



**HIRSCHMANN**

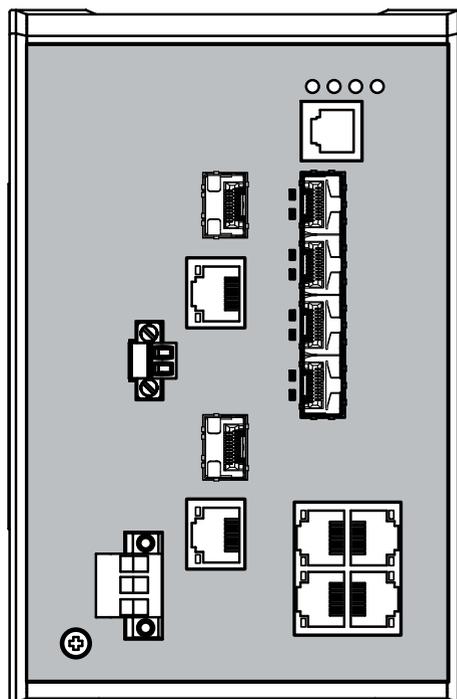
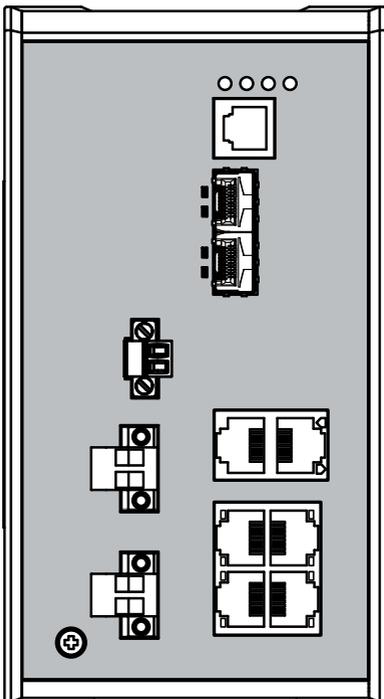
A **BELDEN** BRAND

# User Manual

## Installation

### Industrial Ethernet Rail Switch Power Lite

### RSPL 20/30



040016001031212000

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

© 2012 Hirschmann Automation and Control GmbH

Manuals and software are protected by copyright. All rights reserved. The copying, reproduction, translation, conversion into any electronic medium or machine scannable form is not permitted, either in whole or in part. An exception is the preparation of a backup copy of the software for your own use. For devices with embedded software, the end-user license agreement on the enclosed CD/DVD applies.

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

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

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

Printed in Germany  
Hirschmann Automation and Control GmbH  
Stuttgarter Str. 45-51  
72654 Neckartenzlingen  
Germany  
Tel.: +49 1805 141538

# Contents

<b>Safety instructions</b>	<b>5</b>
<b>About this manual</b>	<b>12</b>
<b>Key</b>	<b>12</b>
<b>1 Device description</b>	<b>13</b>
1.1 General device description	13
1.2 Device name	14
1.3 Combination options	17
1.4 Device views	18
1.4.1 Front view	18
1.4.2 Rear view	20
1.5 Power supply	20
1.5.1 Operating voltage type M9	20
1.5.2 Operating voltage type CC	20
1.6 Ethernet ports	21
1.6.1 Gigabit combo port (optional)	21
1.6.2 10/100 Mbit/s twisted pair connection	22
1.6.3 100 Mbit/s F/O connection	22
1.7 Display elements	23
1.7.1 Device state	23
1.7.2 Port state	24
1.8 Management interfaces	24
1.8.1 V.24 interface (external management)	24
1.8.2 SD card interface	25
1.9 Signal contact	25
<b>2 Device installation</b>	<b>26</b>
2.1 Unpacking and checking	26
2.2 Installing the SD card (optional)	26
2.3 Installing the device and grounding	27
2.3.1 Mounting on the DIN rail	27
2.3.2 Grounding	28
2.4 Installing the SFP modules (optional)	28
2.5 Connecting the terminal blocks	29

2.6	Mounting the terminal blocks and switching on the supply voltage	32
2.7	Connecting the data lines	32
2.7.1	Gigabit combo port (optional)	32
2.7.2	100 Mbit/s F/O connection	33
2.7.3	10/100 Mbit/s twisted pair connection	33
2.8	Insert data in label area	33
<b>3</b>	<b>Basic set-up</b>	<b>34</b>
<b>4</b>	<b>Monitoring the ambient temperature</b>	<b>35</b>
<b>5</b>	<b>Maintenance and service</b>	<b>36</b>
<b>6</b>	<b>Disassembly</b>	<b>37</b>
6.1	Disassembling the device	37
6.2	Disassembling the SFP modules	38
<b>7</b>	<b>Technical data</b>	<b>39</b>
<b>A</b>	<b>Further Support</b>	<b>53</b>

# Safety instructions

## ■ Important Information

**Notice:** Read these instructions carefully, and look at the equipment to become familiar with the device before trying to install, operate, or maintain it. The following special messages may appear throughout this documentation or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.



## **DANGER**

**DANGER** indicates an imminently hazardous situation which, if not avoided, **will result in** death or serious injury.



## **WARNING**

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



## **CAUTION**

**CAUTION** indicates a potentially hazardous situation which, if not avoided, **can result in** minor or moderate injury.

**Note:** A note contains important information on the product, on how to manage the product, or on the respective section of the documentation to which your special attention is being drawn.

## ■ Certified usage

Only use the device for application cases that are described in the Hirschmann product information, including this manual. Only operate the device according to the technical specifications.

## ■ Supply voltage

**Note:** The supply voltage is only connected with the chassis via protective elements.

# **WARNING**

## **ELECTRIC SHOCK**

Ground the device before connecting the power supply.  
Only connect a supply voltage as described in the data plate of your device.

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

- Only for device variants with operating voltage type M9:  
For every supply voltage to be connected, make sure the following requirements are met:
  - ▶ The power supply conforms to overvoltage category I or II.
  - ▶ The voltage supply has an easily accessible disconnecting device (e.g. a switch or a plug).
  - ▶ The disconnecting device is clearly identified so that in the case of an emergency, it is clear which disconnecting device belongs to which line.
  - ▶ The lines to be connected are voltage-free.
  - ▶ There is a fuse in the outer conductor (AC) or the positive conductor (DC) of the voltage supply.  
Regarding the properties of this fuse: [See “General technical data” on page 39.](#)
  - ▶ When using a DC voltage supply: the fuse is suitable for DC voltage.
  - ▶ If the neutral conductor (AC) or the negative conductor (DC) is not grounded: there is a fuse in each of the two wires.
  - ▶ AC voltage Supply: the wire diameter for the input supply line is at least 0.75 mm<sup>2</sup> (North America: AWG18).
  - ▶ DC voltage Supply: the wire diameter for the input supply line is at least 1 mm<sup>2</sup> (North America: AWG16).
  - ▶ The cross-section of the protective conductor cable is the same size as or bigger than the cross-section of the voltage supply cables.
  - ▶ The connection cables used are permitted for the specified temperature range.
  - ▶ Relevant for North America:  
The power supply lines are made up of copper wire (75 °C).
- Only for device variants with operating voltage type CC:  
For every supply voltage to be connected, make sure the following requirements are met:
  - ▶ The power supply conforms to overvoltage category I or II.
  - ▶ The voltage supply has an easily accessible disconnecting device (e.g. a switch or a plug).

- ▶ The disconnecting device is clearly identified so that in the case of an emergency, it is clear which disconnecting device belongs to which line.
- ▶ The lines to be connected are voltage-free.
- ▶ A fuse suitable for DC voltage is located in the plus conductor of the power supply.
- ▶ A fuse suitable for DC voltage is located in the minus conductor of the supply voltage, if this is not grounded.  
Regarding the properties of this fuse: [See “General technical data” on page 39.](#)
- ▶ The wire diameter for the input supply line is at least 1 mm<sup>2</sup> (North America: AWG16).
- ▶ The connection cables used are permitted for the specified temperature range.
- ▶ Relevant for North America:  
The power supply lines are made up of copper wire (75 °C).

## **WARNING**

### **ELECTRIC SHOCK**

Only start connecting the supply voltage if **all** the above mentioned requirements are fulfilled.

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

- Make sure that the electrical installation meets local or nationally applicable safety regulations.
- Use undamaged parts.
- The device does not contain any service components. Internal fuses are only triggered if there is a fault in the device. If the device is not functioning correctly, or if it is damaged, switch off the supply voltage and return the device to the plant for inspection.
- Connect the protective conductor with the ground screw before you set up the other connections. When removing the connections, you remove the protective conductor last.
- For supply voltages with protective conductor connections: first connect the protective conductor before connecting the lines for the supply voltages.
- Only switch on the supply voltage to the device if
  - ▶ the housing is closed,
  - ▶ the terminal blocks are wired up correctly and
  - ▶ the terminal blocks are connected.

