



**HIRSCHMANN**

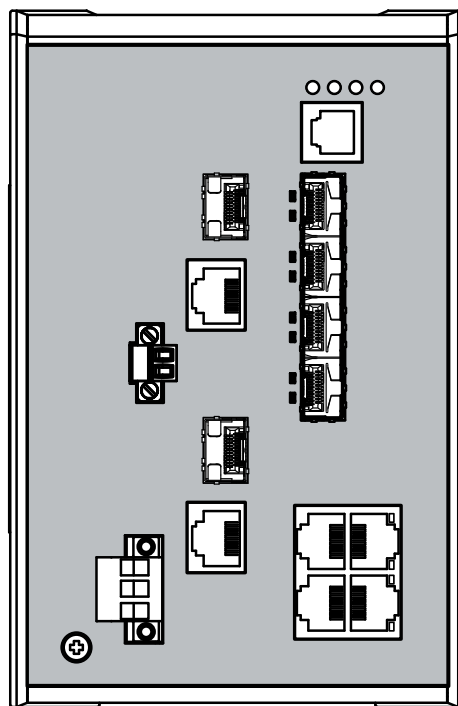
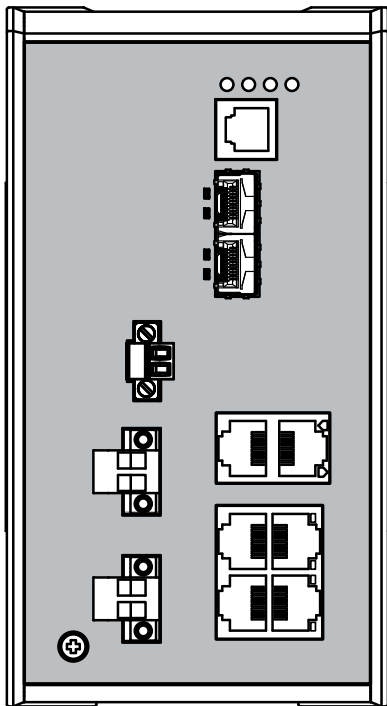
A **BELDEN** BRAND

# User Manual

## Installation

### Industrial Ethernet Rail Switch Power Lite

### RSPL20/30



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

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# 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 these instructions 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 44.](#)
- Connect to the product only components suitable for the requirements of the specific application case.

## ■ Installation site requirements

- 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.

- Only for device variants featuring supply voltage with characteristic value M9:

See [“Device name and product code” on page 17](#).

Install this device only in a switch cabinet or in an operating site with restricted access, to which maintenance staff have exclusive access.

## ■ Strain relief

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

- Relieve the connection points of cables and lines from mechanical stress.
- Design strain relieves in such a way that they prevent any mechanical damage to cables, wires or conductors caused by external influences or their own weight.
- To 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.

## ■ 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.
- Mount the device in the vertical position.
- At ambient air temperatures  $> +140\text{ °F}$  ( $+60\text{ °C}$ ):  
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**

Grounding the device is by means of a separate ground connection on the device.

- 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.

### ■ **Requirements for connecting electrical wires**

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

---

**All** of the following requirements are complied with:

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

*Table 1: Requirements for connecting electrical wires*

### ■ **Requirements for connecting the signal contact**

---

**All** of the following requirements are complied with:

- ▶ The voltage connected complies with the requirements for a safety extra-low voltage (SELV) as per IEC 60950-1 or ES1 as per IEC/EN 62368-1.
- ▶ The connected voltage is limited by a current limitation device or a fuse.  
Observe the electrical threshold values for the signal contact.

[See "General technical data" on page 44.](#)

---

*Table 2: Requirements for connecting the signal contact*

## ■ Requirements for connecting the supply voltage

Device variant	Requirements
<b>All variants</b>	<p><b>All</b> of the following requirements are complied with:</p> <ul style="list-style-type: none"> <li>▶ The supply voltage corresponds to the voltage specified on the type plate of the device.</li> <li>▶ The power supply conforms to overvoltage category I or II.</li> <li>▶ 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.</li> <li>▶ The cross-section of the ground conductor is the same size as or bigger than the cross-section of the power supply cables.</li> <li>▶ Relevant for North America: The power supply cables are suitable for ambient air temperatures of at least +167 °F (+75 °C). The wires of the power supply cables are made of copper.</li> </ul>
Only for device variants featuring supply voltage with the characteristic value CC:	<p>If you connect 2 independent power sources, verify that the minus terminal is grounded. Failure to follow this instruction can result in equipment damage.</p> <p>The wire diameter of the power supply cable is at least 1 mm<sup>2</sup> (North America: AWG16) on the supply voltage input.</p> <p>The following requirements are <b>alternatively</b> complied with:</p>
Alternative 1	The power supply complies with the requirements for a limited power source (LPS) according to IEC/EN 60950-1 or PS2 according to IEC/EN 62368-1.
Alternative 2	Relevant for North America: The power supply complies with the requirements according to NEC Class 2.
Alternative 3	<p><b>All</b> of the following requirements are complied with:</p> <ul style="list-style-type: none"> <li>▶ 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.</li> <li>▶ A back-up fuse suitable for DC voltage is located in the plus conductor of the power supply. The minus conductor is on ground potential. Otherwise, a back-up fuse is also located in the minus conductor. Regarding the properties of this back-up fuse: <a href="#">See “General technical data” on page 44.</a></li> </ul>

Table 3: Requirements for connecting the supply voltage

Device variant	Requirements
Only device variants featuring supply voltage with characteristic value TT:	If you connect 2 independent power sources, verify that the minus terminal is grounded. Failure to follow this instruction can result in equipment damage.
	The wire diameter of the power supply cable is at least 0.75 mm <sup>2</sup> (North America: AWG18) on the supply voltage input.
	The following requirements are <b>alternatively</b> complied with:
	Alternative 1      The power supply complies with the requirements for a limited power source (LPS) according to IEC/EN 60950-1 or PS2 according to IEC/EN 62368-1.
Alternative 2	<b>All</b> of the following requirements are complied with: <ul style="list-style-type: none"> <li>▶ 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.</li> <li>▶ A back-up fuse suitable for DC voltage is located in the plus conductor of the power supply. <p>The minus conductor is on ground potential. Otherwise, a back-up fuse is also located in the minus conductor.</p> <p>Regarding the properties of this back-up fuse:  <a href="#">See “General technical data” on page 44.</a></p> </li> </ul>
	Alternative 3      Relevant for North America: The power supply complies with the requirements according to NEC Class 2.
Only for device variants featuring supply voltage with characteristic value M9:	<b>All</b> of the following requirements are complied with: <ul style="list-style-type: none"> <li>▶ Supply with DC voltage: <p>A back-up fuse suitable for DC voltage is located in the plus conductor of the power supply.</p> <p>The minus conductor is on ground potential. Otherwise, a back-up fuse is also located in the minus conductor.</p> <p>Regarding the properties of this back-up fuse:  <a href="#">See “General technical data” on page 44.</a></p> <p>The wire diameter of the power supply cable is at least 1 mm<sup>2</sup> (North America: AWG16) on the supply voltage input.</p> </li> <li>▶ Supply with AC voltage: <p>A fuse is located in the outer conductor of the power supply.</p> <p>The neutral conductor is on ground potential at both voltage inputs. Otherwise, a fuse is also located in the neutral conductor.</p> <p>Regarding the properties of this fuse:  <a href="#">See “General technical data” on page 44.</a></p> <p>The wire diameter of the power supply cable is at least 0.75 mm<sup>2</sup> (North America: AWG18) on the supply voltage input.</p> </li> </ul>

Table 3: Requirements for connecting the supply voltage

## ■ Supply voltage

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

- For supply voltage connections with protective conductor connection: First connect the protective conductor before connecting the wires for the supply voltage.

