# HIRSCHMANN

A **BELDEN** BRAND

User Manual

Installation
GREYHOUND Switch - GRS1042/GRS1142
GREYHOUND Power Supply Unit - GPS1/GPS2/GPS3
GREYHOUND Media Module - GMM20/30/32/40/42

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Contents

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 the 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.

■ Correct usage

Only use the device for those purposes specified in the catalog and in the technical description. Only operate the device with external devices and components that are recommended and permitted by the manufacturer. The proper and safe operation of this product depends on proper handling during transport, proper storage, assembly and installation, and conscientious operation and maintenance procedures.

■ National and international safety regulations

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

■ Supply voltage

The supply voltage is electrically isolated from the housing.

☐ **Every** time you connect the electrical conductors, make sure that the following requirements are met:
  ▶ The power supply conforms to overvoltage category I or II.
  ▶ The power supply has an easily accessible disconnecting device (e.g., 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 electrical wires are voltage-free.
  ▶ The ground screw on the back of the device is connected to the protective conductor.
  ▶ Supply with AC voltage:
   A fuse is located 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 "General technical data" on page 58.
  ▶ Supply with DC voltage:
   A fuse suitable for DC voltage is located in the plus conductor of the power supply.
   The minus conductor is on ground potential. Otherwise, a fuse is also located in the minus conductor.
   Regarding the properties of this fuse:
   See "General technical data" on page 58.
  ▶ Supply with DC voltage: the fuse is suitable for a DC voltage.
  ▶ If the neutral conductor (AC) or the negative conductor (DC) is not grounded: there is a fuse in each of the two wires.
  ▶ Supply with AC voltage:
   The wire diameter of the power supply cable is at least 0.75 mm² (North America: AWG18) on the supply voltage input.

▶ Supply with DC voltage:
The wire diameter of the power supply cable is at least 1 mm²
(North America: AWG16) on the supply voltage input.
▶ The cross-section of the protective conductor is the same size as
or bigger than the cross-section of the power supply cables.
▶ The cables used are permitted for the temperature range of the
application case.
▶ Relevant for North America:
For use in Class 2 circuits, the copper wire conforms to class 1,
60/75 °C or 75 °C.

⚠ **WARNING**

ELECTRIC SHOCK
Start connecting the electrical wires only if **all** the above safety
requirements are fulfilled.

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

☐ Verify that the electrical installation meets locally or nationally
applicable safety regulations.
☐ Use undamaged parts.
☐ 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.
☐ Only switch on the device when the housing is closed.
☐ First connect the ground screw on the back of the device with the
protective conductor before you set up the other connections. When
removing the connections, you remove the protective conductor last.
☐ For supply voltage connections with protective conductor connection:
First connect the protective conductor before connecting the wires for
the supply voltage.
If your device comprises a 2nd 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.

■ 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).

■ Device casing

⚠ **WARNING**

ELECTRIC SHOCK
Never insert sharp objects (small screwdrivers, wires, etc.) into the inside of the device.
Never insert sharp objects (small screwdrivers, wires, etc.) into the connection terminals for electric conductors, and do not touch the terminals.
Install this device solely in a switch cabinet or in an operating site with restricted access, to which maintenance staff have exclusive access.

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

⚠ **WARNING**

FIRE HAZARD
Install the device in a fire protected shell if you are mounting it vertically.

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

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

☐ Keep the ventilation slits free to ensure good air circulation.

☐ Make sure there is at least 3.94 inches (10 cm) of space in front of the ventilation slits of the housing.

☐ 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.

☐ Operating the device in the maximum surrounding air temperature and stacking devices: When installing the device, make sure there is at least one free rack space (approx. 5 cm) above the device, because heat is discharged via the housing of the device.

☐ If you are operating the device in a 19" switch cabinet: install sliding/mounting rails for supporting the weight of the device.

■ **Operating conditions**

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

▶ 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.

■ CE marking

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

Device variant	Directive
All variants	2011/65/EU (RoHS) Directive of the European Parliament and of the Council on the restriction of the use of certain hazardous substances in electrical and electronic equipment.
All variants	2014/30/EU Directive of the European Parliament and the council for standardizing the regulations of member states with regard to electromagnetic compatibility.
Only for device variants featuring supply voltage with characteristic value H:	2014/35/EU Directive of the European Parliament and the council for standardizing the regulations of member states with regard to electrical equipment for use within specific 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
Tel.: +49 1805 141538

The product can be used in the industrial sector.
▶ Interference immunity: EN 61000-6-2
▶ Emitted interference: EN 55022
▶ Reliability: EN 60950-1

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:

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

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

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

■ Recycling note

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

About this Manual

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

Legend

The symbols used in this manual have the following meanings:

▶	Listing
☐	Work step
■	Subheading

1 Description

1.1 General device description

The GREYHOUND 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 devices allow you to set up switched industrial Ethernet networks that conform to the IEEE 802.3 standard.

■ Basic device

GRS1042

GRS1142
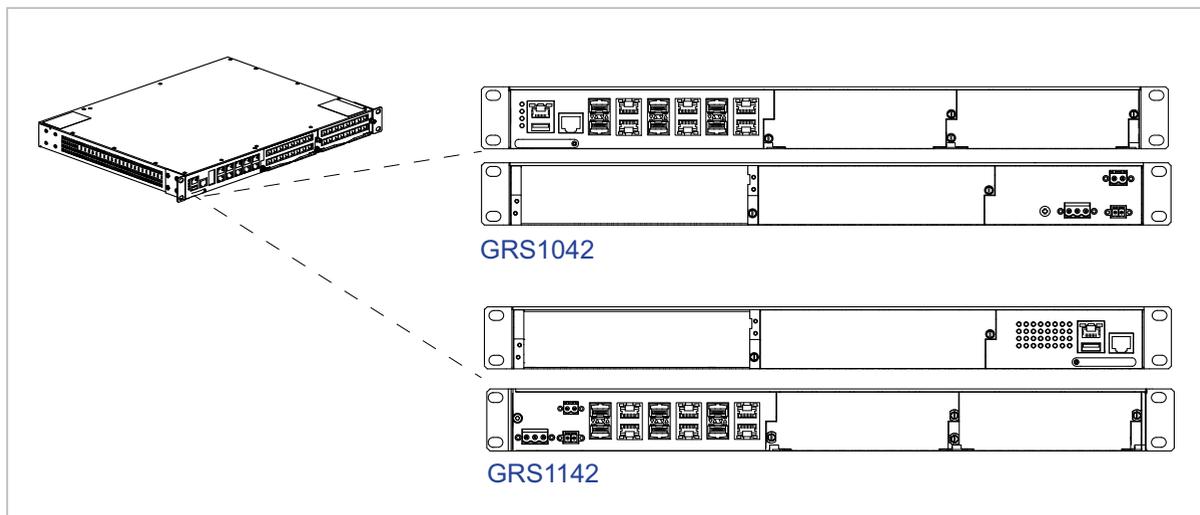
You can choose from between a wide range of variants. You have the option to set up your device individually based on different criteria:
▶ Number of ports
▶ Transmission speed
▶ Types of connectors
▶ Temperature range
▶ Supply voltage range
▶ Certifications
You have numerous options of combining the device characteristics. You can determine the possible combinations using the configurator which is available in the Belden E-Catalog (www.e-catalog.beldensolutions.com) on the web page of the device.