## ■ **Shielded ground**

The shielded ground wire of the twisted pairs lines is connected to the front panel as a conductor.

- Beware of possible short circuits when connecting a cable section with conductive shield braiding.

## ■ **Housing**

### **WARNING**

#### **ELECTRIC SHOCK**

Never insert any pointed objects (small screwdrivers, wires, etc.) into the product!

Never insert sharp objects (small screwdrivers, wires, etc.) into the connection terminals for the supply voltage or the signal contact, and do not touch the terminals!

#### **FIRE HAZARD**

Install the device in a fire protected enclosure according to EN 60950-1.

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

### **WARNING**

Only for device variants with operating voltage type M9:

#### **ELECTRIC SHOCK**

Only install this device in a switch cabinet or in an operating site with limited access, to which only maintenance staff have access.

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

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

The device is grounded by the separate ground screw on the front panel.

- Make sure that the electrical installation meets local or nationally applicable safety regulations.
- The ventilation slots must not be covered to promote free air circulation.
- The clearance between the ventilation slots of the housing and other objects must be at least 10 cm (3.94 in).
- The device must be installed in the vertical position.

### ■ **Environment**

The device may only be operated at the specified surrounding air temperature (temperature of the surrounding air at a distance of up to 5 cm (1.97 in) from the device) and relative air humidity specified in the technical data.

- Install the device in a location where the climatic threshold values specified in the technical data will be observed.
- Use the device only in an environment within the pollution degree specified in the technical data.

### ■ **Qualification requirements for personnel**

Qualified personnel as understood in this manual and the warning signs, are persons who are familiar with the setup, assembly, startup, and operation of this product and are appropriately qualified for their job. This includes, for example, those persons who have been:

- ▶ trained or directed or authorized to switch on and off, to ground and to label power circuits and devices or systems in accordance with current safety engineering standards;
- ▶ trained or directed in the care and use of appropriate safety equipment in accordance with the current standards of safety engineering;
- ▶ trained in providing first aid.

### ■ **General safety instructions**

This device is operated by electricity. You must follow precisely the prescribed safety requirements for the voltage connections in this document.

See [“Supply voltage” on page 5](#).

Non-observance of these safety instructions can therefore cause material damage and/or injuries.

- Only appropriately qualified personnel should work on this device or in its vicinity. Qualified personnel must be thoroughly familiar with the warnings and maintenance procedures in accordance with this operating manual.
- The proper and safe operation of this device depends on proper handling during transport, proper storage and assembly, and conscientious operation and maintenance procedures.
- Never start operating the device with damaged components.
- Only use the devices in accordance with this manual. In particular, observe the warnings and safety-related information.
- Any work that may be required on the electrical installation may only be carried out by personnel trained for this purpose.

**Note:** LED or LASER components in compliance with IEC 60825-1 (2007):

CLASS 1 LASER PRODUCT  
CLASS 1 LED PRODUCT

■ **National and international safety regulations**

- Make sure that the electrical installation meets local or nationally applicable safety regulations.

■ **CE marking**

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

Device variant	Directive
All variants	2004/108/EC (EMC) Directive of the European Parliament and the council for standardizing the regulations of member states with regard to electromagnetic compatibility.  2011/65/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  
Germany  
Tel.: +49 1805 141538

The product can be used in the industrial sector.

- ▶ Interference immunity: EN 61000-6-2
- ▶ Emitted interference: EN 55022
- ▶ Reliability: EN 60950-1

You will find more information on norms and standards here:

[“Technical data” on page 39](#)

**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.

#### ■ **FCC note**

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; (2) this device must accept any interference received, including interference that may cause undesired operation.

Appropriate testing has established that this device fulfills the requirements of a class A digital device in line with part 15 of the FCC regulations.

These requirements are designed to provide sufficient protection against interference when the device is being used in a business environment. The device creates and uses high frequencies and can also radiate high frequencies, and if it is not installed and used in accordance with this operating manual, it can cause radio transmission interference. The use of this device in a living area can also cause interference, and in this case the user is obliged to cover the costs of removing the interference.

#### ■ **Recycling note**

After usage, this product 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.

The following manuals are available as PDF files on the CD/DVD supplied:

- ▶ Installation user manual
- ▶ Basic Configuration user manual
- ▶ Redundancy Configuration user manual
- ▶ Graphical User Interface reference manual
- ▶ Command Line Interface user manual

The Industrial HiVision Network Management Software provides you with additional options for smooth configuration and monitoring:

- ▶ Simultaneous configuration of multiple devices
- ▶ Graphic interface with network layout
- ▶ Auto-topology discovery
- ▶ Event log
- ▶ Event handling
- ▶ Client/server structure
- ▶ Browser interface
- ▶ ActiveX control for SCADA integration
- ▶ SNMP/OPC gateway.

## Key

The symbols used in this manual have the following meanings:

▶	Listing
□	Work step
■	Subheading

# 1 Device description

## 1.1 General device description

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

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

The RSPL 20/30 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 provide 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 devices are mounted very quickly by snapping them onto the DIN rail.

You can choose various media to connect terminal devices and other infrastructure components:

- ▶ twisted pair cable
- ▶ multimode F/O
- ▶ singlemode F/O

The redundancy concept allows the network to be reconfigured quickly.

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

- ▶ a Web browser
- ▶ SSH
- ▶ Telnet
- ▶ HiDiscovery (software for setting up operation of the device)
- ▶ management software (e.g. Industrial HiVision)
- ▶ a V.24 interface (locally on the device)

The devices provide you with a large range of functions, which the manuals for the operating software inform you about. You will find these manuals as PDF files on the enclosed CD/DVD, or you can download them from the Internet on the Hirschmann product pages ([www.hirschmann.com](http://www.hirschmann.com)).

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

## 1.2 Device name

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.

Item	Characteristic	Character	Description	istic value
1 ... 4	Product	RSPL	Rail Switch Power Lite	
5 ... 6	Data rate	20	Switch fast Ethernet	
		30	Switch with gigabit ports	
7	(hyphen)	–		
8 ... 9	Number: (10/)100 Mbit/s ports	08	8 ×	(10/)100 Mbit/s ports
10 ... 11	Number: (10/)100/1000 Mbit/s ports	00	0 ×	(10/)100/1000 Mbit/s ports
		02	2 ×	(10/)100/1000 Mbit/s ports
12 ... 14	Configuration of the uplink ports	2Z6	2 ×	SFP slot for 100 Mbit/s F/O connection
		2O7	2 ×	(10/)100/1000 Mbit/s combo ports
15 ... 16	Configuration of the other ports	TT	6 ×	RJ-45 socket for 10/100 Mbit/s twisted-pair connection
		YT	2 ×	SFP slot for 100 Mbit/s F/O connection
				All others: RJ-45 socket for 10/100 Mbit/s twisted-pair connection
		ZT	4 ×	RJ-45 socket for 10/100 Mbit/s twisted-pair connection
			4 ×	SFP slot for 100 Mbit/s F/O connection
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 with conformal coating	–40 °F ... +158 °F (–40 °C ... +70 °C)
19 ... 20	Operating voltage	CC	2 voltage inputs for redundant voltage supply Rated voltage range DC 24 V ... 48 V	
		M9	1 voltage input Rated voltage range AC 110 V ... 230 V, 50 Hz ... 60 Hz Rated voltage range DC 110 V ... 250 V	

Table 1: Device name

Item	Characteristic	Characteristic value	Description
21 ... 22	Certificates and declarations <sup>a</sup>	Z9	CE, FCC, EN 61131-2, EN 60950-1
		Y9	"Z9" + cUL 508, (UL 60950-1)
		X9	"Z9" + cUL 508, (UL 60950-1), ISA 12.12 Class 1 Div. 2
		V9	"Z9" + IEC 61850-3, IEEE 1613 Substation applications
		VY	"V9" + cUL 508, (UL 60950-1) Substation applications
		VT	"V9" + cUL 508, (UL 60950-1), EN 50121-4 Sub-station and railway applications (trackside)
		T9	"Z9" + EN 50121-4 Railway applications (trackside)
		TY	"T9" + cUL 508, (UL 60950-1) Railway applications (trackside)
23 ... 24	Customization	HS	Hirschmann Standard

*Table 1: Device name*

- a. The following restrictions apply to entries in brackets:  
The UL 60950-1 certification is available on request.

