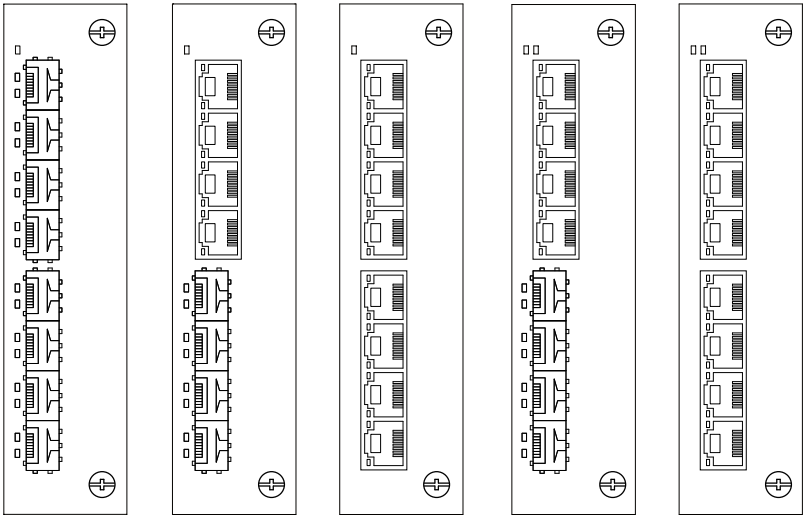
HIRSCHMANN
A BELDEN BRAND

User Manual

Installation
Industrial Ethernet Rail Switch Power Media Module
RSPM



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Germany

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 “Installation” user manual that is not supplied with your device as a printout can be found at:
doc.hirschmann.com

Important information

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.

Warning symbols

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.
La présence de ce symbole sur une étiquette « Danger » ou « Avertissement » signale un risque d'électrocution qui provoquera des blessures physiques en cas de non-respect des consignes de sécurité.

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.
La présence de ce symbole sur une étiquette « Danger » ou « Avertissement » signale un risque d'électrocution qui provoquera des blessures physiques en cas de non-respect des consignes de sécurité.

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.
Ce symbole indique le risque de surfaces chaudes sur l'équipement. En relation avec les consignes de sécurité, le non-respect des instructions entraînera inévitablement des blessures.

⚠ DANGER

DANGER indicates a hazardous situation which, if not avoided, will result in death, serious injury, or equipment damage.

⚠ DANGER

DANGER indique une situation dangereuse qui, si elle n'est pas évitée, entraînera la mort, des blessures graves ou des dommages matériels.

⚠ WARNING

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

⚠ AVERTISSEMENT

AVERTISSEMENT indique une situation dangereuse qui, si elle n'est pas évitée, peut entraîner la mort, des blessures graves ou des dommages matériels.

⚠ CAUTION

CAUTION indicates a hazardous situation which, if not avoided, could result in minor or moderate injury, or equipment damage.

⚠ ATTENTION

ATTENTION indique une situation dangereuse qui, si elle n'est pas évitée, peut entraîner des blessures légères ou des blessures modérées ou des dommages matériels.

NOTICE

NOTICE is used to address practices not related to physical injury which could result in equipment damage.

AVIS

AVIS est utilisé pour indiquer des pratiques non liées à des blessures corporelles qui peuvent entraîner des dommages matériels.

Contents

1. 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.

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

1.1. 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.

1.2. Intended use

- Use the product only for the application cases described in the Hirschmann Automation and Control GmbH product information, including this manual.
- This equipment is not suitable for use in locations where children are likely to be present.
- Operate the product only according to the technical specifications, see *General data* on page 41.
- Connect to the product only components suitable for the requirements of the specific application case.

1.3. Electrical connections

1.3.1. 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.

1.4. ESD Guidelines

The modules are equipped with electrostatically sensitive components. These can be destroyed, or their life cycles reduced, by the effects of an electrical field or by a charge equalization if the connections are touched. You will find information about electrostatically endangered assemblies in DIN EN 61340-5-1 (2007-08) and DIN EN 61340-5-2 (2007-08).

1.5. Relevant for use in explosion hazard areas (Hazardous Locations, Class I, Division 2)

The **relay connections** are to be installed and used within their Entity Parameters as per Control Drawing 000182303DNR.

WARNING: Explosion Hazard – Substitution of any components may impair suitability for Class I, Division 2.

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

WARNING: Explosion Hazard – Do not disconnect equipment unless power has been switched off or the area is known to be non-hazardous.

AVERTISSEMENT : Risque d'explosion - Ne pas débrancher l'équipement tant que le circuit est sous tension à moins que l'emplacement soit connu pour ne contenir aucune concentration de gaz inflammable.

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

Only allowed for RSPE/RSPM model No´s. which are individually labelled "FOR USE IN HAZARDOUS LOCATIONS"

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

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

WARNING - EXPLOSION HAZARD – SUBSTITUTION OF ANY COMPONENTS MAY IMPAIR SUITABILITY FOR HAZARDOUS LOCATIONS OR EXPLOSIVE ATMOSPHERES.

WARNING - EXPLOSION HAZARD - DO NOT DISCONNECT EQUIPMENT UNLESS POWER HAS BEEN SWITCHED OFF OR THE AREA IS KNOWN TO BE NON-HAZARDOUS.

AVERTISSEMENT - RISQUE D'EXPLOSION - NE PAS DEBRANCHER TANT QUE LE CIRCUIT EST SOUS TENSION A MOINS QUE L'EMPLACEMENT SOIT CONNU POUR NE CONTENIR AUCUNE CONCENTRATION DE GAZ INFLAMMABLE.

AVERTISSEMENT - RISQUE D'EXPLOSION - LA SUBSTITUTION DE TOUT COMPOSANT PEUT RENDRE CE MATERIEL INCOMPATIBLE POUR UNE UTILISATION EN CLASSE I, DIVISION 2.

