 Display elements

After the supply voltage is set up, the software starts and initializes itself. Afterwards, the device performs a self-test. During this process, various LEDs light up. The process takes around 40 seconds.
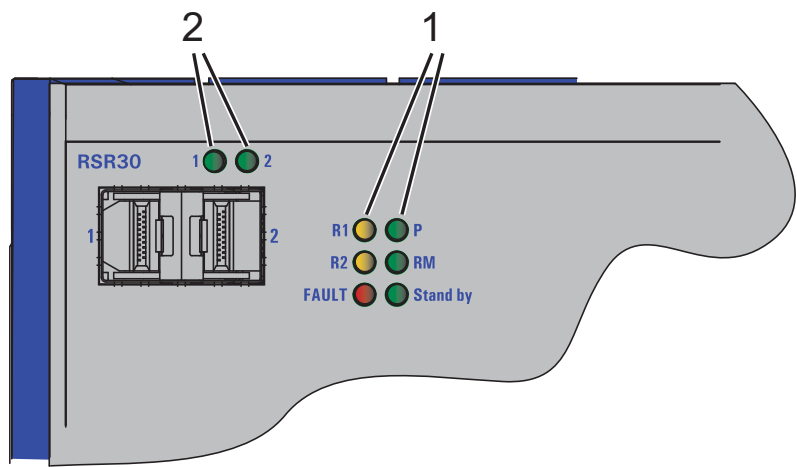

Figure 1: LED display elements
  1 – Device status
  2 – Port status

1.5.1 Device state

These LEDs provide information about conditions which affect the operation of the whole device.
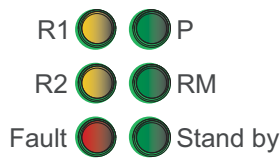
Figure 2: Device status LEDs

P - Power (green/yellow LED)	Meaning
Glowing green	Device variants with 1 power supply unit: Supply voltage is on
Glowing yellow	Device variants with 2 power supply units: There is only one supply voltage (P1 or P2) on
Not glowing	Supply voltage is too low

RM - Ring Manager (green/yellow LED)	
Glowing green	RM function active, redundant port not active
Glowing yellow	RM function active, redundant port active
Not glowing	RM function not active
Flashing green	Incorrect configuration of the HIPER-Ring (e.g. the ring is not connected to the ring port).

Stand-by (green LED)	Meaning
Glowing green	Standby mode enabled
Not glowing	Stand-by mode not enabled

RM and StandBy during read and write access - display saving processes	
Flashing alternately	Error during saving process.
LED's flash synchronously, two times a second	Loading configuration from the AutoConfiguration Adapter ACA or from the device.
LED's flash synchronously, once a second	Saving the configuration in the AutoConfiguration Adapter ACA or in the device.

Applies to software releases previous to 06.0.00:

LED	Display	Color	Activity	Meaning
FAULT	Signal contact 1	red	lights up	The signal contact is open - it is reporting a detected error.
			none	The signal contact is closed, it is **not** reporting any detected errors.
R1	Signal contact 1	yellow	lights up	The signal contact is closed in manual operation.
			none	The signal contact is open in manual operation.
R2	Signal contact 2	yellow	lights up	The signal contact is closed in manual operation.
			none	The signal contact is open in manual operation.

Applies to software release 06.0.00 and higher:

LED	Display	Color	Activity	Meaning
FAULT	Signal contact 1	red	lights up	The signal contact is open - it is reporting a detected error.
			none	The signal contact is closed, it is **not** reporting any detected errors.
	Duplicate IP detection	red	flashes 4 times a period	Reports an IP conflict.
R1	Signal contact 1	yellow	lights up	The signal contact is closed in manual operation.
			none	The signal contact is open in manual operation.
R2	Signal contact 2	yellow	lights up	The signal contact is closed in manual operation.
			none	The signal contact is open in manual operation.

If the manual setting is active on the signal contact, then the error display is independent of the setting of the signal contact.

1.5.2 Port status

These LEDs display port-related information. During the boot phase, they indicate the status of the boot process.
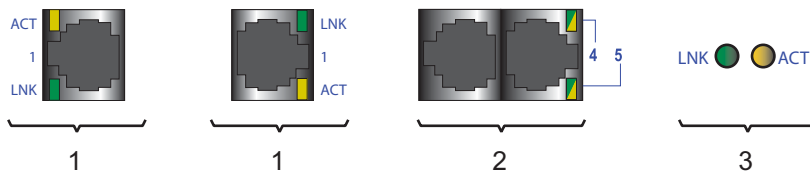

Figure 3: Port status LEDs
1 – Port status LEDs for single or single-row RJ45 sockets: one green and one yellow LED per port
2 – Port status LEDs for double-row RJ45 sockets: one LED per port that either shows yellow or green.
3 – Port status LEDs for DSC, SFP

1 to n - data, link status (green/yellow LED)	Meaning
Not glowing	No valid connection
Glowing green	Valid connection
Flashing green (1 time a period)	Port is switched to stand-by
Flashing green (3 time a period)	Port is disabled
Flashing yellow	Data reception at corresponding port

1.6 Management interfaces

1.6.1 USB interface

The USB socket is an interface for the local connection of an AutoConfiguration Adapter ACA22-USB. It is used for saving/loading the configuration data and diagnostic information, and for loading the software.

The USB interface has the following properties:
▶ Supports the USB master mode
▶ Supports USB 2.0 (data rate max. 12 Mbit/s)
▶ Connector: type A
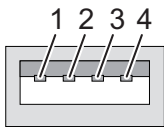▶ Supplies current of max. 500 mA
▶ Voltage not potential-separated

Figure	Pin	Function
	1	VCC (VBus)
	2	− Data
	3	+ Data
	4	Ground (GND)

Table 17: Pin assignment of the USB interface

1.6.2 V.24 interface (external management)

The V.24 interface is an RJ11 socket.
At the V.24 connection, a serial interface is provided for the local connection of an external management station (VT100 terminal or PC with corresponding terminal emulation) or an AutoConfiguration Adapter ACA 11. This enables you to set up a connection to the Command Line Interface (CLI) and to the system monitor.