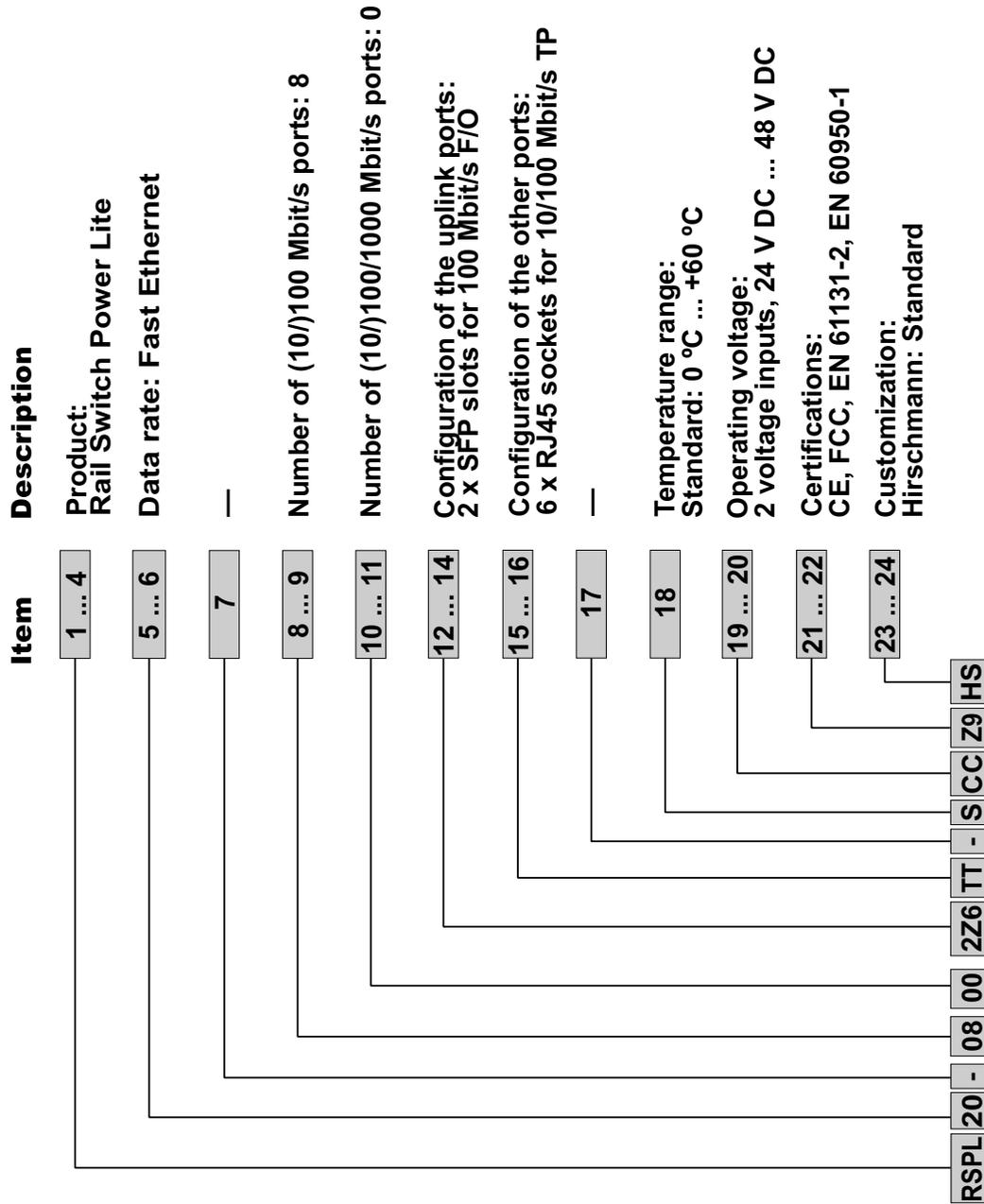


Figure 1: Example of a device name:  
RSPL20-08002Z6TT-SCCZ9HS

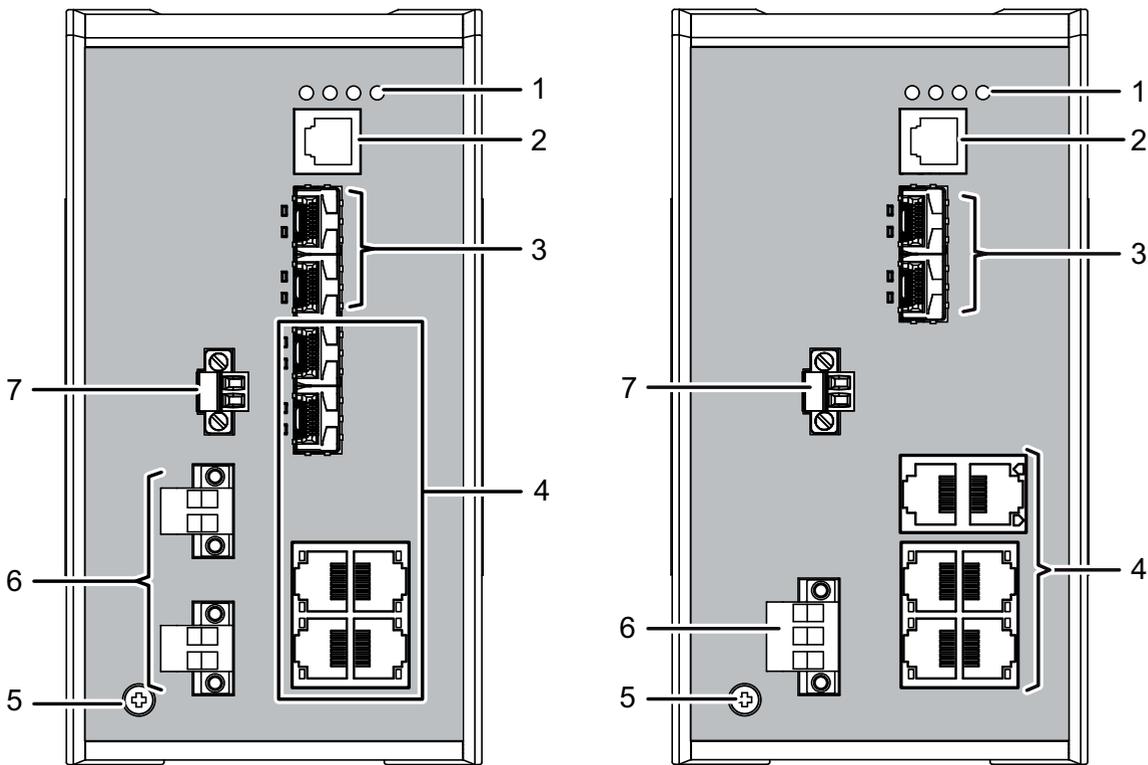
## 1.3 Combination options

Item	1 ... 4	5 ... 6 7	8 ... 9	10 ... 11	12 ... 14	15 ... 16	17 18	19 ... 20	21 ... 22	23 ... 24
Characteristic	Product	Data rate	Number: (10/)100 Mbit/s ports	Number: (10/)100/1000 Mbit/s ports	Configuration of the uplink ports	Configuration of the other ports	Temperature range	Operating voltage	Certificates and declarations	Customization
Characteristic value	RSPL	20	- 08	00	2Z6	TT; YT	- S; T; E	CC; M9	Z9; Y9; X9; V9; VY; VT; T9; TY	HS
		30	- 08	02	2O7	YT; ZT	- S; T; E	CC; M9	Z9; Y9; X9; V9; VY; VT; T9; TY	HS

