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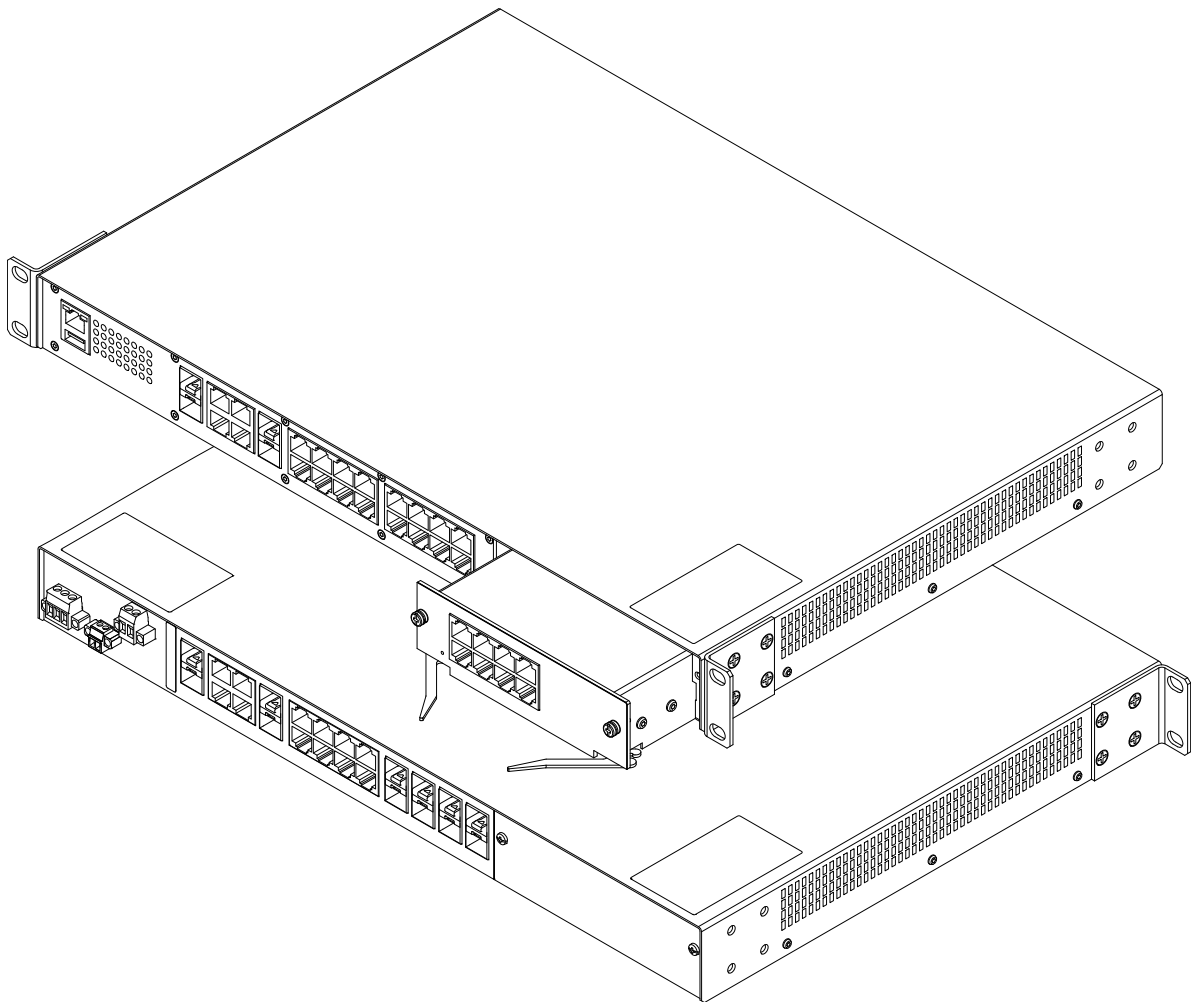
A **BELDEN** BRAND

User Manual

Installation

GREYHOUND Switch

GRS1020/1120/1030/1130



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You can get the latest version of this manual on the Internet at:
<https://www.doc.hirschmann.com>

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

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Important information

Note: Read these instructions carefully, and familiarize yourself with the device before trying to install, operate, or maintain it. The following notes may appear throughout this documentation or on the device. These notes warn of potential hazards or call attention to information that clarifies or simplifies a procedure.

■ Symbol explanation



This is a general warning symbol. This symbol alerts you to potential personal injury hazards. Observe all safety notes that follow this symbol to avoid possible injury or death.



If this symbol is displayed in addition to a safety instruction of the type “Danger” or “Warning”, it means that there is a danger of electric shock and failure to observe the instructions will inevitably result in injury.



This symbol indicates the danger of hot surfaces on the device. In connection with safety instructions, non-observance of the instructions will inevitably result in injuries.



DANGER

DANGER draws attention to an immediately dangerous situation, which will **inevitably** result in a serious or fatal accident if not observed.



WARNING

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



CAUTION

CAUTION indicates a possible danger which, if not avoided, **may** result in minor injuries.

NOTICE

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

Safety instructions



WARNING

UNCONTROLLED MACHINE ACTIONS

To avoid uncontrolled machine actions caused by data loss, configure all the data transmission devices individually.

Before you start any machine which is controlled via data transmission, be sure to complete the configuration of all data transmission devices.

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

■ General safety instructions

You operate this device with electricity. Improper usage of the device entails the risk of physical injury or significant property damage. The proper and safe operation of this device depends on proper handling during transportation, proper storage and installation, and careful operation and maintenance procedures.

- ☐ Before connecting any cable, read this document, and the safety instructions and warnings.
- ☐ Operate the device with undamaged components exclusively.
- ☐ The device is free of any service components. In case of a damaged or malfunctioning device, turn off the supply voltage and return the device to Hirschmann for inspection.

■ 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 product only for the application cases described in the Hirschmann product information, including this manual.
 - ☐ Operate the product only according to the technical specifications.
See [“Technical data” on page 63.](#)
 - ☐ Connect to the product only components suitable for the requirements of the specific application case.

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

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

The following requirements apply without restrictions:

- ▶ The electrical wires are voltage-free.
 - ▶ The cables used are permitted for the temperature range of the application case.
 - ▶ Relevant for North America:
Exclusively use 60/75 °C (140/167 °F) or 75 °C (167 °F) copper (Cu) wire.
 - ▶ The switched voltage complies with the requirements for a safety extra-low voltage (SELV) according to IEC 60950-1 or ES1 according to IEC/EN 62368-1.
-

Table 1: General requirements for connecting electrical wires

- Requirements for connecting the signal contact
Before connecting the signal contact, **always** verify that the requirements listed are complied with.

The following requirements apply without restrictions:

- ▶ The switched voltage complies with the requirements for a safety extra-low voltage (SELV) according to IEC 60950-1 or ES1 according to IEC/EN 62368-1.
 - ▶ The connected voltage is limited by a current limitation device or a fuse.
Observe the electrical threshold values for the signal contact.
See [“General technical data” on page 63.](#)
-

- Requirements for connecting the supply voltage
Before connecting the supply voltage, **always** verify that the requirements listed are complied with.

Prerequisites:

All of the following requirements are complied with:

- ▶ The supply voltage corresponds to the voltage specified on the type plate of the device.
- ▶ The power supply conforms to overvoltage category I or II.
- ▶ The power supply has an easily accessible disconnecting device (for example a switch or a plug). This disconnecting device is clearly identified. So in the case of an emergency, it is clear which disconnecting device belongs to which power supply cable.
- ▶ The ground screw on the back of the device is connected to the protective conductor.
- ▶ The cross-section of the ground conductor is the same size as or bigger than the cross-section of the power supply cables.

The following requirements apply alternatively:

Relevant when the device is supplied via 1 voltage input:

Alternative 1 The power supply complies with the requirements for a limited power source (LPS) according to IEC 60950-1 or ES1 + PS2 according to IEC/EN 62368-1.

Alternative 2 Relevant for North America:
The power supply complies with the requirements according to NEC Class 2.

Alternative 3 **All** of the following requirements are complied with:

- ▶ The power supply complies with the requirements for a safety extra-low voltage (SELV) according to IEC 60950-1 or ES1 according to IEC/EN 62368-1.
- ▶ Supply with DC voltage:
The wire cross-section of the power supply cable at the supply voltage input is at least 1 mm² (North America: AWG16).
A back-up fuse suitable for DC voltage is located in the plus conductor of the power supply.
The minus conductor is on ground potential. Otherwise, a back-up fuse is also located in the minus conductor.
Regarding the properties of this back-up fuse:
[See "Technical data" on page 63.](#)
- ▶ Supply with AC voltage:
The wire cross-section of the power supply cable is at least 0.75 mm² (North America: AWG18) on the supply voltage input.
A back-up fuse is located in the outer conductor of the power supply.
The neutral conductor is on ground potential at both voltage inputs.
Otherwise, a back-up fuse is also located in the neutral conductor.
Regarding the properties of this back-up fuse:
[See "Technical data" on page 63.](#)

Relevant when the device is supplied via 2 voltage inputs:

Alternative 1 The **total** power supply complies with the requirements for a limited power source (LPS) according to IEC 60950-1 or IEC/EN 62368-1.

Alternative 2 Relevant for North America:
The **total** voltage supply complies with the requirements as per NEC Class 2.

Prerequisites:

- Alternative 3 **All** of the following requirements are complied with:
- ▶ The power supply complies with the requirements for a safety extra-low voltage (SELV) according to IEC 60950-1 or ES1 according to IEC/EN 62368-1.
 - ▶ Supply with DC voltage:
The wire cross-section of the power supply cable at the supply voltage input is at least 1 mm² (North America: AWG16).
A fuse suitable for DC voltage is located at both voltage inputs in the plus conductor of the power supply.
The minus conductor is on ground potential at both voltage inputs.
Otherwise, a fuse is also located in the minus conductor.
Regarding the properties of this fuse:
[See "Technical data" on page 63.](#)
 - ▶ Supply with AC voltage:
The wire cross-section of the power supply cable is at least 0.75 mm² (North America: AWG18) on the supply voltage input.
A fuse is located at both voltage inputs in the outer conductor of the power supply.
The neutral conductor is on ground potential at both voltage inputs.
Otherwise, a fuse is also located in the neutral conductor.
Regarding the properties of this fuse:
[See "Technical data" on page 63.](#)

The supply voltage is electrically isolated from the casing.

For supply voltage connections with protective conductor connection:

First connect the protective conductor before connecting the wires for the supply voltage.

If your device has a second supply voltage connection of this type: First connect the protective conductor before connecting the wires for the supply voltages.

■ 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.

■ Device casing

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

- ☐ Keep the ventilation slits free to ensure good air circulation.
- ☐ Make sure there is at least 10 cm (3.94 in) of space in front of the ventilation slits of the casing.
- ☐ Do not touch the housing during operation or shortly after switching off the device. Hot surfaces can cause injury.
- ☐ Mount the device horizontally in a cabinet or vertically on a flat surface. Operating the device as a table unit is inadmissible.
[See "Installing and grounding the device" on page 46.](#)
- ☐ Operating the device in the maximum surrounding air temperature and stacking devices: When installing the device, make sure there is at least 1 free rack space (approx. 5 cm (2 in)) above the device, because heat is discharged via the device casing.
- ☐ If you are operating the device in a 19" switch cabinet: install sliding/mounting rails for supporting the weight of the device.
- ☐ Only switch on the device when the casing is closed.

■ Installation site requirements

Operate the device only at the specified ambient temperature (temperature of the ambient air at a distance of 5 cm (2 in) from the device) and at the specified relative humidity.

- ▶ When you are selecting the installation location, make sure you observe the climatic threshold values specified in the technical data.
- ▶ Use the device in an environment with a maximum pollution degree that complies with the specifications in the technical data.

