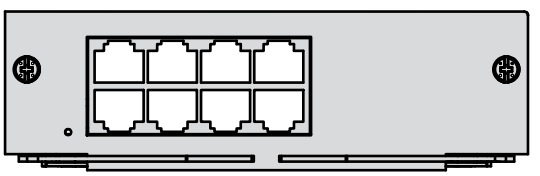
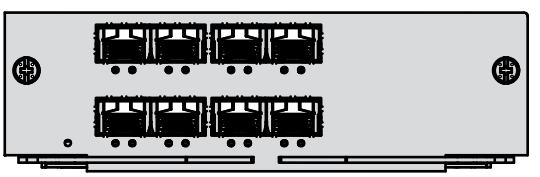
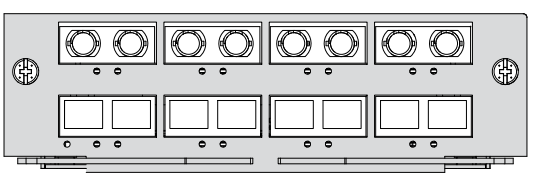
HIRSCHMANN
A BELDEN BRAND

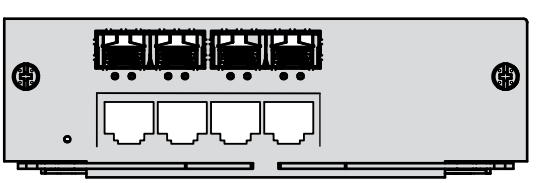
User Manual

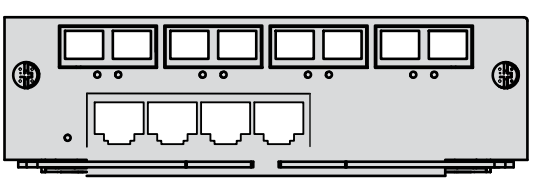
Installation
GREYHOUND Media Modules
GRM20











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

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Safety instructions

General safety instructions

- You operate this device with electricity. The proper and safe operation of this device depends on proper handling during transportation, proper storage and installation, and careful operation and maintenance procedures. Improper usage of the device entails the risk of physical injury or significant property damage.
- Before connecting any cable, read this document, and the safety instructions and warnings.
- Operate the device with undamaged components exclusively.
- Follow precisely the prescribed safety requirements for the voltage connections. You will find detailed information regarding the voltage supply in the “User Manual Installation GREYHOUND”.
- The device is free of any service components. In case of a damaged or malfunctioning the device, turn off the working voltage and return the device to Hirschmann for inspection.

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.

Certified usage

Use the device solely for the application cases described in the Hirschmann product information, including this manual.

Operate the device solely according to the technical specifications.

See “Technical data” on page 26.

National and international safety regulations

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

Shielded ground

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

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

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).

CE marking

The statements in this chapter refer only to media modules which are completely and correctly mounted in a GREYHOUND device (see on page 21 “Mounting a media module”).

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

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.

2004/108/EC (EMC)
Directive of the European Parliament and the council for standardizing the regulations of member states with regard to electromagnetic compatibility.

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
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Germany
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The device can be used in the industrial sector.

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

You find more information on technical and industry standards here:
See “Technical data” on page 26.

Warning! This is a class A device. This device can cause interference in living areas, and in this case the operator may be required to take appropriate measures.

LED or laser components

LED or LASER components according to IEC 60825-1 (2007):
CLASS 1 LASER PRODUCT
CLASS 1 LED PRODUCT

Note: You will find additional warning and safety information in the “User Manual Installation GREYHOUND”.

FCC note:

The statements in this chapter refer only to media modules which are completely and correctly mounted in a GREYHOUND device (see on page 21 “Mounting a media module”).

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 these frequencies. 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 residential 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 device must be disposed of properly as electronic waste, in accordance with the current disposal regulations of your county, state, and country.

About this manual

The “Installation” user manual contains a device description, safety instructions, a description of the display, and the other information that you need to install the device.

Key

The symbols used in this manual have the following meanings:

▶	Listing
☐	Work step
■	Subheading

1 Description

1.1 General description

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

- Types of connectors
- Temperature range
- Certifications

The GREYHOUND Media Modules are designed for the special requirements of industrial automation. They meet the relevant technical standards, provide very high operational reliability, even under extreme conditions, and also long-term reliability and flexibility.

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

- Multimode optical fiber
- Singlemode optical fiber
- twisted pair cable

1.2 Device name and product code

Item	Characteristic	Characteristic value	Description	
1 ... 3	Product	GRM	GREYHOUND media modules	
4	Data rate	2	10/100 Mbit/s	
5	PoE support	0	None	
6	(hyphen)	–		
7 ... 8	Configuration Port 1 and port 3	TT	2 ×	RJ45 socket for 10/100 Mbit/s twisted pair connections
		ZZ	2 ×	SFP slot for 100 Mbit/s F/O connections
		MM	2 ×	DSC multimode socket for 100 Mbit/s F/O connections
		NN	2 ×	ST multimode socket for 100 Mbit/s F/O connections
		VV	2 ×	DSC singlemode socket for 100 Mbit/s F/O connections
		UU	2 ×	ST singlemode socket for 100 Mbit/s F/O connections
9 ... 10	Configuration Port 5 and port 7	See configuration of port 1 and port 3		
11 ... 12	Configuration Port 2 and port 4	See configuration of port 1 and port 3		
13 ... 14	Configuration Port 6 and port 8	See configuration of port 1 and port 3		
15	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)
16 ... 17	Certificates and declarations	You will find detailed information on the certificates and declarations applying to your device in a separate overview. See table 2 on page 11.		
18 ... 19	Customer-specific version	HH	Hirschmann	
20	Hardware configuration	S	Standard	