Table 2: Combination options of the RSPL 20/30 device variants

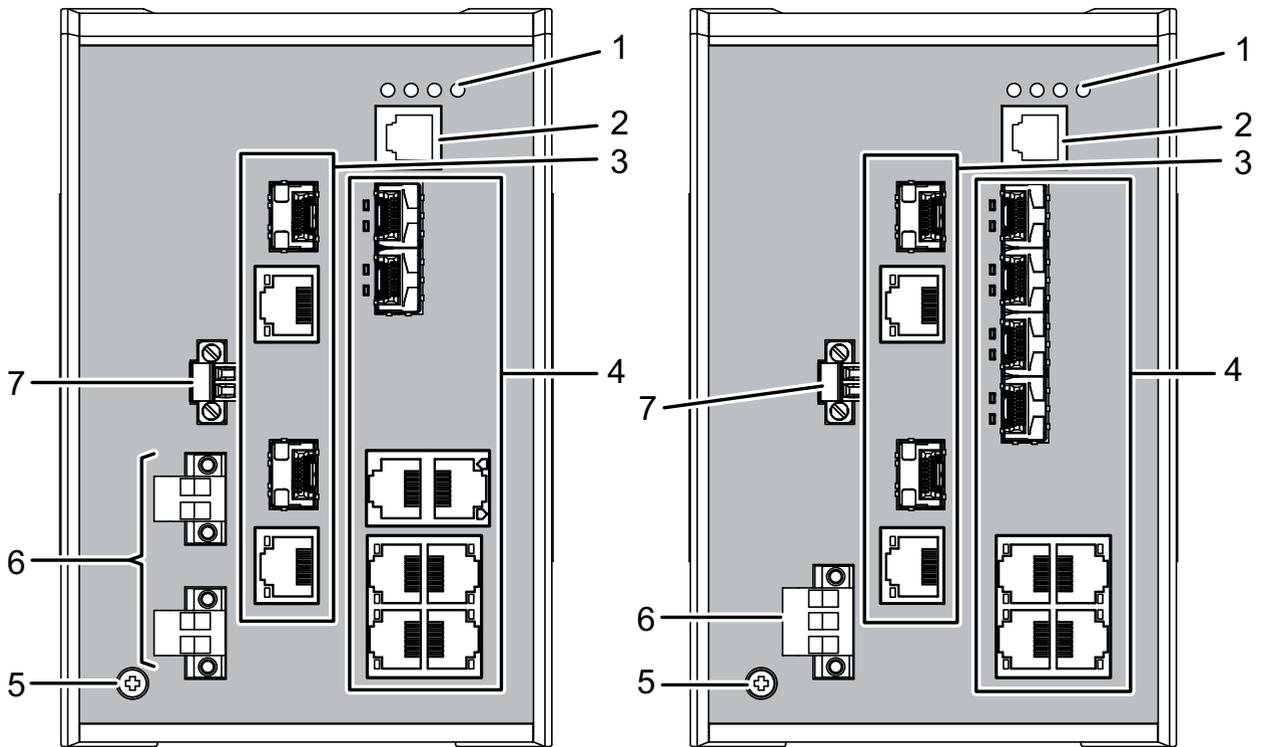
# 1.4 Device views

## 1.4.1 Front view



1	LED display elements for device status	
2	V.24 interface	
3	Uplink ports 2 × SFP slot for 100 Mbit/s F/O connection	
4	Other ports	
	alternatively, depending on device variant	Port configuration of the type: YT 2 × SFP slot for 100 Mbit/s F/O connection 4 × RJ-45 socket for 10/100 Mbit/s twisted-pair connection
		Port configuration of the type: TT 6 × RJ-45 socket for 10/100 Mbit/s twisted-pair connection
5	Grounding screw	
6	Connection for the supply voltage	
	alternatively, depending on device variant	Operating voltage of the type: CC ▶ 2 voltage inputs for redundant voltage supply ▶ 2-pin terminal block
		Operating voltage of the type: M9 ▶ 1 voltage input ▶ 3-pin terminal block
7	Connection for the signal contact	

**Table 3: Front view:**  
*left: Device variants RSPL20.....2Z6YT..CC....*  
*right: Device variants RSPL20.....2Z6TT..M9....*

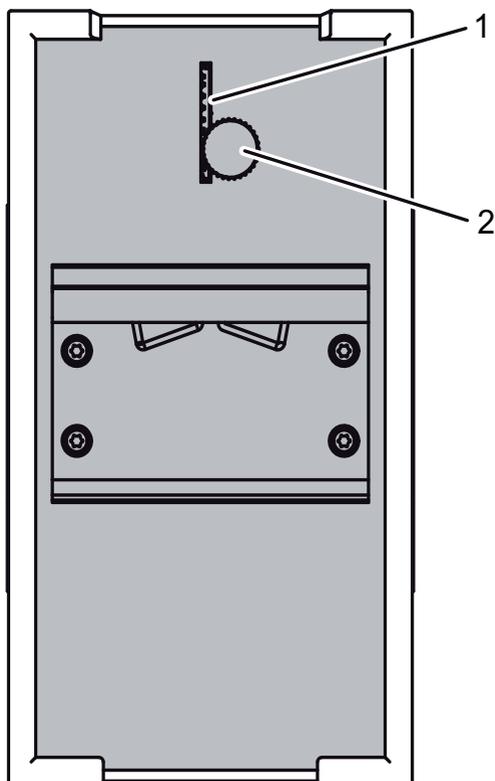


1	LED display elements for device status		
2	V.24 interface		
3	Uplink ports		
4	2 × (10/100/1000 Mbit/s combo ports		
4	alternatively, depending on device variant	Port configuration of the type:	2 × SFP slot for 100 Mbit/s F/O connection
		YT	6 × RJ-45 socket for 10/100 Mbit/s twisted-pair connection
		Port configuration of the type:	4 × SFP slot for 100 Mbit/s F/O connection
		ZT	4 × RJ-45 socket for 10/100 Mbit/s twisted-pair connection
5	Grounding screw		
6	Connection for the supply voltage		
	alternatively, depending on device variant	Operating voltage of the type:	▶ 2 voltage inputs for redundant voltage supply
		CC	▶ 2-pin terminal block
		Operating voltage of the type:	▶ 1 voltage input
		M9	▶ 3-pin terminal block
7	Connection for the signal contact		

**Table 4:** Front view:  
left: Device variants RSPL30.....2O7YT..CC....  
right: Device variants RSPL30.....2O7ZT..M9....

## 1.4.2 Rear view

---



---

1 Slot for the SD card

2 Knurled screw

---

## 1.5 Power supply

### 1.5.1 Operating voltage type M9

A 3-pin terminal block is available to supply the device.  
You will find more information on [page 29](#).

### 1.5.2 Operating voltage type CC

For the redundant supply of the device, two 2-pin terminal blocks are available.

You will find more information on [page 30](#).

## 1.6 Ethernet ports

You can connect terminal devices and other segments on the ports of the device via twisted pair cables or F/O cables.

### 1.6.1 Gigabit combo port (optional)

Alternatively, you can connect F/O (via SFP modules) or twisted pairs to a combo port.

When you use an SFP module, you get an optical interface. You thus deactivate the corresponding TP interface.

#### ■ 10/100/1000 Mbit/s twisted pair connection

These connections are RJ45 sockets.

10/100/1000 Mbit/s TP ports enable the connection of terminal devices or independent network segments according to the IEEE 802.3 10BASE-T/100BASE-TX/1000BASE-T standard.

These ports support:

- ▶ 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 socket housing is electrically connected to the front panel.

The pin assignment corresponds to MDI-X.

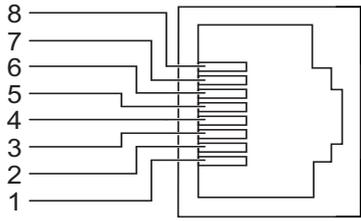
Figure	Pin	Function
	1	BI_DB+
	2	BI_DB-
	3	BI_DA+
	4	BI_DD+
	5	BI_DD-
	6	BI_DA-
	7	BI_DC+
	8	BI_DC-

Table 5: Pin assignment of a 10/100/1000 Mbit/s TP interface in MDI-X mode, RJ45 socket

## ■ 100/1000 Mbit/s F/O connection

These ports are SFP slots.

100/1000 Mbit/s F/O ports enable the connection of terminal devices or independent network segments according to the IEEE 802.3 100BASE-FX/1000BASE-SX/1000BASE-LX standard.

These ports support:

- ▶ 1000 Mbit/s full duplex
- ▶ 100 Mbit/s half-duplex mode, 100 Mbit/s full duplex mode

State on delivery:

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

### 1.6.2 10/100 Mbit/s twisted pair connection

These connections are RJ45 sockets.

10/100 Mbit/s TP ports enable the connection of terminal devices or independent network segments according to the IEEE 802.3 10BASE-T/100BASE-TX standard.

These ports support:

- ▶ 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

Delivery state: autonegotiation activated

The socket housing is electrically connected to the front panel.

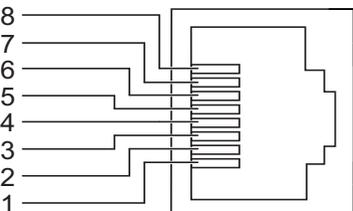
Figure	Pin	Operation
	1+2	One line pair: receiver path
	3+6	One line pair: sender path
	4,5,7,8	—

Table 6: Pin assignment of a TP/TX interface in MDI-X mode, RJ45 socket

### 1.6.3 100 Mbit/s F/O connection

These ports are SFP slots.

100 Mbit/s F/O ports enable the connection of terminal devices or independent network segments in compliance with the IEEE 802.3 100BASE-FX standard.

These ports support:

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

Default setting: Full duplex

## 1.7 Display elements

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

### 1.7.1 Device state

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



LED	Display	Color	Activity	Meaning
Power	Power supply	—	None	The supply voltage is too low.
		Yellow	Lights up	Device variants with redundant voltage supply: The supply voltages <b>1 or 2</b> are on.
			flashes 4 times a period	The software is being updated. Maintain the voltage supply.
		Green	Lights up	Device variants with redundant voltage supply: The supply voltages <b>1 and 2</b> are on. Device variants with simple voltage supply: The supply voltage is on.
Status	Device Status	—	None	Device starts Device is not ready for operation
		Green	Lights up	Device is ready for operation. Characteristics can be configured
		Red	Lights up	The device is not operational, or there are several IP addresses 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.
RM	Redundancy Manager	—	None	No redundancy configured
		Green	Lights up	Redundancy exists
			Flashes 1 time a period	Configuration error
ACA	Storage medium ACA31	—	None	No ACA present
		Green	Lights up	ACA is connected
			Flashes 3 times a period	Read/write authorization
		Yellow	Lights up	ACA is not ready for operation

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

## 1.7.2 Port state

These LED's display port-related information. During the boot phase, these LED's are used to display the status of the boot procedure.