## ■ 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.
Only for device variants featuring supply voltage with characteristic value M9:	2014/35/EU Directive of the European Parliament and of the Council on the harmonisation of the laws of the Member States relating to the making available on the market of electrical equipment designed for use within certain voltage limits.

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  
Germany  
www.hirschmann.com

The product can be used in the industrial sector.

- ▶ Interference immunity: EN 61000-6-2
- ▶ Emitted interference: EN 55032
- ▶ Reliability: EN 62368-1

You find more information on technical standards here:

[“Technical data” on page 44](#)

**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.

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

## ■ 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**

RSPL20/30

#### **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 description

The RSPL20/30 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.

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

- ▶ Number of ports
- ▶ Transmission speed
- ▶ Types of connectors
- ▶ Temperature range
- ▶ Supply voltage range
- ▶ Certifications

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

- ▶ Multimode optical fiber
- ▶ Singlemode optical fiber
- ▶ Twisted pair cable

The device is mounted by latching in place on a DIN rail.  
The devices work without a fan.

The redundancy concept allows the network to be reconfigured quickly.

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

- ▶ Web browser
- ▶ SSH
- ▶ Telnet
- ▶ V.24 interface (locally on the device)
- ▶ 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>

The device provides you with a large range of functions, which the manuals for the operating software inform you about. You find these manuals as PDF files on the Internet at <http://www.doc.hirschmann.com>



The Hirschmann network components help you ensure continuous communication across all levels of the company.

## 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 ... 4	Product	RSPL	Rail Switch Power Lite
5 ... 6	Data rate	20	Fast Ethernet switch
		30	Gigabit Ethernet switch
7	(hyphen)	–	
8 ... 9	Number Fast Ethernet ports	08	8 ×
10 ... 11	Number Gigabit Ethernet ports	00	0 ×
		02	2 ×
12 ... 14	Configuration of the uplink ports	Z26	2 × SFP slot for 100 Mbit/s F/O connections
		Z07	2 × Combo port for 10/100/1000 Mbit/s connections
15 ... 16	Configuration of the other ports	TT	6 × RJ45 socket for 10/100 Mbit/s Twisted pair connections
		YT	2 × SFP slot for 100 Mbit/s F/O connections
			All others: RJ45 socket for 10/100 Mbit/s Twisted pair connections
		ZT	4 × RJ45 socket for 10/100 Mbit/s Twisted pair connections
			4 × SFP slot for 100 Mbit/s F/O connections
17	(hyphen)	–	
18	Temperature range	S	Standard +32 °F ... +140 °F (0 °C ... +60 °C)
		T	Extended -40 °F ... +158 °F (-40 °C ... +70 °C)
		E	Extended -40 °F ... +158 °F (-40 °C ... +70 °C) with Conforma I Coating

Table 4: Device name and product code

Item	Characteristic	Characteristic value	Description
19 ... 20	Supply voltage	CC	2 voltage inputs for redundant power supply Rated voltage range DC: 24 V DC ... 48 V DC
		TT	2 voltage inputs for redundant power supply Rated voltage range DC: 12 V DC ... 24 V DC
		M9	1 voltage input Rated voltage range AC: 110 V AC ... 230 V AC, 50 Hz ... 60 Hz Rated voltage range DC: 110 V DC ... 250 V DC
21 ... 22	Certificates and declarations	You will find detailed information on the certificates and declarations applying to your device in a separate overview. <a href="#">See table 5 on page 18.</a>	
23 ... 24	Customer-specific version	HS	Hirschmann Standard

**Table 4:** Device name and product code

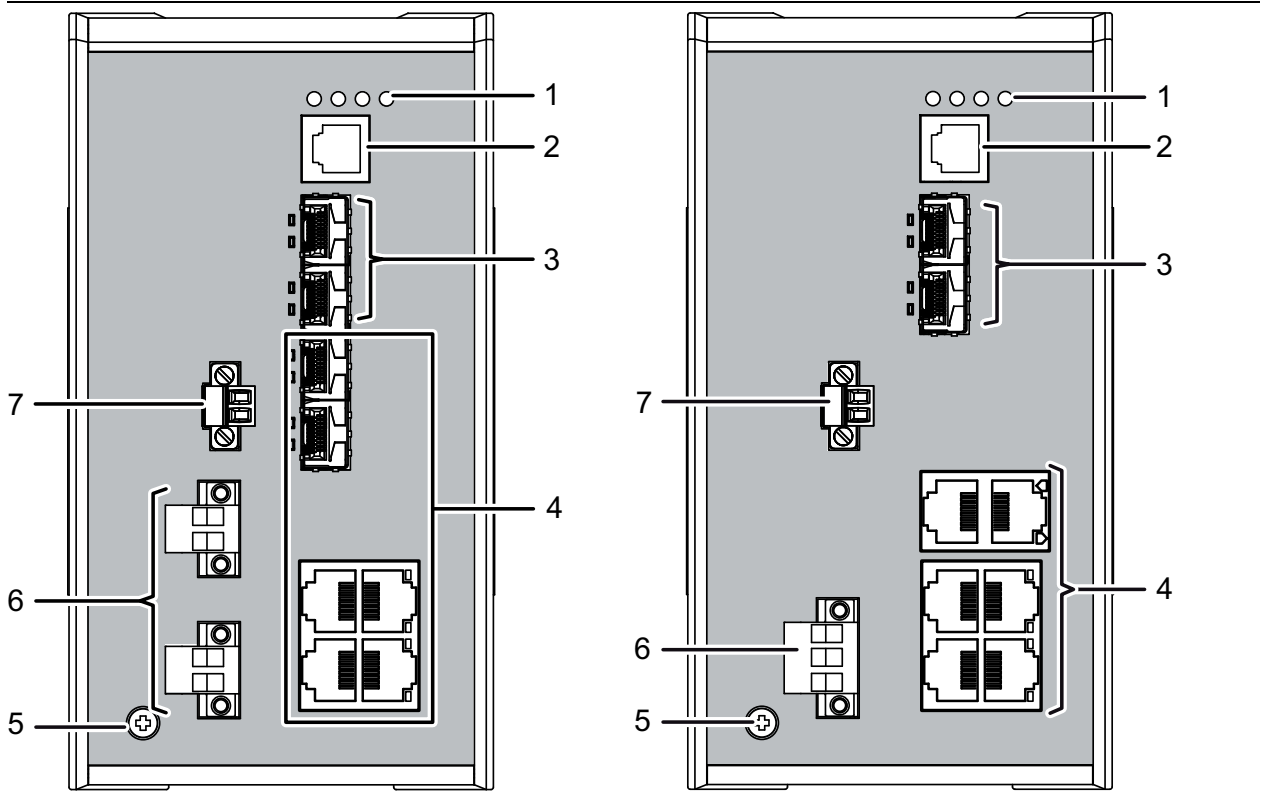
Application case	Certificates and declarations	Characteristic value <sup>a</sup>						
		T9	TY	V9	VT	VY	Y9	Z9
Standard applications	CE	X	X	X	X	X	X	X
	FCC	X	X	X	X	X	X	X
	EN 62368-1	X	X	X	X	X	X	X
	EN 61131-2	X	X	X	X	X	X	X
	UL 508		X		X	X	X	
Substation applications	IEC 61850-3			X	X	X		
	IEEE 1613			X	X	X		
Railway applications (trackside)	EN 50121-4	X	X		X			

**Table 5:** Assignment: application cases, certificates and declarations, characteristic values

a. X = Certificate or declaration present

## 1.3 Device views

### 1.3.1 Front view



Front view:

on the left: Device variants RSPL20.....2Z6YT..CC....

on the right: Device variants RSPL20.....2Z6TT..M9....