■ Strain relief

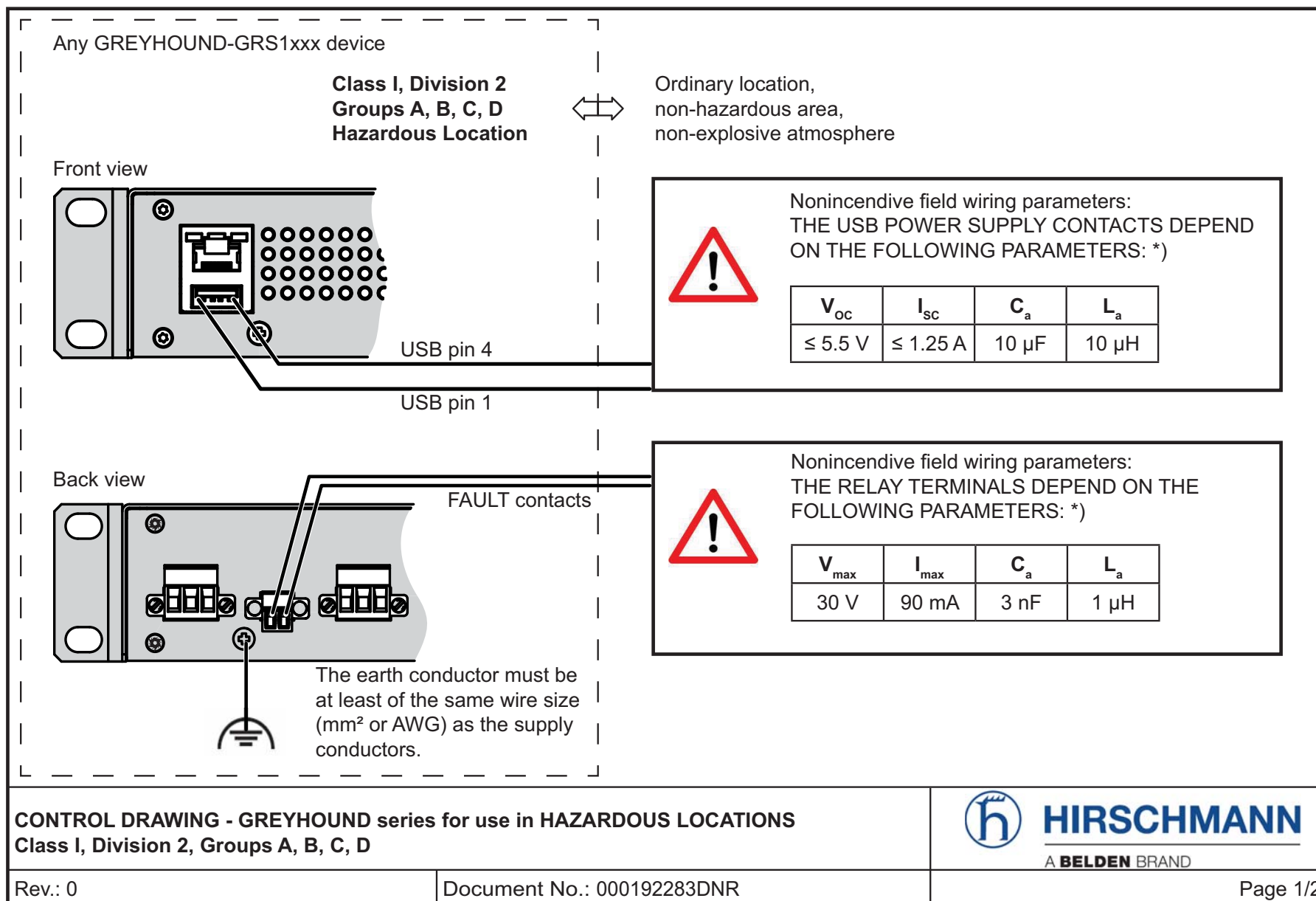
Note: If the strain relief is insufficient, there is a potential risk of torsion, contact problems and creeping interruptions.

- ☐ Relieve the connection points of cables and lines from mechanical stress.
- ☐ Design strain reliefs in such a way that they help prevent any mechanical damage to cables, wires or conductors caused by external influences or their own weight.
- ☐ To help prevent damage to device connections, connectors and cables, follow the instructions for proper installation in accordance with DIN VDE 0100-520:2013-06, sections 522.6, 522.7 and 522.13.

- 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 000192283DNR. Details see the next two pages.

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

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



SUITABLE FOR USE IN CLASS I DIVISION 2 GROUPS A, B, C, D HAZARDOUS LOCATIONS, OR NON-HAZARDOUS LOCATIONS ONLY.

For use in **HAZARDOUS LOCATIONS** only allowed for model numbers which are labelled accordingly.



Nonincendive field wiring circuits must be wired in accordance with the National Electrical Code (NEC), NFPA 70, article 501; CEC, Appendix J, Annex J18. USB AND RELAY CONTACTS (FAULT): Install per Control Drawing 000192283DNR.

WARNING – EXPLOSION HAZARD – SUBSTITUTION OF ANY COMPONENTS MAY IMPAIR SUITABILITY FOR CLASS I DIVISION 2.

WARNING – EXPLOSION HAZARD – DO NOT DISCONNECT EQUIPMENT WHILE THE CIRCUIT IS LIVE OR UNLESS THE AREA IS KNOWN TO BE FREE OF IGNITABLE CONCENTRATIONS.

***) 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.

$$\text{Capacity: } C_a \geq C_i + C_{\text{Cable}} ; \quad \text{Inductivity: } L_a \geq L_i + L_{\text{Cable}}$$

The **maximum cable length** has to be determined as follows:

(a) max. cable length $< (L_0 - L_i) / \text{Cable}_L$ or max. cable length $< (L_a - L_i) / \text{Cable}_L$
("Cable_L" denotes the inductance per unit length of used cable) and

(b) max. Cable Length $< (C_a - C_i) / \text{Cable}_C$
("Cable_C" denotes the capacitance per unit length of used cable).

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

Manufactured in 72654 Neckartenzlingen / Germany by Hirschmann Automation and Control GmbH.
DOM: ww/yyyy (Date of manufacture w - week, y - year. Refer to the device label.)

CONTROL DRAWING - GREYHOUND series for use in HAZARDOUS LOCATIONS
Class I, Division 2, Groups A, B, C, D



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A **BELDEN** BRAND

Rev.: 0

Document No.: 000192283DNR

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

Device variant	Directive
All variants	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.
All variants	2014/30/EU (EMC) Directive of the European Parliament and of the Council on the harmonisation of the laws of the Member States relating to electromagnetic compatibility.
This applies to the following device variants only: Supply voltage with characteristic value M	2014/35/EU Directive of the European Parliament and of the Council on the harmonisation of the laws of the Member States relating to the making available on the market of electrical equipment designed for use within certain voltage limits.

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

Hirschmann Automation and Control GmbH
Stuttgarter Str. 45-51
72654 Neckartenzlingen
Germany
www.doc.hirschmann.com/certificates.html

The product can be used in the industrial sector.

- ▶ Interference immunity: EN 61000-6-2
- ▶ Emitted interference: EN 55032
- ▶ Safety: IEC/EN 62368-1

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.

■ UKCA marking

The labeled devices comply with the following UK regulations:

Device variant	Directive
All variants	S.I. 2012 No. 3032 Restriction of the Use of Certain Hazardous Substances in Electrical and Electronical Equipment Regulations
All variants	S.I. 2016 No. 1091 Electromagnetic Compatibility Regulations
Applies only to the following device variants: Supply voltage with characteristic value M:	S.I. 2016 No. 1101 Electrical Equipment (Safety) Regulations 2016



The UKCA conformity declaration will be available to the relevant authorities at the following address:

Belden UK Ltd.
1 The Technology Centre, Station Road
Framlingham, IP13 9EZ, United Kingdom

You find the UKCA conformity declaration as PDF file for downloading on the Internet at: <https://www.doc.hirschmann.com/certificates.html>

The product can be used in the industrial sector.

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

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

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

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

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

GREYHOUND Switch
GRM20-...

U.S. Contact Information

Belden – St. Louis
1 N. Brentwood Blvd. 15th Floor
St. Louis, Missouri 63105, United States
Phone: 314.854.8000

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

- Recycling note
After usage, this device must be disposed of properly as electronic waste, in accordance with the current disposal regulations of your county, state, and country.

About this Manual

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

Documentation mentioned in the “User Manual Installation” that is not supplied with your device as a printout can be found as PDF files for downloading on the Internet at: <https://www.doc.hirschmann.com>

The Network Management Software Industrial HiVision provides you with options for smooth configuration and monitoring. You find further information on the Internet at the Hirschmann product pages:

<http://www.hirschmann.com/en/QR/INET-Industrial-HiVision>

Key

The symbols used in this manual have the following meanings:

▶	Listing
□	Work step
■	Subheading

1 Description

1.1 General device description

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

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

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

The device allows you to set up switched Industrial Ethernet networks according to standard IEEE 802.3.

The device works without a fan.

The following installation options are available:

- ▶ 19" switch cabinet
- ▶ Flat surface mounting

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

- ▶ Twisted pair cable
- ▶ Multimode F/O
- ▶ Singlemode F/O

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

Product configuration data can be provided by:

- ▶ diagnosis displays
- ▶ Display of the operating parameters

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

- ▶ Web browser
- ▶ Command Line Interface (CLI) via SSH, Telnet or V.24 interface
- ▶ HiDiscovery (software for putting the device into operation)
- ▶ HiView
- ▶ Network management software (for example Industrial HiVision)

The Network Management Software Industrial HiVision provides you with options for smooth configuration and monitoring. You find further information on the Internet at the Hirschmann product pages:

<http://www.hirschmann.com/en/QR/INET-Industrial-HiVision>

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

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

1.2 Device name and product code

The device name corresponds to the product code. The product code is made up of characteristics with defined positions. The characteristic values stand for specific product properties.

1.2.1 Basic device

Item	Characteristic	Characteristic value	Description
1 ... 3	Product	GRS	GREYHOUND Switch
4	Series	1	GREYHOUND Series
5	Position of the ports and power supply inputs	0	Ethernet ports: front of device Power supply inputs: back of device
		1	Ethernet ports: back of device Power supply inputs: back of device
6	Data rate	2	10/100 Mbit/s
		3	10/100 Mbit/s with 100/1000 Mbit/s uplink ports
7	PoE support	0	none
8	(hyphen)	–	
9 ... 12	Configuration of the ports	16T9	16 × RJ45 socket for 10/100 Mbit/s Twisted pair connections
		8T8Z	8 × RJ45 socket for 10/100 Mbit/s Twisted pair connections
		8 ×	SFP slot for 100 Mbit/s F/O connections
13	Temperature range	S	Standard 0 °C ... +60 °C (+32 °F ... +140 °F)
		C	Standard with Conformal Coating 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)
14	Supply voltage 1	C	Voltage input
			Rated voltage range 24 V DC ... 48 V DC
		M	Voltage input
			Rated voltage range 110 V DC ... 250 V DC 110 V AC ... 240 V AC, 50 Hz ... 60 Hz
15	Supply voltage 2	C	Voltage input
			Rated voltage range 24 V DC ... 48 V DC
		M	Voltage input
			Rated voltage range 110 V DC ... 250 V DC 110 V AC ... 240 V AC, 50 Hz ... 60 Hz
		9	none

Table 2: Device name and product code

Item	Characteristic	Characteristic value	Description
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 3 on page 26.	
18 ... 19	Customer-specific version	HH	Hirschmann Standard
20	Hardware configuration	S	Standard
21	Software configuration	E	Entry (Hirschmann Standard)
22 ... 23	Software level	2S	HiOS Layer 2 Standard
24 ... 28	Software version	07.1.	Software version 07.1
		XX.X.	Current software version

Table 2: 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 62368-1	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			
	cUL 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	DNV						X		X	X	X	X		
Railway applications (trackside)	EN 50121-4							X				X	X	X

Table 3: Assignment: application cases, certificates and declarations, characteristic values

a. X= Approval or self-declaration present

1.2.2 Media modules

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 x RJ45 socket for 10/100 Mbit/s Twisted pair connections
		ZZ	2 x SFP slot for 100 Mbit/s F/O connections
		MM	2 x DSC multimode socket for 100 Mbit/s F/O connections
		NN	2 x ST multimode socket for 100 Mbit/s F/O connections
		VV	2 x DSC singlemode socket for 100 Mbit/s F/O connections
		UU	2 x 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 0 °C ... +60 °C (+32 °F ... +140 °F)
		C	Standard with Conformal Coating 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)
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 3 on page 26.	
18 ... 19	Customer-specific version	HH	Hirschmann
20	Hardware configuration	S	Standard

Table 4: Device name and product code

1.3 Combination options

1.3.1 Basic device

Item	1 ... 3	4	5	6	7	8	9 ... 12	13	14	15	16 ... 17	18 ... 19	20	21	22 ... 23	24 ... 28
Characteristic	Product	Series	Position of the ports and power supply inputs	Data rate	PoE support	(hyphen)	Configuration of the ports	Temperature range	Supply voltage 1	Supply voltage 2	Approvals & self-declarations	Customer-specific version	Hardware configuration	Software configuration	Software level	Software version
Attribute values	GRS	1	0, 1	2, 3	none	–	16T9, 8T8Z	S, C, T, E	C, M	C, 9 C, M, 9	Z9, Y9, X9, V9, VY, VU, VT, T9, TY, U9; UY, UX, UT	HH	S	E	2S	04.1.