Control Drawing for RSPE devices according to Class 1 Division 2 Hazardous Locations		
Rev.: 2	Doc. No.: 000182303DNR	Page 1 of 2

Ordinary Location, Non-Hazardous Area, non-explosive atmosphere

Explosive Atmosphere

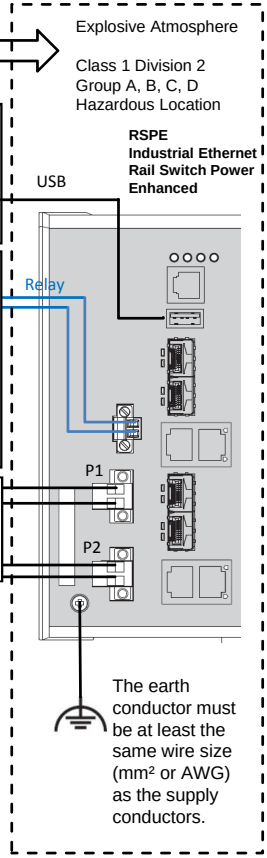
Class 1 Division 2
Group A, B, C, D
Hazardous Location

WARNING! The USB is for temporary connection only, for maintenance use. Do not use, connect or disconnect unless the area is known to be non-hazardous. Connection or disconnection in an explosive atmosphere could result in an explosion!

Relay contacts:
Equipment with non-incendive field wiring parameters.
Polarity is not relevant.
THE RELAY TERMINALS ARE DEPENDENT UPON THE FOLLOWING ENTITY PARAMETERS:

U_i = 30V **I_i = 90mA**
C_i = 2nF **L_i = 1µH**

Power Supply connectors



Temperature Code: T4
Ambient Temperature rating:
Ta : 0° C to +60° C for "S" temperature types
Ta: -40 C to +70° C for "T" or "E" temperature types
Ta: -20° C to +70° C for "U" or "G" temperature types (only for RSPE)
(Refer to the temperature code of the type designation on the device)

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

The maximum cable length has to be determined as follows:
(a) max. Cable Length < (L_a - L_i) / Cable $_L$
("Cable $_L$ " denotes the inductance per unit length of used cable) **and**
(b) max. Cable Length < (C_a - C_i) / Cable $_C$
("Cable $_C$ " denotes the capacitance per unit length of used cable).

The lower value of (a) and (b) is to apply.

Control Drawing for RSPE devices according to Class 1 Division 2 Hazardous Locations		
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1.6. ATEX directive 2014/34/EU – specific regulations for safe operation

Relevant for RSPM devices when operating in explosive gas atmospheres according to ATEX Directive 2014/34/EU, the following applies:

- List of standards:
  - EN IEC 60079-0:2018
  - EN 60079-7:2015 + A1:2018
  - EN IEC 60079-15:2019
- Use only device variants featuring supply voltage with characteristic value CC.
- Make sure that the device has the following label:

  II 3G Ex ec IIC T4 Gc for RSPM types

  DEKRA 15ATEX0016 X

  Ambient temperature range and parameter:

  T4: 0 °C ≤ Ta ≤ +60 °C (+32 °F ≤ Ta ≤ +140 °F) for "S" types, or

  T4: -40 °C ≤ Ta ≤ +70 °C (-40 °F ≤ Ta ≤ +158 °F) for "T" or "E" types, or

  T4: -20 °C ≤ Ta ≤ +70 °C (-4 °F ≤ Ta ≤ +158 °F) for "U" or "G" types (only for RSPE)

  (item 14 of nomenclature breakdown for RSPM types)
- The equipment shall only be used in an area of not more than pollution degree 2, as defined in IEC 60664-1.

- The modules shall be installed in a suitable enclosure in accordance with IEC 60079-0 providing a degree of protection of at least IP54 according to IEC 60529, taking into account the environmental conditions under which the equipment will be used.
- When the temperature under rated conditions exceeds +70 °C (+158 °F) at the cable or the conduit entry point, or +80 °C (+176 °F) at the branching point of the conductors, take measures so that the temperature specification of the selected cable and cable entries is in compliance with the actual measured temperature values.
- Provisions shall be made to prevent the rated voltage from being exceeded by transient disturbances of more than 119 V.
- Connectors shall be connected or disconnected exclusively in dead-voltage state.

⚠ The USB port shall remain disconnected.

1.7. IECEx – Certification Scheme for Explosive Atmospheres

For RSPM devices labeled with an IECEx certificate number, the following applies:

- List of standards:
  - IEC 60079-0:2017
  - IEC 60079-7:2017
  - IEC 60079-15:2017
- Make sure that the device has the following label:

Ex ec IIC T4 Gc for RSPM types

IECEx: DEK 15.0013 X

Ambient temperature range and parameter:

T4: 0 °C ≤ Ta ≤ +60 °C (+32 °F ≤ Ta ≤ +140 °F) for "S" types, or

T4: -40 °C ≤ Ta ≤ +70 °C (-40 °F ≤ Ta ≤ +158 °F) for "T" or "E" types, or

T4: -20 °C ≤ Ta ≤ +70 °C (-4 °F ≤ Ta ≤ +158 °F) for "U" or "G" types (only for RSPE)

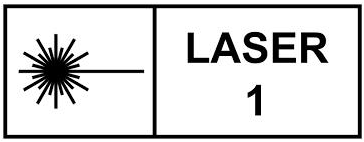
(item 14 of nomenclature breakdown for RSPM types)

- The equipment shall only be used in an area of not more than pollution degree 2, as defined in IEC 60664-1.
- The equipment shall be installed in a suitable enclosure according to IEC 60079-0 providing a degree of protection of at least IP54 according to IEC 60529, taking into account the environmental conditions under which the equipment will be used.
- When the temperature under rated conditions exceeds +70 °C (+158 °F) at the cable or conduit entry point, or +80 °C (+176 °F) at the branching point of the conductors, the temperature specification of the selected cable and cable entries shall be in compliance with the actual measured temperature values.
- Provisions shall be made to prevent the rated voltage from being exceeded by transient disturbances of more than 119 V.
- Connectors shall be connected or disconnected exclusively in dead-voltage state.