1 LED display elements for device status

2 V.24 interface

3 Uplink ports

2 × SFP slot for 100 Mbit/s F/O connections

4 Other ports

alternatively, depending on device variant	Port configuration characteristic value: YT	2 × SFP slot for 100 Mbit/s F/O connections 4 × RJ45 socket for 10/100 Mbit/s Twisted pair connections
--	---	--

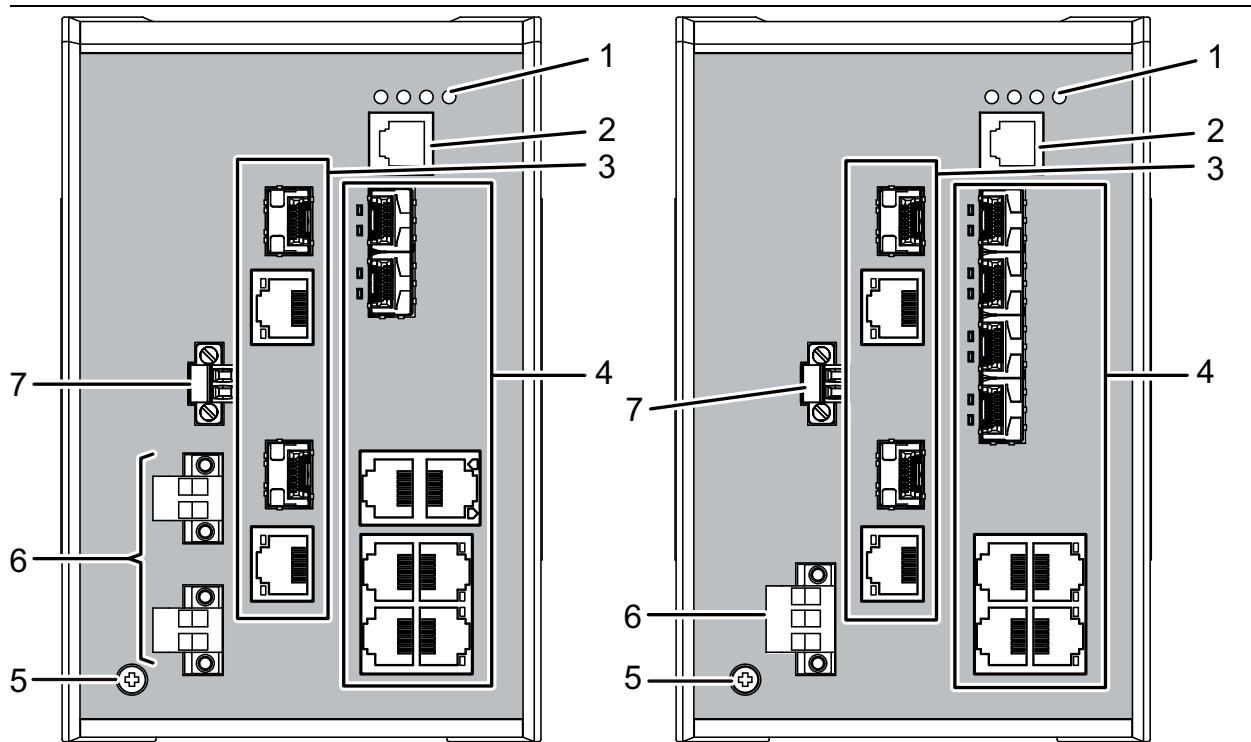
Port configuration characteristic value: ZT	6 × RJ45 socket for 10/100 Mbit/s Twisted pair connections
---	---

5 Grounding screw

6 Supply voltage connection

alternatively, depending on device variant	Supply voltage with the characteristic value: CC	<ul style="list-style-type: none"> <li>▶ 2 voltage inputs for redundant power supply</li> <li>▶ 2-pin terminal block</li> </ul>
	Supply voltage with the characteristic value: TT	<ul style="list-style-type: none"> <li>▶ 2 voltage inputs for redundant power supply</li> <li>▶ 2-pin terminal block</li> </ul>
	Supply voltage with the characteristic value: M9	<ul style="list-style-type: none"> <li>▶ 1 voltage input</li> <li>▶ 3-pin terminal block</li> </ul>

7 Connection for the signal contact



Front view:

on the left: Device variants RSPL30.....2O7YT..CC....

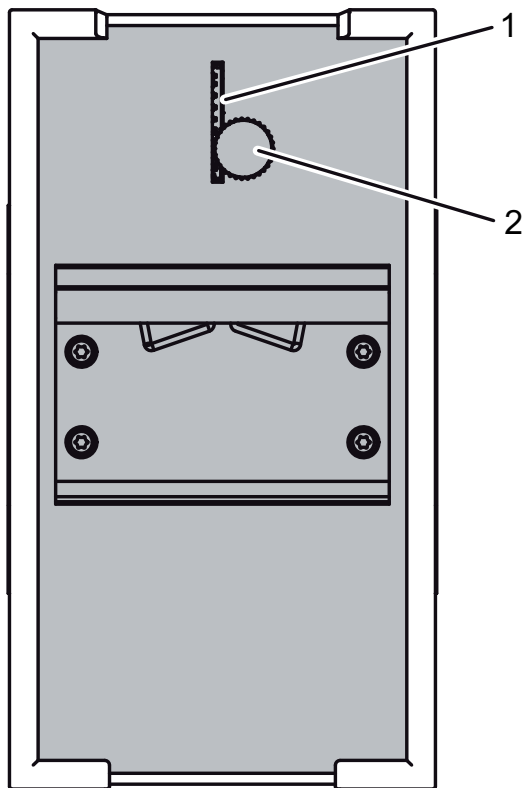
on the right: Device variants RSPL30.....2O7ZT..M9....

1	LED display elements for device status	
2	V.24 interface	
3	Uplink ports	
	2 × Combo port for 10/100/1000 Mbit/s connections	
4	Other ports	
alternatively, depending on device variant	Port configuration characteristic value: YT	2 × SFP slot for 100 Mbit/s F/O connections 6 × RJ45 socket for 10/100 Mbit/s Twisted pair connections
	Port configuration characteristic value: ZT	4 × SFP slot for 100 Mbit/s F/O connections 4 × RJ45 socket for 10/100 Mbit/s Twisted pair connections

5 Grounding screw

6 Supply voltage connection		
alternatively, depending on device variant	Supply voltage with the characteristic value: CC	▶ 2 voltage inputs for redundant power supply ▶ 2-pin terminal block
	Supply voltage with the characteristic value: TT	▶ 2 voltage inputs for redundant power supply ▶ 2-pin terminal block
	Supply voltage with the characteristic value: M9	▶ 1 voltage input ▶ 3-pin terminal block
7 Connection for the signal contact		

### 1.3.2 Rear view



- |   |                      |
|---|----------------------|
| 1 | Slot for the SD card |
| 2 | Thumb screw          |

## 1.4 Power supply

You will find information on the characteristic values here:

[“Device name and product code” on page 17](#)

### 1.4.1 Supply voltage with the characteristic value M9

The following options for power supply are available:

- ▶ 1 × 3-pin terminal block

You will find information on connecting the supply voltage here:

See [“Supply voltage with the characteristic value M9” on page 32](#).

### 1.4.2 Supply voltage with the characteristic value TT

The following options for redundant power supply are available:

- ▶ 2 × 2-pin terminal block

You will find information on connecting the supply voltage here:

See [“Supply voltage with the characteristic value TT” on page 33](#).