The LEDs are directly located on the ports.

Display	Color	Activity	Meaning
Link status	—	None	No valid connection
	Green	Lights up	Valid connection
		Flashes 1 time a period	Port is switched to stand by
Yellow	Flashing	Flashes 3 times a period	Port is disabled
			Data traffic

## 1.8 Management interfaces

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

**Note:** The location on the device is described on [page 18 “Front view”](#).

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 a connection to the Command Line Interface (CLI) and the system monitor to be made.

#### VT 100 terminal settings

Speed	9,600 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.

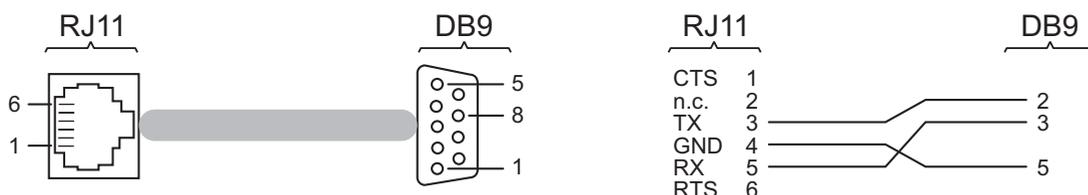


Figure 2: Pin assignment of the V.24 interface and the DB9 connector

**Note:** You will find the order number for the terminal cable, which is supplied separately, in the Technical Data chapter ([see page 48](#)).

## 1.8.2 SD card interface

**Note:** The location on the device is described on [page 20 “Rear view”](#). On the front of the device there is an LED display that informs you about the status of the 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 48](#).

Mode	Pin No.	Description	Type <sup>a</sup>	Description
SD	1	CD/DAT3	I/O/PP	Card detection / data line (bit 3)
	2	CMD	PP	Command / reply
	3	VSS1	S	Supply voltage (ground)
	4	VDD	S	Supply voltage
	5	CLK	I	Clock input
	6	VSS2	S	Supply voltage (ground)
	7	DAT0	I/O/PP	Data line (bit 0)
	8	DAT1	I/O/PP	Data line (bit 1)
	9	DAT2	I/O/PP	Data line (bit 2)

Table 7: Pin connection of SD card

- a. S - voltage supply  
I - input  
O - output, uses push-pull driver  
PP - I/O, uses push-pull driver

## 1.9 Signal contact

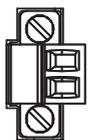


Figure 3: Signal contact: 2-pin terminal block with screw locking

In the state on delivery, the signal contact indicates the device status. It can be configured using the device management.

## 2 Device installation

The devices have been developed for practical application in a harsh industrial environment.

On delivery, the device is ready for operation.

The following steps should be performed to install and configure a switch:

- ▶ [Unpacking and checking](#)
- ▶ [Installing the SD card \(optional\)](#)
- ▶ [Installing the device and grounding](#)
- ▶ [Installing the SFP modules \(optional\)](#)
- ▶ [Connecting the terminal blocks](#)
- ▶ [Mounting the terminal blocks and switching on the supply voltage](#)
- ▶ [Connecting the data lines](#)
- ▶ [Insert data in label area](#)

### 2.1 Unpacking and checking

- Check that the contents of the package are complete ([see page 48 “Scope of delivery”](#)).
- Check the individual parts for transport damage.

### 2.2 Installing the SD card (optional)

**Note:** The location on the device is described on [page 20 “Rear view”](#). Only use the AutoConfiguration Adapter ACA31 storage medium. See [“Accessories” on page 48](#).

- Deactivate the write protection.
- Push the SD card into the slot with the serration facing downwards.
- Tighten the knurled screw to ensure that the SD card does not fall out.

## 2.3 Installing the device and grounding

### **WARNING**

#### **FIRE HAZARD**

Install the device in a fire protected enclosure according to EN 60950-1.

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

### **WARNING**

Only for device variants with operating voltage type M9:

#### **ELECTRIC SHOCK**

Only install this device in a switch cabinet or in an operating site with limited access, to which only maintenance staff have access.

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

### 2.3.1 Mounting on the DIN rail

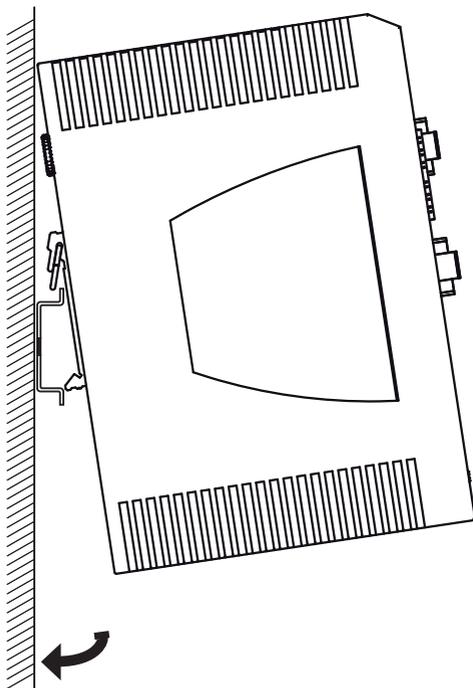


Figure 4: Mounting on the DIN rail

**Note:** Make sure there is at least 10 cm of space above and below the device.

**Note:** The shield ground wire of the twisted pair lines is connected to the front panel as a conductor.

- Mount the device on a 35 mm DIN rail in accordance with DIN EN 60175.
- Attach the upper snap-in guide of the device into the DIN rail and press the device down against the DIN rail until it snaps into place.

### 2.3.2 Grounding

The housing is grounded via the separate ground screw on the bottom left of the front panel.

The device variants with operating voltage type M9 have a protective grounding.

The device variants with operating voltage type CC have a function grounding.

- Connect the grounding to the ground screw of the device.

**Note:** For safety reasons, make sure you only connect the ground wire before you set up the other connections.

## 2.4 Installing the SFP modules (optional)



*Figure 5: Fast Ethernet / Gigabit Ethernet fiber optic SFP module*

- Before attaching an SFP module, first remove the protective cap over the socket.
- Push the SFP module with the lock closed into the socket until it latches audibly in place.

**Note:** Only use Hirschmann SFP modules ([see page 48 “Accessories”](#)).

## 2.5 Connecting the terminal blocks

### **WARNING**

#### **ELECTRIC SHOCK**

Only connect a supply voltage as described in the data plate of your device. Never insert sharp objects (small screwdrivers, wires, etc.) into the connection terminals for the supply voltage or the signal contact, and do not touch the terminals!

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

**Note:** The supply voltage is only connected with the chassis via protective elements.

#### ■ **Operating voltage type M9**

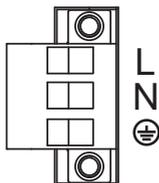


Figure 6: Operating voltage type M9: 3-pin terminal block with screw locking

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

Table 8: Operating voltage type M9: Type and size of the supply voltage, connections

To connect supply voltage, perform the following steps:

- Ensure the required conditions for connecting the supply voltage are observed (see page 5 “Supply voltage”).

## **WARNING**

### **ELECTRIC SHOCK**

Only start connecting the supply voltage if **all** the above mentioned requirements are fulfilled.

See “Supply voltage” on page 5.

Only install this device in a switch cabinet or in an operating site with limited access, to which only maintenance staff have access.

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

- Remove the power connector from the device.
- Connect the protective conductor to the protective conductor terminal.
- Connect the lines for the supply voltage to the terminals +/L and -/N.

### ■ **Operating voltage type CC**

You have the option to supply the supply voltage redundantly, with no load distribution.

Both inputs are separate from one another.

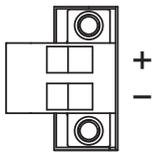


Figure 7: Operating voltage type CC: 2-pin terminal block with screw locking

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

Table 9: Operating voltage type CC: Type and size of the supply voltage, connections

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

- Ensure the required conditions for connecting the supply voltage are observed ([see page 5 “Supply voltage”](#)).



## WARNING

### ELECTRIC SHOCK

Only start connecting the supply voltage if **all** the above mentioned requirements are fulfilled.

[See “Supply voltage” on page 5.](#)

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

- Remove the power connector from the device.
- Connect the lines for the supply voltage to the + and – terminals.

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

### ■ Signal contact

For the signal contact to be connected, make sure the following requirements are met:

- ▶ The lines to be connected are voltage-free.
- ▶ The connected voltage is limited by a current limitation device or a fuse.

Observe the electrical threshold values for signal contact ([see on page 39 “General technical data”](#)).

- Connect the signal contact lines to the terminal block.

## 2.6 Mounting the terminal blocks and switching on the supply voltage

### **WARNING**

#### **ELECTRIC SHOCK**

Ground the device before connecting the power supply.