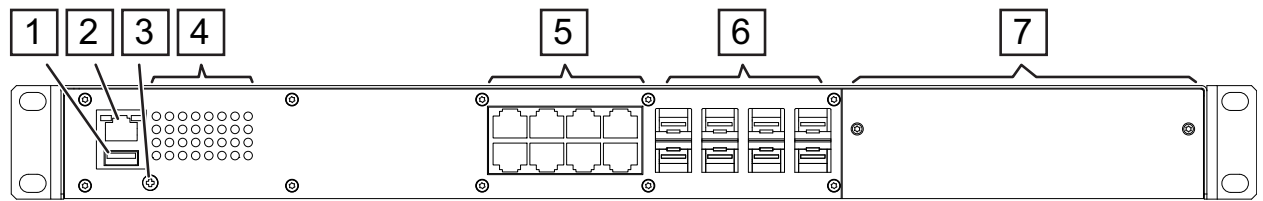
1.3.2 Media modules

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	(hyphen)	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, C, 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				

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	(hyphen)	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, C, 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				

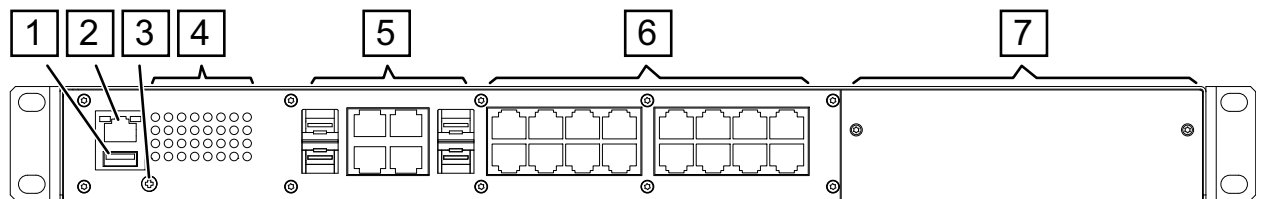
1.4 Device views

1.4.1 Basic device



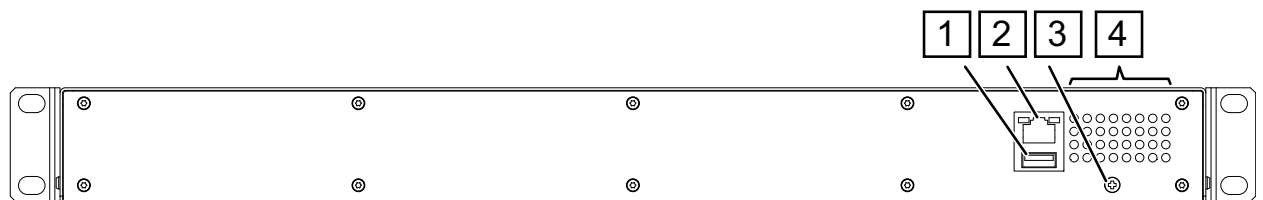
- | | |
|---|--|
| 1 | USB interface |
| 2 | V.24 interface |
| 3 | Grounding screw |
| 4 | LED display elements |
| 5 | 8 × RJ45 socket for 10/100 Mbit/s Twisted pair connections |
| 6 | 8 × SFP slot for 100 Mbit/s F/O connections |
| 7 | Cover panel |

Table 5: Front view using example of device variant GRS1020



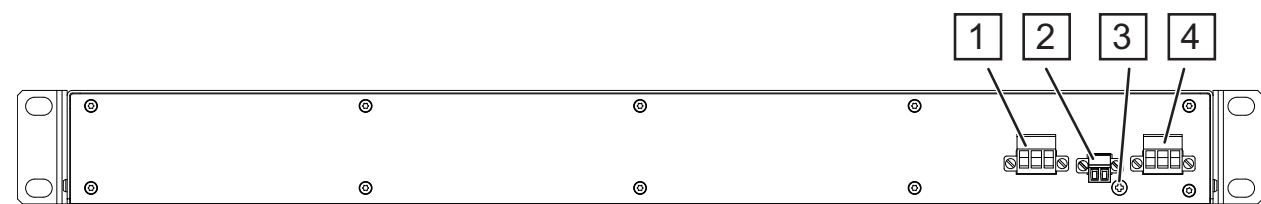
- | | |
|---|---|
| 1 | USB interface |
| 2 | V.24 interface |
| 3 | Grounding screw |
| 4 | LED display elements |
| 5 | 4 × Combo port for 10/100/1000 Mbit/s connections |
| 6 | 16 × RJ45 socket for 10/100 Mbit/s Twisted pair connections |
| 7 | Cover panel |

Table 6: Front view using example of device variant GRS1030



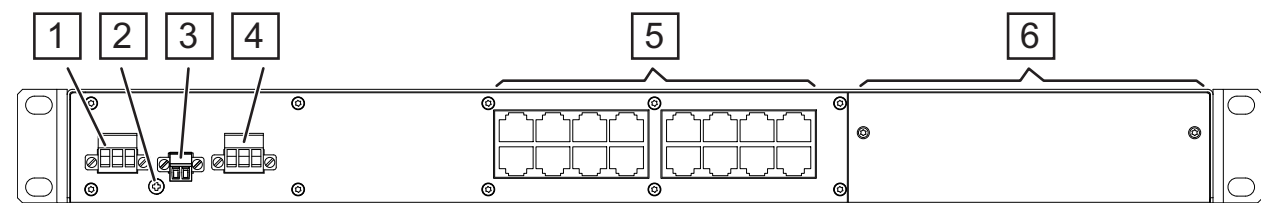
- | | |
|---|----------------------|
| 1 | USB interface |
| 2 | V.24 interface |
| 3 | Grounding screw |
| 4 | LED display elements |

Table 7: Front view using example of device variant GRS1120 and GRS1130



1	Supply voltage connection 1	
	alternatively, depending on device variant	Supply voltage with characteristic value C ► 2-pin terminal block
		Supply voltage with characteristic value M ► 3-pin terminal block
2	Connection for the signal contact	
3	Grounding screw	
4	Supply voltage connection 2	
	alternatively, depending on device variant	Supply voltage with characteristic value C ► 2-pin terminal block
		Supply voltage with characteristic value M ► 3-pin terminal block

Table 8: Rear view using example of device variant GRS1030 and GRS1030



1	Supply voltage connection 1	
	alternatively, depending on device variant	Supply voltage with characteristic value C ► 2-pin terminal block
		Supply voltage with characteristic value M ► 3-pin terminal block
2	Grounding screw	
3	Connection for the signal contact	
4	Supply voltage connection 2	
	alternatively, depending on device variant	Supply voltage with characteristic value C ► 2-pin terminal block
		Supply voltage with characteristic value M ► 3-pin terminal block
5	16 x RJ45 socket for 10/100 Mbit/s Twisted pair connections	
6	Cover panel	

Table 9: Rear view using example of device variant GRS1120

The diagram shows the rear panel of a network device with the following components labeled with numbers in boxes:

- 1**: Supply voltage connection 1 (2-pin terminal block)
- 2**: Grounding screw
- 3**: Connection for the signal contact (3-pin terminal block)
- 4**: Supply voltage connection 2 (2-pin terminal block)
- 5**: 4 x Combo port for 10/100/1000 Mbit/s connections
- 6**: 8 x RJ45 socket for 10/100 Mbit/s Twisted pair connections
- 7**: 8 x SFP slot for 100 Mbit/s F/O connections
- 8**: Cover panel

1	Supply voltage connection 1			
	alternatively, depending on device variant	Supply voltage with characteristic value C	▶	2-pin terminal block
		Supply voltage with characteristic value M	▶	3-pin terminal block
2	Grounding screw			
3	Connection for the signal contact			
4	Supply voltage connection 2			
	alternatively, depending on device variant	Supply voltage with characteristic value C	▶	2-pin terminal block
		Supply voltage with characteristic value M	▶	3-pin terminal block
5	4 x Combo port for 10/100/1000 Mbit/s connections			
6	8 x RJ45 socket for 10/100 Mbit/s Twisted pair connections			
7	8 x SFP slot for 100 Mbit/s F/O connections			
8	Cover panel			

Table 10: Rear view using example of device variant GRS1130

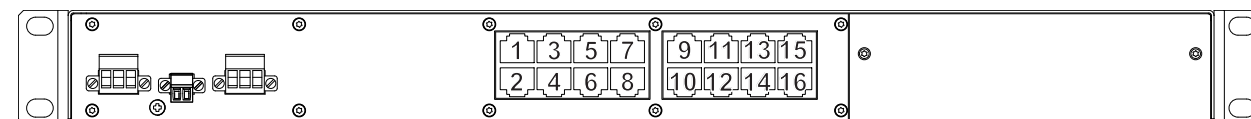
1.4.2 Port assignment

Port	Port description
1 ... 8	8 x RJ45 socket for 10/100 Mbit/s Twisted pair connections
9 ... 16	8 x SFP slot for 100 Mbit/s F/O connections

Table 11: Port assignment: Front view GRS1020

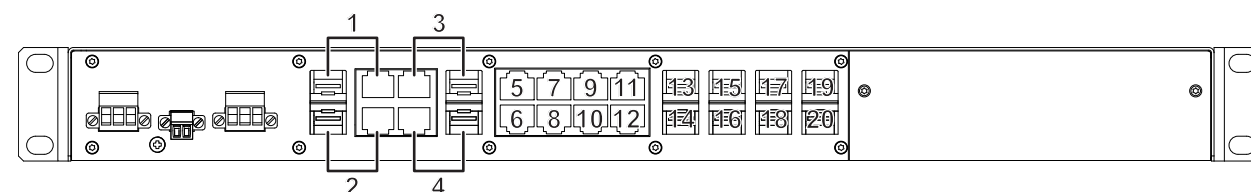
Port	Port description
1 ... 4	4 x 100/1000 Mbit/s uplink port
5 ... 20	16 x RJ45 socket for 10/100 Mbit/s Twisted pair connections

Table 12: Port assignment: Front view GRS1030



Port	Port description
1 ... 16	16 x RJ45 socket for 10/100 Mbit/s Twisted pair connections

Table 13: Port assignment: Rear view GRS1120



Port	Port description
1 ... 4	4 x 100/1000 Mbit/s uplink port
5 ... 12	8 x RJ45 socket for 10/100 Mbit/s Twisted pair connections
13 ... 20	8 x SFP slot for 100 Mbit/s F/O connections

Table 14: Port assignment: Rear view GRS1130

1.4.3 Media modules

■ 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 un-crossed 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

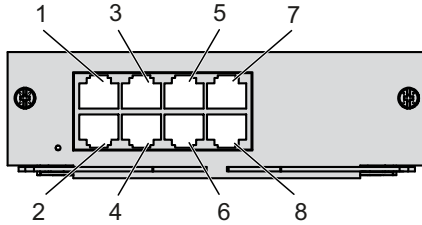
	Port	Port description
	1, 3	2 × RJ45 socket
	5, 7	2 × RJ45 socket
	2, 4	2 × RJ45 socket
	6, 8	2 × RJ45 socket

Table 15: GRM20-TTTTTTTT

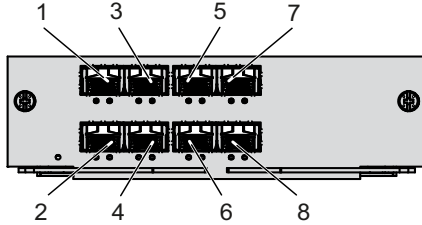
	Port	Port description
	1, 3	2 × SFP slot
	5, 7	2 × SFP slot
	2, 4	2 × SFP slot
	6, 8	2 × SFP slot

Table 16: GRM20-ZZZZZZZZ

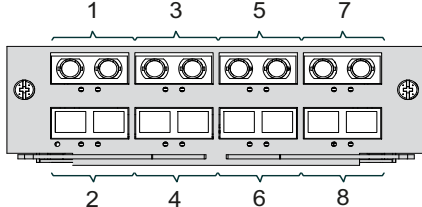
	Port	Port description
	1, 3	2 × ST singlemode socket
	5, 7	2 × ST singlemode socket
	2, 4	2 × DSC multimode socket
	6, 8	2 × DSC multimode socket

Table 17: GRM20-UUUUMMMM

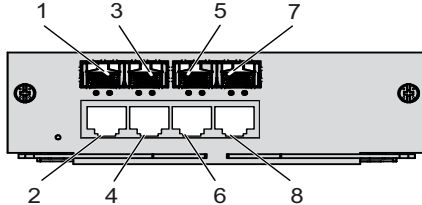
	Port	Port description
	1, 3	2 × SFP slot
	5, 7	2 × SFP slot
	2, 4	2 × RJ45 socket
	6, 8	2 × RJ45 socket

Table 18: GRM20-ZZZZTTTT

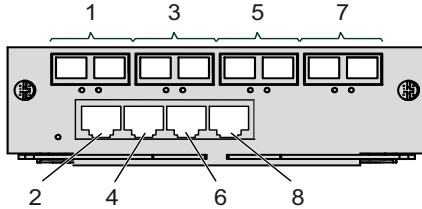
	Port	Port description
	1, 3	2 × DSC multimode socket
	5, 7	2 × DSC multimode socket
	2, 4	2 × RJ45 socket
	6, 8	2 × RJ45 socket

Table 19: 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.

1.5 Power supply

You will find information on the characteristic values here:

[“Device name and product code” on page 24](#)

1.5.1 Supply voltage with characteristic value C

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

Further information:

[See “Supply voltage with characteristic value C” on page 53.](#)

1.5.2 Supply voltage with characteristic value M

A 3-pin terminal block is available for the power supply of the device.

Further information:

[See “Supply voltage with characteristic value M” on page 54.](#)

1.6 Ethernet ports

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

Note: By using media modules, you obtain up to 8 additional Fast Ethernet ports.

1.6.1 Basic device

■ Gigabit combo port

The GREYHOUND device provides 4 combo ports for transmission speeds of up to 1000 Mbit/s.

See [“General technical data” on page 63](#).

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

See [“Accessories” on page 78](#).

By inserting an SFP transceiver, you automatically deactivate the assigned twisted pair port.

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

Table 20: Combo ports: Connection options

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

This port is an RJ45 socket.

The 10/100/1000 Mbit/s twisted pair port allows you to connect network components according to the IEEE 802.3 10BASE-T/100BASE-TX/1000BASE-T standard.

This port supports:

- ▶ Autonegotiation
- ▶ Autopolarity
- ▶ Autocrossing (if autonegotiation is activated)
- ▶ 1000 Mbit/s full duplex
- ▶ 100 Mbit/s half-duplex mode, 100 Mbit/s full duplex mode
- ▶ 10 Mbit/s half-duplex mode, 10 Mbit/s full duplex mode

Delivery state: Autonegotiation activated
The port casing is electrically connected to the front panel.
The pin assignment corresponds to MDI-X.

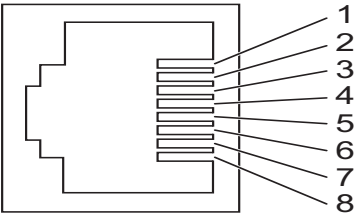
	Pin	Function
	1	BI_DB+
	2	BI_DB-
	3	BI_DA+
	4	BI_DD+
	5	BI_DD-
	6	BI_DA-
	7	BI_DC+
	8	BI_DC-

Table 21: Pin assignments of the 10/100/1000 Mbit/s twisted pair port in 1000 Mbit/s mode, RJ45 socket, MDI-X mode

- 10/100 Mbit/s twisted pair port

This port is an RJ45 socket.