### 1.4.3 Supply voltage with the characteristic value CC

The following options for redundant power supply are available:

- ▶ 2 × 2-pin terminal block

You will find information on connecting the supply voltage here:

See [“Supply voltage with the characteristic value CC” on page 33](#).

## 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 Gigabit combo port (optional)

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.

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

#### ■ 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.

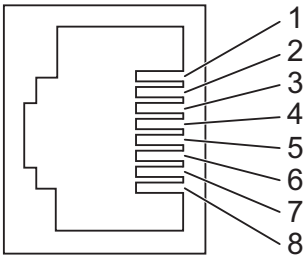
	Pin	Function
	1	RD+ Receive path
	2	RD- Receive path
	3	TD+ Transmission path
	6	TD- Transmission path
	4,5,7,8	—

Table 6: Pin assignment of the 10/100/1000 Mbit/s twisted pair port, RJ45 socket, 10/100 Mbit/s mode

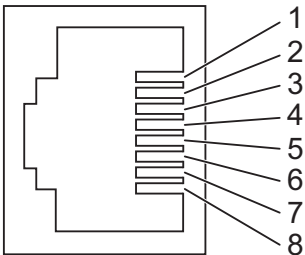
	Pin	Function
	1	BI_DB+
	2	BI_DB-
	3	BI_DA+
	4	BI_DD+
	5	BI_DD-
	6	BI_DA-
	7	BI_DC+
	8	BI_DC-

Table 7: Pin assignments of the 10/100/1000 Mbit/s twisted pair port in 1000 Mbit/s mode, RJ45 socket, MDI-X mode

### ■ 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

## 1.5.2 100 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 IEEE 802.3 100BASE-FX standard.

This port supports:

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

Default setting: Full duplex

## 1.6 Display elements

After the supply voltage is set up, the Software starts and initializes the device. Afterwards, the device performs a self-test. During this process, various LEDs light up.

### 1.6.1 Device state

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



LED	Display	Color	Activity	Meaning
Power	Supply voltage	—	none	Supply voltage is too low
		yellow	lights up	Device variants with redundant power supply: Supply voltage 1 <b>or</b> 2 is on
			flashes 4 times a period	Software update is running. Maintain the power supply.
		green	lights up	Device variants with redundant power supply: Supply voltage 1 <b>and</b> 2 is on Device variants with single power supply: Supply voltage is on
Status	Device Status	—	none	Device is starting and/or is not ready for operation.
		green	lights up	Device is ready for operation. Characteristics can be configured
		red	lights up	Device is ready for operation. Device has detected at least one error in the monitoring results
			flashes 1 time a period	The boot parameters used when the device has been started differ from the boot parameters saved. Start the device again.
			flashes 4 times a period	Device has detected a multiple IP address



LED	Display	Color	Activity	Meaning
RM	Ring Manager	—	none	No redundancy configured
		green	lights up	Redundancy exists
			flashes 1 time a period	Device is reporting an incorrect configuration of the RM function
		yellow	lights up	No redundancy exists
ACA	Storage medium ACA31	—	none	ACA storage medium not connected
		green	lights up	ACA storage medium connected
			flashes 3 times a period	Device writes to/reads from the storage medium
		yellow	lights up	ACA storage medium inoperative

## 1.6.2 Port status

These LEDs provide port-related information. The LEDs are directly located on the ports.

Display	Color	Activity	Meaning
Link status	—	none	Device detects an invalid or missing link
	green	lights up	Device detects a valid link
		flashes 1 time a period	Port is switched to stand-by
		flashes 3 times a period	Port is switched off
	yellow	lights up	Device detects a non-supported SFP transceiver or a non-supported data rate
		flashing	Device is transmitting and/or receiving data
		flashes 1 time a period	Device detects at least one unauthorized MAC address (Port Security Violation)
		flashes 3 times a period	The device deactivates the relevant port (auto-deactivation).

## 1.7 Management interfaces

### 1.7.1 V.24 interface (external management)

A serial interface is provided on the RJ11 socket (V.24 interface) for the local connection of an external management station (VT100 terminal or PC with corresponding terminal emulation). This enables you to set up a connection to the Command Line Interface CLI and to the System Monitor.

**Note:** The Terminal cable is available as an accessory.

VT100 terminal settings	
Speed	9600 Baud
Data	8 bit

## VT100 terminal settings

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.

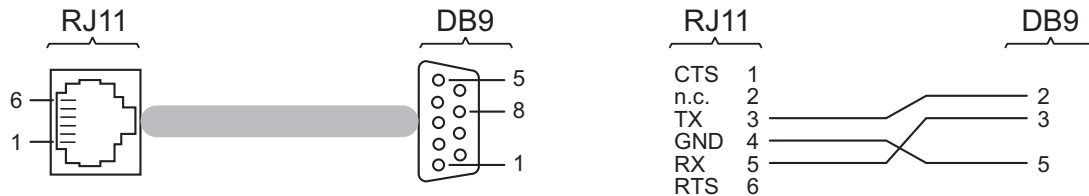


Figure 1: Pin assignment of the V.24 interface and the DB9 plug

### 1.7.2 SD card interface

The SD card interface allows you to connect the AutoConfiguration Adapter ACA31 storage medium. This is used for saving/loading the configuration data and diagnostic information, and for loading the software.

See [“Accessories” on page 56](#).

For information about the position on the device see [“Rear view” on page 21](#).

On the front of the device there is an LED display that informs you about the status of the interface.

Only use Hirschmann SD cards.

## 1.8 Signal contact



*Figure 2: 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 the SD card \(optional\)](#)
- ▶ [Installing and grounding the device](#)
- ▶ [Installing an SFP transceiver \(optional\)](#)
- ▶ [Connecting the terminal blocks](#)
- ▶ [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 56](#).
- Check the individual parts for transport damage.

### 2.2 Installing the SD card (optional)

**Note:** Only use the AutoConfiguration Adapter ACA31 storage medium. See [“Accessories” on page 56](#).

Proceed as follows:

- Deactivate the write protection on the SD card by pushing the write-protect lock towards the middle of the card.
- Push the SD card into the slot with the beveled corner facing upwards.
- Tighten the thumb screw hand-tight to fix the SD card.

## 2.3 Installing and grounding the device

### **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 this instruction can result in death, serious injury, or equipment damage.**

Only for device variants featuring supply voltage with characteristic value M9:

### **WARNING**

#### **ELECTRIC SHOCK**

Install this device only in a switch cabinet or in an operating site with restricted access, to which maintenance staff have exclusive access.

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

### 2.3.1 Installing the device onto the DIN rail

Verify that the device maintains the minimum clearance to meet the climatic conditions during operation:

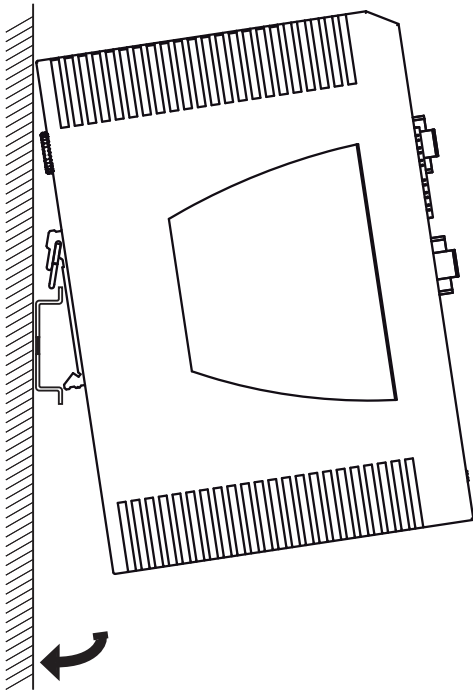
- ▶ Top and bottom device side: 3.94 in (10 cm)
- ▶ Left and right device side: 0.79 in (2 cm)

Decreasing the minimum clearance reduces the specified maximum operating temperature.