■ Power supply units

GREYHOUND Power Supply Unit
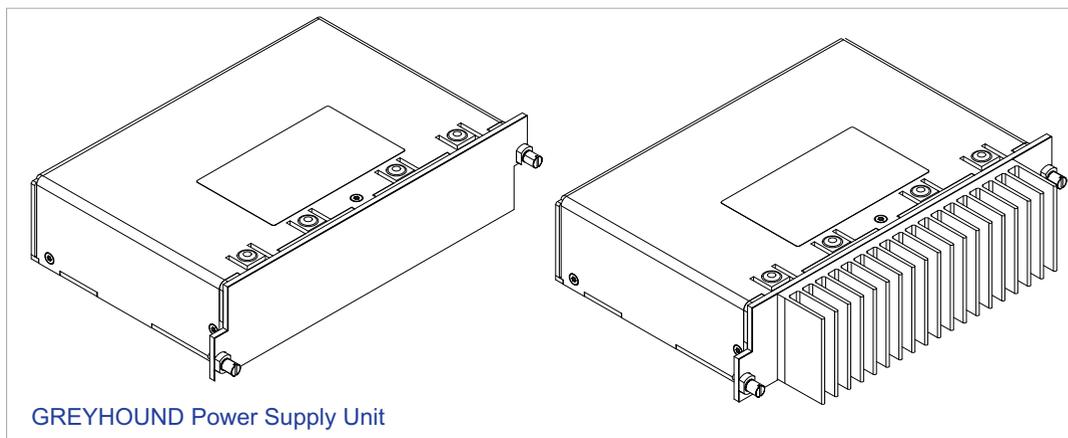
You have the option to select either 1 or 2 power supply units with different input voltages:
► Low Voltage / Power over Ethernet PoE(+)
► High Voltage

You obtain the power supply units as accessories.

■ Media modules

GREYHOUND Media Module
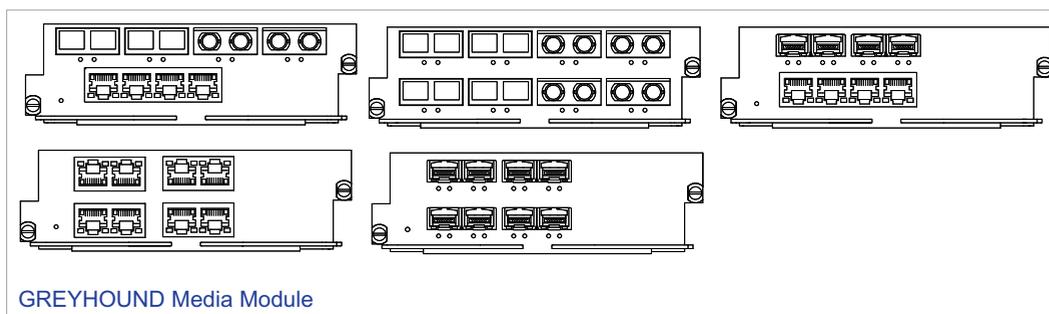
You have the option to select either 1 or 2 media modules. By using a media module, you obtain up to 8 additional Fast and/or Gigabit Ethernet ports.

You obtain the media modules as accessories.

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 and power supply inputs: rear of device		
6	Data rate	4	(10)/100/1000Mbit/s with 2.5 Gbit/s uplink ports		
7	Hardware type	2	PoE(+) support		
8	(hyphen)	–			
9 ... 12	Configuration of the ports	AT2Z	10 ×	RJ45 socket for 10/100/1000 Mbit/s Twisted Pair connections	
			2 ×	SFP slot for 1/2.5 Gbit/s F/O connections	
		6T6Z	6 ×	RJ45 socket for 10/100/1000 Mbit/s Twisted Pair connections	
			6 ×	4 × SFP slots for 1/2.5 Gbit/s F/O connections and 2 × SFP slots for 100/1000 Mbit/s connections	
13	Temperature range	S	Standard	0 °C ... +60 °C (+32 °F ... +140 °F)	
		T	Extended	−40 °F ... +158 °F (−40 °C ... +70 °C)	
		E	Extended with conformal coating	−40 °F ... +158 °F (−40 °C ... +70 °C)	
14	Supply voltage 1	L	Voltage input: low voltage		
			Rated voltage range DC ▶ 24 ... 48 V ▶ 48 V... 54 V Can be combined with power supply unit with characteristic value C or P		
		H	Voltage input: high voltage		
			Rated voltage range DC ▶ 60 V ... 250 V Rated voltage range AC ▶ 110 V ... 240 V, 50 Hz ... 60 Hz Can be combined with power supply unit with characteristic value K		
15	Supply voltage 2	See position 14			
16	Cover panel for power supply unit slot	0	None		
		1	1 × cover panel for slot 2		

Item	Characteristic	Character istic value	Description	
17	Cover panel for media module slot	0	None	
		1	1 ×	Cover panel for slot 2
		2	2 ×	Cover panel for slots 1 and 2
18 ... 19	Certificates and declarations	You will find detailed information on the certificates and declarations applying to your device in a separate overview. See table 1 on page 19.		
20 ... 21	Customer-specific version	HH	Hirschmann standard	
22	Hardware configuration	S	Standard	
23	Software configuration	E	Entry (Hirschmann Standard)	
24 ... 25	Software level	2A	HiOS Layer 2 Advanced	
		3A	HiOS Layer 3 Advanced	
26 ... 27	Software packages	99	Reserved	
		UR	Unicast Routing	
		MR	Unicast + Multicast Routing	
28 ... 32	Software version	06.0	Software version 06.0.	
		XX.X.	Current software version	

1.2.2   Power supply units

Item	Characteristic	Characteristic value	Description	
1 ... 3	Product	GPS	GREYHOUND Power Supply Unit	
4	Type	1	Standard	Power supply for basic device
		2	PoE(+)	Power supply for PoE(+)
		3	PoE (+) basic device	Power supply for basic device and PoE(+)
5	(hyphen)	–		
6	Rated voltage range	C	Rated voltage range DC 24 V ... 48 V	
		K	Rated voltage range DC 60 V ... 250 V	
			Rated voltage range AC 110 V ... 240 V	
		P	Rated voltage range DC 48 V (PoE) ... 54 V (PoE+)	
7	Temperature range	S	Standard	+32 °F ... +140 °F (0 °C ... +60 °C)
		T	Extended	−40 °F ... +158 °F (−40 °C ... +70 °C)
		E	Extended with conformal coating	−40 °F ... +158 °F (−40 °C ... +70 °C)
8 ... 9	Certificates and declarations	You will find detailed information on the certificates and declarations applying to your device in a separate overview. See "Assignment: application cases, certificates and declarations, characteristic values" on page 19.		
10 ... 11	Customer-specific version	HH	Hirschmann	