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

This port supports:

▶ Autonegotiation

▶ Autopolarity

▶ Autocrossing (if autonegotiation is activated)

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

▶ 10 Mbit/s half-duplex mode, 10 Mbit/s full duplex mode

Delivery state: Autonegotiation activated

The port casing is electrically connected to the front panel.

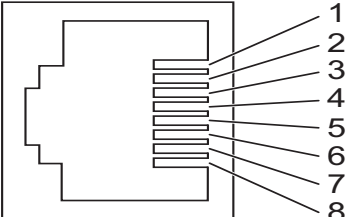
	Pin	Function
	1	RD+ Receive path
	2	RD- Receive path
	3	TD+ Transmission path
	6	TD- Transmission path
	4, 5, 7, 8	–

Table 22: Pin assignment 10/100 Mbit/s twisted pair port, RJ45 socket, MDI-X mode

■ 100 Mbit/s F/O port (optional)

This port is an SFP slot.

The 100 Mbit/s F/O port allows you to connect network components according to the IEEE 802.3 100BASE-FX standard.

This port supports:

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

Default setting: Full duplex

1.6.2 Media modules

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.

■ 100 Mbit/s F/O port

This port is an SFP slot or an ST socket or a DSC socket.

[See “Port assignment of the media module variants” on page 35.](#)

The 100 Mbit/s F/O port allows you to connect network components according to the IEEE 802.3 100BASE-FX standard.

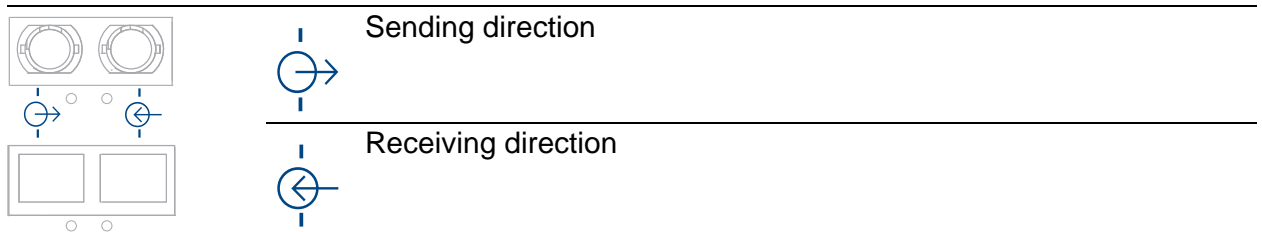
This port supports:

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

Default setting: Full duplex

Applies to device variants with DSC ports or ST ports:

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



■ 10/100 Mbit/s twisted pair port

This port is an RJ45 socket.

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

This port supports:

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

Delivery state: Autonegotiation activated

The port casing is electrically connected to the front panel.

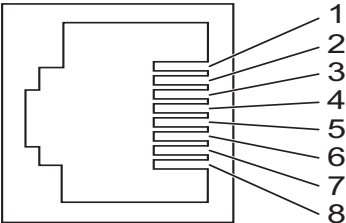
	Pin	Function
	1	RD+ Receive path
	2	RD- Receive path
	3	TD+ Transmission path
	6	TD- Transmission path
	4, 5, 7, 8	–

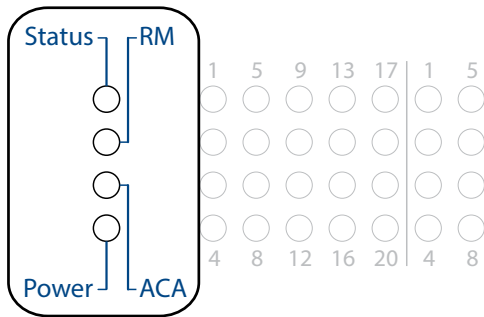
Table 23: Pin assignment 10/100 Mbit/s twisted pair port, RJ45 socket, MDI-X mode

1.7 Display elements

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

1.7.1 Device Status

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



LED	Display	Color	Activity	Meaning
Status	Device status	–	none	Device is starting and/or is not ready for operation.
		green	lights up	Device is ready for operation. Characteristics can be configured
		red	lights up	Device is ready for operation. Device has detected at least one error in the monitoring results
			flashes 1 x a period	The boot parameters used when the device has been started differ from the boot parameters saved. Start the device again.
			flashes 4 x a period	Device has detected a multiple IP address
RM	Redundancy Manager	–	none	No redundancy configured
		green	lights up	Redundancy exists
			flashes 1 x a period	Device is reporting an incorrect configuration of the RM function
		yellow	lights up	No redundancy exists
Power	Supply voltage	–	none	Supply voltage is too low
		yellow	lights up	Device variants with redundant power supply: Supply voltage 1 or 2 is on
			flashes 4 x a period	Software update is running. Maintain the power supply.
		green	lights up	Device variants with redundant power supply: Supply voltage 1 and 2 is on Device variants with single power supply: Supply voltage is on

LED	Display	Color	Activity	Meaning
ACA	Storage medium ACA31	–	none	ACA storage medium not connected
		green	lights up	ACA storage medium connected
			flashes 3 x a period	Device writes to/reads from the storage medium
		yellow	lights up	ACA storage medium inoperative

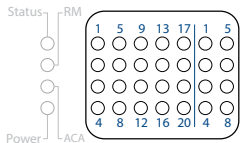
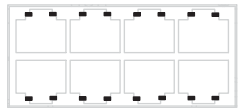
1.7.2 Port status

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 x a period	Port is switched to stand-by
		flashes 3 x a period	Port is switched off
	yellow	flashing alternately	Device is transmitting and/or receiving data
		lights up	Device detects a non-supported SFP transceiver or a non-supported data rate
		flashes 1 x a period	Device detects at least one unauthorized MAC address (Port Security Violation) and sends a trap.
		flashes 3 x a period	The device deactivates the relevant port (auto-deactivation).