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

**Note:** Relevant for North America:

The torque for tightening the screws on the power connector to the device is 4.5 lb in (0.51 Nm).

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

- Use screws to secure the connectors to the device.
- Switch on the supply voltage.

## 2.7 Connecting the data lines

**Note:** In general, you should adhere to the following 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 cables for the data transmission between the buildings.
- ▶ When using copper cables, make sure there is a sufficient gap between the power supply cables and the data cables if they are laid over a long distance. Ideally, install the cables in separate cable channels.
- ▶ Use shielded cables.

**Note:** Make sure that you only connect optical ports of the same type with each other, e.g. single-mode ports with single-mode ports.

### 2.7.1 Gigabit combo port (optional)

Alternatively, you can connect F/O (via SFP modules) or twisted pairs to a combo port.

When you use an SFP module, you get an optical interface. You thus deactivate the corresponding TP interface.

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

You will find more information on [page 21](#).

- Install the data lines according to your requirements.

■ **100/1000 Mbit/s F/O connection**

You will find more information on [page 22](#).

- Install the data lines according to your requirements.

**2.7.2 100 Mbit/s F/O connection**

You will find more information on [page 22](#).

- Install the data lines according to your requirements.

**2.7.3 10/100 Mbit/s twisted pair connection**

You will find more information on [page 22](#).

- Install the data lines according to your requirements.

**2.8 Insert data in label area**

The information field for the IP address on the front of the device helps you to structure your network installation clearly.

### 3 Basic set-up

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:

- ▶ Entry via V.24 connection
- ▶ Entry using the HiDiscovery protocol via the HiDiscovery or Industrial HiVision application
- ▶ Configuration via BOOTP
- ▶ Configuration via DHCP (Option 82)
- ▶ AutoConfiguration Adapter

Further information on the basic settings of the device can be found in the user manual on the CD/DVD.

#### ■ **Default settings**

- ▶ IP address: The device looks for the IP address using DHCP
- ▶ Management password:  
user, password: public (read only)  
admin, password: private (read and write)
- ▶ V.24 data rate: 9,600 Baud
- ▶ Ethernet ports: link status is not evaluated (signal contact)
- ▶ Optical ports: Full duplex  
TP ports: Autonegotiation
- ▶ RSTP (Rapid Spanning Tree) activated

## 4 Monitoring the ambient temperature

Only operate the device up to the specified maximum ambient temperature. See [“General technical data” on page 39](#).

The ambient temperature is the temperature of the air at a distance of 5 cm from the device. It depends on the installation conditions of the device, e.g. 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 inner temperature of the device. It is higher than the ambient temperature. The maximum inner temperature of the device named in the technical data is a guideline that indicates to you that the maximum ambient temperature has possibly been exceeded.

## 5 Maintenance and service

- ▶ When designing this device, Hirschmann was largely able to forego using parts that are subject to wear and tear. The parts subject to wear are designed to last longer than the lifetime of the product when it is operated properly. Operate this device according to the specifications (see “[Technical data](#)”).
- ▶ 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 to improve and develop our software. You should regularly check whether there is a new version of the software that provides you with additional benefits. You will find software information and downloads on the product pages of the Hirschmann website.
- ▶ 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 will find information about the complaints and returns procedures in the Internet under

<http://www.beldensolutions.com/en/Service/Repairs/index.phtml> .

## 6 Disassembly

### 6.1 Disassembling the device

- Disconnect the data lines.
- Switch off the supply voltage.
- Disconnect the terminal blocks.
- Disconnect the grounding.

**Note:** For safety reasons, make sure you disconnect the grounding from all connections last.

- To remove the device from the DIN rail, press the device downwards and pull it out from under the DIN rail.

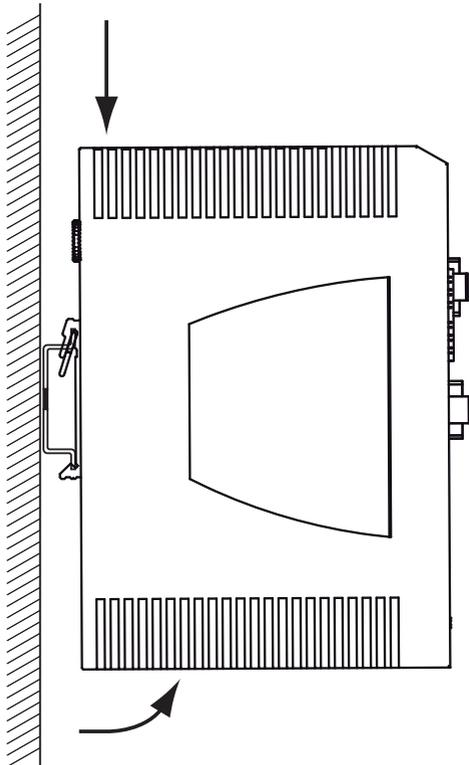


Figure 8: Removal from the DIN rail

## 6.2 Disassembling the SFP modules

- Pull the SFP module out of the socket by means of the opened lock.

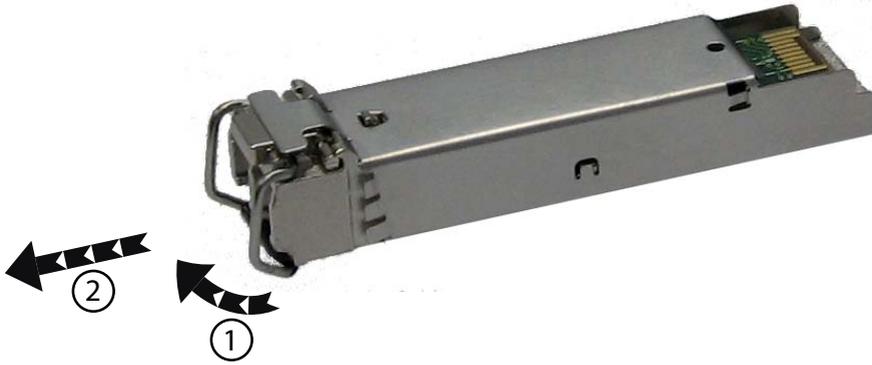


Figure 9: Deinstalling an SFP module

# 7 Technical data

## ■ General technical data

Dimensions W × H × D	RSPL 20/30	See "Dimension drawings" on page 41.		
Weight	RSPL-20-...	approx. 1.0 kg		
	RSPL-30-...	ca. 1,2 kg		
Power supply Power supply type CC	Nominal voltage DC	24 V ... 48 V		
	Voltage range DC incl. maximum tolerances	18 V ... 60 V		
	Connection type	2-pin terminal block		
	Power failure bypass	> 10 ms at 20.4 V DC		
	Overload current protection at input	Non-replaceable fuse		
	Back-up fuse	Nominal rating:	< 4 A	
		Characteristic:	slow blow	
Power supply Power supply type M9	Nominal voltage AC	110 V ... 230 V, 50 Hz ... 60 Hz		
	Voltage range AC incl. maximum tolerances	88 V ... 265 V, 47 Hz ... 63 Hz		
	Nominal voltage DC	110 V ... 250 V		
	Voltage range DC incl. maximum tolerances	88 V ... 320 V		
	Connection type	3-pin terminal block		
	Power failure bypass	> 10 ms at 98 V AC		
	Overload current protection at input	Non-replaceable fuse		
Climatic conditions during operation	Surrounding air temperature	Devices with operating temperature type S (standard): +32 °F ... +140 °F (0 °C ... +60 °C) <sup>a</sup>		
		Devices with operating temperature types E and type T (extended): -40 °C ... +70 °C <sup>b</sup>		
		-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 type S (standard): 83 °C		
	Devices with operating temperature types E and type T (extended): 93 °C			
Humidity	5 % ... 95 % (non-condensing)			
Air pressure	minimum 700 hPa (+3000 m) maximum 1060 hPa (-400 m)			

Climatic conditions during storage	Surrounding air temperature	-40 °F ... +185 °F (-40 °C ... +85 °C)
	Humidity	5 % ... 95 % (non-condensing)
	Air pressure	minimum 700 hPa (+3000 m) maximum 1060 hPa (-400 m)
Signal contact	Switching current	max. 1 A, SELV
	Switching voltage	max. 60 V DC or max. 30 V AC, SELV
Pollution degree		2
Protection classes	Laser protection	Class 1 in compliance with IEC 60825-1
	Degree of protection	IP 20

- a. Hirschmann recommends to use SFP transceivers with the "EEC" extension.
- b. Only use SFP transceivers with the "EEC" extension, otherwise the standard temperature range applies.
- c. Only use SFP transceivers with the "EEC" extension, otherwise the standard temperature range applies.