1.2.3   Media modules

Item	Characteristic	Characteristic value	Description		
1 ... 3	Product	GMM	GREYHOUND Media Module		
4	Data rate	2	100 Mbit/s		
		3	100 Mbit/s and (10)/100/1000 Mbit/s		
		4	(10)/100/1000 Mbit/s		
5	PoE support	0	without PoE(+) support		
		2	PoE(+) support		
6	(hyphen)	–			
7 ... 8	Configuration Port 1 and port 3	TT	2 ×	RJ45 socket for 10/100/1000 Mbit/s Twisted Pair connections	
		OO	2 ×	SFP slot for 100/1000 Mbit/s F/O connections	
		MM	2 ×	DSC multimode socket for 100 Mbit/s F/O connections	
		NN	2 ×	ST multimode socket for 100 Mbit/s F/O connections	
		VV	2 ×	DSC singlemode socket for 100 Mbit/s F/O connections	
		UU	2 ×	ST singlemode socket for 100 Mbit/s F/O connections	
9 ... 10	Configuration Port 5 and port 7	See configuration of port 1 and port 3			
11 ... 12	Configuration Port 2 and port 4	See configuration of port 1 and port 3			
13 ... 14	Configuration Port 6 and port 8	See configuration of port 1 and port 3			
15	Temperature range	S	Standard	+32 °F ... +140 °F (0 °C ... +60 °C)	
		T	Extended	−40 °F ... +158 °F (−40 °C ... +70 °C)	
		E	Extended with conformal coating	−40 °F ... +158 °F (−40 °C ... +70 °C)	
16 ... 17	Certificates and declarations	You will find detailed information on the certificates and declarations applying to your device in a separate overview. See "Assignment: application cases, certificates and declarations, characteristic values" on page 19.			
18 ... 19	Customer-specific version	HH	Hirschmann		
20	Hardware configuration	S	Standard		
21	Software configuration	9	without configuration		
22 ... 26	Software version	XX.X.	Current software version		
		99.9.	without software		

Application case	Certificates and declarations	Characteristic value[a]													
		Z9	Y9	X9	W9	V9	VY	U9	UY	UX	UW	T9	TY	S9	SY
Standard applications	ATEX Zone 2				(X)						(X)				
	CE	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	EN 60950-1	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	EN 61131-2	X	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	X
	ISA 12.12.01 – Class I, Div. 2			(X)						(X)					
	cUL 60950-1		(X)	(X)			(X)		(X)		(X)		(X)		(X)
Substation applications	IEC 61850-3					X	X								
	IEEE 1613					X	X								
Navy applications	DNVGL							(X)	(X)	(X)	(X)				
Railway applications (trackside)	EN 50121-4											X	X	X	X
	EN 50155													X	X

Table 1:   Assignment: application cases, certificates and declarations, characteristic values

a.   X= Approval or self-declaration is present
     (X)= Approval or self-declaration is being prepared

1.3   Device views

1.3.1   GRS1042
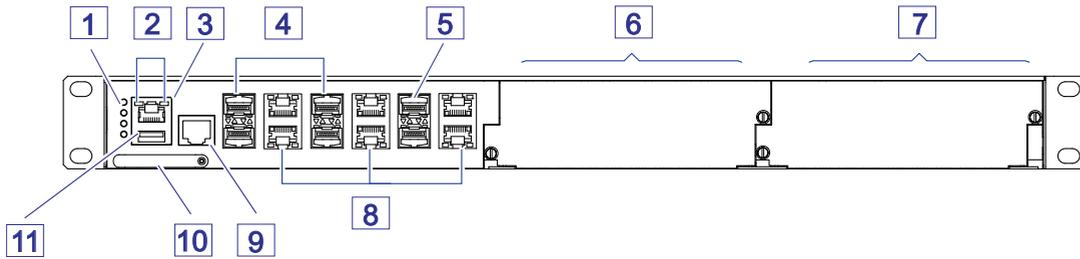
Front view - 6TX/6FX

1	LED display elements for device status
2	Display elements for power supply unit status
3	V.24 interface
4	SFP slot for 1/2.5 Gbit/s F/O connections
5	SFP slot for 100/1000 Mbit/s F/O connections
6 ... 7	Cover panels for media module slot
8	RJ45 socket for 10/100/1000 Mbit/s Twisted Pair connections
9	Out-of-band management port
10	Slot for the SD card
11	USB interface
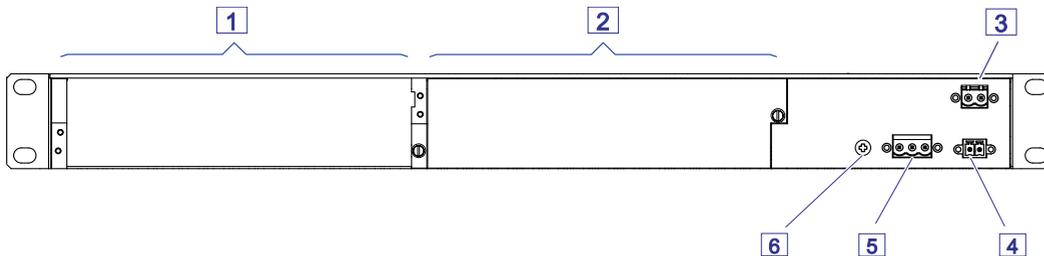
Rear view - 6TX/6FX and **10TX/2FX**

1	Cover panel for power supply unit slot 1
2	Cover panel for power supply unit slot 2
3	2-pin terminal block for the supply voltage, characteristic value L
4	Connection for the signal contact
5	3-pin terminal block for the supply voltage, characteristic value H
6	Grounding screw

1.3.2   GRS1142
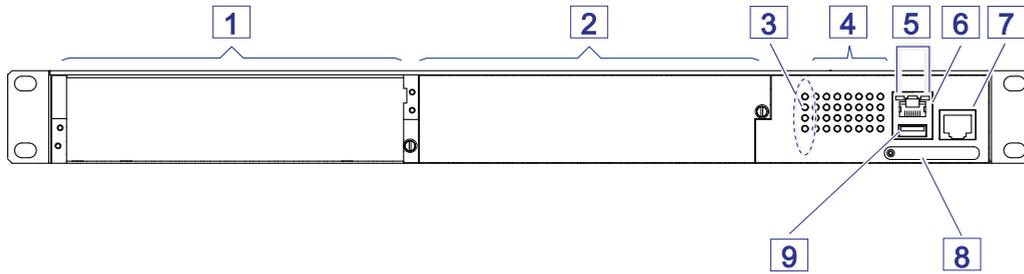
Front view - 6TX/6FX and 10TX/2FX

1	Cover panel for power supply unit slot 1
2	Cover panel for power supply unit slot 2
3	LED display elements for device status
4	LED display elements for port status
5	Display elements for power supply unit status
6	V.24 interface
7	Out-of-band management port
8	Slot for the SD card
9	USB interface
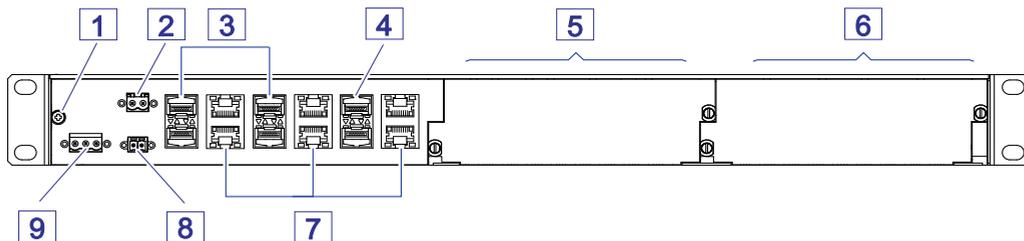
Rear view - 6TX/6FX

1	Grounding screw
2	2-pin terminal block for the supply voltage, characteristic value L
3	SFP slot for 1/2.5 Gbit/s F/O connections
4	SFP slot for 100/1000 Mbit/s F/O connections
5 ... 6	Cover panels for media module slot
7	RJ45 socket for 10/100/1000 Mbit/s Twisted Pair connections
8	Connection for the signal contact
9	3-pin terminal block for the supply voltage, characteristic value H