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	Front or back of the device depends on the device variant
	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
configure
system port-led-mode
portpanel
```

Change to the privileged EXEC mode.
Change to the configuration mode.
Change LED display from service panel to port panel.

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

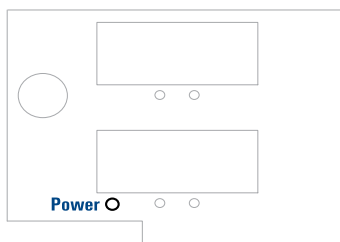
```
enable
configure
system port-led-mode
servicepanel
```

Change to the privileged EXEC mode.
Change to the configuration mode.
Change LED display from port panel to service panel.

1.7.3 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

1.8 Management interfaces

1.8.1 V.24 interface (external management)

A serial interface is provided on the RJ45 socket (V.24 interface) for the local connection of an external management station (VT100 terminal or PC with corresponding terminal emulation). This enables you to set up a connection to the Command Line Interface (CLI) and to the system monitor.

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

The socket housing is electrically connected to the front panel of the device. The V.24 interface is electrically insulated from the supply voltage.

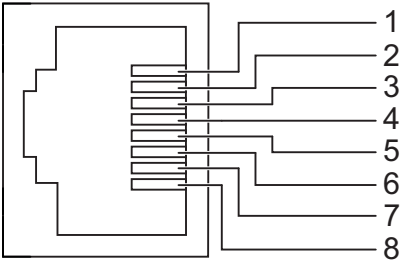
Figure	Pin assignment	Function
	1	–
	2	–
	3	TxD
	4	GND
	5	–
	6	RxD
	7	–
	8	–

Table 24: Pin assignment of the V.24 interface

Note: The Terminal cable is available as an accessory.
See [“Accessories” on page 78](#).

1.8.2 USB interface

The USB interface allows you to connect the AutoConfiguration Adapter ACA22 storage medium. This is used for saving/loading the configuration data and diagnostic information, and for loading the software.
For information about the position on the device see [“Device views” on page 31](#).

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

The USB interface has the following properties:

- ▶ Supplies current of max. 500 mA
- ▶ Voltage not potential-separated
- ▶ Connectors: type A
- ▶ Supports the USB master mode
- ▶ Supports USB 2.0

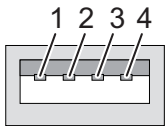
Figure	Pin	Function
	1	VCC (VBus)
	2	- Data
	3	+ Data
	4	Ground (GND)

Table 25: Pin assignment of the USB interface

1.9 Signal contact

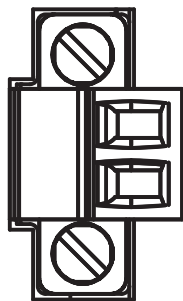


Figure 1: Signal contact: 2-pin terminal block with screw locking

The signal contact is a potential-free relay contact. The signal contact is open when the device is not connected to a power supply.

The signal contact allows you to control external devices or monitor device functions.

In the configuration, you specify how the device uses the signal contact. You will find detailed information on possible applications and the configuration of the signal contact in the software user documentation. You will find the software user documentation as PDF files on the Internet at <https://www.doc.hirschmann.com>

2 Installation

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

On delivery, the device is ready for operation.


Perform the following steps to install and configure the device:

- ▶ [Checking the package contents](#)
- ▶ [Installing and grounding the device](#)
- ▶ [Installing a media module \(optional\)](#)
- ▶ [Installing an SFP transceiver \(optional\)](#)
- ▶ [Connecting the terminal blocks](#)
- ▶ [Operating the device](#)
- ▶ [Connecting data cables](#)
- ▶ [Filling out the inscription label](#)

2.1 Checking the package contents

- ☐ Check whether the package includes all items named in the section [“Scope of delivery” on page 77](#).
- ☐ Check the individual parts for transport damage.

2.2 Installing and grounding the device

 WARNING
ELECTRIC SHOCK Exclusively install this device in a switch cabinet or in a restricted access location according to IEC/EN 62368-1, to which maintenance staff have exclusive access. Failure to follow these instructions can result in death, serious injury, or equipment damage.



CAUTION

OVERHEATING OF THE DEVICE

Verify that all ventilation slots are clear when installing the device. Avoid touching the device while it is operating.

Failure to follow these instructions can result in minor injury or equipment damage.

■ Mounting in a switch cabinet

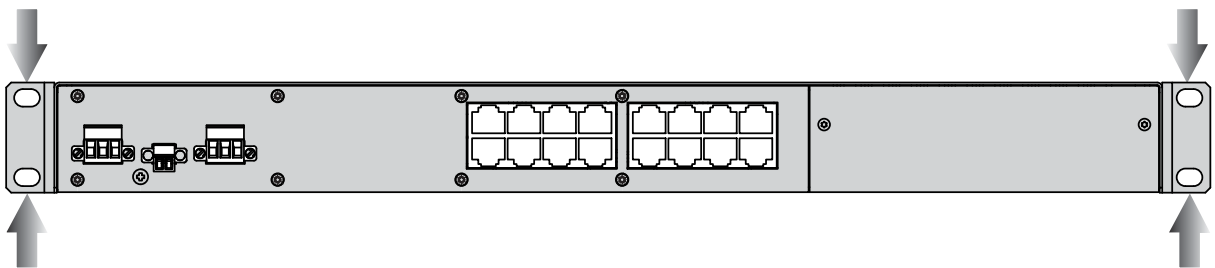
Note: Install the device in the 19" switch cabinet using sliding or mounting rails.

This provides a more stable position of your device in environments subject to vibration.

For more information on sliding/mounting rails and how to install them, please contact your switch cabinet manufacturer.

The devices are designed to be mounted in a 19" switch cabinet.

In the delivery state, there are 2 pre-mounted mounting brackets on the sides of the device.



- ☐ Ensure adequate ventilation. If necessary, install an additional fan in the switch cabinet to prevent the device from overheating.
- ☐ Measure the depth of the 19" cabinet so that all the lines to be connected can be fed in easily.

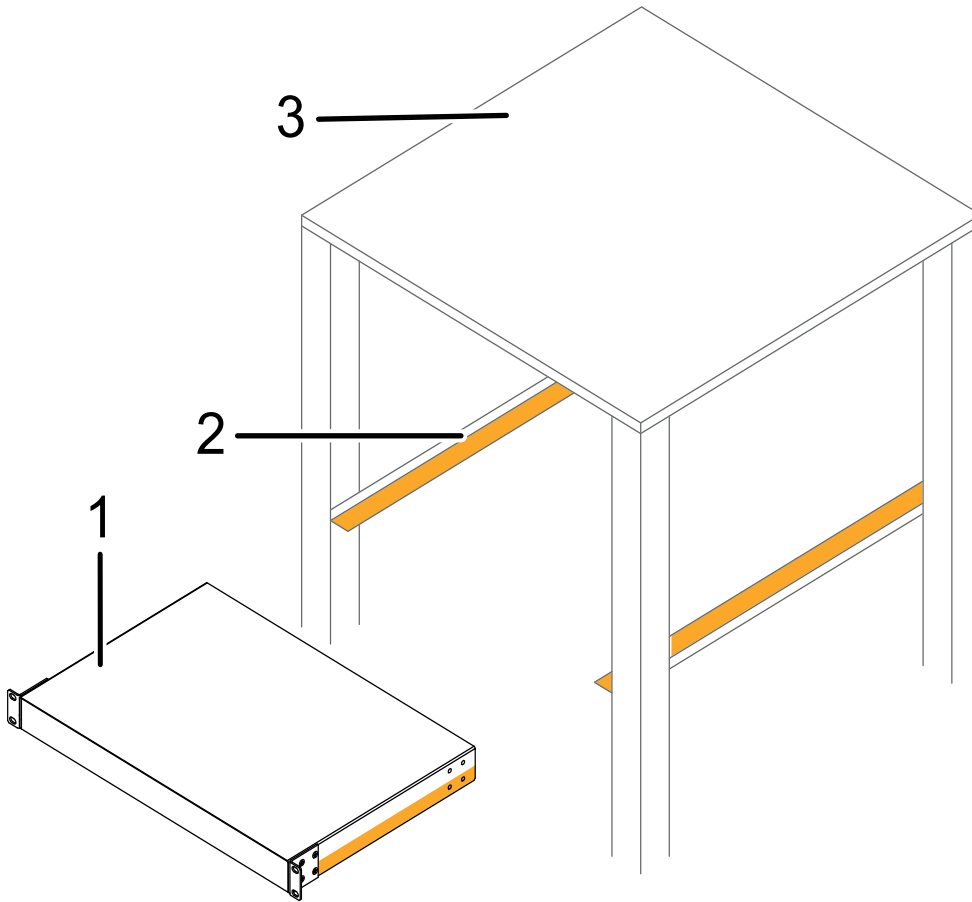


Figure 2: Assembly in a switch cabinet with sliding/mounting rails

- 1 - device*
- 2 - sliding/mounting rail*
- 3 - 19" switch cabinet*

Perform the following work steps:

- ☐ Assemble the sliding or mounting rails in the 19" switch cabinet as specified by the manufacturer.
- ☐ Position the device on the rails in the switch cabinet.
- ☐ Fasten the device in the switch cabinet by screwing it in with the mounting brackets.

Note: When operating the device in an environment with strong vibrations, you have the option to additionally fasten the device to the switch cabinet using 2 holding brackets on the back of the device. You obtain the additional brackets as accessories.

See ["Accessories" on page 78](#).

■ Mounting on a vertical flat surface



WARNING

FIRE HAZARD

Install the device in a fire enclosure according to IEC/EN 62368-1 if you install the device vertically.

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

- ☐ Use the pre-mounted brackets as shown below.
- ☐ Additionally attach 2 brackets to the back of the device.
You obtain the additional brackets as accessories.
[See “Accessories” on page 78.](#)
- ☐ Fasten the device by screwing the brackets to the wall.

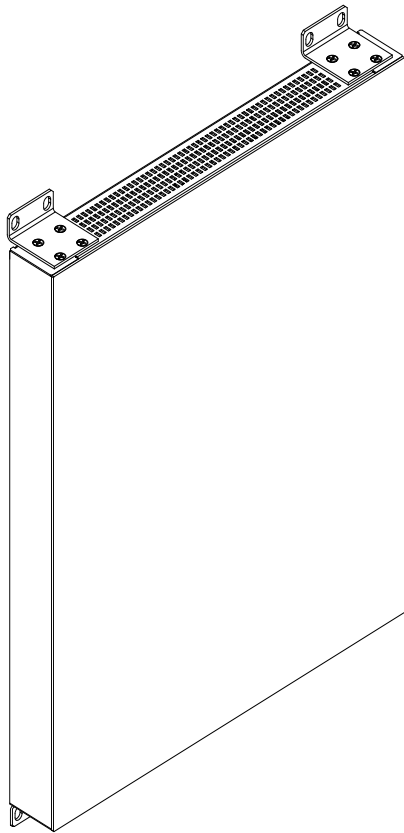


Figure 3: Mounting on a vertical flat surface

■ Grounding the device

The device variants have a connection for protective grounding.

- ☐ Ground the device via the ground screw.

You find the prescribed tightening torque in chapter:

[“General technical data” on page 63](#)

Note: This applies to the following device variants only:

Supply voltage with characteristic value M

The device is grounded via the ground screw and also via the power supply socket.

[See figure 7 on page 54.](#)

2.3 Installing a media module (optional)

Hirschmann supplies the media modules in a ready-to-operate state. By using a media module, you obtain up to 8 additional Fast Ethernet ports. You have the option of mounting the media modules while the device is operating.

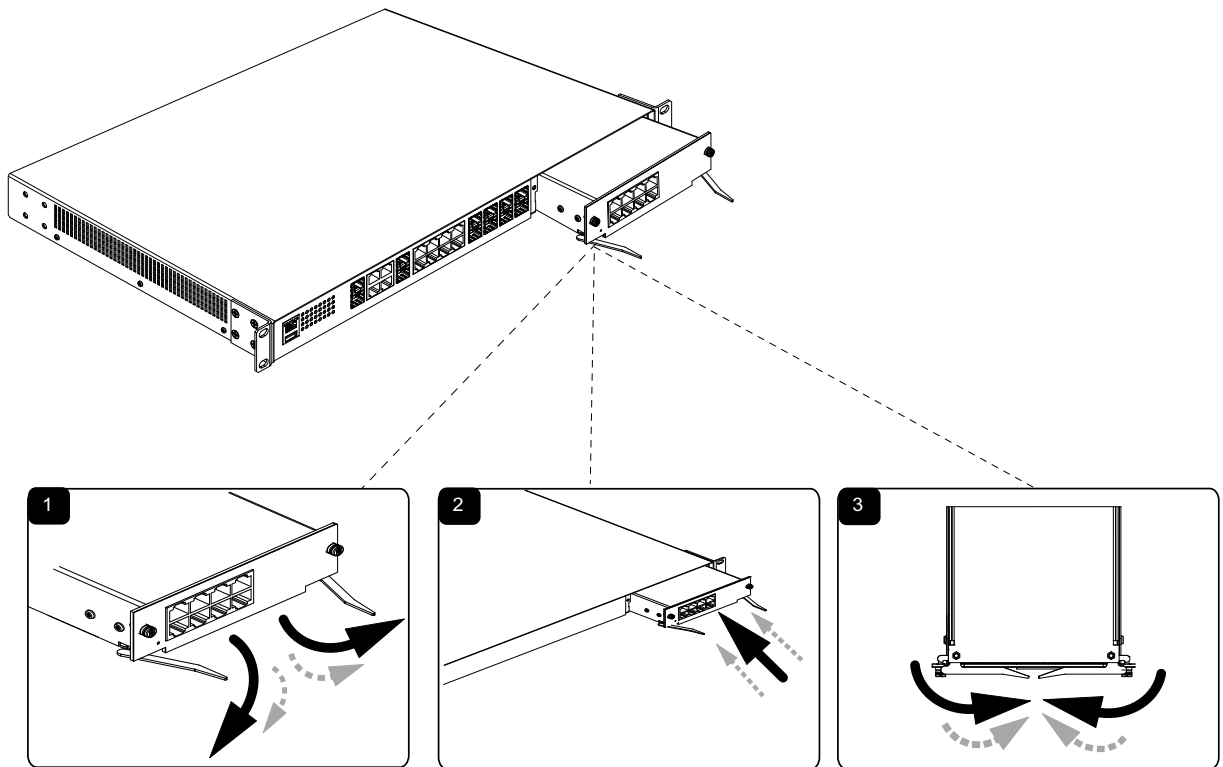


Figure 4: Mounting a media module

Perform the following work steps:

- ☐ Remove the cover panel from the media module slot on the basic device.
- ☐ Open the locking mechanism of the media module by pressing the locking levers outwards (1).
- ☐ Insert the media module straight into the media module slot (2).
- ☐ Lock the media module in place by pressing the locking levers inwards (3).
- ☐ Fasten the media module with the screws in the front panel of the basic device.

You find the prescribed tightening torque in chapter:

[“General technical data” on page 63](#)

2.4 Installing an SFP transceiver (optional)

Prerequisites:

Exclusively use Hirschmann SFP transceivers.

See [“Accessories” on page 78](#).

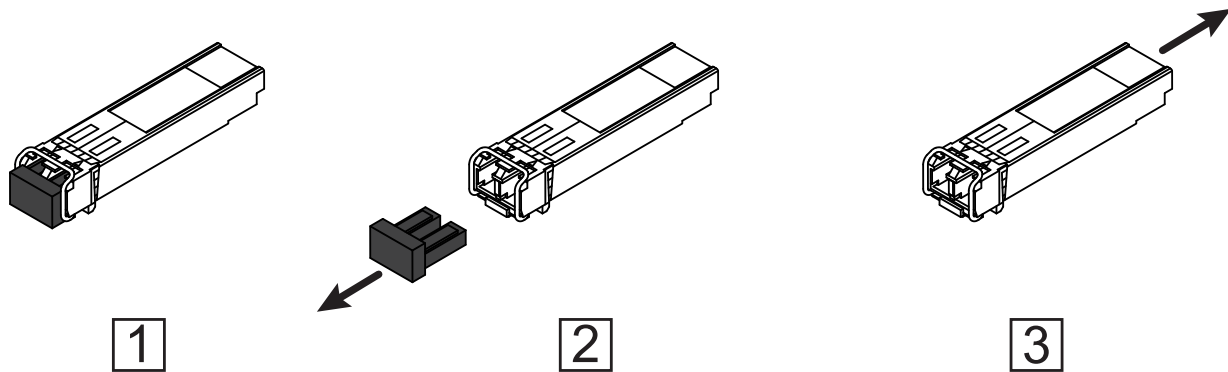




Figure 5: Installing SFP transceivers: Installation sequence

Perform the following work steps:

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

2.5 Connecting the terminal blocks

 WARNING
ELECTRIC SHOCK Connect only a supply voltage that corresponds to the type plate of your device. Failure to follow these instructions can result in death, serious injury, or equipment damage.

 WARNING
ELECTRIC SHOCK Never insert pointed objects (narrow screwdrivers, wires, etc.) into the device or into the connection terminals for electric conductors. Do not touch the connection terminals. Failure to follow these instructions can result in death, serious injury, or equipment damage.

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

2.5.1 Supply voltage with characteristic value C

You will find information on the characteristic values here:

[“Device name and product code” on page 24](#)

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

Both supply voltage inputs are uncoupled.

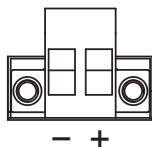


Figure 6: Supply voltage with characteristic value C: 2-pin terminal block with screw lock

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

Table 26: Supply voltage with characteristic value C: type and specification of the supply voltage, pin assignment on the device

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

- ☐ Remove the terminal connector from the device.
 - ☐ Connect the wires according to the pin assignment on the device with the clamps.
 - ☐ Fasten the wires in the terminal block by tightening the terminal screws.
- You find the prescribed tightening torque in chapter:

[“General technical data” on page 63](#)

2.5.2 Supply voltage with characteristic value M

You will find information on the characteristic values here:

[“Device name and product code” on page 24](#)

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

Both supply voltage inputs are uncoupled.

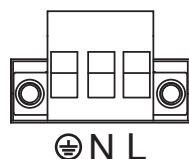


Figure 7: Supply voltage with characteristic value M: 3-pin terminal block with screw lock



Type of the voltages that can be connected	Specification of the supply voltage	Pin assignment	
DC voltage	Rated voltage range 110 V DC ... 250 V DC Voltage range incl. maximum tolerances 88 V DC ... 288 V DC	+/L -/N 	Plus terminal of the supply voltage Minus terminal of the supply voltage Protective conductor
AC voltage	Rated voltage range 110 V AC ... 240 V AC, 50 Hz ... 60 Hz Voltage range including maximum tolerances 88 V AC ... 276 V AC, 47 Hz ... 63 Hz	+/L -/N 	Outer conductor Neutral conductor Protective conductor

Table 27: Supply voltage with characteristic value M: type and specification of the supply voltage, pin assignment on the device

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

- ☐ Remove the terminal connector from the device.
- ☐ Connect the wires according to the pin assignment on the device with the clamps.
- ☐ Fasten the wires in the terminal block by tightening the terminal screws.
You find the prescribed tightening torque in chapter:
[“General technical data” on page 63](#)

2.5.3 Signal contact

- ☐ Connect the signal contact lines with the terminal block connections.
- ☐ Fasten the wires in the terminal block by tightening the terminal screws.
You find the prescribed tightening torque in chapter:
[“General technical data” on page 63](#)

2.6 Operating the device

Perform the following work steps:

- ☐ Use screws to secure the connectors to the device.
You find the prescribed tightening torque in chapter:
[“General technical data” on page 63](#)
- ☐ Enable the supply voltage.

2.7 Connecting data cables

Note the following general recommendations for data cable connections in environments with high electrical interference levels:

- ☐ Keep the length of the data cables as short as possible.
- ☐ Use optical data cables for the data transmission between the buildings.
- ☐ When using copper cables, provide a sufficient separation between the power supply cables and the data cables. Ideally, install the cables in separate cable channels.
- ☐ Verify that power supply cables and data cables do not run parallel over longer distances. To reduce inductive coupling, verify that the power supply cables and data cables cross at a 90 ° angle.
- ☐ Use shielded data cables for gigabit transmission via copper cables, for example SF/UTP cables according to ISO/IEC 11801. To meet EN 50121-4 and marine application requirements, use shielded data cables at all transmission rates.
- ☐ Connect the data cables according to your requirements.
[See “Ethernet ports” on page 37.](#)
- ☐ Connect the data cables according to your requirements.
Further information:
[See “Device name and product code” on page 24.](#)

2.8 Filling out the inscription label

The information field for the MAC address on the front of the device helps you to identify your device.

3 Making basic settings

Note: 2 or more devices configured with the same IP address can cause unpredictable operation of your network.

Install and maintain a process that assigns a unique IP address to every device in the network.

The IP parameters must be entered when the device is installed for the first time. The device provides 6 options for configuring the 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
- ▶ Configuration via DHCP (Option 82)
- ▶ AutoConfiguration Adapter

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

3.1 Default settings

- ▶ IP address: The device looks for the IP address using DHCP
- ▶ Management password:
 - Login: user (read-only)
 - password: public
 - Login: admin (read/write permissions)
 - password: private
- ▶ Parameters that can be set via the management are set to pre-defined values in accordance with the MIB
- ▶ V.24 data rate: 9600 Baud
- ▶ Ring redundancy: disabled
- ▶ Ethernet ports: link status is not evaluated (signal contact)
- ▶ Optical 100 Mbit/s ports: 100 Mbit/s full duplex
- ▶ All other ports: autonegotiation

3.2 First login (Password change)

To help prevent undesired access to the device, it is imperative that you change the default password during initial setup.

Perform the following steps:

- ☐ Open the Graphical User Interface, the Command Line Interface, or HiView the first time you log on to the device.
- ☐ Log on to the device with the default password “private”. The device prompts you to type in a new password.
- ☐ Type in your new password.
To help increase security, choose a password that contains at least 8 characters which includes upper-case characters, lower-case characters, numerical digits, and special characters.
- ☐ When you log on to the device with the Command Line Interface, then the device prompts you to confirm your new password.
- ☐ Log on to the device again with your new password.

Note: If you lost your password, then use the System Monitor to reset the password.

For further information see:

<https://hirschmann-support.belden.com/en/kb/required-password-change-new-procedure-for-first-time-login>

4 Monitoring the ambient air temperature

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

See [“General technical data” on page 63](#).

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

5 Maintenance and service

- ☐ When designing this device, Hirschmann largely avoided using high-wear parts. The parts subject to wear and tear are dimensioned to last longer than the lifetime of the product when it is operated normally. Operate this device according to the specifications.
- ☐ Relays are subject to natural wear. This wear depends on the frequency of the switching operations. Check the resistance of the closed relay contacts and the switching function depending on the frequency of the switching operations.
- ☐ Hirschmann is continually working on improving and developing their software. Check regularly whether there is an updated version of the software that provides you with additional benefits. You find information and software downloads on the Hirschmann product pages on the Internet (<http://www.hirschmann.com>).
- ☐ Internal fuses are triggered only in the case of a detected error in the device. In case of damage or malfunction of the device, turn off the supply voltage and return the device to the plant for inspection.
- ☐ Depending on the degree of pollution in the operating environment, check at regular intervals that the ventilation slots in the device are not obstructed.

You find information on settling complaints on the Internet at <http://www.beldensolutions.com/en/Service/Repairs/index.phtml>.

6 Disassembly

6.1 Removing a media module (optional)

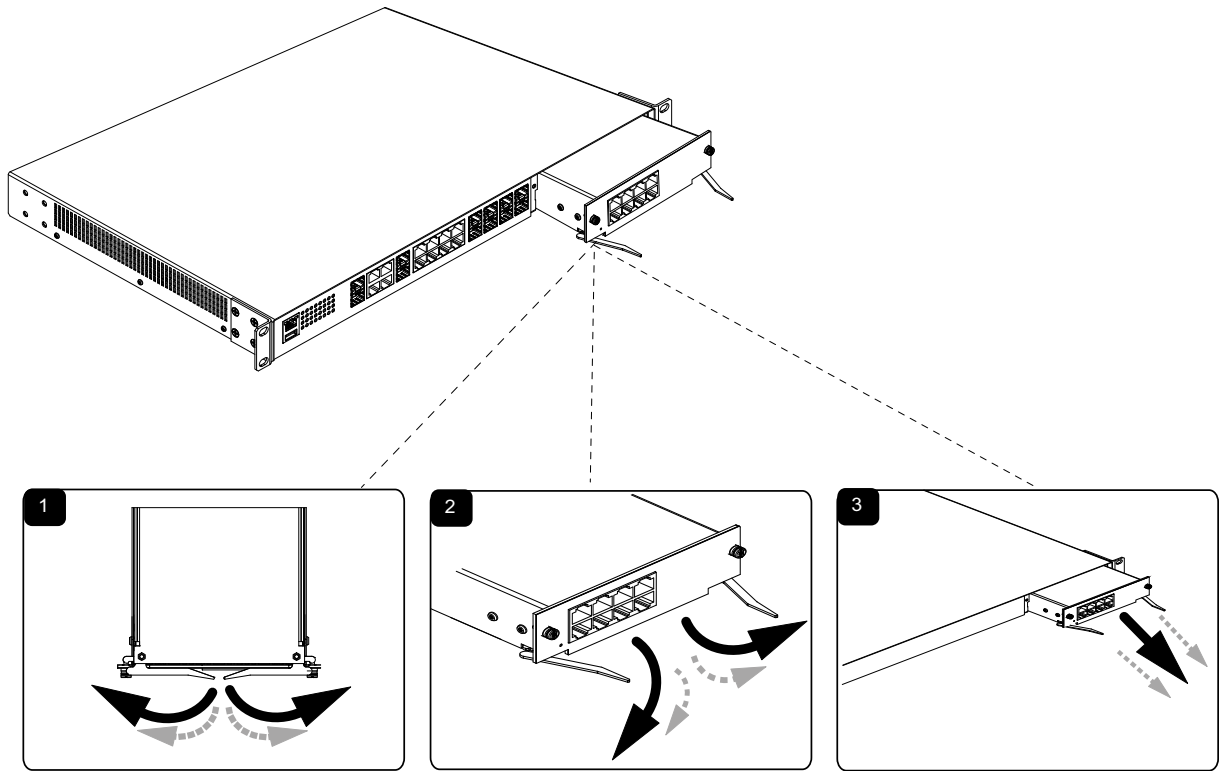


Figure 8: Demounting a media module

- ☐ Loosen the screws in the front panel of the media module.
 - ☐ Open the locking mechanism of the media module by pressing the locking levers outwards (1, 2).
 - ☐ Pull the media module out of the slot (3).
 - ☐ Close the media module slot on the basic device using a cover panel.
 - ☐ Fasten the cover panel using the 2 screws on the basic device.
- You find the prescribed tightening torque in chapter:
[“General technical data” on page 63](#)

6.2 Removing an SFP transceiver (optional)

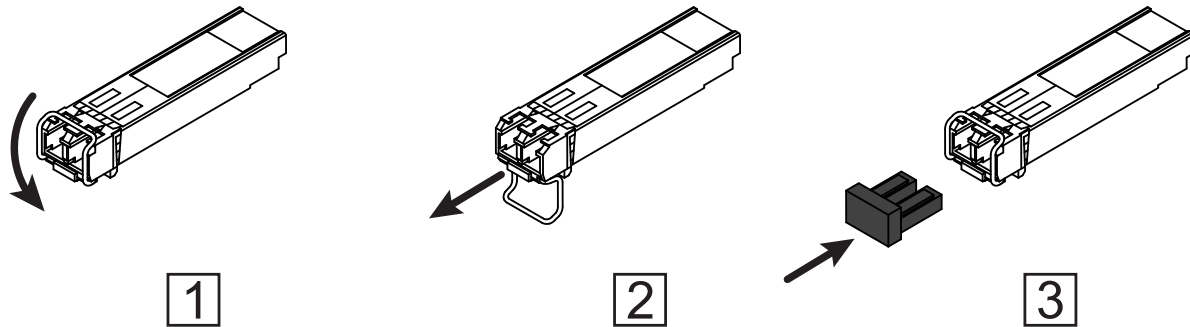


Figure 9: De-installing SFP transceivers: De-installation sequence

Perform the following work steps:

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

6.3 Removing the device



WARNING

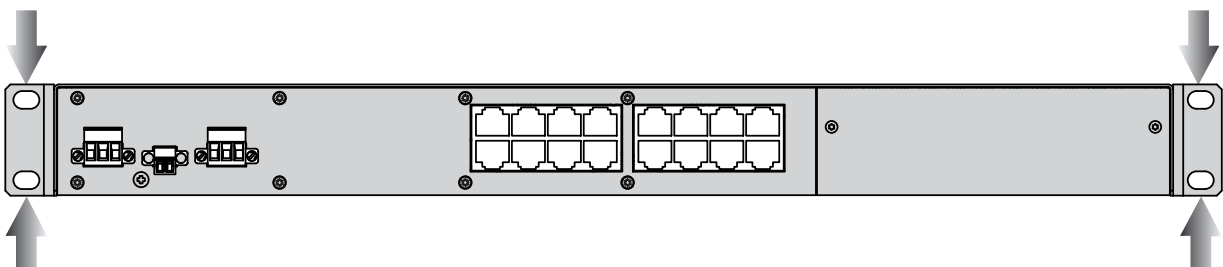
ELECTRIC SHOCK

Disconnect the grounding only after disconnecting all other cables.

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

Perform the following work steps:

- ☐ To detach the device from the switch cabinet or the wall, remove the screws from the brackets on the device.



7 Technical data

7.1 General technical data

■ Basic device

Dimensions W x H x D	GRS1020	See "Dimension drawings" on page 68.
	GRS1120	
	GRS1030	
	GRS1130	
Weight Supply voltage with characteristic value M	GRS1020-16T9	3.7 kg (8.16 lb)
	GRS1120-16T9	
	GRS1030-16T9	3.8 kg (8.38 lb)
	GRS1130-16T9	
	GRS1020-8T8Z	3.6 kg (7.94 lb)
	GRS1120-8T8Z	
	GRS1030-8T8Z	3.7 kg (8.16 lb)
	GRS1130-8T8Z	
Weight Supply voltage with characteristic value C	Optional second power unit	Additional 380 g (12.22 oz)
	GRS1020-16T9	3.8 kg (8.38 lb)
	GRS1120-16T9	
	GRS1030-16T9	3.8 kg (8.38 lb)
	GRS1130-16T9	
	GRS1020-8T8Z	3.6 kg (7.94 lb)
	GRS1120-8T8Z	
	GRS1030-8T8Z	3.7 kg (8.16 lb)
Pollution degree	GRS1130-8T8Z	
	Optional second power unit	Additional 430 g (13.83 oz)
Protection classes	Laser protection	Class 1 in compliance with IEC 60825-1
	Degree of protection	IP20
Ground connection	Screw type	M3
	Tightening torque	0.34 Nm (3 lb-in)
	min. conductor cross-section	0.75 mm ² (AWG18)

■ Media modules

Dimensions	GRM	See "Dimension drawings" on page 68.
Weight (X = Characteristic value M, N, U or V)	GRM20-TTTTTTTT	450 g (14.48 oz)
	GRM20-XXXXXXXXXS	520 g (16.72 oz)
	GRM20-XXXXXXXXXT	670 g (21.45 oz)
	GRM20-XXXXXXXXXE	
	GRM20-ZZZZZZZZS	650 g (20.90 oz) Without SFP transceiver
	GRM20-ZZZZZZZZT	
	GRM20-ZZZZZZZZE	
Connection type	GRM20-ZZZZTTTTT	470 g (15.11 oz) Without SFP transceiver
	GRM20-XXXXTTTTT	500 g (17.64 oz)
Connection type	Screw type	Screw with loss prevention
	Tightening torque	0.34 Nm (3 lb-in)
Pollution degree		2
Protection classes	Laser protection	Class 1 in compliance with IEC 60825-1