⚠ The USB port shall remain disconnected.

1.8. LED or laser components

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



WARNING: Class 1 laser product according to IEC 60825-1:2014 and EN 0825-1:2014 + A11:2021.
Complies with 21 CFR 1040.10 and 1040.11 except for conformance with IEC 60825-1 Ed. 3., as described in “Laser Notice No. 56”, dated May 8, 2019.

AVERTISSEMENT : Produit laser de classe 1 selon les normes CEI 60825-1:2014 et EN 0825-1:2014 + A11:2021.
Conforme aux normes 21 CFR 1040.10 et 1040.11, à l'exception de la conformité à la norme CEI 60825-1 Éd. 3., comme décrit dans le document « Laser Notice No. 56 » du 8 mai 2019.

1.9. Recycling note

The symbol of a crossed-out wheeled bin shown on the device indicates that the device **MUST NOT** be disposed of with household waste at the end of its service life.

After its service life, the used device must be disposed of properly as electronic waste in accordance with the locally applicable disposal regulations.

End users are responsible for deleting personal data from the used device prior to disposal.

End users are obliged to separate used batteries and accumulators that are not enclosed by the used device from the used device in a non-destructive manner before disposing of the used device. The used batteries and accumulators must be handed in for separate collection. This does not apply if the used device is handed in for reuse.

2. Approvals

2.1. CE marking

The statements in this chapter refer only to media modules which are correctly mounted in a RSPE basic device. For more information, see *Mounting a media module* on page 35.

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

- **2011/65/EU and 2015/863/EU (RoHS)**
  Directive of the European Parliament and of the Council on the restriction of the use of certain hazardous substances in electrical and electronic equipment.
- **2014/30/EU (EMC)**
  Directive of the European Parliament and of the Council on the harmonisation of the laws of the Member States relating to electromagnetic compatibility.
- **2014/34/EU (ATEX)**
  Directive of the European Parliament and the Council on the harmonisation of the laws of the Member States relating to equipment and protective systems intended for use in potentially explosive atmospheres.

  The ATEX Directive applies exclusively to the device variants labeled with an ATEX certificate number:

  ATEX directive 2014/34/EU – specific regulations for safe operation on page 15

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

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

You can download the PDF file of the EU conformity declaration at *https://www.doc.hirschmann.com/certificates.html*.

The device can be used in industrial environments.

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

For more information on technical standards, see *Underlying technical standards* on page 54.

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.

AVERTISSEMENT : Ce produit est un équipement de la classe A. Ce produit peut provoquer des interférences dans les habitations. Dans ce cas, l'exploitant peut être tenu de procéder aux mesures appropriées.

2.2. FCC note

The statements in this chapter refer only to media modules which are correctly mounted in a RSPE basic device. For more information, see *Mounting a media module* on page 35.

Supplier's Declaration of Conformity

47 CFR § 2.1077 Compliance Information

RSPM

U.S. Contact Information

Belden Inc. – 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.

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.

3. Description

The device is designed for the special requirements of industrial automation. The device meets the relevant industry standards, provides very high operational reliability, even under extreme conditions, and also long-term reliability and flexibility.

The RSPM media modules are designed for exclusive use in a RSPE basic device.

By using media modules, you obtain up to 16 additional Fast Ethernet ports.

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

- Support of PoE(+)
- Types of connectors
- Temperature range
- Certifications

You can choose various media to connect to the end devices and other network components:

- Twisted-pair cable
- Multimode F/O (Fiber Optic)
- Singlemode F/O (Fiber Optic)

3.1. 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 *catalog.belden.com* on the web page of the device.

Table 1. Device name and product code

Item	Characteristic	Characteristic value	Description	
1 ... 4	Product	RSPM	Rail Switch Power Media Module	
5	Data rate	2	10/100 Mbit/s	
6	Hardware type	0	Standard	
		2	Standard with PoE(+)	
7	(hyphen)	–		
8 ... 10	Port configuration Part A	4Z6	4 ×	SFP slot for 100 Mbit/s F/O connections
		4T1	4 ×	RJ45 socket for 10/100 Mbit/s Twisted pair connections
11 ... 13	Port configuration Part B	4Z6	4 ×	SFP slot for 100 Mbit/s F/O connections
		4T1	4 ×	RJ45 socket for 10/100 Mbit/s Twisted pair connections
14	Temperature range[1]	S	Standard	0 °C ... +60 °C (+32 °F ... +140 °F)
		T	Extended	-40 °C ... +70 °C (-40 °F ... +158 °F)
		E	Extended with Conformal Coating	-40 °C ... +70 °C (-40 °F ... +158 °F)
15 ... 16	Certificates and declarations	You will find detailed information on the certificates and declarations applying to your device in a separate overview: *Table 2* on page 25		
17 ... 18	Customer-specific version	HH	Hirschmann	Standard
19	Hardware configuration	S	Standard	
20	Software configuration	9	without configuration	
21 ... 25	Software version	99.9	without software	
26 ... 27	Maintenance	99	without software	

1. When you install RSPM modules with temperature characteristic value T or E in an RSPE device with temperature characteristic value U or G, the temperature range of the RSPE temperature characteristic value U or G applies for the overall system.

Table 2. Assignment: application cases, certificates and declarations, characteristic values

Application case	Certificates and declarations	Characteristic values (Approval or self-declaration present)
Standard applications	ATEX Zone 2	W9, WX, WU, WD, WC, WB, WA, UW
	IECEx	WD, WC, WB, WA
	CE	Z9, X9, W9, WX, WU, WD, WC, WB, WA, U9, UY, UX, UW, T9, TY, V9, VP, VU, P9
	FCC	Z9, X9, W9, WX, WU, WD, WC, WB, WA, U9, UY, UX, UW, T9, TY, V9, VP, VU, P9
	ANSI/UL 121201	X9, WX, WU, WD, WC, UX
	EN 62368-1	Z9, X9, W9, WX, WU, WD, WC, WB, WA, U9, UY, UX, UW, T9, TY, V9, VP, VU, P9
	EN 61131-2	Z9, X9, W9, WX, WU, WD, WC, WB, WA, U9, UY, UX, UW, T9, TY, V9, VP, VU, P9
	UL 61010-1, UL 61010-2-210	X9, WX, WU, WD, WC, UY, UX, UW, TY, VP, VU, P9
Substation applications	IEC 61850-3	V9, VP, VU
	IEEE 1613	V9, VP, VU
Navy applications	DNV	WU, WD, WB, U9, UY, UX, UW, VU
Railway applications (trackside)	EN 50121-4	T9, TY

3.2. Media module variants

The media modules have different interface types.