Table 1: Device name and product code

Application case	Certificates and declarations	Characteristic value[a]												
		Z9	**Y9**	**X9**	**V9**	**VY**	**VU**	**VT**	**U9**	**UY**	**UX**	**UT**	**T9**	**TY**
Standard applications	CE	X	X	X	X	X	X	X	X	X	X	X	X	X
	EN 60950-1	X	X	X	X	X	X	X	X	X	X	X	X	X
	EN 61131-2	X	X	X	X	X	X	X	X	X	X	X	X	X
	FCC	X	X	X	X	X	X	X	X	X	X	X	X	X
	ISA 12.12.01 – Class I, Div. 2			(X)							(X)			
	UL 508		(x)	(x)		(x)	(x)	(x)		(x)	(x)	(x)		(x)
	UL 60950-1		(X)	(X)		(X)	(X)	(X)		(X)	(X)	(X)		(X)
Substation applications	IEC 61850-3				X	X	X	X						
	IEEE 1613				X	X	X	X						
Navy applications	GL						(X)		(X)	(X)	(X)	(X)		
	ABS						(x)		(x)	(x)	(x)	(x)		
	BV						(x)		(x)	(x)	(x)	(x)		
	DNV						(x)		(x)	(x)	(x)	(x)		
	LR						(x)		(x)	(x)	(x)	(x)		
Railway applications	EN 50121-4							X				X	X	X

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

a. X = Certificate or declaration present
(X) = Certificate or declaration in preparation
(x) = Certificate or declaration available upon request