## ■ Dimension drawings

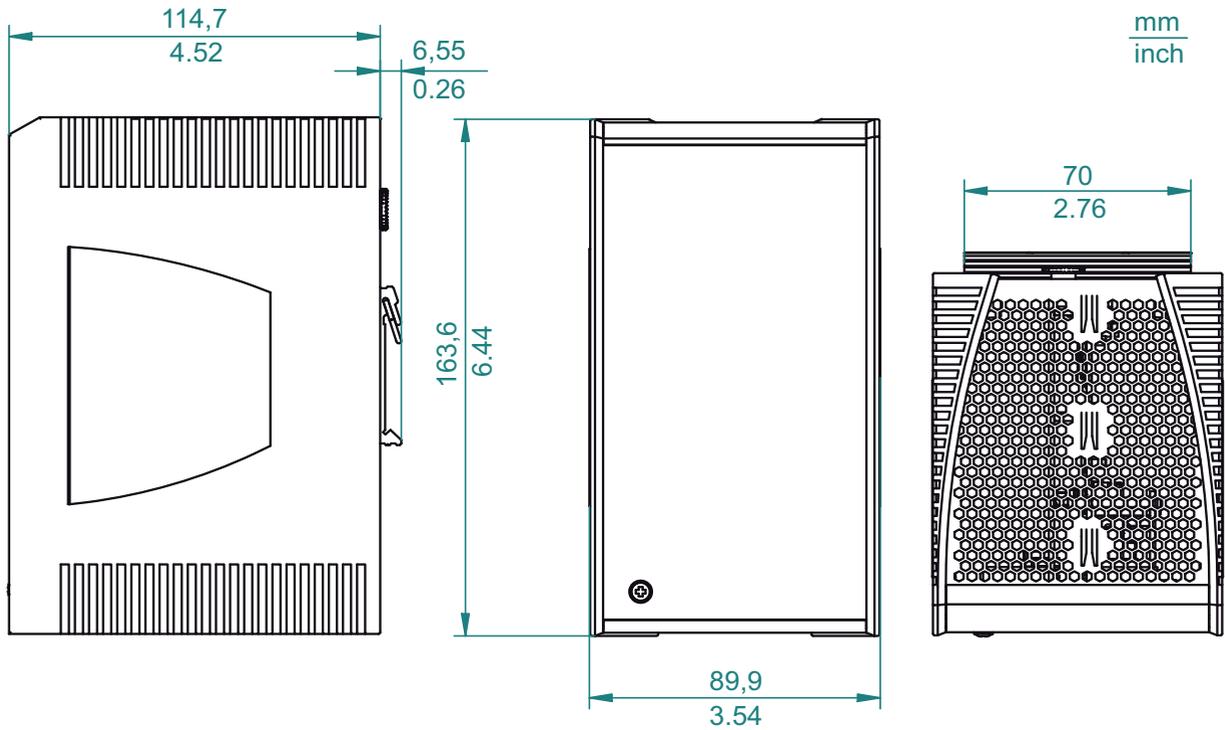


Figure 10: Dimensions of device variants RSPL20-...

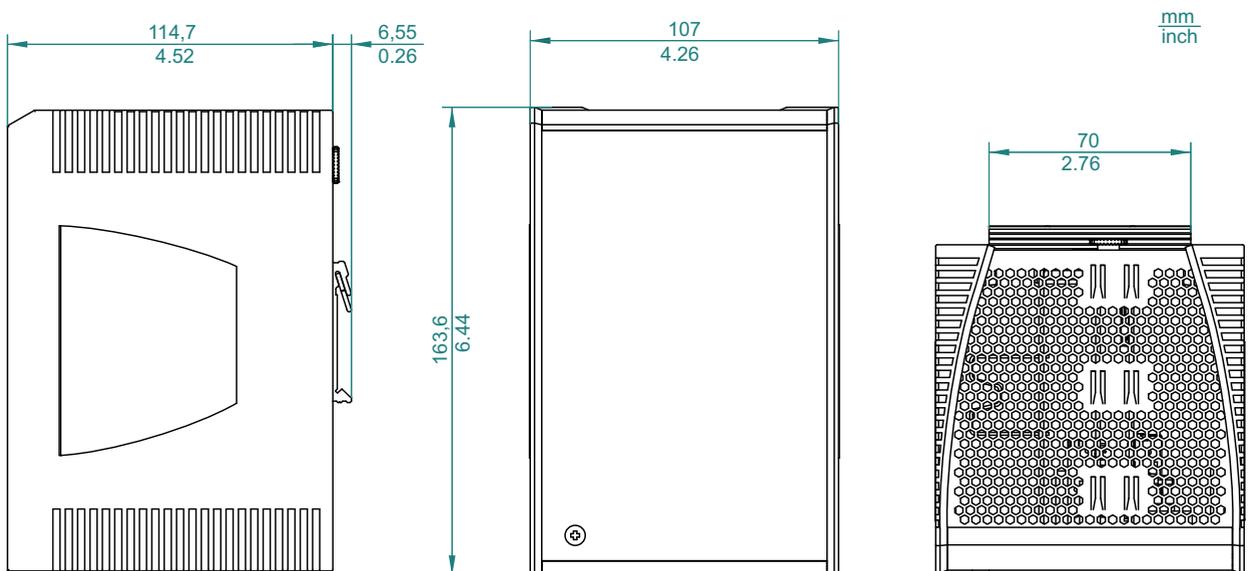


Figure 11: Dimensions of device variants RSPL30-...

## ■ EMC and immunity

Stability		Standard applications <sup>a</sup>	Railway applications (trackside) <sup>b</sup>	Sub-station applications <sup>c</sup>
IEC 60068-2-6, test Fc	Vibration	—	—	2 Hz ... 9 Hz with 3 mm amplitude
		5 Hz ... 8.4 Hz with 3.5 mm amplitude	5 Hz ... 8.4 Hz with 3.5 mm amplitude	5 Hz ... 8.4 Hz with 3.5 mm amplitude
		8.4 Hz ... 150 Hz with 1 g	8.4 Hz ... 150 Hz with 1 g	1 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

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

b. EN 50121-4 – applies to devices with the certification codes VT, T9, TY

c. EN 61850-3, IEEE 1613 – applies to devices with the certification codes V9, VY, VT

<b>EMC emitted interference</b>		<b>Standard applications <sup>a</sup></b>	<b>Railway applications (trackside) <sup>b</sup></b>	<b>Sub-station applications <sup>c</sup></b>
<b>Emitted interference</b>				
EN 55022		Class A	Class A	Class A
GL Guidelines		—	—	—
FCC 47 CFR Part 15		Class A	Class A	Class A
EN 61000-6-4		Fulfilled	Fulfilled	Fulfilled
<b>Conducted interference</b>				
EN 55022	AC and DC supply connections	Class A	Class A	Class A
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 55022	Telecommunication connections	Class A	Class A	Class A
EN 61000-6-4	Telecommunication connections	Fulfilled	Fulfilled	Fulfilled

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

b. EN 50121-4 – applies to devices with the certification codes VT, T9, TY

c. EN 61850-3, IEEE 1613 – applies to devices with the certification codes V9, VY, VT

EMC interference immunity		Standard applications <sup>a</sup>	Railway applications (trackside) <sup>b</sup>	Sub-station applications <sup>c</sup>
<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	80 MHz ... 3000 MHz	10 V/m	20 V/m	10 V/m
IEEE 1613	80 MHz ... 1000 MHz	—	—	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>Voltage surges - DC supply connection</b>				
EN 61000-4-5 IEEE 1613	line/ground	± 2 kV	± 2 kV	± 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 IEEE 1613	line/ground	± 2 kV	± 2 kV	± 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>Line-conducted interference voltages</b>				
EN 61000-4-6	150 kHz ... 80 MHz	10 V	10 V	10 V

<b>EMC interference immunity</b>		<b>Standard applications <sup>a</sup></b>	<b>Railway applications (trackside) <sup>b</sup></b>	<b>Sub-station applications <sup>c</sup></b>
<b>Damped vibration - AC/DC supply connection</b>				
EN 61000-4-12 IEEE C37.90.1	line/ground	—	—	2.5 kV
EN 61000-4-12 IEEE C37.90.1	line/line	—	—	1 kV
<b>Damped vibration - data line</b>				
EN 61000-4-12 IEEE C37.90.1	line/ground	—	—	2.5 kV
EN 61000-4-12	line/line	—	—	1 kV
<b>Impulse-shaped magnetic fields</b>				
EN 61000-4-9		—	300 A/m	300 A/m

- a. EN 61131-2, CE, FCC – applies to all devices
- b. EN 50121-4 – applies to devices with the certification codes VT, T9, TY
- c. EN 61850-3, IEEE 1613 – applies to devices with the certification codes V9, VY, VT