The different interfaces of the media modules provide you with the following functions:

Specific functions of the TP/TX interface:

- Auto Polarity Exchange
- Autocrossing (device may be connected with a crossed-over or an uncrossed cable)
- Autonegotiation (selecting the operating mode: speed/duplex)
- Link Control

Specific functions of the F/O interface:

- Link Down monitoring

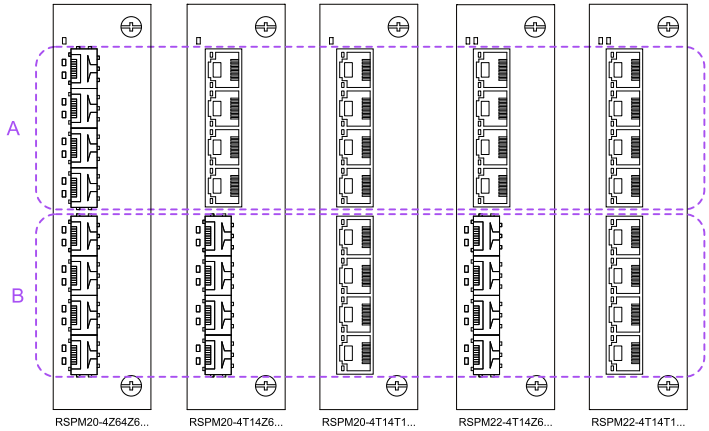
Port configuration

The 8 ports of the media modules are arranged in the port configuration part A and port configuration part B, each part comprising 4 ports.

The media module variants provide one of the following interface types for each port configuration part:

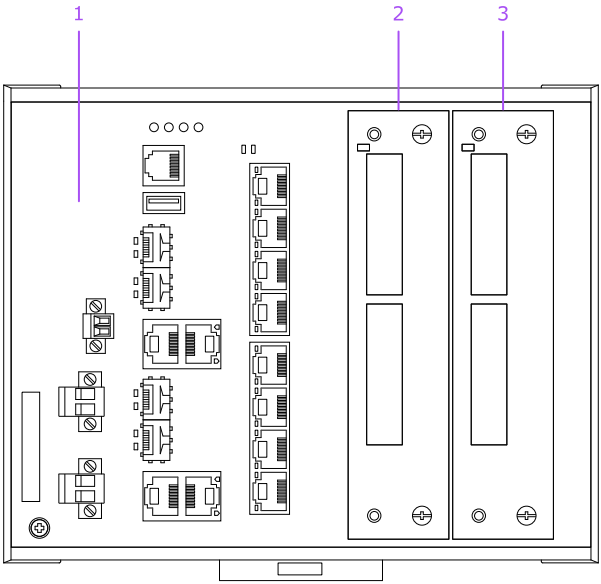
- SFP slot for 100 Mbit/s F/O connections
- RJ45 socket for 10/100 Mbit/s Twisted pair connections

For more information, see *Device name and product code* on page 24



A	Port configuration	Part A
B	Port configuration	Part B

Media module slots on the RSPE device



1	RSPE basic device (slot 1)	
2	Slot 2 for media module RSPM	All media modules are pluggable except RSPM20-4Z64Z6... (8 F/O ports)
3	Slot 3 for media module RSPM	All media modules are pluggable.

3.3. Ethernet ports

You have the option to connect terminal devices or other segments to the ports of the media modules via twisted-pair cables or F/O cables.

Connect the ports of the media modules plugged into the basic device as required in order to set up your Industrial Ethernet or expand your existing network.

3.3.1. Twisted-pair port 10/100 Mbit/s

This port is an RJ45 socket.

The 10/100 Mbit/s twisted-pair port allows you to connect network components according to IEEE 802.3 10BASE-T/100BASE-TX.

This port supports:

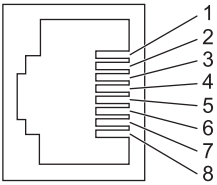
- Auto-Negotiation
- Autopolarity
- Auto-Crossover (if Auto-Negotiation is enabled)
- 100 Mbit/s half duplex mode, 100 Mbit/s full duplex mode
- 10 Mbit/s half duplex mode, 10 Mbit/s full duplex mode

Delivery state:

- Autonegotiation enabled

The port casing is electrically connected to the front panel.

Table 3. Pin assignment 10/100 Mbit/s twisted-pair port, RJ45 socket, MDI-X mode

RJ45	Pin	10/100 Mbit/s	Function
	1	RD+	Receive path
	2	RD−	Receive path
	3	TD+	Transmission path
	6	TD−	Transmission path
	4, 5, 7, 8	–	–

3.3.2. Support of PoE(+)

For more information on the product code, see *Device name and product code* on page 24.

The 10/100 Mbit/s twisted pair port allows you to connect network components as a PoE voltage sink according to the standard IEEE 802.3 10BASE-T/100BASE-TX and IEEE 802.3af/at.

With the presence of the PoE power supply, a separate power supply for the connected device is unnecessary. The PoE power is supplied via the wire pairs transmitting the signal (phantom voltage). The individual ports (joint PoE voltage) are not electrically insulated from each other.