See [“General technical data” on page 44.](#)

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 overall shield of a connected shielded twisted pair cable is connected to the grounding connector on the front panel as a conductor.

### 2.3.2 Grounding the device

The device is grounded via the separate ground screw on the bottom left of the front side of the device.

The device variants featuring supply voltage with characteristic value M9 have a connection for protective grounding.

The device variants featuring supply voltage with characteristic value CC and TT have a connection for functional grounding.

- Ground the device via the ground screw.

## 2.4 Installing an SFP transceiver (optional)

### Prerequisites:

Exclusively use Hirschmann SFP transceivers.

See [“Accessories” on page 56](#).

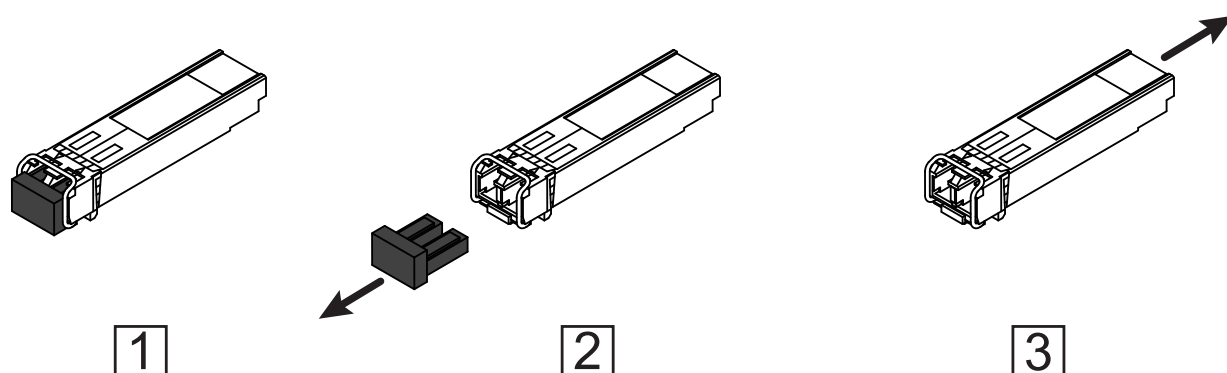


Figure 3: Installing SFP transceivers: Installation sequence

### Proceed as follows:

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

## 2.5 Connecting the terminal blocks

### **WARNING**

#### **ELECTRIC SHOCK**

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

See [“Requirements for connecting electrical wires” on page 9](#).

Never insert sharp objects (small screwdrivers, wires, etc.) into the connection terminals for electric conductors, and do not touch the terminals.

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

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

## 2.5.1 Supply voltage with the characteristic value M9

You will find information on the characteristic values here:

[“Device name and product code” on page 17](#)

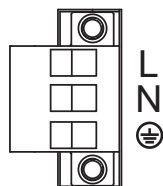


Figure 4: Supply voltage with the characteristic value M9: 3-pin terminal block with screw locking

Type of the voltages that can be connected	Specification of the supply voltage	Pin assignment
DC voltage	Rated voltage range DC: 110 V DC ... 250 V DC Voltage range DC incl. maximum tolerances: 88 V DC ... 320 V DC	+/L Plus terminal of the supply voltage
		-/N Minus terminal of the supply voltage
		Protective conductor
AC voltage	Rated voltage range AC: 110 V AC ... 230 V AC, 50 Hz ... 60 Hz Voltage range AC incl. maximum tolerances: 88 V AC ... 265 V AC, 47 Hz ... 63 Hz	+/L Outer conductor
		-/N Neutral conductor
		Protective conductor

### **WARNING**

#### **ELECTRIC SHOCK**

Install this device only in a switch cabinet or in an operating site with restricted access, to which maintenance staff have exclusive access.

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

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

- Remove the terminal connector from the device.
  - Connect the protective conductor with the clamp.
  - 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.
- You find the prescribed tightening torque in chapter:

[“General technical data” on page 44](#)



## 2.5.2 Supply voltage with the characteristic value CC

You will find information on the characteristic values here:

[“Device name and product code” on page 17](#)

You have the option of supplying the supply voltage redundantly, without load distribution.

Both supply voltage inputs are uncoupled.

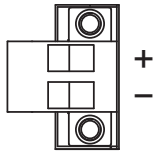


Figure 5: Supply voltage with the characteristic value CC: 2-pin terminal block with screw locking

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

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

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.
- ▶ You find the prescribed tightening torque in chapter:  
[“General technical data” on page 44](#)

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

## 2.5.3 Supply voltage with the characteristic value TT

You will find information on the characteristic values here:

[“Device name and product code” on page 17](#)

You have the option of supplying the supply voltage redundantly, without load distribution.

Both supply voltage inputs are uncoupled.

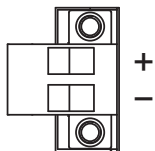


Figure 6: Supply voltage with characteristic value TT: 2-pin terminal block with screw lock

Type of the voltages that can be connected	Specification of the supply voltage	Pin assignment
DC voltage	Rated voltage range DC: 12 V DC ... 24 V DC Voltage range DC incl. maximum tolerances: 10.2 V DC ... 32 V DC	+
		-
		Plus terminal of the supply voltage
		Minus terminal of the supply voltage

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

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.
- ▶ You find the prescribed tightening torque in chapter:
  - “General technical data” on page 44

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

#### 2.5.4 Signal contact

- Connect the signal contact lines with the terminal block connections.
- Fasten the wires in the terminal block by tightening the terminal screws.
- ▶ You find the prescribed tightening torque in chapter:
  - “General technical data” on page 44

## 2.6 Operating the device

### **WARNING**

#### **ELECTRIC SHOCK**

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

See [“Requirements for connecting electrical wires” on page 9.](#)

Ground the device before connecting any other cables.

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

Relevant for North America:

You find the prescribed tightening torque in chapter:  
[“General technical data” on page 44](#)

Proceed as follows:

- Use screws to secure the connectors to the device.
- Enable the supply voltage.

## 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 22.](#)

## **2.8 Filling out the inscription label**

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

### 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:

- ▶ Input via the V.24 interface
- ▶ 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 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
- ▶ Ethernet ports: link status is not evaluated (signal contact)
- ▶ Optical ports: Full duplex
- ▶ TP ports: Autonegotiation
- ▶ RSTP (Rapid Spanning Tree) activated

#### ■ **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 Upgrading Software

For RSPL20/30 devices, you have the option of performing upgrades with the software level 2S.

For software version 04.0 or higher, the software image “HiOS” is available for this purpose.

## 5 Monitoring the ambient air temperature

Operate the device below the specified maximum ambient air temperature exclusively.

See [“General technical data” on page 44](#).