1.3.3 Power supply units

GPS1-C
GPS1-K

GPS3-P
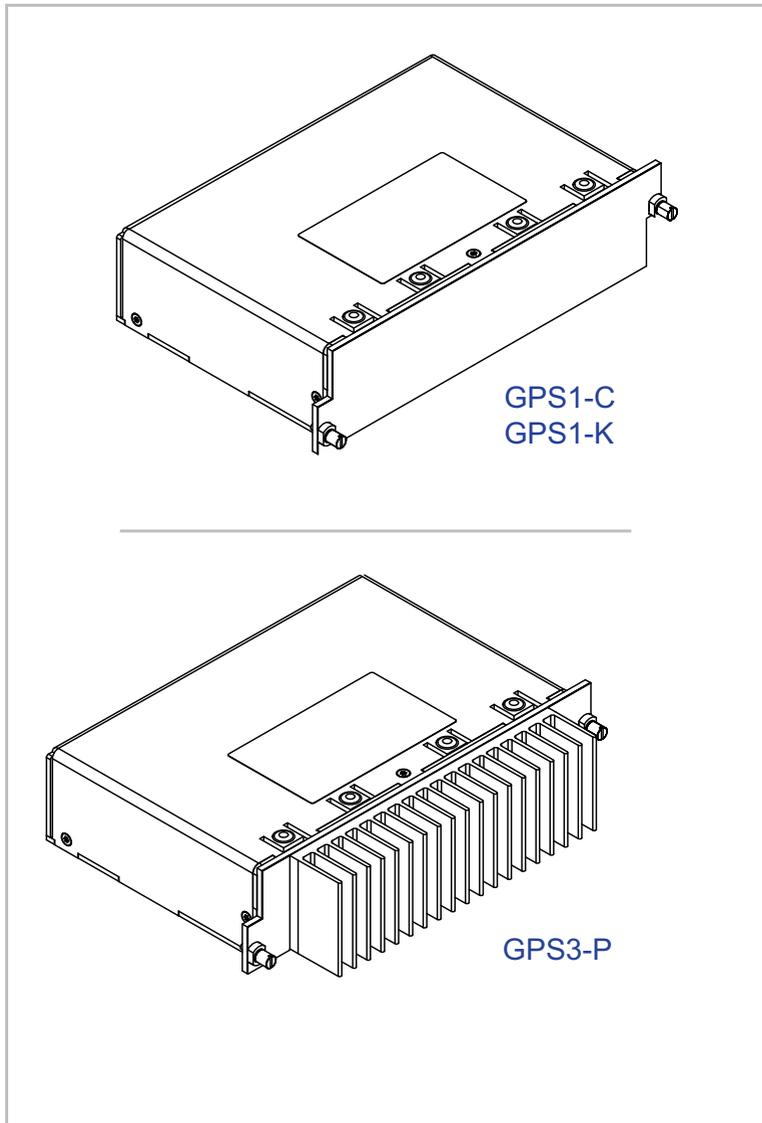
1.3.4   Media modules
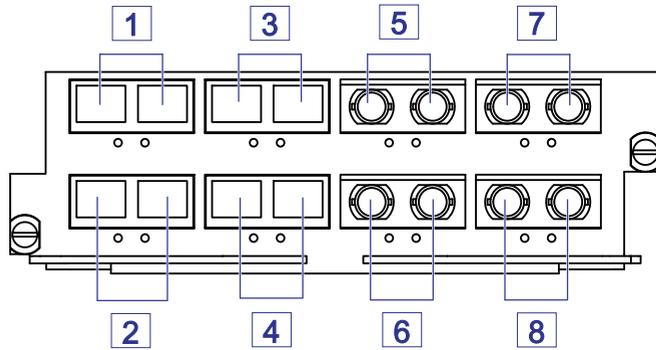
GMM20-VVUUMMNN

Port	Port description
1, 3	2 × DSC singlemode socket
5, 7	2 × ST singlemode socket
2, 4	2 × DSC multimode socket
6, 8	2 × ST multimode socket
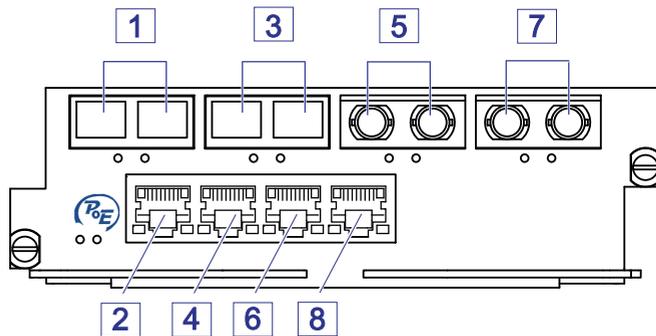
GMM30-MMNNTTTT / GMM32-MMNNTTTT

Port	Port description
1, 3	2 × DSC multimode socket
5, 7	2 × ST multimode socket
2, 4	2 × RJ45 socket
6, 8	2 × RJ45 socket
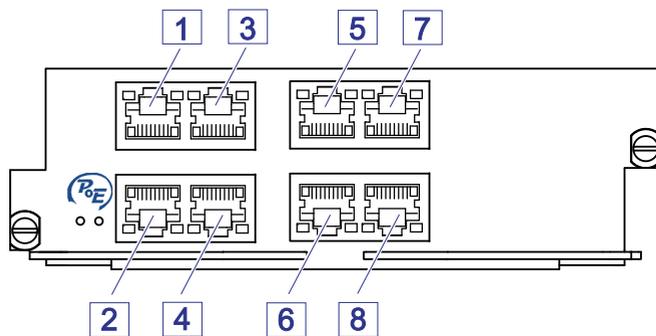
GMM40-TTTTTTTT / GMM42-TTTTTTTT

Port	Port description
1, 3	2 × RJ45 socket
5, 7	2 × RJ45 socket

2, 4	2 × RJ45 socket
6, 8	2 × RJ45 socket

GMM40-OOOOOOOO
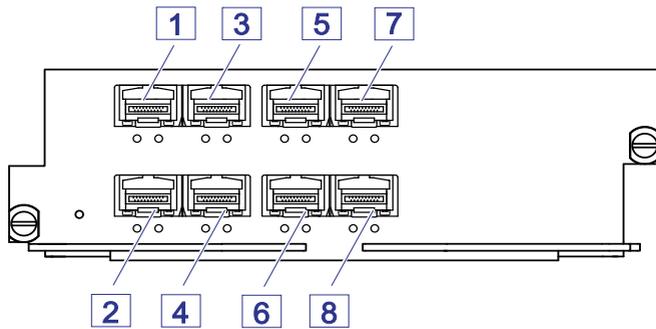
Port	Port description
1, 3	2 × SFP slot
5, 7	2 × SFP slot
2, 4	2 × SFP slot
6, 8	2 × SFP slot
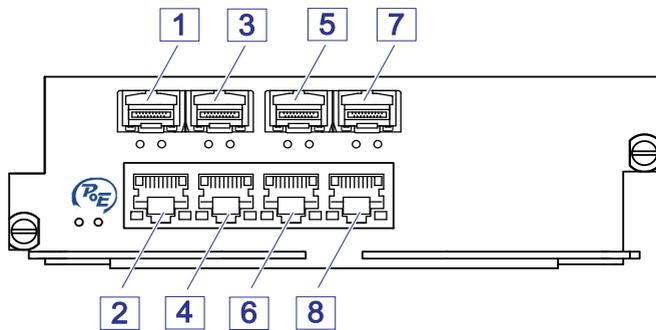
GMM40-OOOOTTTT / GMM42-OOOOTTTT