Maximum power available to	
PoE end devices in total:	124 W
a media module:	62 W

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

The PoE support complies with the following technical standards:

Technical standard	Description	Classes
IEEE 802.3af	PoE	max. Powered Device (PD) class 0 (15.4 W)
IEEE 802.3at	PoE+	max. Powered Device (PD) class 4 (30 W)

In accordance with IEEE 802.3af and IEEE 802.3at:

- Endpoint PSE
- Alternative A

3.3.3. F/O port 100 Mbit/s

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

Note: Insert the RSPM20-4Z64Z6... media module in the media module slot 3 only. For more information, see *Media module slots on the RSPE device* on page 27.

3.4. Display elements

3.4.1. Media module status

Device variant RSPM20

1 LED is located on the upper part of the media module. This LED provides information on the supply voltage status of the media module.

Figure 1. Power LED for media module status

Table 4. Power LED: Color, activity and meaning

Color	Activity	Meaning
none	none	Media module is inoperative
green	lights up	Voltage supply to the media module is on
green	flashes 3 × a period	Hot-swappable module **not** supported[2], cold start[3] on the device required An incompatible media module mounted in the slot **or** a compatible media module mounted in the wrong slot[4]

Device variant RSPM22

2 LEDs are located on the upper part of the media module. These LEDs combined provide information on the supply voltage status and the PoE status of the media module.

Figure 2. Power LED for media module status and PoE status

Table 5. Power LED: Color, activity and meaning

Color	Activity	Meaning
none	none	Media module is inoperative

2. Applies exclusively to device software before 05.0.
3. For a cold start, disconnect the device from the power supply.
4. For the correct mounting, see *Mounting a media module* on page 35.

Table 5. Power LED: Color, activity and meaning (continued)

Color	Activity	Meaning
green	lights up	Voltage supply to the media module is on Voltage supply to the PoE port is on
yellow	lights up	PoE voltage is missing or is too low

3.4.2. Port status

These LEDs display port-related information.

The LEDs are directly located on the ports.

Figure 3. Fast Ethernet port

Table 6. LED L/D (link status/data): Color, activity and meaning

Color	Activity	Meaning
none	none	Device detects an invalid or missing link
yellow	flashing	Device is transmitting and/or receiving data
yellow	flashes 1 × a period	Device detects at least one unauthorized MAC address (Port Security Violation)
yellow	lights up	Device detects a non-supported SFP transceiver or a non-supported data rate
green	lights up	Device detects a valid link
green	flashes 1 × a period	Port is switched to stand-by
green	flashes 3 × a period	Port is switched off

Table 7. LED PoE (PoE status): Color, activity and meaning

Color	Activity	Meaning
none	none	RSPM20 LED is without any function
		RSPM22: No powered device connected

Table 7. LED PoE (PoE status): Color, activity and meaning (continued)

Color	Activity	Meaning
yellow	flashes 1 × a period	Output budget has been exceeded Device has detected a connected powered device
yellow	flashes 3 × a period	PoE administrator status deactivated
green	lights up	Powered device is supplied with PoE voltage.

4. Installation

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

On delivery, the device is ready for operation.

To install the device, perform the following steps:

4.1. Checking the package contents

- Check whether the package includes all items named in *Scope of delivery* on page 51.
- Check the individual parts for transport damage.

4.2. Mounting a media module

Mounting a media module

Hirschmann supplies the media modules ready for operation. The media modules provide restricted hot-swap-capability. You have the option of mounting the media modules while the device is operating. To start the operation, it is necessary to restart the device.

Perform the following steps:

1. If the cover panel is mounted, then remove it from the media module slot on the device.
2. Insert the media module into the slot on the device.
3. Fasten the media module to the device by tightening the 2 screws.
4. Restart the device.

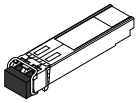
4.3. Installing an SFP transceiver (optional)

Prerequisites:

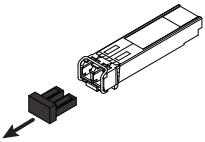
Exclusively use Hirschmann SFP transceivers. Transceivers are available as accessories, see *Accessories* on page 52.

Perform the following steps:

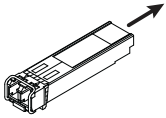
1. Take the SFP transceiver out of the transport packaging.



2. Remove the protection cap from the SFP transceiver.



3. Push the SFP transceiver with the lock closed into the slot until it latches in.



4.4. 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 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 ducts.
- Verify that power supply cables and data cables do not run parallel over longer distances. If reducing the inductive coupling is necessary, verify that the power supply cables and data cables cross at a 90° angle.
- Use shielded data cables for gigabit transmission via copper cables, 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. For more information, see *Ethernet ports* on page 27.

5. Maintenance and service

- When designing this device, Hirschmann largely avoided using high-wear parts. The parts subject to wear and tear are dimensioned to last longer than the lifetime of the product when it is operated normally. Operate this device according to the specifications.
- 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 at:
  www.belden.com

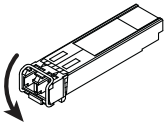
You find information on settling complaints at:
https://my.belden.com

6. Disassembly

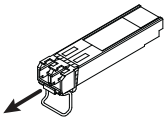
6.1. Removing an SFP transceiver (optional)

Perform the following steps:

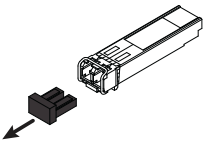
1. Open the locking mechanism of the SFP transceiver.



2. Pull the SFP transceiver out of the slot via the open locking mechanism.



3. Close the SFP transceiver with the protection cap.



6.2. Removing a media module

You have the option to remove the media modules while the device is operating.

Perform the following steps:

1. Loosen the 2 screws on the media module.
2. Pull the media module out of the slot.
3. Seal the media module slot on the device with a cover panel.

   The cover panel is available as an accessory, see *Accessories* on page 52.