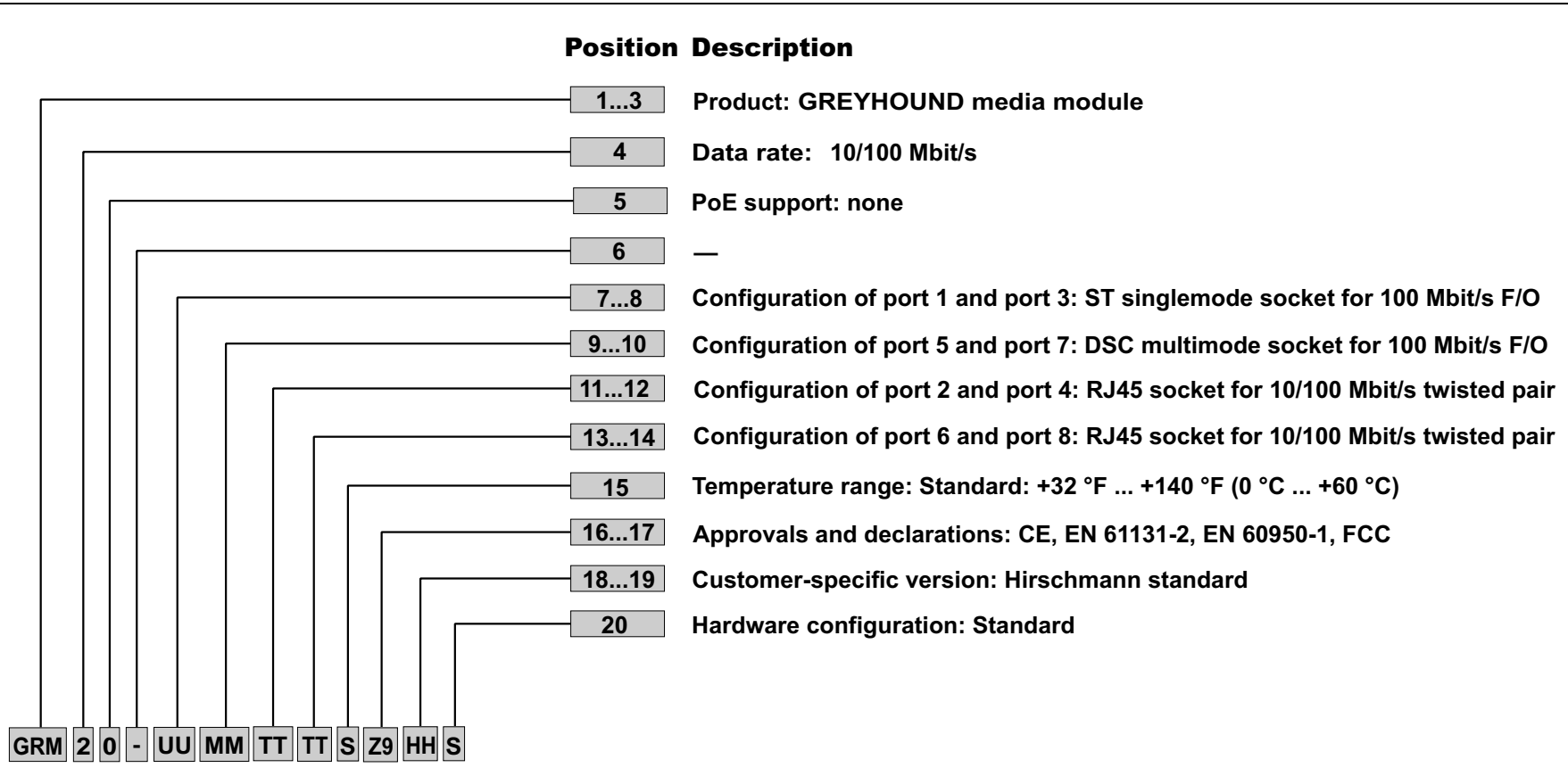


Table 3: Sample product code GRM20-UUMMTTTTSZ9HHS

1.3 Combination options

Item	1 ... 3	4	5	6	7 ... 8	9 ... 10	11 ... 12	13 ... 14	15	16 ... 17	18 ... 19	20
Characteristic	Device	Data rate	PoE support		Port 1 and port 3	Port 5 and port 7	Port 2 and port 4	Port 6 and port 8	Temperature range	Certificates and declarations	Customer-specific version	Hardware configuration
Attribute values	GRM	2	0	-	ZZ	ZZ	ZZ	ZZ	S; T; E	Z9, Y9, X9, V9, VY, VU, VT, T9, TY, U9; UY, UX, UT	HH	S
					ZZ	ZZ	TT	TT				
					TT	TT	TT	TT				
					VV	VV	VV	VV; UU MM; NN				
					VV	VV	UU	UU MM; NN				
					VV	VV	MM	MM; NN				
					VV	VV	NN	NN				
					VV	VV	TT	TT				
					VV	UU	UU	UU, MM, NN				
					VV	UU	MM	MM; NN				
					VV	UU	NN	NN				
					VV	UU	TT	TT				
					VV	MM	MM	MM; NN				
					VV	MM	NN	NN				
					VV	MM	TT	TT				
					VV	NN	NN	NN				
					VV	NN	TT	TT				

Table 4: Combination options for the GREYHOUND Media Modules

Item	1 ... 3	4	5	6	7 ... 8	9 ... 10	11 ... 12	13 ... 14	15	16 ... 17	18 ... 19	20
Characteristic	Device	Data rate	PoE support		Port 1 and port 3	Port 5 and port 7	Port 2 and port 4	Port 6 and port 8	Temperature range	Certificates and declarations	Customer-specific version	Hardware configuration
Attribute values	GRM	2	0	-	UU	UU	UU	UU, MM, NN	S; T; E	Z9, Y9, X9, V9, VY, VU, VT, T9, TY, U9; UY, UX, UT	HH	S
					UU	UU	MM	MM; NN				
					UU	UU	NN	NN				
					UU	UU	TT	TT				
					UU	MM	MM	MM; NN				
					UU	MM	NN	NN				
					UU	MM	TT	TT				
					UU	NN	NN	NN				
					UU	NN	TT	TT				
					MM	MM	MM	MM; NN				
					MM	MM	NN	NN				
					MM	MM	TT	TT				
					MM	NN	NN	NN				
					MM	NN	TT	TT				
					NN	NN	NN	NN				
					NN	NN	TT	TT				

Table 4: Combination options for the GREYHOUND Media Modules

1.4 Media module variants

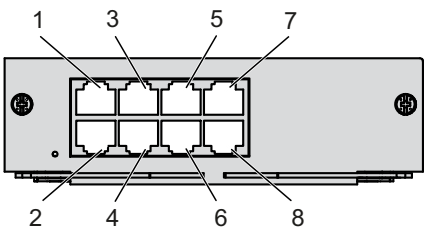
You have the option of choosing various media to connect to the end devices and other network components:

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

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

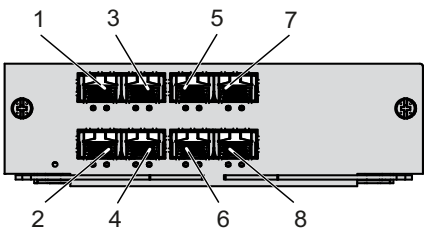
- Specific functions of the TP/TX interface
  - Auto Polarity Exchange
  - Autocrossing (device may be connected with a crossed-over or an uncrossed cable)
  - Autonegotiation (selecting the operating mode: speed/duplex)
  - Link Control
- Specific functions of the F/O interface
  - Link Down monitoring

Port assignment of the media module variants



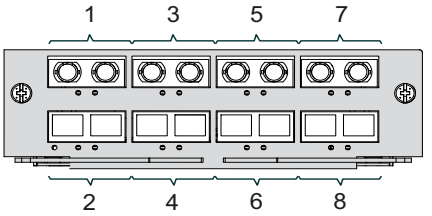
Port	Port description
1, 3	2 × RJ45 socket
5, 7	2 × RJ45 socket
2, 4	2 × RJ45 socket
6, 8	2 × RJ45 socket

Table 5: GRM20-TTTTTTTT



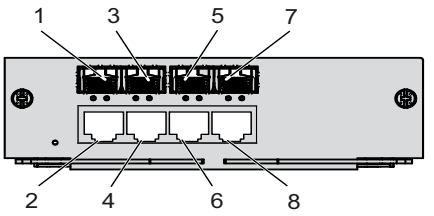
Port	Port description
1, 3	2 × SFP slot
5, 7	2 × SFP slot
2, 4	2 × SFP slot
6, 8	2 × SFP slot

Table 6: GRM20-ZZZZZZZZ



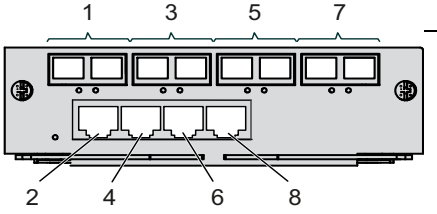
Port	Port description
1, 3	2 × ST singlemode socket
5, 7	2 × ST singlemode socket
2, 4	2 × DSC multimode socket
6, 8	2 × DSC multimode socket

Table 7: GRM20-UUUUMMMM



Port	Port description
1, 3	2 × SFP slot
5, 7	2 × SFP slot
2, 4	2 × RJ45 socket
6, 8	2 × RJ45 socket

Table 8: GRM20-ZZZZTTTT



Port	Port description
1, 3	2 × DSC multimode socket
5, 7	2 × DSC multimode socket
2, 4	2 × RJ45 socket
6, 8	2 × RJ45 socket

Table 9: GRM20-MMMMTTTT

Default settings

- Ethernet ports: link status is not evaluated (signal contact)
- IP address: The device looks for the IP address using DHCP
- Optical ports: Full duplex
  TP ports: Autonegotiation

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

1.5 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.