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

1.4 Power supply

You have the following options to supply your device with voltage:

GRS1042

GRS1142
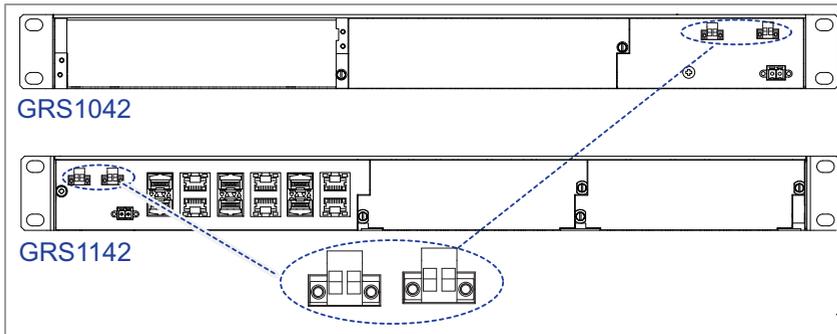
▶ via 2-pin terminal blocks
Device variants with characteristic value LL

GRS1042

GRS1142
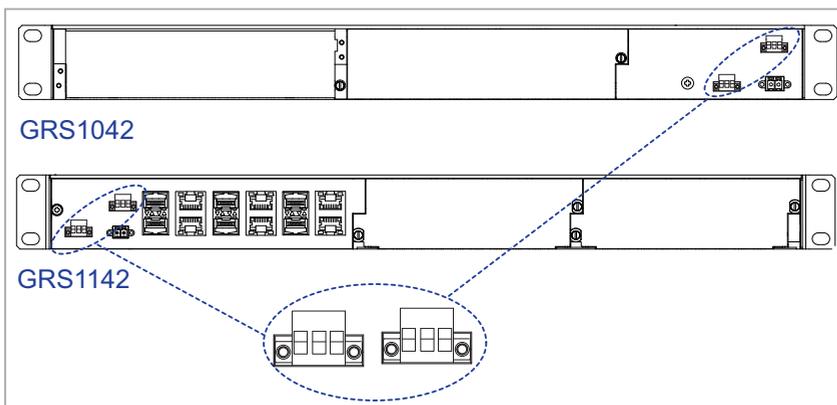
▶ via 3-pin terminal blocks
Device variants with characteristic value HH

GRS1042

GRS1142
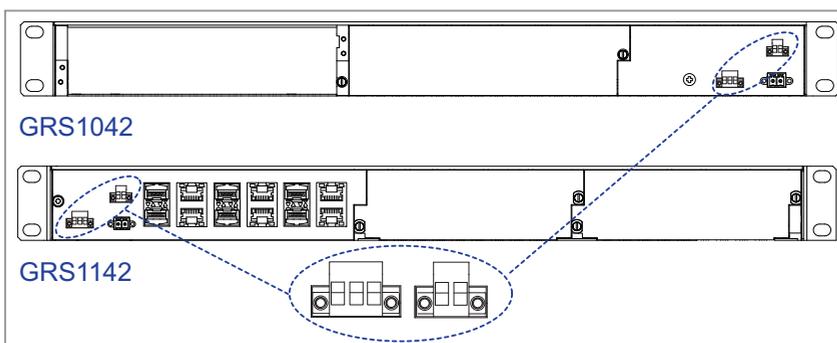
▶ via one 2-pin and one 3-pin terminal block
Device variants with characteristic value HL

You will find information on connecting the supply voltage here:
"Connecting the terminal blocks" on page 46.

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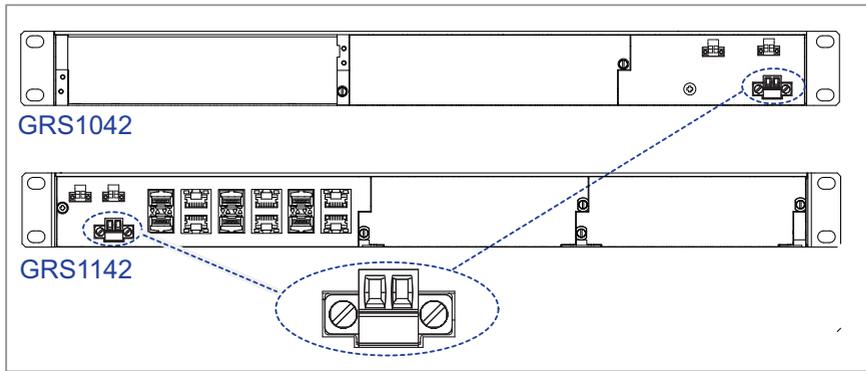
Figure 1:   Signal contact: 2-pin terminal block with screw locking

The signal contact is a potential-free relay contact.
The device allows you to perform remote diagnosis via the signal contact. In the process, the device signals events such as a line interruption. When an event occurs, the device opens the relay contact and interrupts the closed circuit. The management setting specifies which events switch a contact. You can also use the management to switch the signal contact manually and thus control external devices.

1.6   Ethernet ports

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

1.6.1   1/2.5 Gbit/s F/O port

The port allows you to connect network components according to the IEEE 802.3 1000BASE-SX/1000BASE-LX standard.
The port allows you to connect network components according to IEEE P802.3bz 2.5 Gbit/s.
This port supports:
Full duplex mode
Delivery state:
1/2.5 Gbit/s full duplex when using a Gigabit Ethernet SFP transceiver

1.6.2   100/1000 Mbit/s F/O port

This port is an SFP slot.
The 100/1000 Mbit/s F/O port offers you the ability to connect network components according to the IEEE 802.3 100BASE-FX/1000BASE-SX/1000BASE-LX standard.
This port supports:
▶ 1000 Mbit/s full duplex
▶ 100 Mbit/s half-duplex mode, 100 Mbit/s full duplex mode
State on delivery:
▶ 100 Mbit/s full duplex when using a Fast Ethernet SFP transceiver
▶ 1000 Mbit/s full duplex when using a Gigabit Ethernet SFP transceiver

1.6.3   100 Mbit/s F/O port

This port is an SFP slot or an ST or DSC socket.
The 100 Mbit/s F/O port offers you the ability to connect network components according to the IEEE 802.3 100BASE-FX standard.
This port supports:
▶ 100 Mbit/s half-duplex mode, 100 Mbit/s full duplex mode
Default setting: Full duplex

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

	Sending direction
	Receiving direction
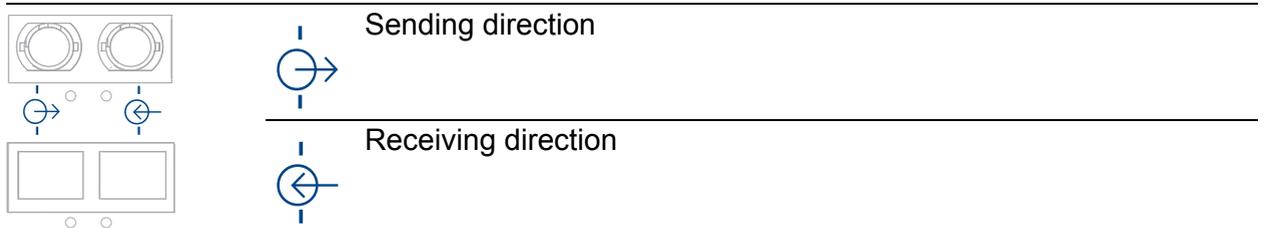
1.6.4　10/100/1000 Mbit/s twisted pair port

This port is an RJ45 socket.