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

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



## 6 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>.

# 7 Disassembly

## 7.1 Removing the device

### **WARNING**

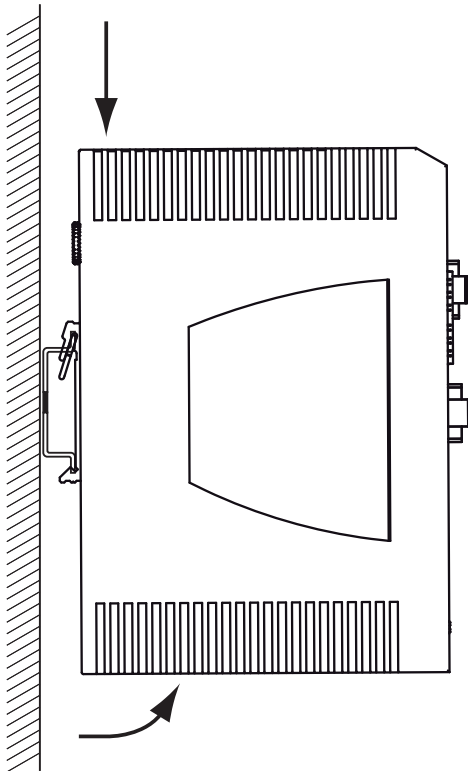
#### **ELECTRIC SHOCK**

Disconnect the grounding only after disconnecting all other cables.

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

Proceed as follows:

- Disconnect the data cables.
- Disable the supply voltage.
- Disconnect the terminal blocks.
- Disconnect the grounding.
- To remove the device from the DIN rail, press the device downwards and pull it out from under the DIN rail.



## 7.2 Removing an SFP transceiver (optional)

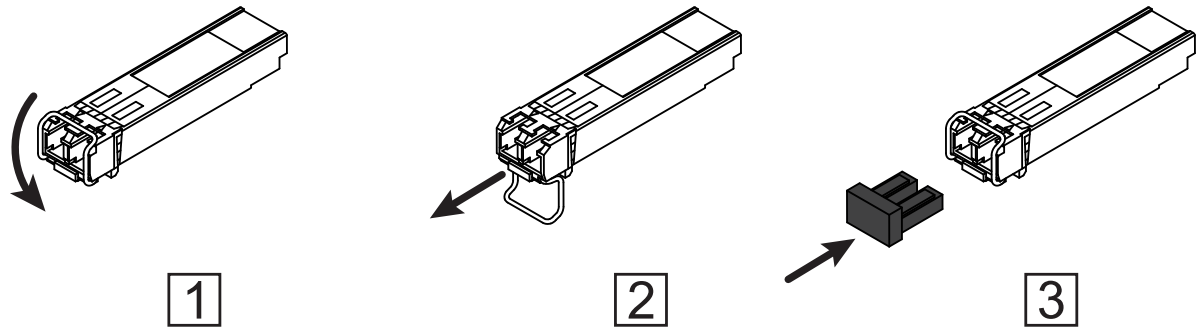


Figure 7: De-installing SFP transceivers: De-installation sequence

### Proceed as follows:

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

## 8 Technical data

### 8.1 General technical data

Dimensions W × H × D	RSPL20/30	See "Dimension drawings" on page 47.		
Weight	RSPL-20-...	approx. 2.20 lb (1.0 kg)		
	RSPL-30-...	approx. 2.65 lb (1.2 kg)		
Supply voltage with the characteristic value CC	Rated voltage DC:	24 V DC ... 48 V DC		
	Voltage range DC incl. maximum tolerances:	18 V DC ... 60 V DC		
	Connection type	2-pin terminal block		
	Tightening torque	4.5 lb-in (0.51 Nm)		
	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:	1 A	
		Characteristic:	slow blow	
Peak inrush current	<4 A			
Supply voltage with characteristic value TT	Rated voltage DC:	12 V DC ... 24 V DC		
	Voltage range DC incl. maximum tolerances:	10.2 V DC ... 32 V DC		
	Connection type	2-pin terminal block		
	Tightening torque	4.5 lb-in (0.51 Nm)		
	Power loss buffer	>10 ms at 10.2 V DC		
	Overload current protection on the device	Non-replaceable fuse		
	Back-up fuse for each voltage input	At rated voltage DC	12 V DC	
		Nominal rating:	5 A	
	Characteristic:	slow blow		
	At rated voltage DC	24 V DC		
	Nominal rating:	4 A		
	Characteristic:	slow blow		
Peak inrush current	<14 A			

Supply voltage with the characteristic value M9	Rated voltage AC:	110 V AC ... 230 V AC, 50 Hz ... 60 Hz
	Voltage range AC incl. maximum tolerances:	88 V AC ... 265 V AC, 47 Hz ... 63 Hz
	Rated voltage DC:	110 V DC ... 250 V DC
	Voltage range DC incl. maximum tolerances:	88 V DC ... 320 V DC
	Connection type	3-pin terminal block
	Tightening torque	4.5 lb-in (0.51 Nm)
	Power loss buffer	>10 ms at 98 V AC
	Overload current protection on the device	Non-replaceable fuse
	Back-up fuse	Nominal rating: 1 A ... 20 A Characteristic: slow blow
Peak inrush current	<3.5 A	
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 <sup>b</sup>	Derating <sup>a</sup> : refer to the Hirschmann product web page at <a href="http://www.hirschmann.com">http://www.hirschmann.com</a> Devices with operating temperature characteristic value E and T (extended): -40 °F ... +158 °F (-40 °C ... +70 °C) <sup>c</sup> -40 °F ... +185 °F (-40 °C ... +85 °C) for 16 hours (tested in accordance with IEC 60068-2-2) <sup>c</sup> Devices with operating temperature characteristic value E and T (extended): -40 °F ... +158 °F (-40 °C ... +70 °C) <sup>c</sup> -40 °F ... +185 °F (-40 °C ... +85 °C) for 16 hours (tested in accordance with IEC 60068-2-2) <sup>c</sup>
	Maximum inner temperature of device (guideline)	Devices with operating temperature characteristic value S (Standard): +181.4 °F (+83 °C) Devices with operating temperature characteristic value E and T (extended): +199.4 °F (+93 °C)
	Humidity	5 % ... 95 % (non-condensing)
	Air pressure	min. 700 hPa (+9842 ft; +3000 m) max. 1060 hPa (-1312 ft; -400 m)
	Climatic conditions during storage	Ambient air temperature <sup>b</sup>
Humidity		5 % ... 95 % (non-condensing)
Air pressure		min. 700 hPa (+9842 ft; +3000 m) max. 1060 hPa (-1312 ft; -400 m)

Signal contact	Connection type	2-pin terminal block
		Tightening torque
		3 lb-in (0.34 Nm)
	Switching current	max. 1 A
	Switching voltage	max. 60 V DC max. 30 V AC
		under UL conditions: max. 30 V DC, resistive load
Pollution degree		2
Protection classes	Laser protection	Class 1 in compliance with IEC 60825-1
	Degree of protection	IP20

- a. Reduction of the maximum permitted ambient air temperature under specific conditions
- b. Temperature of the ambient air at a distance of 2 in (5 cm) from the device
- c. Exclusively use SFP transceivers with the "EEC" extension, otherwise the standard temperature range applies.