7. Technical data

7.1. General data

Dimensions	See *Dimension drawings* on page 42.	
Weight	RSPM20-4Z64Z6...	290 g (10.23 oz)
	RSPM20-4T14T1... RSPM22-4T14T1...	130 g (4.59 oz)
	RSPM20-4T14Z6... RSPM22-4T14Z6...	220 g (7.76 oz)
Pollution degree	2	
Laser protection	Class 1 in compliance with IEC 60825-1	
Degree of protection of the RSPE device	IP20	

7.2. Power consumption/power output

The order numbers correspond to the product codes of the devices. For more information, see *Device name and product code* on page 24.

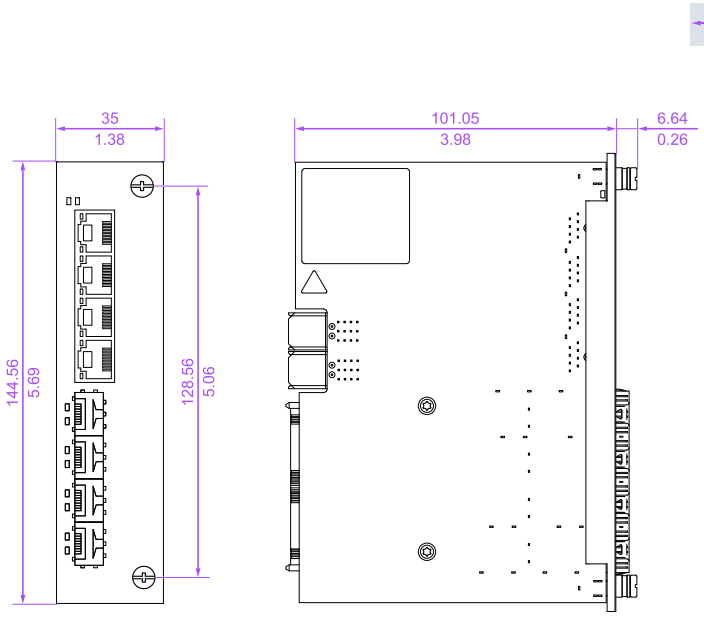
RSPM device name	Maximum power consumption[5]	Power output
RSPM20-4Z64Z6...	9 W	31 Btu (IT)/h
RSPM20-4T14T1...	2 W	7 Btu (IT)/h
RSPM20-4T14Z6...	5 W	17 Btu (IT)/h
RSPM22-4T14T1... including PoE output power	2 W	7 Btu (IT)/h
RSPM22-4T14Z6... including PoE output power	5 W	17 Btu (IT)/h

5. You can find the total power consumption specifications for basic modules that are to be installed in the User Manual Installation RSPE at *doc.hirschmann.com*.

7.3. Dimension drawings

7.3.1. Dimension drawings

Figure 4. Dimensions of a media module



7.4. Climatic conditions during operation

Table 8. Climatic conditions during operation

Ambient air temperature[6]	Devices with operating temperature characteristic value S (standard): 0 °C ... +60 °C (+32 °F ... +140 °F)[7]
	Devices with operating temperature characteristic value E and T (extended): -40 °C ... +70 °C (-40 °F ... +158 °F)[8]

6. Temperature of the ambient air at a distance of 5 cm (2 in) from the device
7. Hirschmann recommends to use SFP transceivers with EEC extension.
8. Exclusively use SFP transceivers with extension EEC. If you use SFP transceivers without extension EEC, the standard temperature range applies.

Table 8. Climatic conditions during operation (continued)

	-40 °C ... +85 °C (-40 °F ... +185 °F) for 16 hours (tested in accordance with IEC 60068-2-2)[9]
Maximum inner temperature of device (guideline)	Devices with operating temperature characteristic value S (standard): +88 °C (+190 °F)
	Devices with operating temperature characteristic value E and T (extended): +98 °C (+208 °F)
Humidity	5 % ... 95 % (non-condensing)
Air pressure	min. 700 hPa (+3000 m ASL; +9842 ft ASL) max. 1060 hPa (-400 m ASL; -1312 ft ASL)

7.5. Climatic conditions during storage

Table 9. Climatic conditions during storage

Ambient air temperature[10]	-40 °C ... +85 °C (-40 °F ... +185 °F)
Humidity	5 % ... 95 % (non-condensing)
Air pressure	min. 700 hPa (+3000 m ASL; +9842 ft ASL) max. 1060 hPa (-400 m ASL; -1312 ft ASL)

7.6. Immunity

Table 10. Immunity: Standard applications

Applicable standard	Behavior	Frequency
IEC 60068-2-6, test Fc	Vibration	5 Hz ... 8.4 Hz with 3.5 mm (0.14 in) amplitude
IEC 60068-2-6, test Fc	Vibration	8.4 Hz ... 150 Hz with 1 g
IEC 60068-2-27, test Ea	Shock	15 g at 11 ms

9. Exclusively use SFP transceivers with extension EEC. If you use SFP transceivers without extension EEC, the standard temperature range applies.

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

Table 11. Immunity: Marine applications

Applicable standard	Behavior	Frequency
IEC 60068-2-6, test Fc	Vibration	2 Hz ... 13.2 Hz with 1 mm (0.04 in) amplitude
IEC 60068-2-6, test Fc	Vibration	13.2 Hz ... 100 Hz with 0.7 g

Table 12. Immunity: Substation applications

Applicable standard	Behavior	Frequency
IEC 60068-2-6, test Fc	Vibration	1 Hz ... 8.2 Hz with 3.5 mm (0.14 in) amplitude
IEC 60068-2-6, test Fc	Vibration	8.2 Hz ... 150 Hz with 1 g
IEC 60068-2-27, test Ea	Shock	15 g at 11 ms

7.7. Electromagnetic compatibility (EMC)

For detailed information on the certificates and declarations applying to your device, see *Table 2* on page 25.