VT100 terminal settings	
Speed	9600 Baud
Data	8 bit
Stopbit	1 bit
Handshake	off
Parity	none

The socket housing is electrically connected to the front panel of the device. The V.24 interface is electrically insulated from the supply voltage.
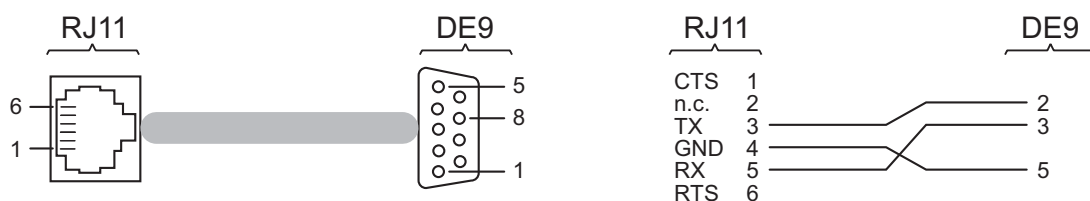
Figure 4: Pin assignment of the V.24 interface and the DE9 connector

Note: The Terminal cable is available as an accessory.

1.7   Signal contact
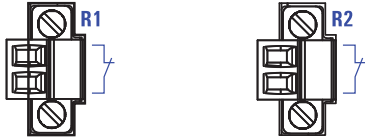
Figure 5:   Signal contact: 2-pin terminal block with screw locking

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

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
- ▶ Installing an SFP transceiver (optional)
- ▶ Connecting the terminal block
- ▶ Mounting the terminal block
- ▶ Operating the device
- ▶ Connecting data cables
- ▶ Filling out the inscription label

2.1 Checking the package contents

Proceed as follows:
- ☐ Check whether the package includes all items named in the section "Scope of delivery" on page 61.
- ☐ Check the individual parts for transport damage.

2.2 Installing and grounding the device

⚠ **WARNING**
FIRE HAZARD Install the device in a fire enclosure according to EN 60950-1. **Failure to follow this instruction can result in death, serious injury, or equipment damage.**

2.2.1 Installing the device onto the DIN rail

Verify that the device maintains the minimum clearance to meet the climatic conditions during operation:
- ▶ Top and bottom device side: 3.94 in (10 cm)
- ▶ Left and right device side: 0.79 in (2 cm)
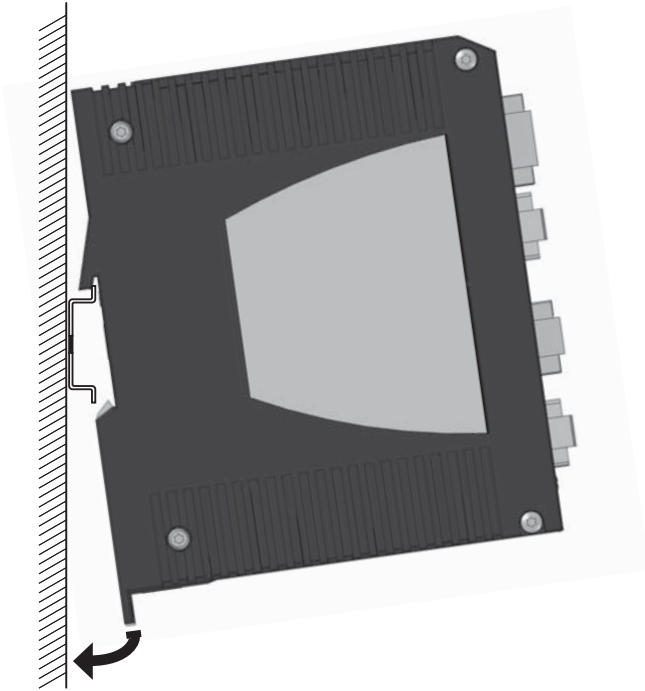
To mount the device onto a horizontally mounted 35 mm DIN rail according to DIN EN 60715, proceed as follows:
- ☐ Slide the upper snap-in guide of the device into the DIN rail.
- ☐ Press the media module downwards onto the clip-in bar.
- ☐ Snap in the device.

Note: The shielding ground of the industrial connectable twisted pair lines is connected to the lower panel as a conductor.

2.2.2   Mounting on a vertical flat surface

You have the option of attaching the device to a vertical flat surface. This requires a wall mounting plate, which you purchase as a separate accessory. See "Accessories" on page 61.
Verify that the device maintains the minimum clearance to meet the climatic conditions during operation:
- ▶ Top and bottom device side: 3.94 in (10 cm)
- ▶ Left and right device side: 0.79 in (2 cm)

Figure 6:   Mounting the device on the wall

Proceed as follows:
☐ Mount the device on the wall plate as shown in the illustration. Insert the upper snap-in guide of the device into the rail and press it down against the rail until it snaps into place.
☐ Fasten the wall plate (see on page 61 "Accessories") on a level wall surface using four screws.

2.2.3   Grounding the device

Use a wire diameter for the ground conductor that is no smaller than the diameter of the supply voltage connection, however of at least 0.75 mm² (AWG18).
The device is grounded by the separate ground screw on the front panel.