## 8.2 Dimension drawings

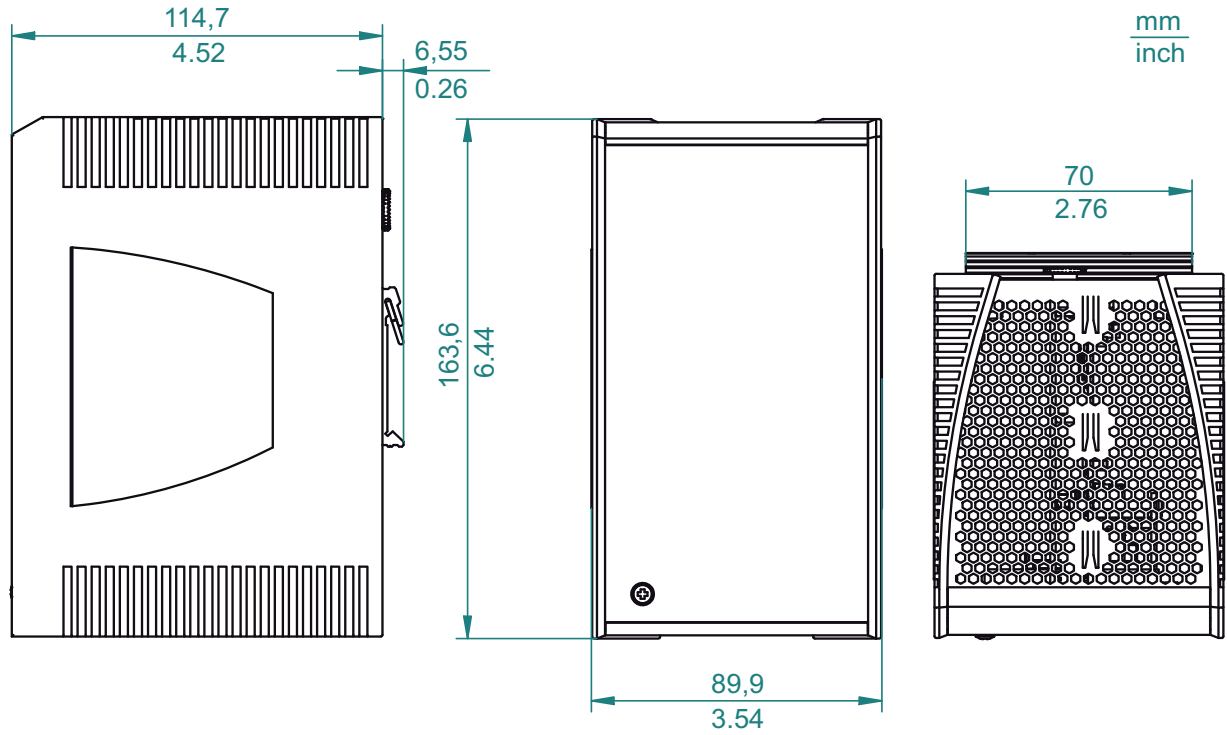


Figure 8: Dimensions of device variants RSPL20-...

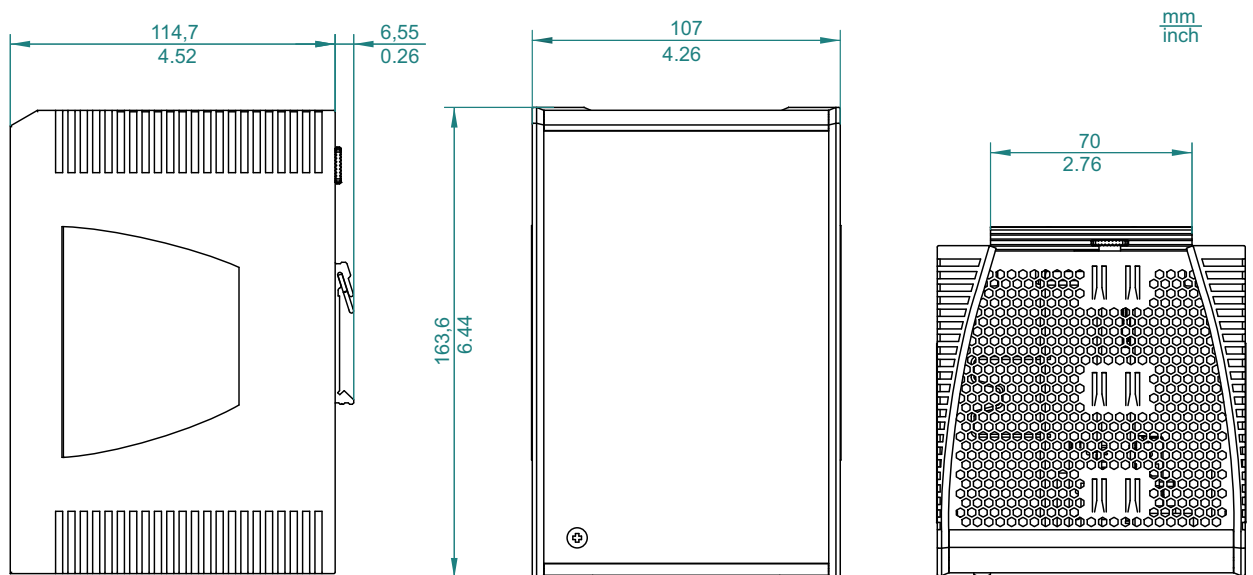


Figure 9: Dimensions of device variants RSPL30-...

## 8.3 EMC and immunity

You will find detailed information on the certificates and declarations applying to your device in a separate overview.  
See [table 5 on page 18](#).

Stability		Standard applications	Railway applications (trackside)	Substation applications
IEC 60068-2-6, test Fc	Vibration	—	—	2 Hz ... 9 Hz with 0.11 in (3 mm) amplitude
		5 Hz ... 8.4 Hz with 0.14 in (3.5 mm) amplitude	5 Hz ... 8.4 Hz with 0.14 in (3.5 mm) amplitude	5 Hz ... 8.4 Hz with 0.14 in (3.5 mm) amplitude
		8.4 Hz ... 150 Hz with 1 g	8.4 Hz ... 150 Hz with 1 g	9 Hz ... 200 Hz with 1 g
		—	—	200 Hz ... 500 Hz with 1.5 g
IEC 60068-2-27, test Ea	Shock	15 g at 11 ms	15 g at 11 ms	15 g at 11 ms



<b>EMC interference emission</b>		<b>Standard applications</b>	<b>Railway applications (trackside)</b>	<b>Substation applications</b>
<b>Radiated emission</b>				
EN 55032		Class A	Class A	Class A
DNV GL Guidelines		—	—	—
FCC 47 CFR Part 15		Class A	Class A	Class A
EN 61000-6-4		Fulfilled	Fulfilled	Fulfilled
<b>Conducted emission</b>				
EN 55032	AC and DC supply connections	Class A	Class A	Class A
DNV GL Guidelines	AC and DC supply connections	—	—	—
FCC 47 CFR Part 15	AC and DC supply connections	Class A	Class A	Class A
EN 61000-6-4	AC and DC supply connections	Fulfilled	Fulfilled	Fulfilled
EN 55032	Telecommunication connections	Class A	Class A	Class A
EN 61000-6-4	Telecommunication connections	Fulfilled	Fulfilled	Fulfilled

<b>EMC interference immunity</b>		<b>Standard applications</b>	<b>Railway applications (trackside)</b>	<b>Substation applications</b>
<b>Electrostatic discharge</b>				
EN 61000-4-2 IEEE C37.90.3	Contact discharge	±4 kV	±6 kV	±8 kV
EN 61000-4-2 IEEE C37.90.3	Air discharge	±8 kV	±8 kV	±15 kV
<b>Electromagnetic field</b>				
EN 61000-4-3 IEEE 1613	80 MHz ... 3000 MHz	max. 10 V/m	max. 20 V/m	max. 10 V/m
	80 MHz ... 1000 MHz	—	—	max. 35 V/m
<b>Fast transients (burst)</b>				
EN 61000-4-4 IEEE C37.90.1	AC/DC supply connection	±2 kV	±2 kV	±4 kV
EN 61000-4-4 IEEE C37.90.1	Data line	±4 kV	±4 kV	±4 kV