7.7.1. EMC interference emission

Table 13. EMC interference emission: Standard applications

Applicable standard		
Radiated emission		
FCC 47 CFR Part 15		Class A
EN 55032		Class A
EN 61000-6-4		Fulfilled
Conducted emission		
FCC 47 CFR Part 15	Supply connection	Class A
EN 55032	Supply connection	Class A
EN 55032	Telecommunication connections	Class A
EN 61000-6-4	Supply connection	Fulfilled
EN 61000-6-4	Telecommunication connections	Fulfilled

Table 14. EMC interference emission: Marine applications

Applicable standard		
Radiated emission		
FCC 47 CFR Part 15		Class A
EN 55032		Class A
EN 61000-6-4		Fulfilled
DNV Guidelines		EMC B
Conducted emission		
FCC 47 CFR Part 15	Supply connection	Class A
EN 55032	Supply connection	Class A
EN 55032	Telecommunication connections	Class A
EN 61000-6-4	Supply connection	Fulfilled
EN 61000-6-4	Telecommunication connections	Fulfilled
DNV Guidelines		EMC B

Table 15. EMC interference emission: Railway applications (trackside)

Applicable standard		
Radiated emission		
FCC 47 CFR Part 15		Class A
EN 55032		Class A
EN 61000-6-4		Fulfilled
Conducted emission		
FCC 47 CFR Part 15	Supply connection	Class A
EN 55032	Supply connection	Class A
EN 55032	Telecommunication connections	Class A
EN 61000-6-4	Supply connection	Fulfilled
EN 61000-6-4	Telecommunication connections	Fulfilled

Table 16. EMC interference emission: Substation applications

Applicable standard		
Radiated emission		
FCC 47 CFR Part 15		Class A
EN 55032		Class A

Table 16. EMC interference emission: Substation applications (continued)

Applicable standard		
EN 61000-6-4		Fulfilled
Conducted emission		
FCC 47 CFR Part 15	Supply connection	Class A
EN 55032	Supply connection	Class A
EN 55032	Telecommunication connections	Class A
EN 61000-6-4	Supply connection	Fulfilled
EN 61000-6-4	Telecommunication connections	Fulfilled

7.7.2. EMC interference immunity

Table 17. EMC interference immunity: Standard applications

Applicable standard		
Electrostatic discharge		
EN 61000-4-2 IEEE C37.90.3	Contact discharge	±4 kV
EN 61000-4-2 IEEE C37.90.3	Air discharge	±8 kV
Electromagnetic field		
EN 61000-4-3	80 MHz ... 1000 MHz	max. 10 V/m
EN 61000-4-3	1.4 GHz ... 6.0 GHz	3 V/m
Fast transients (burst)		
EN 61000-4-4 IEEE C37.90.1	DC supply connection	±1 kV
EN 61000-4-4 IEEE C37.90.1	Data line	±4 kV
Voltage surges - DC supply connection		
EN 61000-4-5	line/ground	±2 kV
EN 61000-4-5	line/line	±1 kV
Voltage surges - data line		
EN 61000-4-5	line/ground	±1 kV
Conducted disturbances		
EN 61000-4-6	150 kHz ... 80 MHz	10 V

Table 18. EMC interference immunity: Marine applications applications

Applicable standard		
Electrostatic discharge		
EN 61000-4-2 IEEE C37.90.3	Contact discharge	±6 kV
EN 61000-4-2 IEEE C37.90.3	Air discharge	±8 kV
Electromagnetic field		
EN 61000-4-3	80 MHz ... 6000 MHz	max. 10 V/m
Fast transients (burst)		
EN 61000-4-4 IEEE C37.90.1	DC supply connection	±1 kV
EN 61000-4-4 IEEE C37.90.1	Data line	±1 kV
Voltage surges - DC supply connection		
EN 61000-4-5	line/ground	±1 kV
EN 61000-4-5	line/line	±0.5 kV
Voltage surges - data line		
EN 61000-4-5	line/ground	±1 kV
Conducted disturbances		
EN 61000-4-6	150 kHz ... 80 MHz	10 V

Table 19. EMC interference immunity: Railway applications (trackside)

Applicable standard		
Electrostatic discharge		
EN 61000-4-2 IEEE C37.90.3	Contact discharge	±6 kV
EN 61000-4-2 IEEE C37.90.3	Air discharge	±8 kV
Electromagnetic field		
EN 61000-4-3	80 MHz ... 1000 MHz	max. 20 V/m
EN 61000-4-3	1.0 GHz ... 2.0 GHz	max. 10 V/m
EN 61000-4-3	2.0 GHz ... 2.7 GHz	5 V/m
EN 61000-4-3	5.1 GHz ... 6.0 GHz	3 V/m

Table 19. EMC interference immunity: Railway applications (trackside) (continued)

Applicable standard		
Fast transients (burst)		
EN 61000-4-4 IEEE C37.90.1	DC supply connection	±2 kV
EN 61000-4-4 IEEE C37.90.1	Data line	±2 kV
Voltage surges - DC supply connection		
EN 61000-4-5	line/ground	±2 kV
EN 61000-4-5	line/line	±1 kV
Voltage surges - data line		
EN 61000-4-5	line/ground	±2 kV
Conducted disturbances		
EN 61000-4-6	150 kHz ... 80 MHz	10 V

Table 20. EMC interference immunity: Substation applications

Applicable standard		
Electrostatic discharge		
EN 61000-4-2 IEEE C37.90.3	Contact discharge	±8 kV
EN 61000-4-2 IEEE C37.90.3	Air discharge	±15 kV
Electromagnetic field		
EN 61000-4-3	80 MHz … 1000 MHz	max. 10 V/m
EN 61000-4-3	1400 MHz … 3000 MHz	3 V/m
IEEE 1613	80 MHz … 1000 MHz	max. 35 V/m
Fast transients (burst)		
EN 61000-4-4 IEEE C37.90.1	DC supply connection	±4 kV
EN 61000-4-4 IEEE C37.90.1	Data line	±4 kV
Voltage surges - DC supply connection		
EN 61000-4-5	line/ground	±2 kV
IEEE 1613	line/ground	±5 kV
EN 61000-4-5	line/line	±1 kV

Table 20. EMC interference immunity: Substation applications (continued)