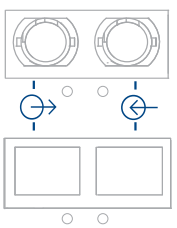
1.5.1 100 Mbit/s F/O port

This port is an SFP slot or an ST or DSC socket.
See “Accessories” on page 32.
The 100 Mbit/s F/O port offers you the ability 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

Applies to device variants with DSC ports or ST ports:
When connecting the data cables, note the sending and receiving directions.



Sending direction

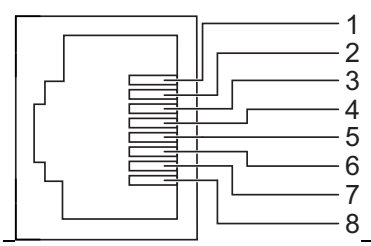
Receiving direction

1.5.2 10/100 Mbit/s twisted pair port

This port is an RJ45 socket.
The 10/100 Mbit/s twisted pair port offers you the ability to connect network components according to the IEEE 802.3 10BASE-T/100BASE-TX standard.
This port supports:

- Autonegotiation
- Autopolarity
- Autocrossing (if autonegotiation is activated)
- 100 Mbit/s half-duplex mode, 100 Mbit/s full duplex mode
- 10 Mbit/s half-duplex mode, 10 Mbit/s full duplex mode

Delivery state: autonegotiation active
The socket housing is electrically connected with the front panel.



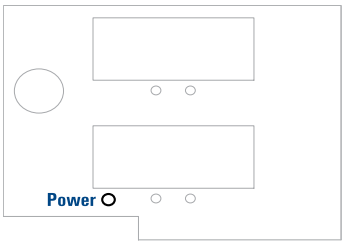
Pin	Function	
1	RD+	Receive path
2	RD−	Receive path
3	TD+	Transmission path
6	TD−	Transmission path
4,5,7,8	—	

Table 10: Pin assignment of the 10/100 Mbit/ twisted pair port, RJ-45 socket, MDI-X mode

1.6 Display elements

1.6.1 Media module status

1 LED is located on the media module at the bottom left.
This LED provides information on the supply voltage status of the media module.



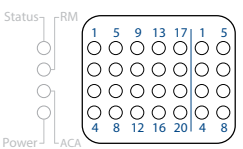
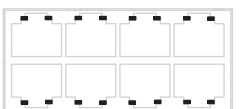
LED	Display	Color	Activity	Meaning
Power	Supply voltage	—	None	Media module is inoperative
		Green	Lights up	Supply voltage is on

1.6.2 Port state

These LEDs provide port-related information.

Display	Color	Activity	Meaning
Link status	—	None	Device detects an invalid or missing link
	Green	Lights up	Device detects a valid link
		Flashes 1 time a period	Port is switched to stand-by
		Flashes 3 times a period	Port is switched off
	Yellow	Flashing	Device is transmitting and/or receiving data

The LED display for F/O ports is located in the service panel of the basic device.
There are 2 LED displays for twisted pair ports and combo ports, located in the service panel of the basic device and directly on the relevant port:

LED display		Position on the device
	Service panel	depends on the device variant Front or back of the device
	Port panel (for twisted pair ports only)	Front of the device

By default, the port status is displayed on the service panel. You have the option of changing between the LED displays using the command line interface (CLI). You require administrator rights for this.

To change to the LED display on the port panel, execute the following commands in the CLI:

`enable`	Change to the privileged EXEC mode.
`configure`	Change to the configuration mode.
`system port-led-mode portpanel`	Umschalten LED-Anzeige von Service-Panel auf Port-Panel des Gerätes.

To change to the LED display on the service panel, execute the following commands in the CLI:

`enable`	Change to the privileged EXEC mode.
`configure`	Change to the configuration mode.
`system port-led-mode servicepanel`	Umschalten LED-Anzeige von Port-Panel auf Service-Panel.

2 Installation

The devices have been developed for practical application in a harsh industrial environment.
Hirschmann supplies the media modules ready for operation.

Perform the following steps to install and configure the device:

- Checking the package contents
- Mounting a media module
- Installing an SFP transceiver (optional)
- Connecting data cables

2.1 Checking the package contents

Proceed as follows:

☐ Check whether the package includes all items named in the section “Scope of delivery” on page 32.

☐ Check the individual parts for transport damage.