<b>EMC interference immunity</b>		<b>Standard applications</b>	<b>Railway applications (trackside)</b>	<b>Substation applications</b>
<b>Voltage surges - DC supply connection</b>				
EN 61000-4-5	line/ground	±2 kV	±2 kV	±2 kV
IEEE 1613	line/ground	—	—	±5 kV
EN 61000-4-5	line/line	±1 kV	±1 kV	±1 kV
<b>Voltage surges - AC supply connection</b>				
EN 61000-4-5	line/ground	±2 kV	±2 kV	±4 kV
IEEE 1613	line/ground	—	—	±5 kV
EN 61000-4-5	line/line	±1 kV	±1 kV	±2 kV
<b>Voltage surges - data line</b>				
EN 61000-4-5	line/ground	±1 kV	±2 kV	±4 kV
<b>Conducted disturbances</b>				
EN 61000-4-6	150 kHz ... 80 MHz	10 V	10 V	10 V

<b>EMC interference immunity</b>		<b>Standard applications</b>	<b>Railway applications (trackside)</b>	<b>Substation applications</b>
<b>Damped oscillation - AC/DC supply connection</b>				
EN 61000-4-12	line/ground	—	—	2.5 kV
IEEE C37.90.1				
EN 61000-4-12	line/line	—	—	1 kV
IEEE C37.90.1				
<b>Damped oscillation – data line</b>				
EN 61000-4-12	line/ground	—	—	2.5 kV
IEEE C37.90.1				
EN 61000-4-12	line/line	—	—	1 kV
<b>Pulse magnetic field</b>				
EN 61000-4-9		—	300 A/m	300 A/m

## 8.4 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 <sup>a</sup>	Wave length	Fiber	System attenuation	Example for F/O cable length <sup>b</sup>	Fiber attenuation	BLP <sup>c</sup> /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 <sup>d</sup>	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 <sup>e</sup>	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) <sup>f</sup>	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 10: F/O port 1000BASE-FX (SFP fiber optic Gigabit Ethernet Transceiver)

Product code M-SFP-...	Mode <sup>a</sup>	Wave length	Fiber	System attenuation	Example for F/O cable length <sup>b</sup>	Fiber attenuation	BLP <sup>c</sup> /Dispersion
-LH+/LC	LH	1550 nm	9/125 μm	15 dB ... 30 dB	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 10: 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 <sup>a</sup>	Wave length TX	Wave length RX	Fiber	System attenuation	Example for F/O cable length <sup>b</sup>	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)

*Table 11: F/O port (bidirectional Gigabit Ethernet SFP transceiver)*

Product code M-SFP-BIDI...	Mode <sup>a</sup>	Wave length TX	Wave length RX	Fiber	System attenuation	Example for F/ O cable length <sup>b</sup>	Fiber attenuation	Dispersion
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 11: 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 <sup>a</sup>	Wave length	Fiber	System attenuation	Example for F/O cable length <sup>b</sup>	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)

Table 12: Fiber port 100BASE-FX (SFP fiber optic Fast Ethernet Transceiver)

Product code M-FAST-SFP-...	Mode <sup>a</sup>	Wave length	Fiber	System attenuation	Example for F/O cable length <sup>b</sup>	Fiber attenuation	BLP/Dispersion
-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 <sup>c</sup>	18 ps/(nm×km)

*Table 12: 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.

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

*Table 13: Network range: 10/100/1000 Mbit/s twisted pair port*

## 8.5 Power consumption/power output

The order numbers correspond to the product codes of the devices.  
See “Device name and product code” on page 17.

Device name	Maximum power consumption	Power output
<b>RSPL20-08002Z6TT...</b>		
Supply voltage with characteristic value CC, K9 or KK	8 W	27 Btu (IT)/h
Supply voltage with characteristic value TT	10 W	34 Btu (IT)/h
<b>RSPL20-08002Z6YT...</b>		
Supply voltage with characteristic value CC, K9 or KK	10 W	34 Btu (IT)/h
Supply voltage with characteristic value TT	12 W	41 Btu (IT)/h
<b>RSPL30-08022O7YT...</b>		
Supply voltage with characteristic value CC, K9 or KK	14 W	47 Btu (IT)/h
Supply voltage with characteristic value TT	16 W	55 Btu (IT)/h
<b>RSPL30-08022O7ZT...</b>		
Supply voltage with characteristic value CC, K9 or KK	16 W	55 Btu (IT)/h
Supply voltage with characteristic value TT	18 W	61 Btu (IT)/h

## 8.6 Scope of delivery, order numbers and accessories

### ■ Scope of delivery

Amount	Article
1 ×	Device
1 ×	Safety and general information sheet
1 ×	2-pin terminal block for signal contact
1 ×	3-pin terminal block for the supply voltage (only for device variants featuring supply voltage with characteristic value M9)
2 ×	2-pin terminal block for the supply voltage (only for device variants featuring supply voltage with characteristic value CC)
2 ×	2-pin terminal block for the supply voltage (only for device variants featuring supply voltage with characteristic value TT)

### ■ 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.



<b>Name</b>	<b>Order number</b>
Terminal cable	943 301-001
AutoConfiguration Adapter ACA31	942 074-001
For device variants featuring supply voltage with characteristic value M9: 3-pin terminal block (50 pieces) for supply voltage	943 845-008
For device variants featuring supply voltage with characteristic value CC 2-pin terminal block for supply voltage (50 pieces)	943 845-009
2-pin terminal block for signal contact (50 pieces)	943 845-010
Power Cord	942 000-001
Network management software Industrial HiVision	943 156-xxx
Protection cap for RJ45 socket (50 pieces)	943 936-001
Protection cap for SFP slot (25 pieces)	943 942-001

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

*Table 14: Accessory: Gigabit Ethernet SFP transceiver*

- a. You will find further information on certifications on the Internet on the Hirschmann product pages ([www.hirschmann.com](http://www.hirschmann.com)).

<b>Bidirectional Gigabit Ethernet SFP transceiver</b>	<b>Order number</b>
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 15: Accessory: Bidirectional Gigabit Ethernet SFP transceiver*

<b>Fast Ethernet SFP transceiver</b>	<b>Order number</b>
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:	
<ul style="list-style-type: none"> <li>▶ Longer RSTP switching times and link loss detection times compared to twisted pair ports provided by the device directly.</li> <li>▶ Not applicable for combo ports.</li> <li>▶ Not applicable for ports which support only Gigabit Ethernet.</li> <li>▶ It is currently not possible to set autocrossing manually.</li> </ul>	
M-FAST SFP-MM/LC	943 865-001
M-FAST SFP-MM/LC EEC	943 945-001
M-FAST SFP-SM/LC	943 866-001
M-FAST SFP-SM/LC EEC	943 946-001
M-FAST SFP-SM+/LC	943 867-001
M-FAST SFP-SM+/LC EEC	943 947-001
M-FAST SFP-LH/LC	943 868-001
M-FAST SFP-LH/LC EEC	943 948-001
SFP-FAST-MM/LC <sup>a</sup>	942 194-001
SFP-FAST-MM/LC EEC <sup>a</sup>	942 194-002
SFP-FAST-SM/LC <sup>a</sup>	942 195-001
SFP-FAST-SM/LC EEC <sup>a</sup>	942 195-002

a. You will find further information on certifications on the Internet on the Hirschmann product pages ([www.hirschmann.com](http://www.hirschmann.com)).

## 9 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
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
FCC 47 CFR Part 15	Code of Federal Regulations
IEC/EN 61850-3	Communication networks and systems for power utility automation - Part 3: General requirements.
IEEE 1613	IEEE Standard Environmental and Testing Requirements for Communication Networking Devices in Electric Power Substations
IEEE 802.1AB	Station and Media Access Control Connectivity Discovery
IEEE 802.1D	MAC Bridges (switching function)
IEEE 802.1Q	Virtual LANs (VLANs, MRP, Spanning Tree)
IEEE 802.3	Ethernet

*Table 16: 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.

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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