Applicable standard		
Voltage surges - data line		
EN 61000-4-5	line/ground	±2 kV
Conducted disturbances		
EN 61000-4-6	150 kHz ... 80 MHz	10 V
Damped oscillation – DC supply connection		
EN 61000-4-18 IEEE C37.90.1	line/ground	2.5 kV
EN 61000-4-12 IEEE C37.90.1	line/line	1 kV
Damped oscillation – data line		
EN 61000-4-12 IEEE C37.90.1	line/ground	2.5 kV
EN 61000-4-18	line/line	±1 kV

7.8. Network range

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

7.8.1. Twisted-pair port 10/100/1000 Mbit/s

Table 21. Network range: 10/100/1000 Mbit/s twisted-pair port

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

7.8.2. Fast Ethernet SFP transceiver

Table 22. F/O port 100BASE-FX (SFP Fiber Optic Fast Ethernet Transceiver)

Product code	Mode[11]	Wave length	Fiber	System attenuation	Example for F/O cable length[12]	Fiber attenuation	BLP/Dispersion
M-FAST-SFP-MM/LC...	MM	1310 nm	50/125 µm	0 dB ... 8 dB	0 km ... 5 km (0 mi ... 3.11 mi)	1.0 dB/km	800 MHz×km
M-FAST-SFP-MM/LC...	MM	1310 nm	62.5/125 µm	0 dB ... 11 dB	0 km ... 4 km (0 mi ... 2.49 mi)	1.0 dB/km	500 MHz×km
M-FAST-SFP-SM/LC...	SM	1310 nm	9/125 µm	0 dB ... 13 dB	0 km ... 25 km (0 mi ... 15.53 mi)	0.4 dB/km	3.5 ps/(nm×km)
M-FAST-SFP-SM+/LC...	SM	1310 nm	9/125 µm	10 dB ... 29 dB	25 km ... 65 km (15.53 mi ... 40.39 mi)	0.4 dB/km	3.5 ps/(nm×km)
M-FAST-SFP-LH/LC...	SM	1550 nm	9/125 µm	10 dB ... 29 dB	47 km ... 104 km (29.20 mi ... 64.62 mi)	0.25 dB/km	19 ps/(nm×km)
M-FAST-SFP-LH/LC...	SM	1550 nm	9/125 µm	10 dB ... 29 dB	55 km ... 140 km (14.29 mi ... 86.99 mi)	0.18 dB/km[13]	18 ps/(nm×km)

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

12. Including 3 dB system reserve when compliance with the fiber data is observed.

13. With ultra-low-loss optical fiber.

8. Scope of delivery

Table 23. Scope of delivery

Amount	Article
1 ×	Device
1 ×	Safety and general information sheet

9. Order numbers

9.1. Accessories

You find more information on available accessories in the Belden Online Catalog at *catalog.belden.com*.

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.

Table 24. General accessories

Article	Order number
Protection cap for RJ45 socket (50 pieces)	943936001
Protection cap for SFP slot (25 pieces)	943942001
Cover panel for unused module slot	942131001

9.1.1. Fast Ethernet SFP transceiver

Fast Ethernet SFP transceiver	Order number
M-FAST SFP-TX/RJ45	942098001
M-FAST SFP-TX/RJ45 EEC	942098002

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 ports.
- Not applicable for ports which support only Gigabit Ethernet.
- It is currently not possible to set autocrossing manually.

M-FAST SFP-MM/LC	943865001
M-FAST SFP-MM/LC EEC	943945001
M-FAST SFP-SM/LC	943866001
M-FAST SFP-SM/LC EEC	943946001
M-FAST SFP-SM+/LC	943867001
M-FAST SFP-SM+/LC EEC	943947001

Fast Ethernet SFP transceiver	Order number
M-FAST SFP-LH/LC	943868001
M-FAST SFP-LH/LC EEC	943948001
SFP-FAST-MM/LC [14]	942194001
SFP-FAST-MM/LC EEC [15]	942194002
SFP-FAST-SM/LC [16]	942195001
SFP-FAST-SM/LC EEC [17]	942195002

14. You will find further information on certifications at *catalog.belden.com*.
15. You will find further information on certifications at *catalog.belden.com*.
16. You will find further information on certifications at *catalog.belden.com*.
17. You will find further information on certifications at *catalog.belden.com*.

10. Underlying 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.

If your device has a shipping approval according to DNV, you find the approval mark printed on the device label. You will find out whether your device has other shipping approvals at *www.belden.com* in the product information.

Table 25. List of technical standards

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
CSA C22.2 No. 142	Canadian National Standard(s) – Process Control Equipment – Industrial Products
DNV-CG-0339	Environmental test specification for electrical, electronic and programmable equipment and systems.
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
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 60079-0	Explosive atmospheres – Part 0: Equipment – General requirements
IEC/EN 60079-7	Explosive atmospheres – Part 7: Equipment protection by increased safety "e"
IEC/EN 60079-15	Explosive atmospheres – Part 15: Equipment protection by type of protection "n"
IEC/EN 61850-3	Communication networks and systems for power utility automation - Part 3: General requirements.
IEC/EN 62368-1	Equipment for audio/video, information and communication technology - Part 1: Safety requirements
IEEE 802.1AB	Station and Media Access Control Connectivity Discovery
IEEE 802.1D	Media Access Control Bridges
IEEE 802.1Q	Virtual LANs (VLANs, MRP, Spanning Tree)
IEEE 802.3	Ethernet
IEEE 1613	IEEE Standard Environmental and Testing Requirements for Communication Networking Devices in Electric Power Substations

Table 25. List of technical standards (continued)

UL 61010-2-201	Safety requirements for electrical equipment for measurement, control, and laboratory use - Part 2-201: Particular requirements for control equipment

Further support

Technical questions

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

You find the addresses of our partners on the Internet at *www.belden.com*.

For technical support, visit *my.belden.com*. This site also includes a free of charge knowledge base and a software download section.

Technical Documents

The current manuals and operating instructions for Belden products are available at *doc.hirschmann.com*.

Customer Innovation Center

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

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