## ■ Network range

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

Product code M-SFP-...	Wave length	Fiber	System attenuation	Example for F/O line length <sup>a</sup>	Fiber attenuation	BLP <sup>b</sup> /dispersion
-SX/LC...	MM 850 nm	50/125 μm	0-7.5 dB	0-550 m	3.0 dB/km	400 MHz·km
-SX/LC...	MM 850 nm	62.5/125 μm	0-7.5 dB	0-275 m	3.2 dB/km	200 MHz·km
-MX/LC	MM 1310 nm	50/125 μm	0-8 dB	2 km <sup>c</sup>	1.0 dB/km	500 MHz·km
-MX/LC	MM 1310 nm	62.5/125 μm	0-8 dB	1 km	1.0 dB/km	500 MHz·km
-LX/LC...	MM 1310 nm <sup>d</sup>	50/125 μm	0-10.5 dB	0-550 m	1.0 dB/km	800 MHz·km
-LX/LC...	MM 1310 nm <sup>d</sup>	62.5/125 μm	0-10.5 dB	0-550 m	1.0 dB/km	500 MHz·km
-LX/LC...	SM 1310 nm	9/125 μm	0-10.5 dB	0-20 km <sup>e</sup>	0.4 dB/km	3.5 ps/(nm·km)
-LX+/LC...	SM 1310 nm	9/125 μm	5-20 dB	14-42 km	0.4 dB/km	3.5 ps/(nm·km)
-LH/LC...	LH 1550 nm	9/125 μm	5-22 dB	23-80 km	0.25 dB/km	19 ps/(nm·km)
-LH+/LC	LH 1550 nm	9/125 μm	15-30 dB	71-108 km	0.25 dB/km	19 ps/(nm·km)
-LH+/LC	LH 1550 nm	9/125 μm	15-30 dB	71-128 km	0.21 dB/km (typically)	19 ps/(nm·km)

Table 10: Fiber port 1000BASE-FX (SFP fiber optic Gigabit Ethernet Transceiver)

- a. including 3 dB system reserve when compliance with the fiber data is observed
- b. The bandwidth length product cannot be used to calculate the expansion.
- c. Distances of up to 3 km reachable, 1000 MHz·km (1300 nm)
- d. With F/O adapter compliant with IEEE 802.3-2002 clause 38 (single-mode fiber offset-launch mode conditioning patch cord)
- e. including 2.5 dB system reserve when compliance with the fiber data is observed

Product code M-SFP-BIDI...	Wave length TX	Wave length RX	Fiber	System attenuation	Example for F/O line length <sup>a</sup>	Fiber attenuation	Dispersion
Type A LX/LC EEC	SM 1310 nm	1550 nm	9/125 μm	0-11 dB	0-20 km	0.4 dB/km	3.5 ps/(nm·km)
Type B LX/LC EEC	SM 1550 nm	1310 nm	9/125 μm	0-11 dB	0-20 km	0.25 dB/km	19 ps/(nm·km)
Type A LH/LC EEC	LH 1490 nm	1590 nm	9/125 μm	5-24 dB	23-80 km	0.25 dB/km	19 ps/(nm·km)
Type B LH/LC EEC	LH 1590 nm	1490 nm	9/125 μm	5-24 dB	23-80 km	0.25 dB/km	19 ps/(nm·km)

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

- a. including 3 dB system reserve when compliance with the fiber data is observed

Product code M-FAST- SFP-...	Wave length	Fiber	System attenuation	Example for F/O line length <sup>a</sup>	Fiber attenuation	BLP/ dispersion
-MM/LC...	MM 1310 nm	50/125 μm	0-8 dB	0-5 km	1.0 dB/km	800 MHz*km
-MM/LC...	MM 1310 nm	62.5/125 μm	0-11 dB	0-4 km	1.0 dB/km	500 MHz*km
-SM/LC...	SM 1310 nm	9/125 μm	0-13 dB	0-25 km	0.4 dB/km	3.5 ps/(nm*km)
-SM+/LC...	SM 1310 nm	9/125 μm	10-29 dB	25-65 km	0.4 dB/km	3.5 ps/(nm*km)
-LH/LC...	SM 1550 nm	9/125 μm	10-29 dB	47-104 km	0.25 dB/km	19 ps/(nm*km)
-LH/LC...	SM 1550 nm	9/125 μm	10-29 dB	55-140 km	0.18 dB/km <sup>b</sup>	18 ps/(nm*km)

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

- a. including 3 dB system reserve when compliance with the fiber data is observed
- b. with ultra-low-loss optical fiber

MM = Multimode, SM = Singlemode, LH = Singlemode Longhaul

#### TP port

Length of a twisted pair segment                      max. 100 m/328 ft (for cat5e cable)

*Table 13: TP port 10BASE-T / 100BASE-TX / 1000BASE-T*

## ■ Power consumption/power output, order numbers

The order numbers correspond to the product codes of the devices.  
See “Device name” on page 14.

Device name	Maximum power consumption	Power output
RSPL20-08002Z6TT.....	8 W	27 BTU (IT)/h
RSPL20-08002Z6YT.....	10 W	34 BTU (IT)/h
RSPL30-08022O7YT.....	14 W	47 BTU (IT)/h
RSPL30-08022O7ZT.....	16 W	55 BTU (IT)/h

## ■ Scope of delivery

Number	Article
1 ×	Device
1 ×	2-pin terminal block for signal contact
1 ×	3-pin terminal block for supply voltage (Only for device variants with operating voltage type M9)
2 ×	2-pin terminal block for supply voltage (for device variants with operating voltage type CC only)
1 ×	Installation user manual
1 ×	CD/DVD with manual

## ■ Accessories

**Note:** Please note that products recommended as accessories may have characteristics that do not fully match those of the corresponding product. This may limit their possible usage in the overall system.

Name	Order number
Terminal cable	943 301-001
AutoConfiguration Adapter ACA 31	942 074-001
For device variants with operating voltage type M9: 3-pin terminal block (50 pieces) for supply voltage	943 845-008
For device variants with operating voltage type CC: 2-pin terminal block (50 pieces) for supply voltage	943 845-009
2-pin terminal block (50 pieces) for signal contact	943 845-010
Power Cord	942 000-001
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
Industrial HiVision Network Management software	943 156-xxx
Gigabit Ethernet SFP transceiver	Order number
M-SFP-SX/LC	943 014-001
M-SFP-SX/LC EEC	943 896-001
M-SFP-MX/LC	942 035-001
M-SFP-LX/LC	943 015-001

<b>Gigabit Ethernet SFP transceiver</b>	<b>Order number</b>
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
<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
<b>Fast-Ethernet SFP transceiver</b>	<b>Order number</b>
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

## ■ Underlying norms and standards

<b>Name</b>	
EN 61000-6-2	Generic norm – immunity in industrial environments
EN 55022	IT equipment – radio interference characteristics
EN 61131-2	Programmable logic controllers
EN 60950-1	Safety for the installation of IT equipment
cUL 60950-1	Safety for Information Technology Equipment
FCC 47 CFR Part 15	Code of Federal Regulations
cUL 508	Safety for Industrial Control Equipment
IEC/EN 61850-3	Communications networks and systems in substations
EN 50121-4	Railway applications - EMC - emitted interference and interference immunity for signal and telecommunication systems
ISA 12.12.01, CSA C22.2 no. 213	Electrical Equipment for Use in Class I and Class II, Div.2 and Class III Hazardous (Classified) Locations
IEEE 1613	Standard Environment and Testing Requirements for Communication Networking Devices in Electric Power Substations
IEEE 802.1 AB	Station and Media Access Control Connectivity Discovery
IEEE 802.1 D	Media access control (MAC) bridges (includes IEEE 802.1p Priority and Dynamic Multicast Filtering, GARP, GMRP)
IEEE 802.1 Q	Virtual Bridged Local Area Networks (VLAN Tagging, GVRP)
IEEE 802.3	Ethernet

*Table 14: List of norms and standards*

The device generally fulfills the norms and standards named in their current versions.

The device has a certification based on a specific standard only if the certification indicator appears on the housing.





# A Further Support

## ■ Technical Questions

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

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

Contact our support at <https://hirschmann-support.belden.eu.com>

You can contact us

in the EMEA region at

- ▶ Tel.: +49 (0)1805 14-1538
- ▶ E-mail: [hac.support@belden.com](mailto:hac.support@belden.com)

in the America region at

- ▶ Tel.: +1 (717) 217-2270
- ▶ E-mail: [inet-support.us@belden.com](mailto:inet-support.us@belden.com)

in the Asia-Pacific region at

- ▶ Tel.: +65 6854 9860
- ▶ E-mail: [inet-ap@belden.com](mailto:inet-ap@belden.com)

## ■ Hirschmann Competence Center

The Hirschmann Competence Center is ahead of its competitors:

- ▶ Consulting incorporates comprehensive technical advice, from system evaluation through network planning to project planning.
- ▶ Training offers you an introduction to the basics, product briefing and user training with certification.

The current technology and product training courses can be found at <http://www.hicomcenter.com>

- ▶ Support ranges from the first installation through the standby service to maintenance concepts.

With the Hirschmann Competence Center, you have decided against making any compromises. Our client-customized package leaves you free to choose the service components you want to use.

Internet:

<http://www.hicomcenter.com>



**HIRSCHMANN**

---

A **BELDEN** BRAND