2.2 Mounting a media module

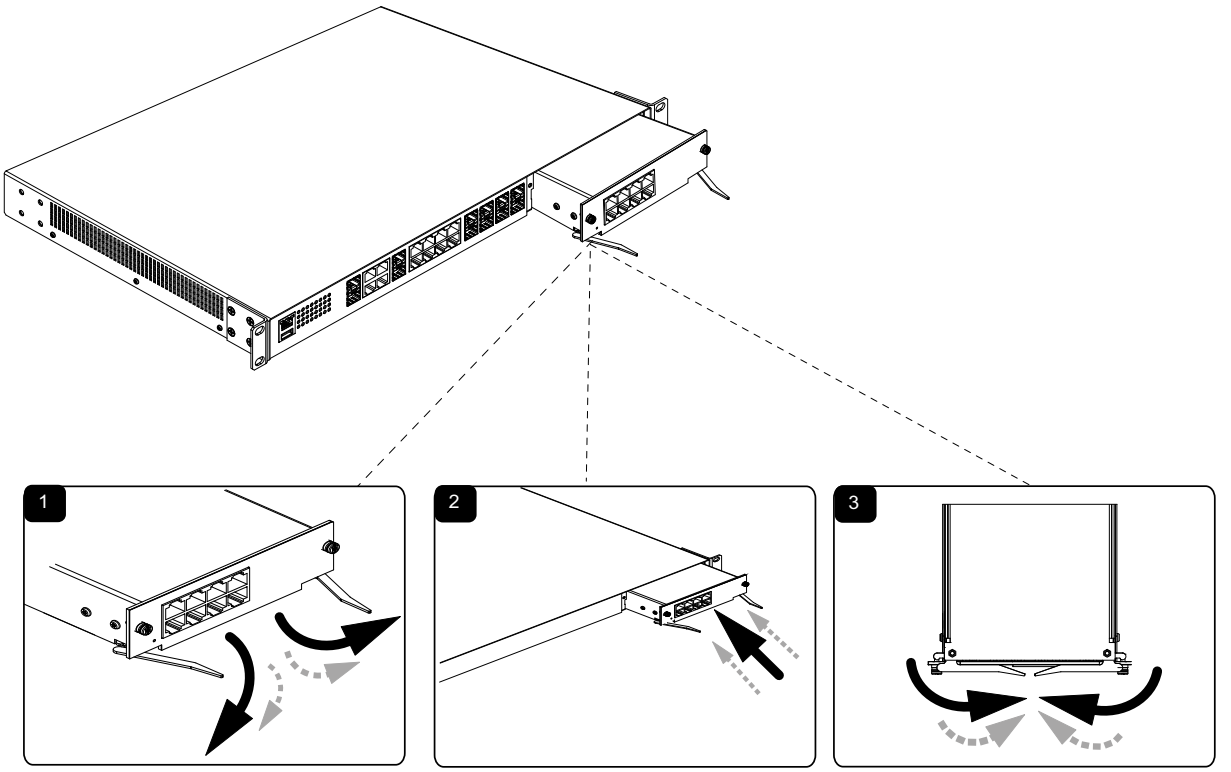


Figure 1: Mounting a media module

Hirschmann supplies the media modules ready for operation. By using a media module, you obtain up to 8 additional Fast Ethernet ports. The media modules provide hot-swap-capability. You have the option of mounting the media modules while the device is operating.
Proceed as follows:

- ☐ Remove the dummy panel from the media module slot on the basic device.
- ☐ Open the lock of the media module by pressing the locking lever outwards (step **1**)
- ☐ Insert the media module straight into the media module slot (step **2**).
- ☐ Close the lock of the media module by pressing the locking lever inwards (step **3**)
- ☐ Fasten the media module with the screws in the front panel of the basic device.

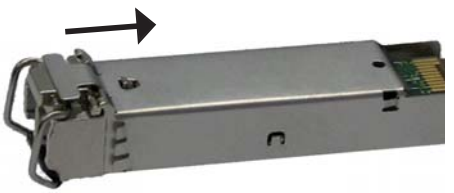
2.3 Installing an SFP transceiver (optional)

For this device, only use suitable SFP modules from Hirschmann.
See “Accessories” on page 32.

Proceed as follows:

☐ Remove the protective cap from the SFP transceiver.

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



2.4 Connecting data cables

In general, 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 data cables for the data transmission between the buildings.
- When using copper cables, provide a sufficient gap between the power supply cables and the data cables. Ideally, install the cables in separate cable channels.
- Use shielded cables.

☐ Connect the data cable according to your requirements.

For further information see “Device name and product code” on page 10.

3 Maintenance and service

- When designing this device, Hirschmann largely avoided using high-wear parts. The parts subject to wear and tear are dimensioned to last longer than the lifetime of the product when it is operated normally. Operate this device according to the specifications.
- Relays are subject to natural wear. This wear depends on the frequency of the switching operations. Check the resistance of the closed relay contacts and the switching function depending on the frequency of the switching operations.
- Hirschmann are continually working on improving and developing their software. Check regularly whether there is an updated version of the software that provides you with additional benefits. You find information and software downloads on the Hirschmann product pages on the Internet (www.hirschmann.com).
- Depending on the degree of pollution in the operating environment, check at regular intervals that the ventilation slots in the device are not obstructed.

Note: You will find information about the complaints and returns procedures on the Internet under
http://www.beldensolutions.com/en/Service/Repairs/index.phtml .

4 Disassembly

4.1 Removing an SFP transceiver (optional)

Proceed as follows:

☐ Pull the SFP transceiver out of the slot by means of the opened lock.

☐ Close the SFP transceiver with the protective cap.