2.3 Installing an SFP transceiver (optional)

Prerequisites:
Exclusively use Hirschmann SFP transceivers.
See "Accessories" on page 61.
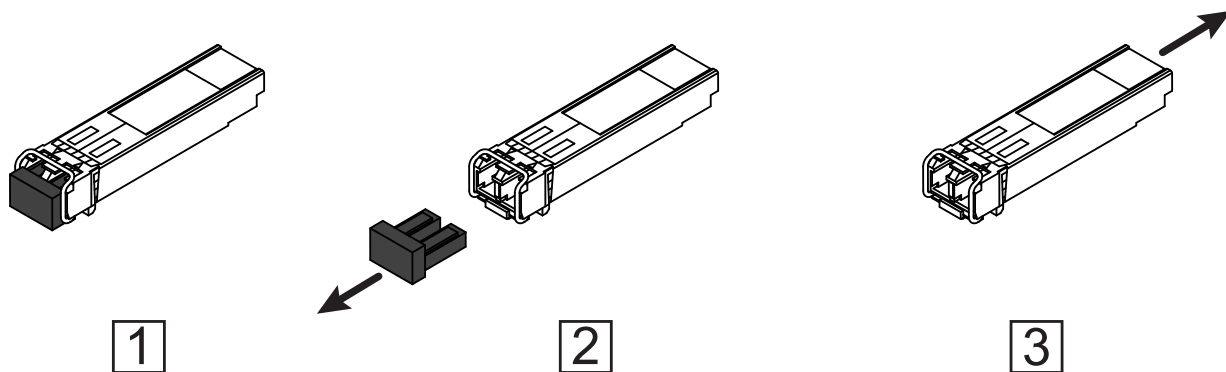
Figure 7: Installing SFP transceivers: Installation sequence

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 block

⚠ WARNING
ELECTRIC SHOCK Exclusively connect a supply voltage that corresponds to the type plate of your device. **Failure to follow this instruction can result in death, serious injury, or equipment damage.**

The supply voltage and the signal contacts are connected via a 2-pin terminal block with screw lock.

Note: The torque for tightening the terminal block for the signal contact on the device is 3 lb-in (0.34 Nm).

The torque for tightening the supply voltage terminal block on the device is 4.5 lb-in (0.51 Nm).

1	Supply voltage connection 1		
	Product code Position 18	C	2-pin terminal block
			Voltage range: See 53 "General technical data".
2	Supply voltage connection 2		
	Product code Position 19	C	2-pin terminal block
			Voltage range: See 53 "General technical data".

Table 18: Connecting the supply voltage

2.4.1   Supply voltage

In devices with two voltage inputs, the supply voltage can be connected redundantly. Both inputs are uncoupled. There is no distributed load. The supply voltage is electrically isolated from the housing.

Note: With non-redundant supply of the mains voltage, the device reports a power failure. You can avoid this message by changing the configuration in the management, or, with power supply units of the same type, by feeding the supply voltage in through both inputs.

2.4.2 Supply voltage with the characteristic value C

You will find information on the characteristic values here:
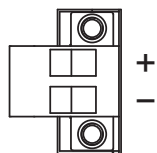
Figure 8:   Supply voltage with characteristic value C: 2 pin terminal block with screw lock

The supply voltage is connected via pin 1 and pin 2.

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

Table 19:   Supply voltage with characteristic value C: type and specification of the supply voltage, pin assignment on the device

For **every** 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.

With a non-redundant supply of the supply voltage, the device reports the loss of a supply voltage. You can prevent this message by changing the configuration in the Management.

2.4.3 Signal contact

Proceed as follows:
☐ Connect the signal contact lines with the terminal block connections.
☐ Fasten the wires in the terminal block by tightening the terminal screws.

2.5 Mounting the terminal block

Proceed as follows:
☐ Mount the terminal block for the voltage supply and signal contact on the front of the device using the snap lock. Verify that the snap lock latches in place.

2.6 Operating the device

Proceed as follows:
☐ By connecting the supply voltage via the terminal block, you start the operation of the device.

2.7 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. To reduce inductive coupling, verify that the power supply cables and data cables cross at a 90° angle.
☐ Use shielded data cables for gigabit transmission via copper cables, for example SF/UTP cables according to ISO/IEC 11801. Exclusively use shielded data cables to meet EMC requirements according to EN 50121-4 and marine applications.
☐ Connect the data cables according to your requirements.
See "Ethernet ports" on page 30.

Proceed as follows:
☐ Connect the data cables according to your requirements.

For further information see "Description of the device variants" on page 19.

2.8　Filling out the inscription label

The information field for the IP address helps you identify your device.
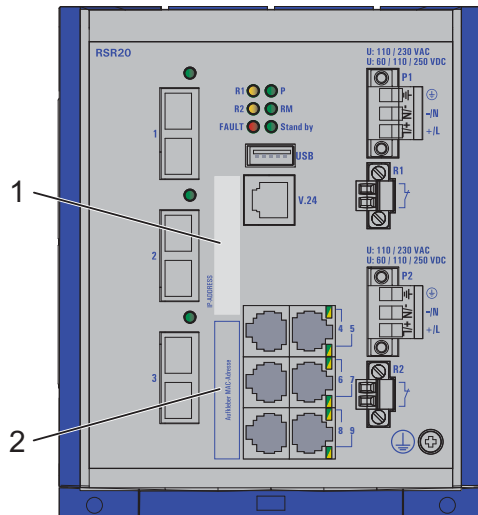
Figure 9:　Label area for IP address of device
*　　　　　1 – IP address of device (label area)*
*　　　　　2 – MAC address of device (label)*

3 Making basic settings

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:

▶ Configuration via V.24 connection
▶ Configuration using the HiDiscovery protocol
▶ Configuration via BOOTP
▶ Configuration via DHCP
▶ Configuration via DHCP (Option 82)
▶ Configuration using AutoConfiguration Adapter

■ **Default settings**
  ▶ IP address: The device looks for the IP address using DHCP
  ▶ Management password:
    user, password: public (read only)
    admin, password: private (read/write)
  ▶ V.24 data rate: 9600 Baud
  ▶ Ring redundancy: disabled
  ▶ Ethernet ports: link status is not evaluated (signal contact)
  ▶ Optical ports: Full duplex
    TP ports: Autonegotiation
  ▶ Ring Manager: disabled
  ▶ Stand-by coupling: disabled
  ▶ Rapid Spanning Tree (RSTP): enabled

3.1   First login (Password change)

Applies to devices with the software release Classic 9.1:

▶ 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.