	Degree of protection	IP20

7.2 Supply voltage

Supply voltage with characteristic value M		
Rated voltage	110 V AC ... 240 V AC, 50 Hz ... 60 Hz 110 V DC ... 250 V DC	
Voltage range including maximum tolerances	88 V AC ... 276 V AC 88 V DC ... 288 V DC	
Connection type	3-pin terminal block	
	Tightening torque	0.5 Nm (4.4 lb-in)
	min. conductor cross-section	Supply with AC voltage: 0.75 mm ² (AWG18)
		Supply with DC voltage: 1 mm ² (AWG16)
	max. conductor cross-section	2.5 mm ² (AWG12)
Power loss buffer	>20 ms at 230 V DC	
Back-up fuse for each voltage input	Nominal rating:	2.5 A
	Characteristic:	slow blow
Overload current protection on the device	Non-replaceable fuse	
Peak inrush current	<6 A	

Table 28: Supply voltage: Supply voltage with characteristic value M

Supply voltage with characteristic value C		
Rated voltage	24 V DC ... 48 V DC	
Voltage range incl. maximum tolerances	18 V DC ... 60 V DC	

Table 29: Supply voltage: Supply voltage with characteristic value C

Supply voltage with characteristic value C			
Connection type	2-pin terminal block		
	Tightening torque	0.34 Nm (3 lb-in)	
	min. conductor cross-section	1 mm² (AWG16)	
	max. conductor cross-section	1.3 mm² (AWG16)	
Power loss buffer	>10 ms at 20.4 V DC		
Back-up fuse for each voltage input	Nominal rating:	6.3 A	
	Characteristic:	slow blow	
Overload current protection on the device	Non-replaceable fuse		
Peak inrush current	<7 A		

Table 29: Supply voltage: Supply voltage with characteristic value C

7.3 Power consumption/power output

Name	Characteristic value	Maximum power consumption	power output
Basic devices ^a			
GRS1020-16T9	M	7.5 W	26 Btu (IT)/h
GRS1120-16T9		7.5 W	26 Btu (IT)/h
GRS1030-16T9		10.5 W	36 Btu (IT)/h
GRS1130-16T9		10.5 W	36 Btu (IT)/h
GRS1020-8T8Z		12 W	41 Btu (IT)/h
GRS1120-8T8Z		12 W	41 Btu (IT)/h
GRS1030-8T8Z		16 W	55 Btu (IT)/h
GRS1130-8T8Z		16 W	55 Btu (IT)/h
GRS1020-16T9	C	9 W	31 Btu (IT)/h
GRS1120-16T9		9 W	31 Btu (IT)/h
GRS1030-16T9		12 W	41 Btu (IT)/h
GRS1130-16T9		12 W	41 Btu (IT)/h
GRS1020-8T8Z		15.5 W	53 Btu (IT)/h
GRS1120-8T8Z		15.5 W	53 Btu (IT)/h
GRS1030-8T8Z		18 W	61 Btu (IT)/h
GRS1130-8T8Z		18 W	61 Btu (IT)/h
Media modules			
GRM20-TTTTTTTT	(X = Characteristic value M, N, U or V)	2 W	7 Btu (IT)/h
GRM20-XXXXTTTT		7.5 W	26 Btu (IT)/h
GRM20-XXXXXXXXXS		9 W	31 Btu (IT)/h
GRM20-XXXXXXXXXT			
GRM20-XXXXXXXXXE			

- a. with redundant power supply with characteristic value M: +4 Btu (IT)/h
with redundant power supply with characteristic value C: +10 Btu (IT)/h

7.4 Signal contact

Signal contact		
Nominal value	$I_{\max} = 2 \text{ A}$ at $U_{\max} = 230 \text{ V AC}$	
	$I_{\max} = 2 \text{ A}$ at $U_{\max} = 30 \text{ V DC}$	
	$I_{\max} = 0.2 \text{ A}$ at $U_{\max} = 125 \text{ V DC}^a$	
	$I_{\max} = 0.1 \text{ A}$ at $U_{\max} = 250 \text{ V DC}^b$	
	according to the UL Standards: $I_{\max} = 1 \text{ A}$ at $U_{\max} = 60 \text{ V DC}$	
Connection type	2-pin terminal block	
	Tightening torque	0.34 Nm (3 lb-in)
	min. conductor cross-section	Supply with AC voltage: 0.75 mm ² (AWG18)
		Supply with DC voltage: 1 mm ² (AWG16)
	max. conductor cross-section	1.3 mm ² (AWG16)

Table 30: Signal contact

- a. Not UL 60950 certified.
b. Not UL 60950 certified.

7.5 Climatic conditions during operation

Climatic conditions during operation		
Ambient air temperature ^a	Standard	
	up to 2000 m ASL (6562 ft ASL)	0 °C ... +60 °C (+32 °F ... +140 °F)
	above 2000 m ASL (6562 ft ASL)	0 °C ... +50 °C (+32 °F ... +122 °F)
	Standard with Conformal Coating	
	up to 2000 m ASL (6562 ft ASL)	0 °C ... +60 °C (+32 °F ... +140 °F)
	above 2000 m ASL (6562 ft ASL)	0 °C ... +50 °C (+32 °F ... +122 °F)
	Extended ^{bc}	
	up to 2000 m ASL (6562 ft ASL)	-40 °C ... +70 °C (-40 °F ... +158 °F) -40 °C ... +85 °C (-40 °F ... +185 °F) for 16 hours (tested according to IEC 60068-2- 2) ^d
	above 2000 m ASL (6562 ft ASL)	-40 °C ... +60 °C (-40 °F ... +140 °F)
	Extended with Conformal Coating ^{ef}	
	above 6562 ft ASL (2000 m ASL)	-40 °C ... +70 °C (-40 °F ... +158 °F)
	above 6562 ft ASL (2000 m ASL)	-40 °C ... +60 °C (-40 °F ... +140 °F)
Humidity	5 % ... 95 % (non-condensing)	
Air pressure	min. 540 hPa (+5000 m ASL; +16404 ft ASL)	
	max. 1060 hPa (-400 m ASL; -1312 ft ASL)	

Table 31: Climatic conditions during operation

- a. Temperature of the ambient air at a distance of 5 cm (2 in) from the device
b. If you are using SFP modules without the “EEC” extension, an operating temperature range of +32 °F to +140 °F (0 °C to +60 °C) applies for your device. [See “Accessories” on page 78.](#)
c. Applies to device variants 8T8Z with extended temperature range: If more than 4 SFP transceivers are used, the maximum operating temperature is reduced by 2 K per additional SFP transceiver.
d. Use SFP transceivers with the “EEC” extension only, otherwise the standard temperature range applies.

- e. If you are using SFP modules without the “EEC” extension, an operating temperature range of +32 °F to +140 °F (0 °C to +60 °C) applies for your device.
- f. Applies to GRS device variants with the extended temperature range: If more than 4 SFP transceivers are used, the maximum operating temperature is reduced by 2 K per additional SFP transceiver.

7.6 Climatic conditions during storage

Climatic conditions during storage		
Ambient temperature	-40 °C ... +85 °C (-40 °F ... +185 °F)	up to 3 months
	-40 °C ... +70 °C (-40 °F ... +158 °F)	up to 1 year
	-40 °C ... +50 °C (-40 °F ... +122 °F)	up to 2 years
	0 °C ... +30 °C (+32 °F ... +86 °F)	up to 10 years
Humidity	5 % ... 95 % (non-condensing)	
Air pressure	min. 540 hPa (+5000 m ASL; +16404 ft ASL)	
	max. 1060 hPa (-400 m ASL; -1312 ft ASL)	

Table 32: Climatic conditions during storage

7.7 Dimension drawings

■ Basic device

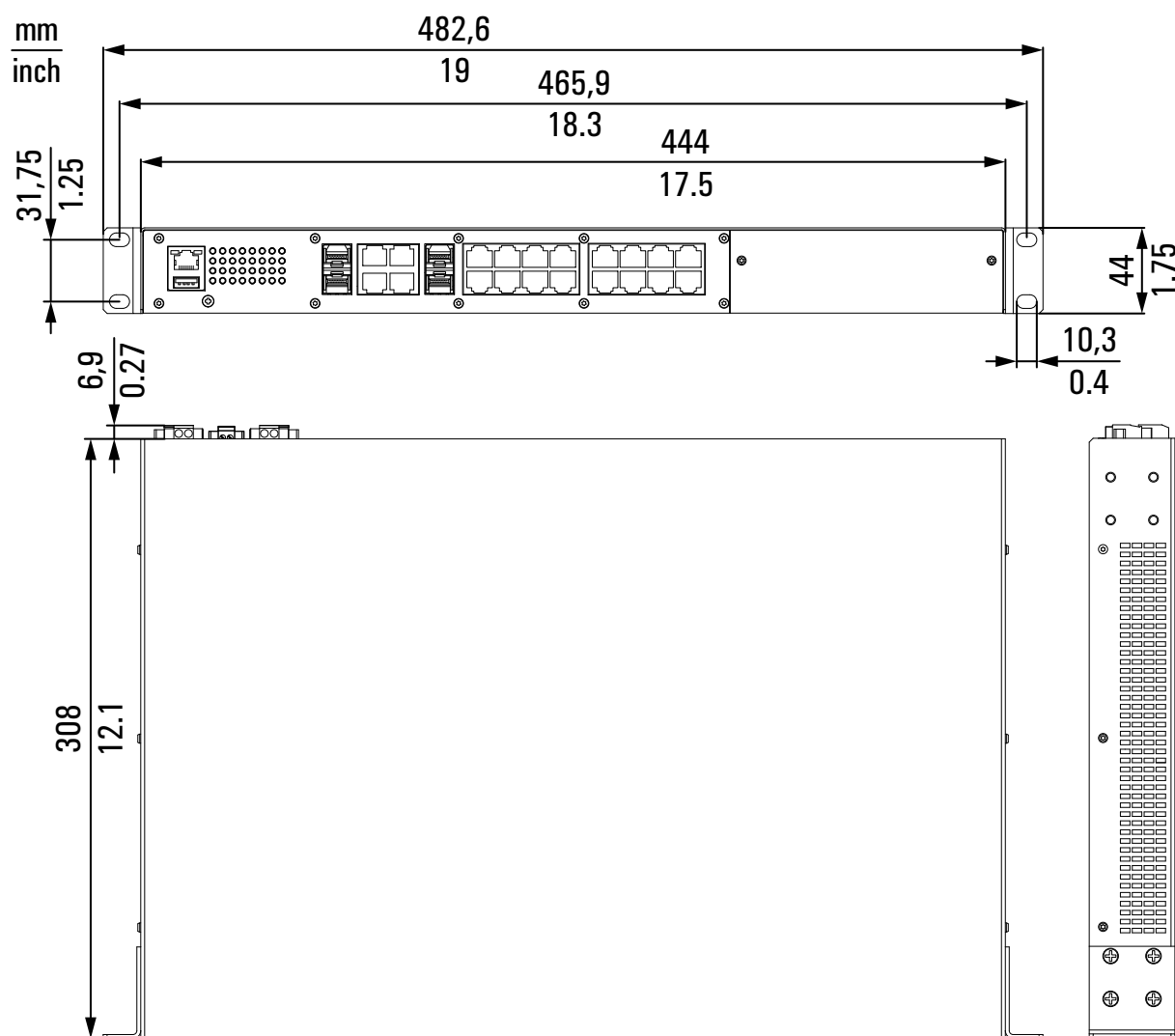


Figure 10: Dimension drawings: basic device

■ Media modules

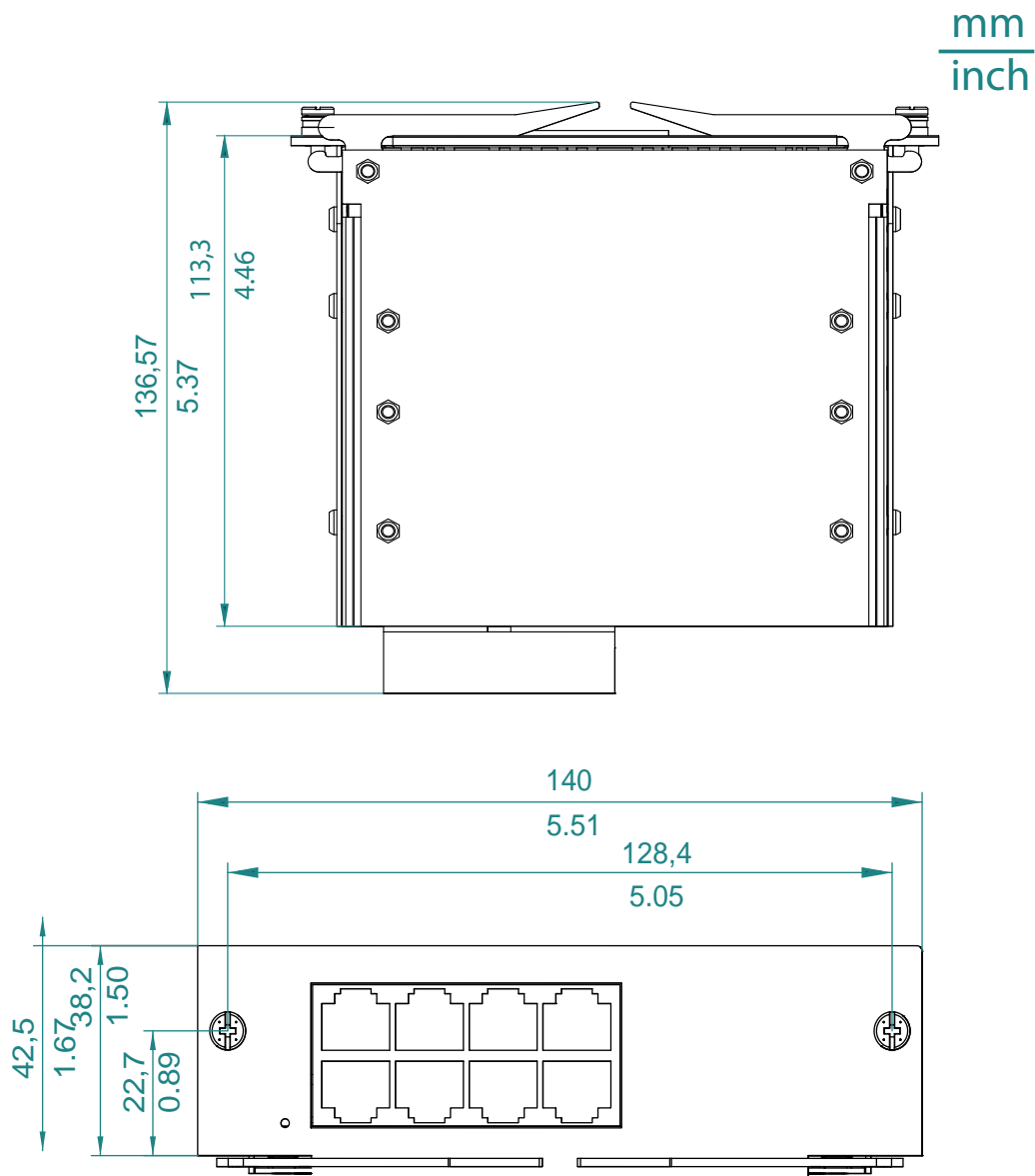


Figure 11: Dimension drawings: media modules

7.8 EMC and immunity

Note: Use shielded data cables for gigabit transmission via copper cables. Use shielded data cables for all transmission rates to meet the requirements according to EN 50121-4 and marine applications.

EMC interference emission		Standard applications ^a	Marine applications ^b	Railway applications (trackside) ^c	Substation applications ^d
Radiated emission					
EN 55032		Class A	Class A	Class A	Class A
DNV 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 55032	DC supply connection	Class A	Class A	Class A	Class A
DNV 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 55032	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 approval codes V9, VY, VU, VT

EMC interference immunity		Standard applications ^a	Marine applications ^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	max. 10 V/m	max. 10 V/m	max. 20 V/m	max. 10 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	±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	Marine applications ^b	Railway applications (trackside) ^c	Substation applications ^d
Damped oscillation – 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 field					
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 approval codes V9, VY, VU, VT

Immunity		Standard applications ^a	Marine applications ^b	Railway applications (trackside) ^c	Substation applications ^d
IEC 60068-2-6, test Fc	Vibration	5 Hz ... 8.4 Hz with	2 Hz ... 13.2 Hz with	–	2 Hz ... 9 Hz with 3 mm
		3.5 mm (0.14 in)	1 mm (0.04 in)	–	(0.11 in) amplitude
		amplitude	amplitude	–	9 Hz ... 200 Hz with 1 g
		8.4 Hz ... 150 Hz with	13.2 Hz ... 200 Hz with	–	200 Hz ... 500 Hz with
		1 g	0.7 g	–	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 approval codes V9, VY, VU, VT

7.9 Network range

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

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

Table 33: Network range: 10/100/1000 Mbit/s twisted pair port

7.9.1 Fast Ethernet SFP transceiver

Product code M-FAST-SFP-...	Mode ^a	Wave length	Fiber	System attenuation	Example for F/O cable length ^b	Fiber attenuation	BLP/Dispersion
-MM/LC...	MM	1310 nm	50/125 µm	0 dB ... 8 dB	0 km ... 5 km (0 mi ... 3.11 mi)	1.0 dB/km	800 MHz×km
-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
-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)
-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)
-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)
-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 ^c	18 ps/(nm×km)

Table 34: Fiber port 100BASE-FX (SFP fiber optic Fast Ethernet Transceiver)

- a. MM = Multimode, SM = Singlemode, LH = Singlemode Longhaul
- b. Including 3 dB system reserve when compliance with the fiber data is observed.
- c. With ultra-low-loss optical fiber.

7.9.2 Bidirectional Fast Ethernet SFP transceiver

Product code	Mode ^a	Wave length TX	Wave length RX	Fiber	System attenuation	Example for F/O line length ^b	Fiber attenuation	BLP/Dispersion
SFP-FAST-BA MM/LC EEC	MM	1310 nm	1550 nm	50/125 µm 62.5/125 µm	0 dB ... 16 dB	0 km ... 2 km (0 mi ... 1.24 mi)	1.0 dB/km	800 MHz×km 500 MHz×km
SFP-FAST-BB MM/LC EEC	MM	1550 nm	1310 nm	50/125 µm 62.5/125 µm	0 dB ... 16 dB	0 km ... 2 km (0 mi ... 1.24 mi)	1.0 dB/km	800 MHz×km 500 MHz×km
SFP-FAST-BA SM/LC EEC	SM	1310 nm	1550 nm	9/125 µm	0 dB ... 18 dB	0 km ... 20 km (0 mi ... 12.43 mi)	0.4 dB/km	3.5 ps/(nm×km)
SFP-FAST-BB SM/LC EEC	SM	1550 nm	1310 nm	9/125 µm	0 dB ... 18 dB	0 km ... 20 km (0 mi ... 12.43 mi)	0.25 dB/km	19 ps/(nm×km)
SFP-FAST-BA SM+/LC EEC	SM	1310 nm	1550 nm	9/125 µm	0 dB ... 29 dB	0 km ... 60 km (0 mi ... 37.29 mi)	0.4 dB/km	3.5 ps/(nm×km)