4.2 Removing a media module

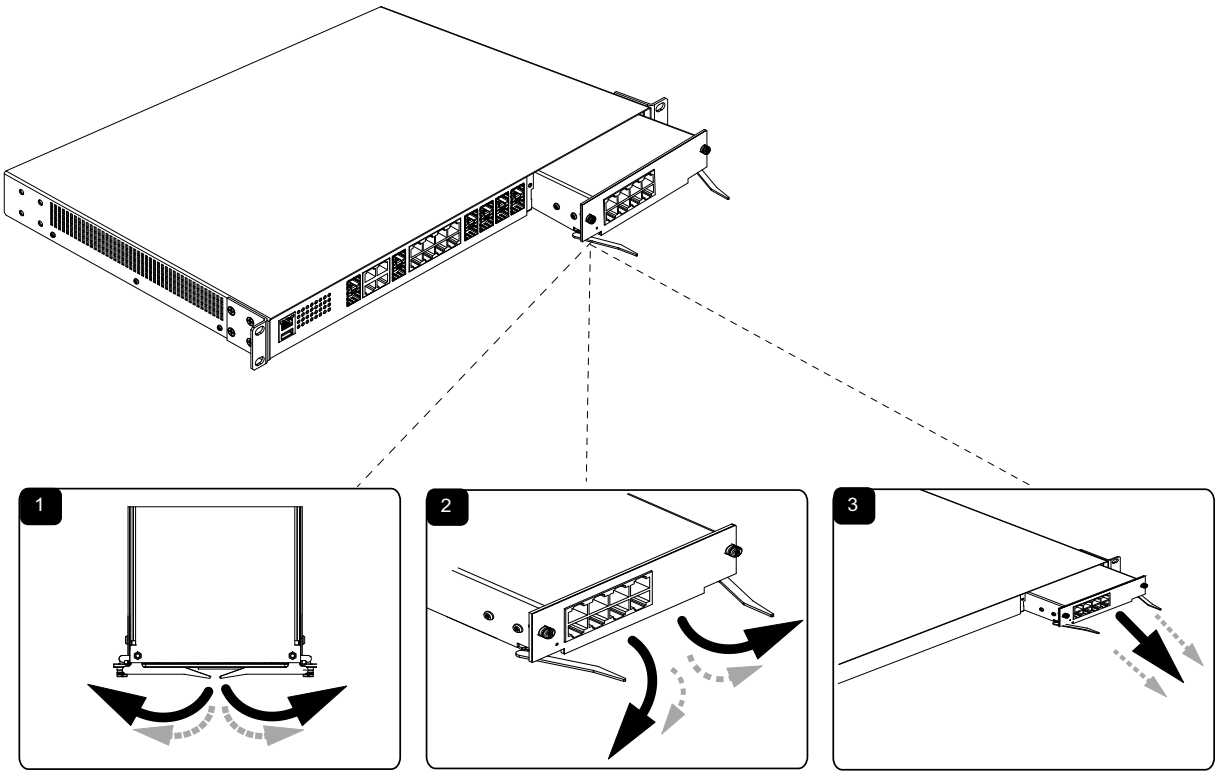


Figure 2: Demounting a media module

☐ Loosen the screws in the front panel of the media module.
☐ Open the lock of the media module by pressing the locking lever outwards (steps **1** and **2**).
☐ Pull the media module out of the slot (step **3**).
☐ Close the media module slot on the basic device using a dummy panel.
☐ Fasten the dummy panel using the 2 screws on the basic device.

5 Technical data

General technical data

Dimensions	GRM20	See “Dimension drawings” on page 27.
Weight of media modules	GRM20-TTTTTTTT	14.48 oz (450 g)
	GRM20-XXXXXXXXS[a]	16.72 oz (520 g)
	GRM20-XXXXXXXXT[a] GRM20-XXXXXXXXE[a]	21.45 oz (670 g)
	GRM20-ZZZZZZZZS	20.90 oz (650 g) Without SFP transceiver
	GRM20-ZZZZZZZZT GRM20-ZZZZZZZZE	
	GRM20-ZZZZTTTT	15.11 oz (470 g) Without SFP transceiver
	GRM20-XXXXTTTT[a]	17.64 oz (500 g)
Climatic conditions during operation	Ambient air temperature[b]	Devices with operating temperature characteristic value S (standard): +32 °F ... +140 °F (0 °C ... +60 °C) [c]
		Devices with the operating temperature characteristic value E and T (Extended) [d]: −40 °F ... +158 °F (−40 °C ... +70 °C) [e] −40 °F ... +185 °F (−40 °C ... +85 °C) for 16 hours (tested in accordance with IEC 60068-2-2) [d]
	Humidity	5 % ... 95 % (non-condensing)
	Air pressure	at least 600 hPa (+13123 ft; +4000 m) maximum 1060 hPa (−1312 ft; −400 m)
Climatic conditions during storage	Ambient air temperature[b]	−40 °F ... +185 °F (−40 °C ... +85 °C)
	Humidity	5 % ... 95 % (non-condensing)
	Air pressure	at least 600 hPa (+13123 ft; +4000 m) maximum 1060 hPa (−1312 ft; −400 m)
Pollution degree		2
Protection classes	Laser protection	Class 1 in compliance with IEC 60825-1

a. X = M, N, U or V
b. Temperature of the ambient air at a distance of 2 inches (5 cm) from the device
c. Hirschmann recommends to use SFP transceivers with the "EEC" extension.
d. Note the specifications for the basic device in the “User Manual Installation GREYHOUND”.
e. Use SFP transceivers with the “EEC” extension only, otherwise the standard temperature range applies.