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 the device
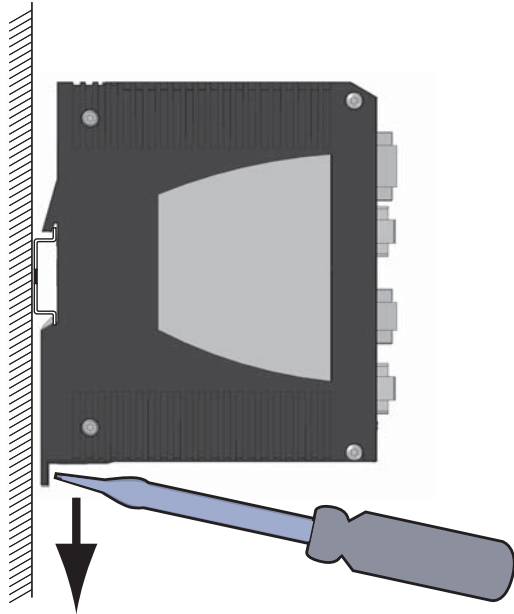
Proceed as follows:
- ☐ Disconnect the data cables.
- ☐ Disable the supply voltage.
- ☐ Disconnect the terminal blocks.
- ☐ Disconnect the grounding.
- ☐ Insert a screwdriver horizontally below the casing into the locking gate.
- ☐ Without tilting the screwdriver, pull the locking gate down and tilt the device upwards.

6.2 Removing an SFP transceiver (optional)

Figure 10: 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).

7   Technical data

■ General technical data

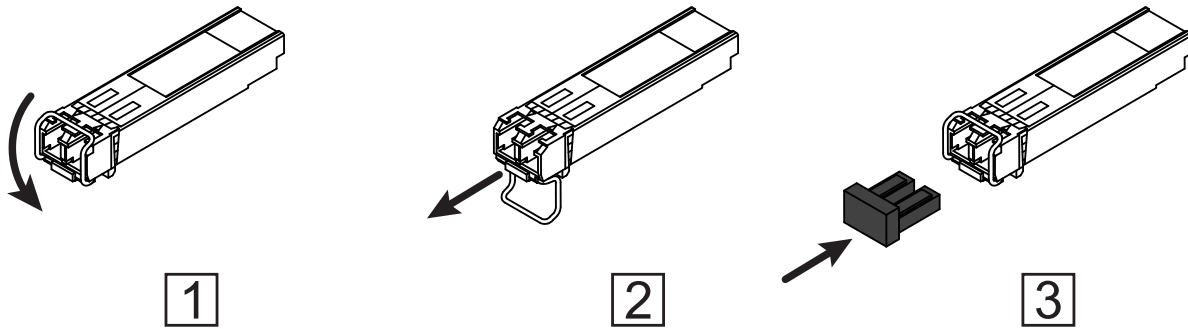|		
Dimensions W × D × H	RSR20-.../RSR30-...	4.72 in × 5.39 in × 4.53 in (120 mm × 137 mm × 115 mm)
	RSR20-.../RSR30-...inclusive wall mounting plate	4.72 in × 5.71 in × 4.53 in (120 mm × 145 mm × 115 mm)
Weight	RSR20-.../RSR30-...	approximately 2.2 lb (1 kg)
Supply voltage with characteristic value C	Connection type	2-pin terminal block
	Rated voltage DC:	24 V DC ... 48 V DC
	Voltage range DC incl. maximum tolerances:	18 V DC ... 60 V DC
	Power failure bridging:	>10 ms at 20.4 V DC
	Back-up fuse for each voltage input	Nominal rating: 6.3 A Characteristic: slow blow
Signal contact	Connection type	2-pin terminal block
	Nominal value for AC	2 A at 30 V AC
	Nominal value for DC	2 A at 30 V DC
		0.2 A at 60 V DC
Climatic conditions during operation	Minimum clearance around the device	Top and bottom device side: 3.94 in (10 cm) Left and right device side: 0.79 in (2 cm)
	Ambient air temperature[a]	Devices with operating temperature characteristic value S (Standard): +32 °F ... +140 °F (0 °C ... +60 °C)[b]
		Devices with operating temperature characteristic value U and F (Extended): -40 °F to +158 °F (-40 °C to +70 °C) [c]
	Humidity	10 % ... 95 % (non-condensing)
	Air pressure	up to 6562 ft (2000 m; 795 hPa)
Climatic conditions during storage	Ambient temperature	−40 °F ... +185 °F (−40 °C ... +85 °C)
	Humidity	10 % ... 95 % (non-condensing)
	Air pressure	up to 6562 ft (2000 m; 795 hPa)
Maximum inner temperature of device (guideline)	Devices with operating temperature characteristic value S (Standard):	176 °F (80 °C)
	Devices with operating temperature characteristic value U and F (Extended):	203 °F (95 °C)
Pollution degree		2
Protection classes	Laser protection Protection class	Class 1 according to EN 60825-1 (2007) IP30

a. Temperature of the ambient air at a distance of 2 in (5 cm) from the device
b. Hirschmann recommends to use SFP transceivers with "EEC" extension.
c. Exclusively use SFP transceivers with the "EEC" extension, otherwise the standard temperature range applies.