The 10/100/1000 Mbit/s twisted pair port offers you the ability 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

You will find information on the pin assignment in a separate overview.

1.6.5　Support of PoE(+)

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 and IEEE 802.3af/at standards.

The PoE power is supplied via the wire pairs transmitting the signal (phantom voltage).

Maximum power available to a media module:
124 W

1.6.6   Out-of-band management port

This port is an RJ45 socket.
The port allows you to connect network components according to the
IEEE 802.3 10BASE-T/100BASE-TX standard.
This port supports:
▶ Autonegotiation
▶ 100 Mbit/s half duplex, 100 Mbit/s full duplex, 10 Mbit/s half duplex,
   10 Mbit/s full duplex

The port allows you to manage the device and upload configurations via the
following protocols:
▶ SNMP
▶ SSH
▶ Telnet
▶ FTP
▶ SCP
▶ HTTP/HTTPS

For more information see the **Command Line Interface reference manual**.
You can download the manual on the Internet at the Hirschmann product
pages www.hirschmann.com.

1.7   Pin assignments

RJ45	Pin	10/100 Mbit/s	1000 Mbit/s	PoE
	MDI mode			
	1	TX+	BI_DA+	Positive V_{PSE}
	2	TX−	BI_DA−	Positive V_{PSE}
	3	RX+	BI_DB+	Negative V_{PSE}
	4	—	BI_DC+	—
	5	—	BI_DC−	—
	6	RX−	BI_DB−	Negative V_{PSE}
	7	—	BI_DD+	—
	8	—	BI_DD−	—
	MDI-X mode			
	1	RX+	BI_DB+	Negative V_{PSE}
	2	RX−	BI_DB−	Negative V_{PSE}
	3	TX+	BI_DA+	Positive V_{PSE}
	4	—	BI_DD+	—
	5	—	BI_DD−	—
	6	TX−	BI_DA−	Positive V_{PSE}
	7	—	BI_DC+	—
	8	—	BI_DC−	—
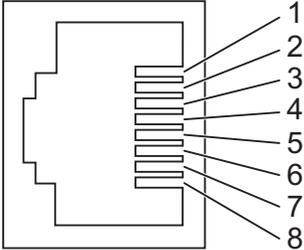
1.8 Display elements

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

1.8.1 Device state

These LEDs provide information about conditions which affect the operation of the whole device.
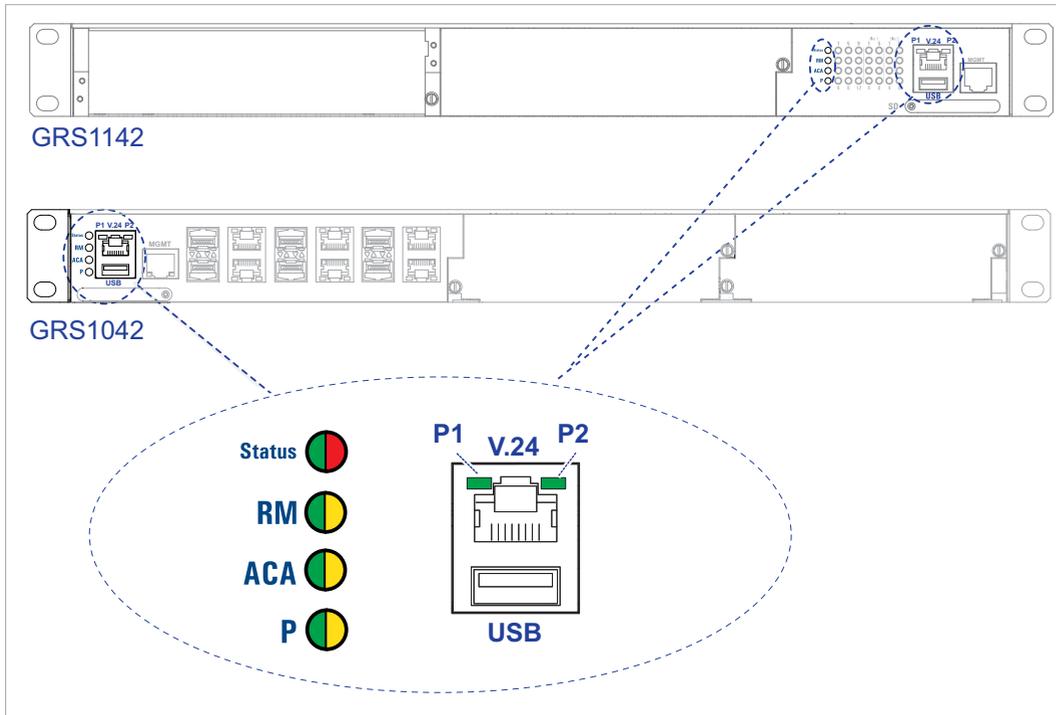
LED	Display	Color	Activity	Meaning
Status	Device Status	—	None	Device is starting and/or is not ready for operation
		Green	Lights up	Device is ready for operation. Characteristics can be configured
		Red	Lights up	Device is ready for operation. Device has detected at least one error in the monitoring results
			Flashes 1 time a period	The boot parameters used when the device has been started differ from the boot parameters saved. Start the device again.
			flashes 4 times a period	Device has detected a multiple IP address
RM	Ring Manager	—	None	No redundancy configured
		Green	Lights up	Redundancy exists
			Flashes 1 time a period	Device is reporting an incorrect configuration of the RM function
		Yellow	Lights up	No redundancy exists

LED	Display	Color	Activity	Meaning
ACA	Storage medium ACA22 ACA31	—	None	ACA storage medium not connected
		Green	Lights up	ACA storage medium connected
			Flashes 3 times a period	Device writes to/reads from the storage medium
		Yellow	Lights up	ACA storage medium inoperative
P	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 times a period	Software update is running. Maintain the power supply.
		Green	Lights up	Device variants with redundant power supply: Supply voltages 1 **and** 2 are on
				Device variants with single power supply: Supply voltage is on
P1	Supply voltage	—	None	At least one of the following cases applies: ▶ Power supply unit is not connected to slot P1. ▶ There is no external supply voltage **or** it is too low. ▶ No internal supply voltage.
		Green	Lights up	▶ Power supply unit is connected to slot P1. ▶ Boot procedure started ▶ Valid supply voltage connected.
P2	Supply voltage	—	None	At least one of the following cases applies: ▶ Power supply unit is not connected to slot P2. ▶ There is no external supply voltage **or** it is too low. ▶ No internal supply voltage.
		Green	Lights up	▶ Power supply unit is connected to slot P2. ▶ Boot procedure started ▶ Valid supply voltage connected.