Dimension drawings

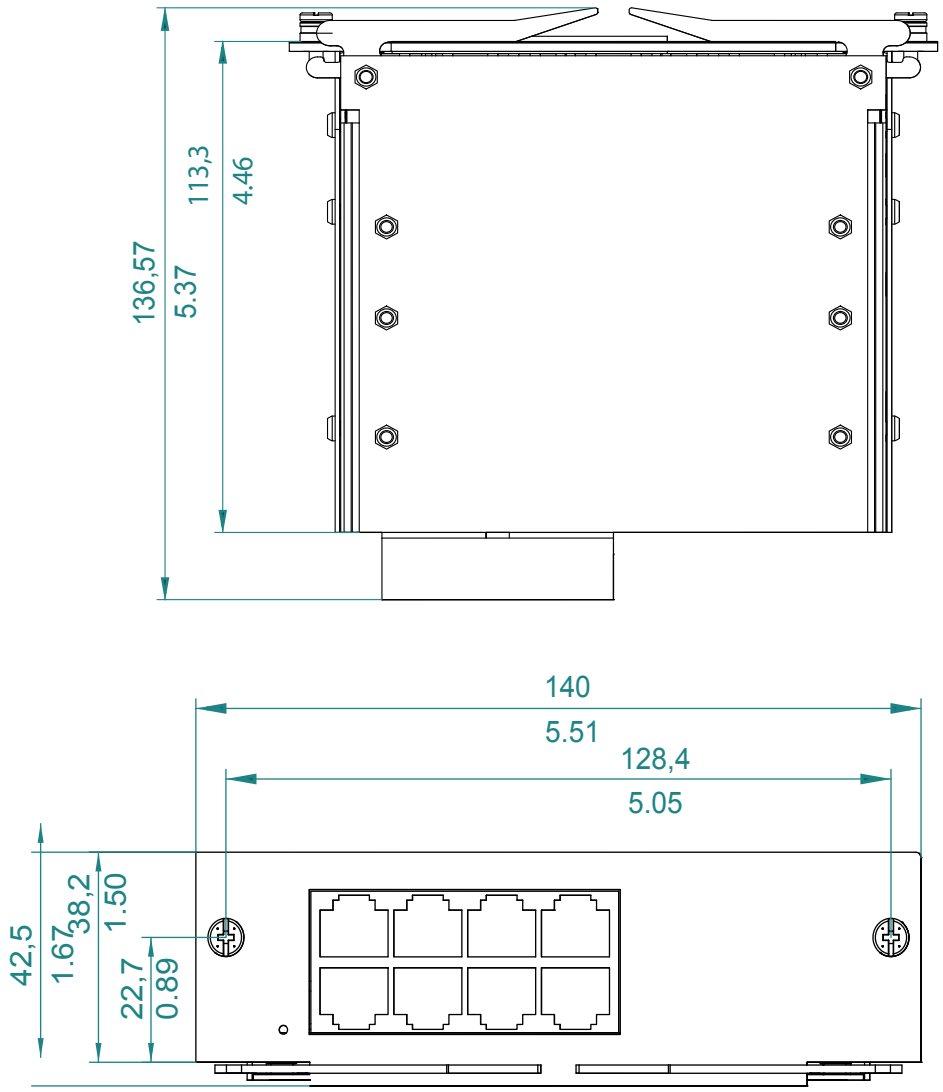


Figure 3: Dimensions of a media module

EMC and immunity

EMC interference emission		Standard applications[a]	Merchant Navy [b]	Railway applications (trackside) [c]	Substation applications [d]
Radiated emission					
EN 55022		Class A	Class A	Class A	Class A
GL Guidelines		—	EMC 1	—	—
FCC 47 CFR Part 15		Class A	Class A	Class A	Class A
EN 61000-6-4		Fulfilled	Fulfilled	Fulfilled	Fulfilled
Conducted emission					
EN 55022	DC supply connection	Class A	Class A	Class A	Class A
GL Guidelines	DC supply connection	—	EMC 1	—	—
FCC 47 CFR Part 15	DC supply connection	Class A	Class A	Class A	Class A
EN 61000-6-4	DC supply connection	Fulfilled	Fulfilled	Fulfilled	Fulfilled
EN 55022	Telecommunication connections	Class A	Class A	Class A	Class A
EN 61000-6-4	Telecommunication connections	Fulfilled	Fulfilled	Fulfilled	Fulfilled

a. EN 61131-2, CE, FCC – applies to all devices
b. Merchant Navy – applies to devices with the approval codes U9, UT, UX, UY, VU
c. EN 50121-4 – applies to devices with the certification codes VT, T9, TY
d. EN 61850-3, IEEE 1613 – applies to devices with the certification codes V9, VY, VU, VT

EMC interference immunity		Standard applications[a]	Merchant Navy [b]	Railway applications (trackside) [c]	Substation applications [d]
Electrostatic discharge					
EN 61000-4-2 IEEE C37.90.3	Contact discharge	± 4 kV	± 6 kV	± 6 kV	± 8 kV
EN 61000-4-2 IEEE C37.90.3	Air discharge	± 8 kV	± 8 kV	± 8 kV	± 15 kV
Electromagnetic field					
EN 61000-4-3	80 MHz ... 3000 MHz	10 V/m	10 V/m	20 V/m	10 V/m

EMC interference immunity		Standard applications[a]	Merchant Navy [b]	Railway applications (trackside) [c]	Substation applications [d]
IEEE 1613	80 MHz ... 1000 MHz	—	—	—	35 V/m
Fast transients (burst)					
EN 61000-4-4 IEEE C37.90.1	DC supply connection	± 2 kV	± 2 kV	± 2 kV	± 4 kV
EN 61000-4-4 IEEE C37.90.1	Data line	± 4 kV	± 4 kV	± 2 kV	± 4 kV
Voltage surges - DC supply connection					
EN 61000-4-5	line/ground	± 2 kV	± 2 kV	± 2 kV	± 2 kV
IEEE 1613	line/ground	—	—	—	± 5 kV
EN 61000-4-5	line/line	± 1 kV	± 1 kV	± 1 kV	± 1 kV
Voltage surges - data line					
EN 61000-4-5	line/ground	± 1 kV	± 1 kV	± 2 kV	± 2 kV
Conducted disturbances					
EN 61000-4-6	150 kHz ... 80 MHz	10 V	10 V	10 V	10 V