■ Dimension drawings

mm / inch

136.44 / 5.37

6,99 / 0.28

120,83 / 4.76

120 / 4.72

145,3 / 5.72
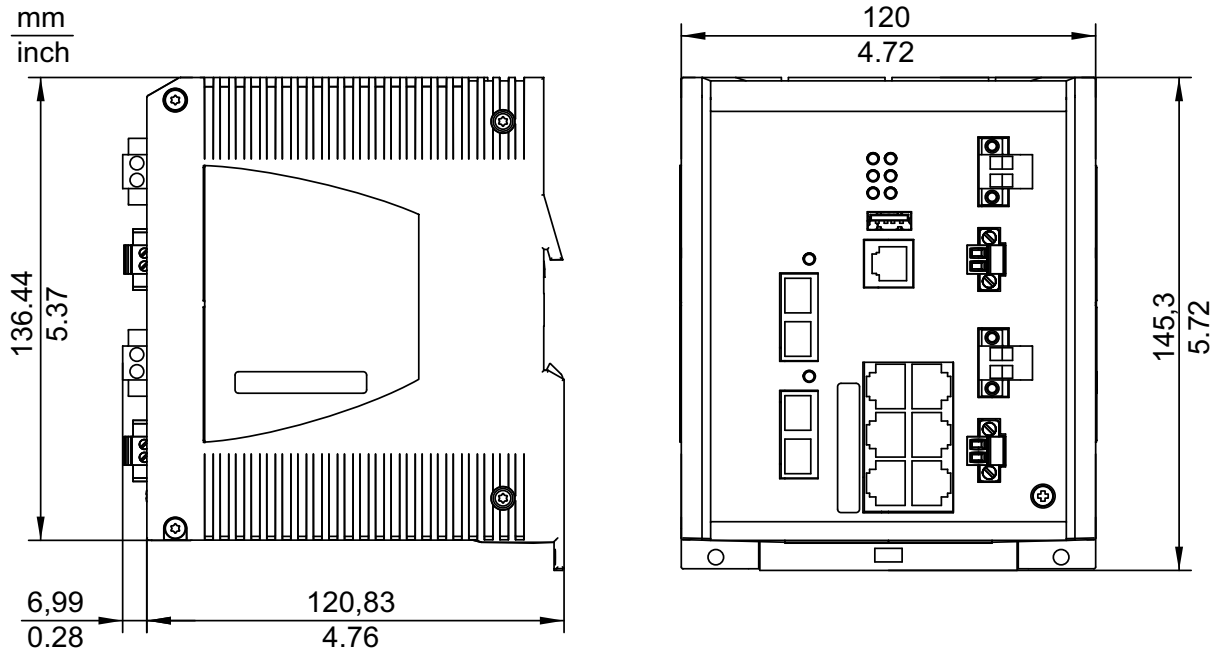
■ Drill holes drawing for wall mounting plate