1.8.2 Port state

These LEDs provide port-related information.
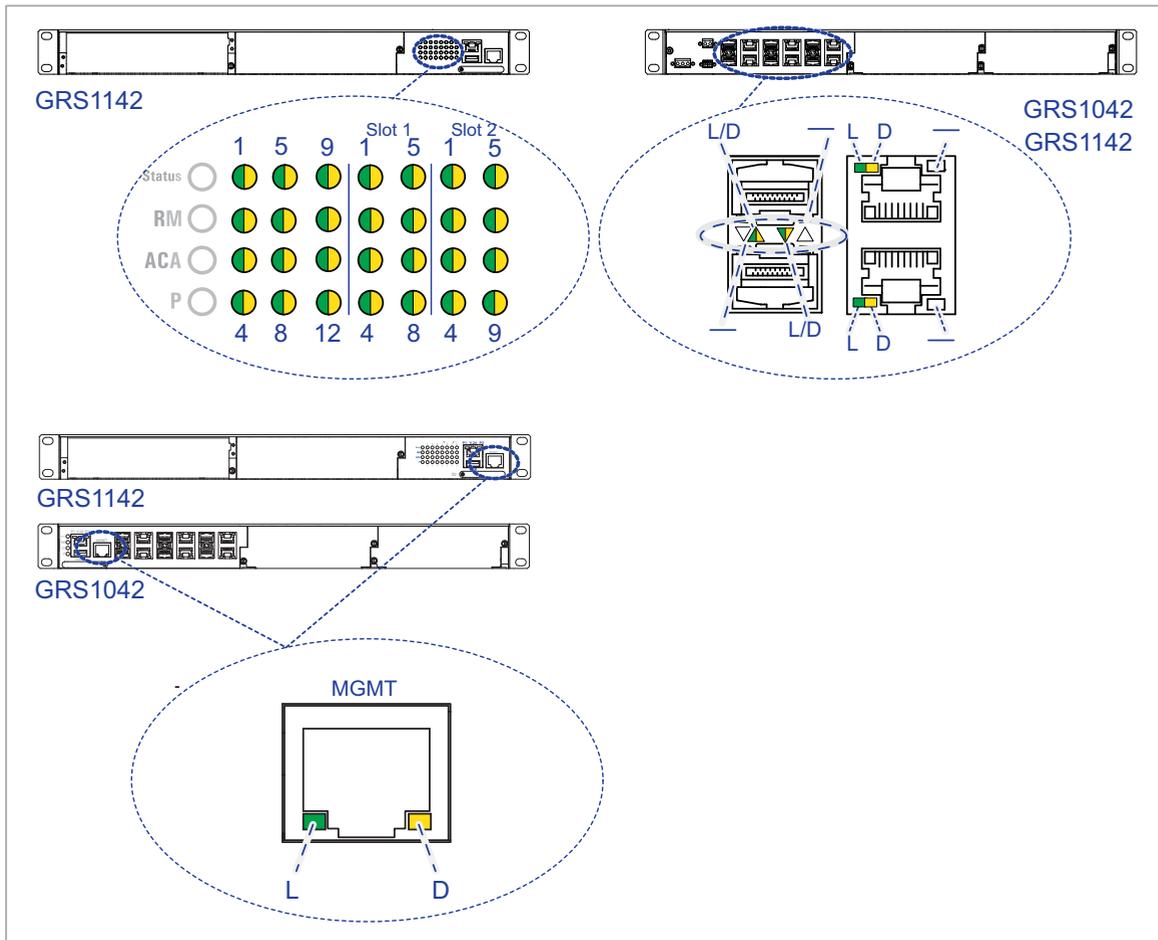
LED	Display	Color	Activity	Meaning
L/D	Link state/ data traffic	—	None	Device detects an invalid or missing link
		Green	Lights up	Device detects a valid link
			Flashes 1 time a period	Port is switched to stand-by
			Flashes 3 times a period	Port is switched off
		Yellow	Flashing alternately	Device is transmitting and/or receiving data
			Lights up	Device detects a **non-**supported SFP transceiver or a **non-**supported data rate
			Flashes 1 time a period	Device detects at least one unauthorized MAC address (Port Security Violation) and sends a trap.
			Flashes 3 times a period	The device deactivates the relevant port (auto-deactivation).

■ Switching LEDs

LED display		Position on the device
	Service panel	Only device variants GRS 1142
	Port panel	GRS 1042 and 1142
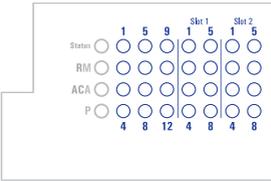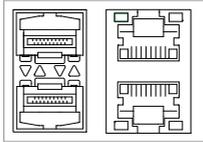
With device variants GRS 1142 the port status is displayed on the service panel by default. You have the option of changing between the LED displays using the command line interface (CLI). You require administrator rights for this.

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

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

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

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

1.8.3 Media module status

■ GMM20/GMM30/GMM40

LED	Display	Color	Activity	Meaning
Power	Supply voltage	—	None	Media module is inoperative
		Green	Lights up	Voltage supply to the media module is on
L/D	Link state/ data traffic	—	None	Device detects an invalid or missing link
		Green	Lights up	Device detects a valid link
			Flashes 1 time a period	Port is switched to stand-by
			Flashes 3 times a period	Port is switched off
		Yellow	Lights up	Device detects a **non-**supported SFP transceiver or a **non-**supported data rate
			Flashing	Device is transmitting and/or receiving data
			Flashes 1 time a period	Device detects at least one unauthorized MAC address (Port Security Violation)

■ GMM32/GMM42

LED	Display	Color	Activity	Meaning
Power	Supply voltage	—	None	Media module is inoperative
		Green	Lights up	Voltage supply to the media module is on Voltage supply to the PoE port is on
		Yellow	Lights up	PoE voltage is missing or is too low
L/D	Link state/ data traffic	—	None	Device detects an invalid or missing link
		Green	Lights up	Device detects a valid link
			Flashes 1 time a period	Port is switched to stand-by
			Flashes 3 times a period	Port is switched off
		Yellow	Lights up	Device detects a **non-**supported SFP transceiver or a **non-**supported data rate
			Flashing	Device is transmitting and/or receiving data
			Flashes 1 time a period	Device detects at least one unauthorized MAC address (Port Security Violation)
PoE	PoE status	Green	Lights up	Power device is supplied with PoE voltage
		Yellow	Flashes 1 time a period	Output budget has been exceeded Device has detected a connected powered device
			Flashes 3 times a period	PoE administrator status deactivated

1.9 Management interfaces

1.9.1 V.24 interface (external management)

GRS1042

GRS1142
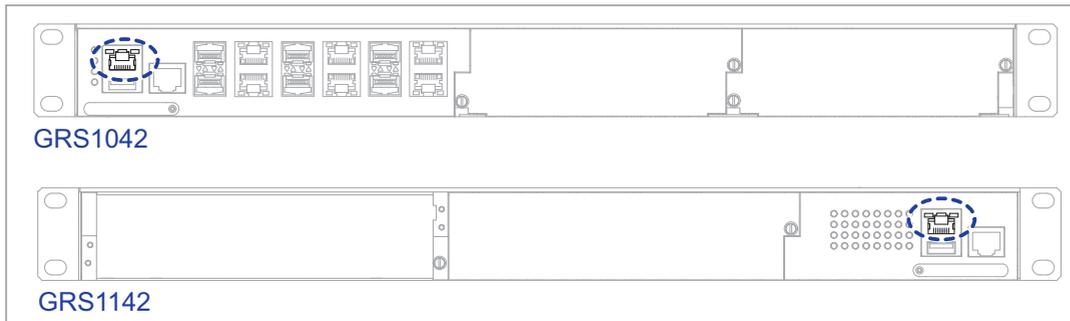
A serial interface is provided on the RJ45 socket (V.24 interface) for the local connection of an external management station (VT100 terminal or PC with corresponding terminal emulation). This enables you to set up a connection to the Command Line Interface (CLI) and to the system monitor.