EMC interference immunity		Standard applications[a]	Merchant Navy [b]	Railway applications (trackside) [c]	Substation applications [d]
Damped vibration – DC supply connection					
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
Damped oscillation - data line					
EN 61000-4-12 IEEE C37.90.1	line/ground	—	—	—	2.5 kV
EN 61000-4-12	line/line	—	—	—	± 1 kV
Pulse magnetic fields					
EN 61000-4-9		—	—	300 A/m	—

a. EN 61131-2, CE, FCC – applies to all devices
b. Merchant Navy – applies to devices with the approval codes U9, UT, UX, UY, VU
c. EN 50121-4 – applies to devices with the certification codes VT, T9, TY
d. EN 61850-3, IEEE 1613 – applies to devices with the certification codes V9, VY, VU, VT

Stability		Standard applications[a]	Merchant Navy [b]	Railway applications (trackside) [c]	Substation applications [d]
IEC 60068-2-6, test Fc	Vibration	5 Hz ... 8.4 Hz with 0.14 in. (3.5 mm) amplitude	2 Hz ... 13.2 Hz with 0.04 in. (1 mm) amplitude	—	2 Hz ... 9 Hz with 0.12 in. (3 mm) amplitude
		8.4 Hz ... 150 Hz with 1 g —	13.2 Hz ... 200 Hz with 0.7 g —	— —	9 Hz ... 200 Hz with 1 g 200 Hz ... 500 Hz with 1.5 g
IEC 60068-2-27, test Ea	Shock	15 g at 11 ms	—	—	10 g at 11 ms

a. EN 61131-2, CE, FCC – applies to all devices
b. Merchant Navy – applies to devices with the approval codes U9, UT, UX, UY, VU
c. EN 50121-4 – applies to devices with the certification codes VT, T9, TY
d. EN 61850-3, IEEE 1613 – applies to devices with the certification codes V9, VY, VU, 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-FAST-SFP-...		Wave length	Fiber	System attenuation	Example for F/O line length [a]	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[b]	18 ps/(nm×km)

Table 11: 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

Product code		Wave length	Fiber	System attenuation	Example for F/O line length [a]	Fiber attenuation	BLP/ dispersion
-MM, -NN	MM	1300 nm	50/125 µm	0-8 dB	0-5 km	1.0 dB/km	800 MHz*km
-MM, -NN	MM	1300 nm	62.5/125 µm	0-11 dB	0-4 km	1.0 dB/km	500 MHz*km
-VV, -UU	SM	1300 nm	9/125 µm	0-16 dB	0-30 km	0.4 dB/km	3.5 ps/(nm*km)

Table 12: F/O port 100BASE-FX

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

MM = Multimode, SM = Singlemode

10/100/1000 Mbit/s twisted pair port	
Length of a twisted pair segment	max. 100 m (for cat5e cable)

Power consumption/power output, order numbers

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

Name	Maximum power consumption	Power output
GRM20-TTTTTTTT…	2 W	7 Btu (IT)/h
GRM20-XXXXTTTT…[a]	7.5 W	26 Btu (IT)/h
GRM20-XXXXXXXX...[a]	9 W	31 Btu (IT)/h

a. X= M, N, U, V, Z

Scope of delivery

Number	Article
1 ×	Installation user manual
1 ×	Device

Accessories

Note: Please note that products recommended as accessories may have characteristics that do not fully correspond to those of the device. This may limit their possible usage in the overall system.

Name	Order number
Dust protection cap (50 pieces) for RJ 45 sockets	943 936-001
Dust protection cap (25 pieces) for SFP slot	943 942-001

Fast Ethernet SFP transceiver	Order number
M-FAST SFP-TX/RJ45	942 098-001
M-FAST SFP-TX/RJ45 EEC	942 098-002
Note the following for the M-FAST SFP-TX... transceivers: ▶ Twisted pair ports realized through these transceivers have longer link failure detection times when compared to twisted pair ports provided by the device. ▶ When using these SFP transceivers, assume a higher failover time for RSTP. ▶ Not applicable for combo ports.	
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 technical standards

Name	
ANSI/ ISA 12.12.01	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
EN 50121-4	Railway applications - EMC - emitted interference and interference immunity for signal and telecommunication systems
EN 55022	Information technology equipment – Radio disturbance characteristics – Limits and methods of measurement
EN 60950-1	Information technology equipment – Safety – Part 1: General requirements
EN 61000-6-2	Electromagnetic compatibility (EMC) – Part 6-2: Generic standards – Immunity for industrial environments
EN 61000-6-4	Electromagnetic compatibility (EMC) – Part 6-4: Generic standards – Emission standard for industrial environments
EN 61131-2	Programmable controllers – Part 2: Equipment requirements and tests
EN 61850-3	Communications networks and systems in stations
FCC 47 CFR Part 15	Code of Federal Regulations
Germanischer Lloyd	Rules for Classification and Construction VI-7-2 – GL
IEEE 1613	Standard Environment and Testing Requirements for Communication Networking Devices in Electric Power Substations
IEEE 802.1 w	Rapid Reconfiguration
IEEE 802.3	Ethernet
NEMA TS 2	Traffic Controller Assemblies with NTCIP Requirements (environmental requirements)

Table 13: List of technical and industry standards

The device generally fulfills the technical and industry standards named in their current versions.
The device has an approval based on a specific standard or de facto standard only if the approval indicator appears on the housing.
If your device has a shipping approval according to Germanischer Lloyd, you find the approval mark printed on the device label. You will find out whether your device has other shipping approvals on the Hirschmann website under www.hirschmann.com in the product information.

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

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