5,4 / 0.22

7 / 0.28

120 / 4.72

10 / 0.40

100 / 3.94

mm / inch

147,6 / 5.82

157 / 6.19

4,4 / 0.18
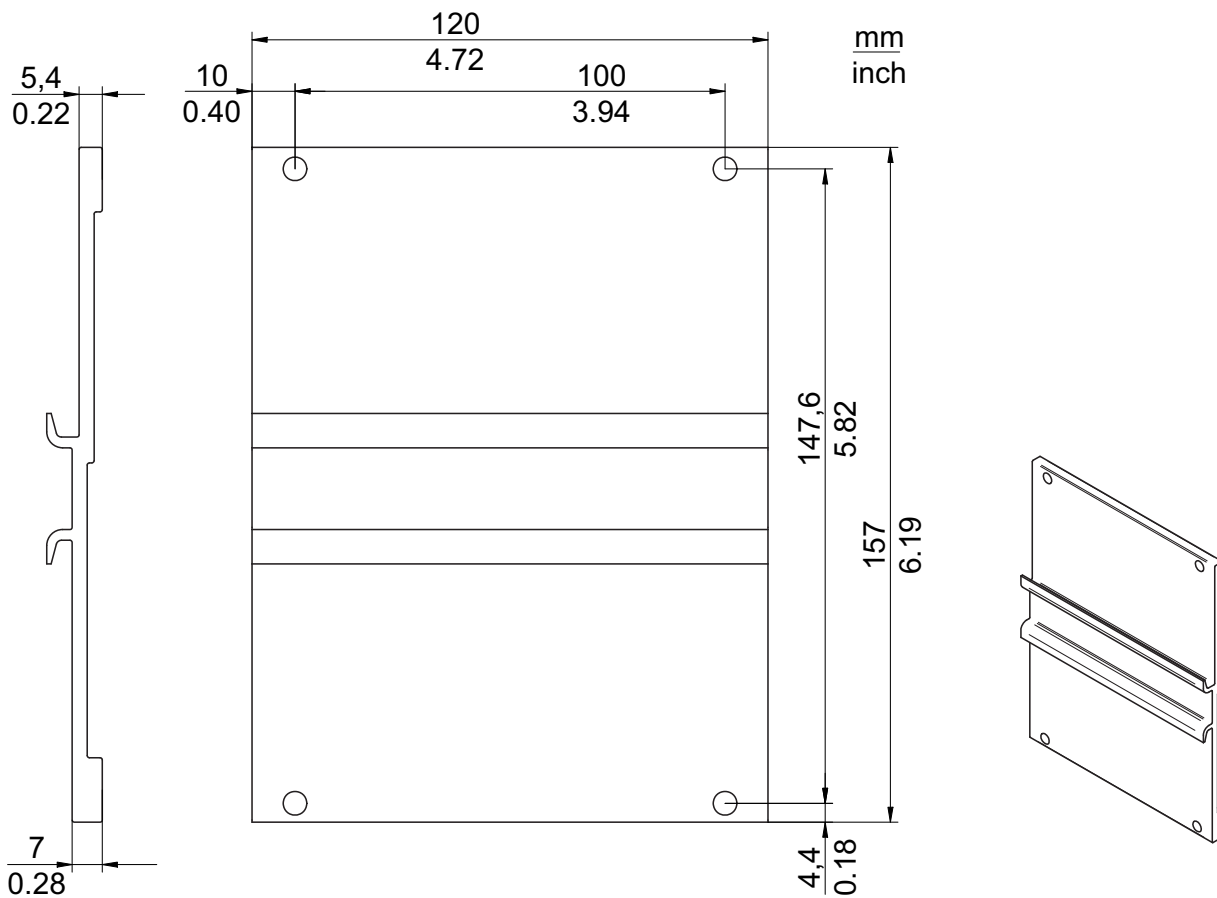
■ EMC and immunity

IEC/EN 61850-3:2002 EMI TYPE tests, test in comp. with	Description	Certification C Test level	Certification H Test level
IEC/EN 61000-4-2	ESD Contact discharge Air discharge	 +/- 8 kV +/- 15 kV	 +/- 8 kV +/- 15 kV
IEC/EN 61000-4-3	Electromagnetic field 80 - 2700MHz	 20 V/m	 20 V/m
IEC/EN 61000-4-4	Burst DC Power line AC Power line Data line	 +/- 4 kV +/- 4 kV +/- 4 kV	 +/- 4 kV +/- 4 kV +/- 4 kV
IEC/EN 61000-4-5	Surge DC Power line AC Power line Data line	 +/- 2 kV line/ground +/- 1 kV line/line +/- 4 kV line/ground +/- 2 kV line/line +/- 4 kV line/ground	 +/- 2 kV line/ground +/- 1 kV line/line +/- 4 kV line/ground +/- 2 kV line/line +/- 4 kV line/ground
IEC/EN 61000-4-6	Conducted interference voltage 50kHz - 80MHz	 10 V	 10 V
IEC/EN 61000-4-12	Damped oscillation DC Power line AC Power line Data line	 +/- 2.5kV line/ground +/- 1kV line/line +/- 2.5kV line/ground +/- 1kV line/line +/- 2.5kV line/ground +/- 1kV line/line	 +/- 2.5kV line/ground +/- 1kV line/line +/- 2.5kV line/ground +/- 1kV line/line +/- 2.5kV line/ground +/- 1kV line/line
IEC 60255-5	Electrical strength DC Power line power supply unit type C Signal contact	 500 VAC[a] 2000 VAC	 500 VAC [a] 2000 VAC

a. Protective elements limit this voltage to 60 VDC (1 mA)

IEEE 1613:2009 EMI TYPE tests, test in comp. with	Description	Certification C Test level	Certification H Test level
IEEE C37.90.3	ESD Contact discharge Air discharge	 +/- 8 kV +/- 15 kV	 +/- 8 kV +/- 15 kV
IEEE C37.90.2	Electromagnetic field 80 - 2700MHz	 35 V/m (peak)	 35 V/m (peak)
IEEE C37.90.1	Burst DC Power line AC Power line Data line	 +/- 4 kV +/- 4 kV +/- 4 kV	 +/- 4 kV +/- 4 kV +/- 4 kV

IEEE 1613:2009 EMI TYPE tests, test in comp. with	Description	Certification C	Certification H
		Test level	Test level
IEEE C37.90.1	Damped oscillation		
	DC Power line	+/- 2.5kV line/ground +/- 1kV line/line	+/- 2.5kV line/ground +/- 1kV line/line
	AC Power line	+/- 2.5kV line/ground +/- 1kV line/line	+/- 2.5kV line/ground +/- 1kV line/line
	Data line	+/- 2.5kV line/ground +/- 1kV line/line	+/- 2.5kV line/ground +/- 1kV line/line
IEEE C37.90	H.V. Impulse		
	DC Power line	+/- 5 kV line/ground	+/- 5 kV line/ground
	AC Power line	+/- 5 kV line/ground	+/- 5 kV line/ground
IEEE C37.90	Electrical strength		
	DC Power line power supply unit type C	500 VAC[a] 2000 VAC	500 VAC [a] 2000 VAC
	Signal contact		

a. Protective elements limit this voltage to 60 VDC (1 mA)

Environment TYPE tests, test in comp. with	Description	Certification C Test level	Certification H Test level
IEC 60068-2-1	Cold	-40 °C, 16 hours	-40 °C, 16 hours
IEC 60068-2-2	Dry heat	+85 °C, 16 hours	+85 °C, 16 hours
IEC 60068-2-30	Relative humidity	95 % (non-condensed), 55 °C 4 cycles	95 % (non-condensed), 55 °C 4 cycles
IEC 60068-2-6	Vibration, test Fc	2- 9 Hz with 3 mm amplitude 1 g at 9 - 200 Hz 1.5 g at 200 - 500 Hz	2- 9 Hz with 3 mm amplitude 1 g at 9 - 200 Hz 1.5 g at 200 - 500 Hz
IEC 60068-2-27	Shock, test Ea	15 g at 11 ms	15 g at 11 ms
IEC 60068-2-27	Shock	5 g at 30 ms	-
IEC 60068-2-64	Vibration	5 Hz - 150 Hz broadband noise [a]	-

a. During storage: 5.9 m/s2 (vertical) 3.9 m/s2 (horizontal), 5 h / axis

EMC emitted interference	Certification C	Certification H
EN 55022	Class A	Class A
FCC 47 CFR Part 15	Class A	Class A
German Lloyd	Classification and Construction Guidelines VI-7-3 Part 1 Ed.2003	Classification and Construction Guidelines VI-7-3 Part 1 Ed.2003