SFP-FAST-BB SM+/LC EEC	SM	1550 nm	1310 nm	9/125 µm	0 dB ... 29 dB	0 km ... 60 km (0 mi ... 37.29 mi)	0.25 dB/km	19 ps/(nm×km)

Table 35: F/O port (bidirectional Fast Ethernet SFP transceiver)

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

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

7.9.3 Gigabit Ethernet SFP transceiver

Product code M-SFP-...	Mode ^a	Wave length	Fiber	System attenuation	Example for F/O cable length ^b	Fiber attenuation	BLP ^c /Dispersion
-SX/LC...	MM	850 nm	50/125 µm	0 dB ... 7.5 dB	0 km ... 0.55 km (0 mi ... 0.34 mi)	3.0 dB/km	400 MHz×km
-SX/LC...	MM	850 nm	62.5/125 µm	0 dB ... 7.5 dB	0 km ... 0.275 km (0 mi ... 0.17 mi)	3.2 dB/km	200 MHz×km
-MX/LC...	MM	1310 nm	50/125 µm	0 dB ... 12 dB	0 km ... 1.5 km (0 mi ... 0.93 mi)	1.0 dB/km	800 MHz×km

Table 36: F/O port 1000BASE-FX (SFP fiber optic Gigabit Ethernet Transceiver)

Product code M-SFP-...	Mode ^a	Wave length	Fiber	System attenuation	Example for F/O cable length ^b	Fiber attenuation	BLP ^c /Dispersion
-MX/LC...	MM	1310 nm	62,5/125 µm	0 dB ... 12 dB	0 km ... 0.50 km (0 mi ... 0.31 mi)	1,0 dB/km	500 MHz×km
-LX/LC...	MM	1310 nm ^d	50/125 µm	0 dB ... 10.5 dB	0 km ... 0.55 km (0 mi ... 0.34 mi)	1.0 dB/km	800 MHz×km
-LX/LC...	MM	1310 nm ^e	62.5/125 µm	0 dB ... 10.5 dB	0 km ... 0.55 km (0 mi ... 0.34 mi)	1.0 dB/km	500 MHz×km
-LX/LC...	SM	1310 nm	9/125 µm	0 dB ... 10.5 dB	0 km ... 20 km (0 mi ... 12.43 mi) ^f	0.4 dB/km	3.5 ps/(nm×km)
-LX+/LC...	SM	1310 nm	9/125 µm	5 dB ... 20 dB	14 km ... 42 km (8.70 mi ... 26.10 mi)	0.4 dB/km	3.5 ps/(nm×km)
-LH/LC...	LH	1550 nm	9/125 µm	5 dB ... 22 dB	23 km ... 80 km (14.29 mi ... 49.71 mi)	0.25 dB/km	19 ps/(nm×km)
-LH+/LC	LH	1550 nm	9/125 µm	15 dB ... 30 dB	71 km ... 108 km (44.12 mi ... 67.11 mi)	0.25 dB/km	19 ps/(nm×km)
-LH+/LC	LH	1550 nm	9/125 µm	15 dB ... 30 dB	71 km ... 128 km (44.12 mi ... 79.54 mi)	0.21 dB/ km (typically)	19 ps/(nm×km)

Table 36: F/O port 1000BASE-FX (SFP fiber optic Gigabit Ethernet Transceiver)

- a. MM = Multimode, SM = Singlemode, LH = Singlemode Longhaul
- b. Including 3 dB system reserve when compliance with the fiber data is observed.
- c. Using the bandwidth-length product is inappropriate for expansion calculations.
- d. With F/O adapter compliant with IEEE 802.3-2002 Clause 38 (single-mode fiber offset-launch mode conditioning patch cord).
- e. With F/O adapter compliant with IEEE 802.3-2002 Clause 38 (single-mode fiber offset-launch mode conditioning patch cord).
- f. Including 2.5 dB system reserve when compliance with the fiber data is observed.

7.9.4 Bidirectional Gigabit Ethernet SFP transceiver

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

Table 37: F/O port (bidirectional Gigabit Ethernet SFP transceiver)

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

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

8 Scope of delivery

8.1 Basic device

Amount	Article
1 x	Basic device
1 x	2-pin terminal block for signal contact
1 x	3-pin terminal block for the supply voltage (exclusively for device variants featuring supply voltage with characteristic value M9)
2 x	3-pin terminal block for the supply voltage (exclusively for device variants featuring supply voltage with characteristic value MM)
1 x	2-pin terminal block for the supply voltage (exclusively for device variants featuring supply voltage with characteristic value C9)
2 x	2-pin terminal block for the supply voltage (exclusively for device variants featuring supply voltage with characteristic value CC)
2 x	Bracket
1 x	Safety and general information sheet

8.2 Media modules

Amount	Article
1 x	Media module
1 x	Safety and general information sheet

9 Accessories

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

9.1 General accessories

General accessories	Order number
Power Cord, supply voltage cable with EURO connector according to CEE 7/4 to 3-pin terminal block (4.9 ft (1.5 m))	942 067-001
Power Cord, supply voltage cable with EURO connector according to CEE 7/4 to 3-pin terminal block (8.2 ft (2.5 m))	942 067-101
Terminal cable: RJ45 on USB	942 096-001
Terminal cable: RJ45 on Sub-D, 9-pin	942 097-001
AutoConfiguration Adapter ACA22-USB (EEC)	942 124-001
3-pin High Voltage Interlock terminal block (50 pcs.)	943 845-008
2-pin Low Voltage Interlock terminal block (50 pcs.)	943 845-009
Protection cap for RJ45 socket (50 pieces)	943 936-001
Protection cap for SFP slot (25 pieces)	943 942-001
Bracket for fastening the housing	943 943-001
Network management software Industrial HiVision	943 156-xxx

Table 38: Accessories: General accessories

10 Order numbers

The order numbers correspond to the product codes of the devices.
See “Device name and product code” on page 24.

10.1 Fast Ethernet SFP transceiver

Fast Ethernet SFP transceiver	Order number
M-FAST SFP-TX/RJ45	942 098-001
M-FAST SFP-TX/RJ45 EEC	942 098-002
The following operating conditions apply to twisted pair transceivers:	
▶ Usable with:	
- HiOS as of software version 03.0.00	
- for PRP ports on RSP devices, as of software version 02.0.01	
- for PRP ports on EES devices, as of software version 02.0.02	
- Classic switch software as of software version 08.0.00	
- HiSecOS as of software version 01.2.00	
▶ Longer RSTP switching times and link loss detection times compared to twisted pair ports provided by the device directly.	
▶ Not applicable for combo ports.	
▶ Not applicable for ports which support only Gigabit Ethernet.	
▶ It is currently not possible to set autocrossing manually.	
M-FAST SFP-MM/LC	943 865-001
M-FAST SFP-MM/LC EEC	943 945-001
M-FAST SFP-SM/LC	943 866-001
M-FAST SFP-SM/LC EEC	943 946-001
M-FAST SFP-SM+/LC	943 867-001
M-FAST SFP-SM+/LC EEC	943 947-001
M-FAST SFP-LH/LC	943 868-001
M-FAST SFP-LH/LC EEC	943 948-001
SFP-FAST-MM/LC ^a	942 194-001
SFP-FAST-MM/LC EEC ^a	942 194-002
SFP-FAST-SM/LC ^a	942 195-001
SFP-FAST-SM/LC EEC ^a	942 195-002

Table 39: Accessory: Fast Ethernet SFP transceiver

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

10.2 Bidirectional Fast Ethernet SFP transceiver

Bidirectional Fast Ethernet SFP transceiver	Certification type ^a	Order number
SFP-FAST-BA MM/LC EEC	Entry level	942 204-001
SFP-FAST-BB MM/LC EEC	Entry level	942 204-002
SFP-FAST-BA SM/LC EEC	Entry level	942 205-001
SFP-FAST-BB SM/LC EEC	Entry level	942 205-002
SFP-FAST-BA SM+/LC EEC	Entry level	942 206-001
SFP-FAST-BB SM+/LC EEC	Entry level	942 206-002

Table 40: Accessory: Bidirectional Fast Ethernet SFP transceiver

a. following approvals: CE, FCC or UL 61010-2-20.

10.3 Gigabit Ethernet SFP transceiver

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

The following operating conditions apply to twisted pair transceivers:

- ▶ Usable with:
 - HiOS as of software version 03.0.00
 - Classic Switch software, as of software version 04.1.00.
 - HiSecOS as of software version 01.2.00
- Do not use with the following devices:
 - SPIDER II
 - MSP/MSM
 - EES
- ▶ Longer RSTP switching times and link loss detection times compared to twisted pair ports provided by the device directly.
- ▶ Not applicable for combo and Fast Ethernet ports.
- ▶ Exclusively supports the autonegotiation mode including autocrossing.

M-SFP-SX/LC	943 014-001
M-SFP-SX/LC EEC	943 896-001
M-SFP-MX/LC EEC	942 108-001
M-SFP-LX/LC	943 015-001
M-SFP-LX/LC EEC	943 897-001
M-SFP-LX+/LC	942 023-001
M-SFP-LX+/LC EEC	942 024-001
M-SFP-LH/LC	943 042-001
M-SFP-LH/LC EEC	943 898-001
M-SFP-LH+/LC	943 049-001
M-SFP-LH+/LC EEC	942 119-001
SFP-GIG-LX/LC ^a	942 196-001
SFP-GIG-LX/LC EEC ^a	942 196-002

Table 41: Accessory: Gigabit Ethernet SFP transceiver

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

10.4 Bidirectional Gigabit Ethernet SFP transceiver

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

Table 42: Accessory: Bidirectional Gigabit Ethernet SFP transceiver

11 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 – Emission and immunity of the signaling and telecommunications apparatus (Rail Trackside)
EN 55032	Electromagnetic compatibility of multimedia equipment – Emission Requirements
IEC/EN 62368-1	Equipment for audio/video, information and communication technology - Part 1: safety requirements
EN 61000-3-2	Electromagnetic compatibility (EMC) - Part 3-2: Limits - Limits for harmonic current emissions
EN 61000-3-3	Electromagnetic compatibility (EMC) - Part 3-3: Limits - Limitation of voltage changes, voltage fluctuations and flicker.
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 – Emitted interference in industrial environments
EN 61131-2	Programmable controllers – Part 2: Equipment requirements and tests
IEC/EN 61850-3	Communication networks and systems for power utility automation - Part 3: General requirements.
FCC 47 CFR Part 15	Code of Federal Regulations
DNV-CG-0339	Environmental test specification for electrical, electronic and programmable equipment and systems.
IEEE 1613	Standard Environment and Testing Requirements for Communication Networking Devices in Electric Power Substations
IEEE 802.3	Ethernet
NEMA TS 2	Traffic Controller Assemblies with NTCIP Requirements (environmental requirements)

Table 43: List of the technical standards

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

The device has an approval based on a specific standard exclusively if the approval indicator appears on the device casing.

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

A Further support

Technical questions

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

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

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

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

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