■ Network range

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

Product code M-SFP-...	Mode[a]	Wave length	Fiber	System attenuation	Example for F/O cable length[b]	Fiber attenuation	BLP[c]/ Dispersion
-SX/LC...	MM	850 nm	50/125 µm	0 dB ... 7.5 dB	0 mi ... 0.34 mi (0 km ... 0.55 km)	3.0 dB/km	400 MHz×km
-SX/LC...	MM	850 nm	62.5/125 µm	0 dB ... 7.5 dB	0 mi ... 0.17 mi (0 km ... 0.275 km)	3.2 dB/km	200 MHz×km
-MX/LC EEC	MM	1310 nm	50/125 µm	0 dB ... 12 dB	0 mi ... 0.93 mi (0 km ... 1.5 km)	1.0 dB/km	800 MHz×km
-MX/LC EEC	MM	1310 nm	62.5/125 µm	0 dB ... 12 dB	0 mi ... 0.31 mi (0 km ... 0.5 km)	1.0 dB/km	500 MHz×km
-LX/LC...	MM	1310 nm[d]	50/125 µm	0 dB ... 10.5 dB	0 mi ... 0.34 mi (0 km ... 0.55 km)	1.0 dB/km	800 MHz×km
-LX/LC...	MM	1310 nm[e]	62.5/125 µm	0 dB ... 10.5 dB	0 mi ... 0.34 mi (0 km ... 0.55 km)	1.0 dB/km	500 MHz×km
-LX/LC...	SM	1310 nm	9/125 µm	0 dB ... 10.5 dB	0 mi ... 12.43 mi (0 km ... 20 km)[f]	0.4 dB/km	3.5 ps/(nm×km)
-LX+/LC...	SM	1310 nm	9/125 µm	5 dB ... 20 dB	8.70 mi ... 26.10 mi (14 km ... 42 km)	0.4 dB/km	3.5 ps/(nm×km)
-LH/LC...	LH	1550 nm	9/125 µm	5 dB ... 22 dB	14.29 mi ... 49.71 mi (23 km ... 80 km)	0.25 dB/km	19 ps/(nm×km)

Table 20: 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
-LH+/LC	LH	1550 nm	9/125 µm	15 dB ... 30 dB	44.12 mi ... 67.11 mi (71 km ... 108 km)	0.25 dB/km	19 ps/(nm×km)
-LH+/LC	LH	1550 nm	9/125 µm	15 dB ... 30 dB	44.12 mi ... 79.54 mi (71 km ... 128 km)	0.21 dB/km (typically)	19 ps/(nm×km)

Table 20: 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.

Product code M-SFP-BIDI...	Mode[a]	Wave length TX	Wave length RX	Fiber	System attenuation	Example for F/O cable length[b]	Fiber attenuation	Dispersion
Type A LX/LC EEC	SM	1310 nm	1550 nm	9/125 µm	0 dB ... 11 dB	0 km ... 12.43 mi (0 km ... 20 km)	0.4 dB/km	3.5 ps/ (nm×km)
Type B LX/LC EEC	SM	1550 nm	1310 nm	9/125 µm	0 dB ... 11 dB	0 mi ... 12.43 mi (0 km ... 20 km)	0.25 dB/ km	19 ps/(nm×km)
Type A LH/LC EEC	LH	1490 nm	1590 nm	9/125 µm	5 dB ... 24 dB	14.29 mi ... 49.71 mi (23 km ... 80 km)	0.25 dB/ km	19 ps/(nm×km)
Type B LH/LC EEC	LH	1590 nm	1490 nm	9/125 µm	5 dB ... 24 dB	14.29 mi ... 49.71 mi (23 km ... 80 km)	0.25 dB/ km	19 ps/(nm×km)

Table 21: 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.

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

Table 22: Fiber 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
JJ, MM, NN, M2, M3, M4	MM	1300 nm	50/125 μm	0-8 dB	0-5 km	1,0 dB/km	800 MHz×km
JJ, MM, NN, M2, M3, M4	MM	1300 nm	62.5/125 μm	0-11 dB	0-4 km	1,0 dB/km	500 MHz×km
VV, UU, S2, S4	SM	1300 nm	9/125 μm	0-16 dB	0-30 km	0,4 dB/km	3.5 ps/(nm×km)
LL, L2	LH	1550 nm	9/125 μm	7-29 dB	24-86 km	0,3 dB/km	19 ps/(nm×km)
GG, G2	LH	1550 nm	9/125 μm	14-47 dB	67-176 km	0,25 dB/km	19 ps/(nm×km)

Table 23: 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.

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

Table 24: Network range: 10/100/1000 Mbit/s twisted pair port

■ Power consumption/power output, order numbers

The order numbers correspond to the product codes of the devices.

RSR device	power consumption (inclusive SFP transceivers)	power output (inclusive SFP transceivers)
3 × Combo port and 6 × TX port (100 Mbit/s)	15 W	51 Btu (IT)/h
2 × Combo port, 2 × SFP slot (100 Mbit/s) and 6 × TX port (100 Mbit/s)	16 W	55 Btu (IT)/h
2 × Combo port and 8 × TX port (100 Mbit/s)	14 W	48 Btu (IT)/h
2 × SFP slot (1000 Mbit/s), 2 × SFP slot (100 Mbit/s) and 6 × TX port (100 Mbit/s)	14 W	48 Btu (IT)/h
2 × SFP slot (1000 Mbit/s) and 8 × TX port (100 Mbit/s)	12 W	41 Btu (IT)/h
3 × FX port (100 Mbit/s) and 6 × TX port (100 Mbit/s)	14 W	48 Btu (IT)/h
2 × FX port (100 Mbit/s) and 6 × TX port (100 Mbit/s)	12 W	41 Btu (IT)/h
8 × TX port (100 Mbit/s)	10 W	34 Btu (IT)/h

■ Scope of delivery

Device	Scope of delivery
RSR20-.../ RSR30-...	RSR20-.../RSR30-... device 2 terminal blocks (2-pin) for 2 for the voltage supply 2 terminal blocks (2-pin) for 2 for signal contacts Safety and general information sheet

■ Accessories

Note that products recommended as accessories may have different characteristics to those of the device, which may limit the application range of the overall system. For example, if you add an accessory with IP20 to a device with IP65, the degree of protection of the overall system is reduced to IP20.

Gigabit Ethernet SFP transceiver	Order number
M-SFP-TX/RJ45	943 977-001
M-SFP-TX/RJ45 EEC	942 161-001

The following operating conditions apply to twisted pair transceivers:
▶ Usable with:
  - HiOS as of software version 03.0.00
  - Classic Switch software, as of software version 04.1.00
  - HiSecOS as of software version 01.2.00
▶ Longer RSTP switching times and link loss detection times compared to twisted pair ports provided by the device directly.
▶ Not applicable for combo and Fast Ethernet ports.
▶ Exclusively supports the autonegotiation mode including autocrossing.

M-SFP-SX/LC	943 014-001

Table 25: Accessory: Gigabit Ethernet SFP transceiver

Gigabit Ethernet SFP transceiver	Order number
M-SFP-SX/LC EEC	943 896-001
M-SFP-MX/LC EEC	942 108-001
M-SFP-LX/LC	943 015-001
M-SFP-LX/LC EEC	943 897-001
M-SFP-LX+/LC	942 023-001
M-SFP-LX+/ LC EEC	942 024-001
M-SFP-LH/LC	943 042-001
M-SFP-LH/LC EEC	943 898-001
M-SFP-LH+/LC	943 049-001
M-SFP-LH+/LC EEC	942 119-001
SFP-GIG-LX/LC[a]	942 196-001
SFP-GIG-LX/LC EEC[a]	942 196-002

Table 25: Accessory: Gigabit Ethernet SFP transceiver

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

Bidirectional Gigabit Ethernet SFP transceiver	Order number
M-SFP-BIDI Type A LX/LC EEC	943 974-001
M-SFP-BIDI Type B LX/LC EEC	943 974-002
M-SFP-BIDI Type A LH/LC EEC	943 975-001
M-SFP-BIDI Type B LH/LC EEC	943 975-002
M-SFP-BIDI Bundle LX/LC EEC (Type A + B)	943 974-101
M-SFP-BIDI Bundle LH/LC EEC (Type A + B)	943 975-101

Table 26: Accessory: Bidirectional Gigabit Ethernet SFP transceiver

Fast Ethernet SFP transceiver	Order number
M-FAST SFP-TX/RJ45	942 098-001
M-FAST SFP-TX/RJ45 EEC	942 098-002

The following operating conditions apply to twisted pair transceivers:
▶ Usable with:
  - HiOS as of software version 03.0.00
  - for PRP ports on RSP devices, as of software version 02.0.01
  - for PRP ports on EES devices, as of software version 02.0.02
  - Classic switch software as of software version 08.0.00
  - HiSecOS as of software version 01.2.00
▶ Longer RSTP switching times and link loss detection times compared to twisted pair ports provided by the device directly.
▶ Not applicable for combo ports.
▶ Not applicable for ports which support only Gigabit Ethernet.
▶ It is currently not possible to set autocrossing manually.

M-FAST SFP-MM/LC	943 865-001
M-FAST SFP-MM/LC EEC	943 945-001
M-FAST SFP-SM/LC	943 866-001
M-FAST SFP-SM/LC EEC	943 946-001
M-FAST SFP-SM+/LC	943 867-001
M-FAST SFP-SM+/LC EEC	943 947-001
M-FAST SFP-LH/LC	943 868-001

Table 27: Accessory: Fast Ethernet SFP transceiver

Fast Ethernet SFP transceiver	Order number
M-FAST SFP-LH/LC EEC	943 948-001
SFP-FAST-MM/LC[a]	942 194-001
SFP-FAST-MM/LC EEC[a]	942 194-002
SFP-FAST-SM/LC[a]	942 195-001
SFP-FAST-SM/LC EEC[a]	942 195-002

Table 27: Accessory: Fast Ethernet SFP transceiver

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

Designation	Order number
AutoConfiguration Adapter ACA22-USB (EEC)	942 124-001
Terminal cable	943 301-001
2-pin terminal block (50 pcs.) for voltage supply (low voltage input 18 to 60 V DC)	943 845-009
2-pin terminal block (50 pcs.) for signal contact	943 845-010
Rail Power Supply RPS 30	943 662-003
Rail Power Supply RPS 80 EEC	943 662-080
Rail Power Supply RPS 120 EEC	943 662-120
Rail power supply RPS 60/48V EEC (for Power over Ethernet)	943 952-001
Industrial HiVision Network Management software	943 156-xxx
Wall mounting plate in DIN rail design, width 4.72 in. (120 mm)	943 971-001

■ Underlying technical standards

Name	
Bureau Veritas	Rules for the Classification of Steel Ships – BV
CSA C22.2 No. 213	Canadian National Standard(s) for Nonincendive Electrical Equipment for Use in Class I, Division 2 Hazardous Locations
EN 50121-4	Railway applications - EMC - emitted interference and interference immunity for signal and telecommunication systems
EN 55032	Electromagnetic compatibility of multimedia equipment – Emission Requirements
EN 60950-1	Information technology equipment – Safety – Part 1: General 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
FCC 47 CFR Part 15	Code of Federal Regulations
DNVGL-CG-0339	Environmental test specification for electrical, electronic and programmable equipment and systems.
IEC/EN 61850-3	Communication networks and systems for power utility automation - Part 3: General requirements.
IEEE 802.1D	Switching, GARP, GMRP, Spanning Tree
IEEE 802.1D	Media access control (MAC) bridges (includes IEEE 802.1p Priority and Dynamic Multicast Filtering, GARP, GMRP)

Table 28: List of the technical standards

Name	
IEEE 802.1Q	Virtual LANs (VLANs, MRP, Spanning Tree)
IEEE 802.1Q	Virtual Bridged Local Area Networks (VLAN Tagging, GVRP)
IEEE 802.1w	Rapid Reconfiguration
IEEE 802.3	Ethernet
IEEE 1613	IEEE Standard Environmental and Testing Requirements for Communication Networking Devices in Electric Power Substations
UL 508	Safety for Industrial Control Equipment

Table 28: List of the technical standards

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

A Further support

Technical questions

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

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

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

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

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