VT 100 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 2:   Pin assignment of the V.24 interface

1.9.2   USB interface

GRS1042

GRS1142
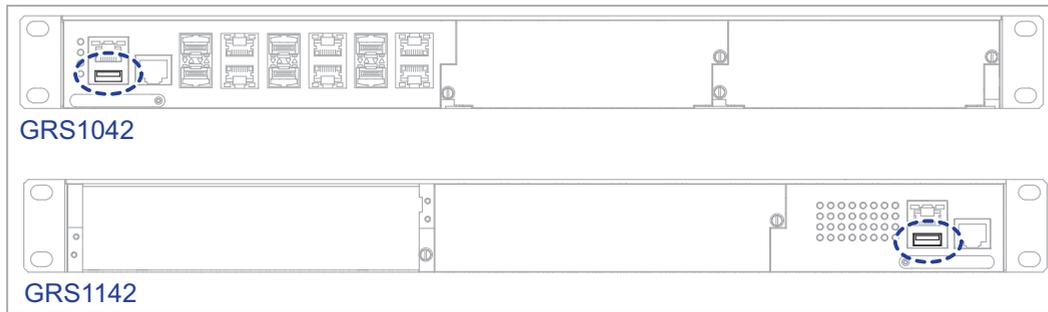
The USB interface allows you to connect the AutoConfiguration Adapter ACA22 storage medium. This is used for saving/loading the configuration data and diagnostic information, and for loading the software.

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	Operation
1 2 3 4	1	VCC (VBus)
	2	− Data
	3	+ Data
	4	Ground (GND)
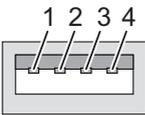
Table 3:   Pin assignment of the USB interface

1.9.3 SD card interface

Prerequisite:
Only use Hirschmann SD cards.
See "Accessories" on page 71.

GRS1042

GRS1142
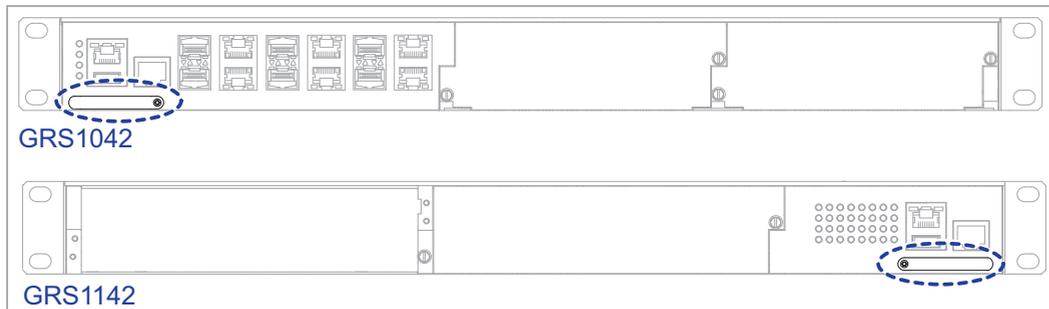
The SD card interface allows you to connect the AutoConfiguration Adapter ACA31 storage medium. This is used for saving/loading the configuration data and diagnostic information, and for loading the software.
On the front of the device there is an LED display that informs you about the status of the interface.

2 Installation

The devices have been developed for practical application in a harsh industrial environment.
On delivery, the device is ready for operation.

Perform the following steps to install and configure the device:
- ▶ Checking the package contents
- ▶ Installing the SD card (optional)
- ▶ Mounting the cover panel and the power supply unit (optional)
- ▶ Mounting a media module (optional)
- ▶ Installing and grounding the device
- ▶ Connecting the terminal blocks
- ▶ Operating the device
- ▶ Installing an SFP transceiver (optional)
- ▶ 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 70.
- ☐ Check the individual parts for transport damage.

2.2 Installing the SD card (optional)

Prerequisite:
Only use the AutoConfiguration Adapter ACA31 storage medium.
See "Accessories" on page 71.

Proceed as follows:
- ☐ Deactivate the write protection on the SD card by pushing the write-protect lock towards the middle of the card.
- ☐ Push the SD card into the slot with the beveled corner on the right side.

2.3 Mounting the cover panel and the power supply unit (optional)

2.3.1 Mounting the cover panel

Prerequisite:
To comply with the EMC requirements, close each of the free, open slots with a cover panel, which you obtain as accessories.

Proceed as follows:
☐ Place the cover panel over the power supply unit or media module slot of the device.
☐ Fasten the cover panel to the device by tightening the 2 screws.

2.3.2 Mounting the power supply unit

Hirschmann supplies the power supply units in a ready-to-operate state. The power supply units are hot-swap-capable. You have the option of mounting the power supply units while the device is operating.
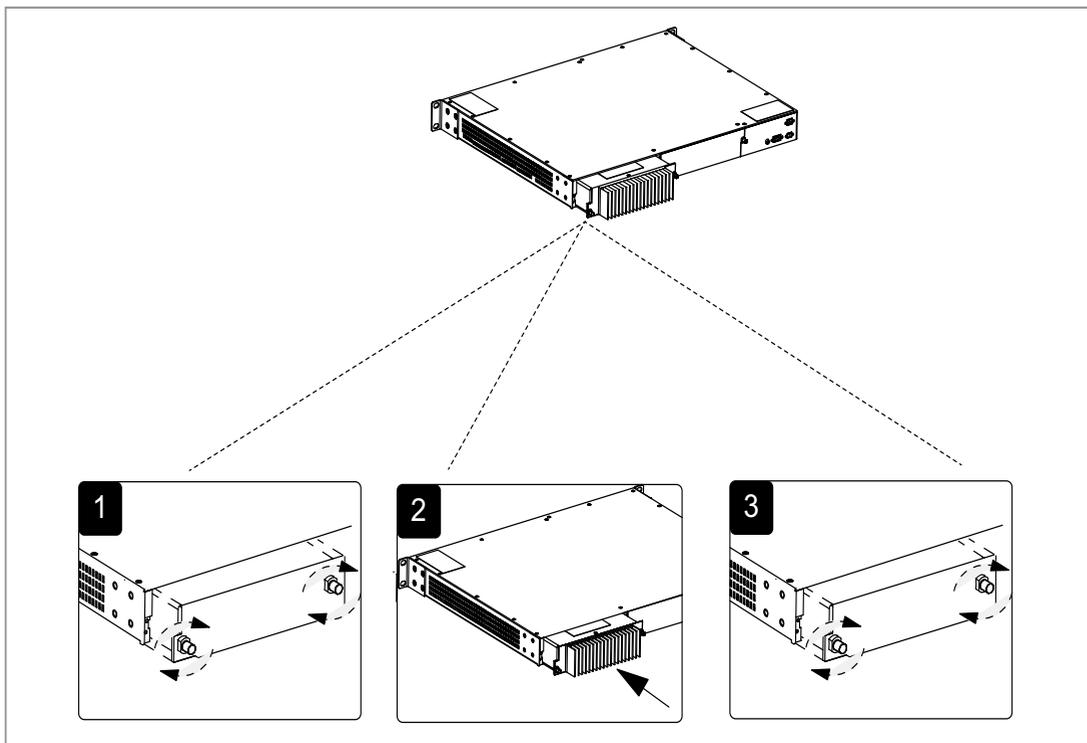
Proceed as follows:
☐ Remove the cover panel (if mounted) from the power supply unit slot on the device.
☐ Insert the power supply unit straight into the slot.
☐ Fasten the power supply unit to the device by tightening the 2 screws. The tightening torque is 4.4 lb-in (0.5 Nm).

2.4   Mounting 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 and/or Gigabit Ethernet ports. The media modules are hot-swap-capable. You have the option of mounting the media modules while the device is operating.
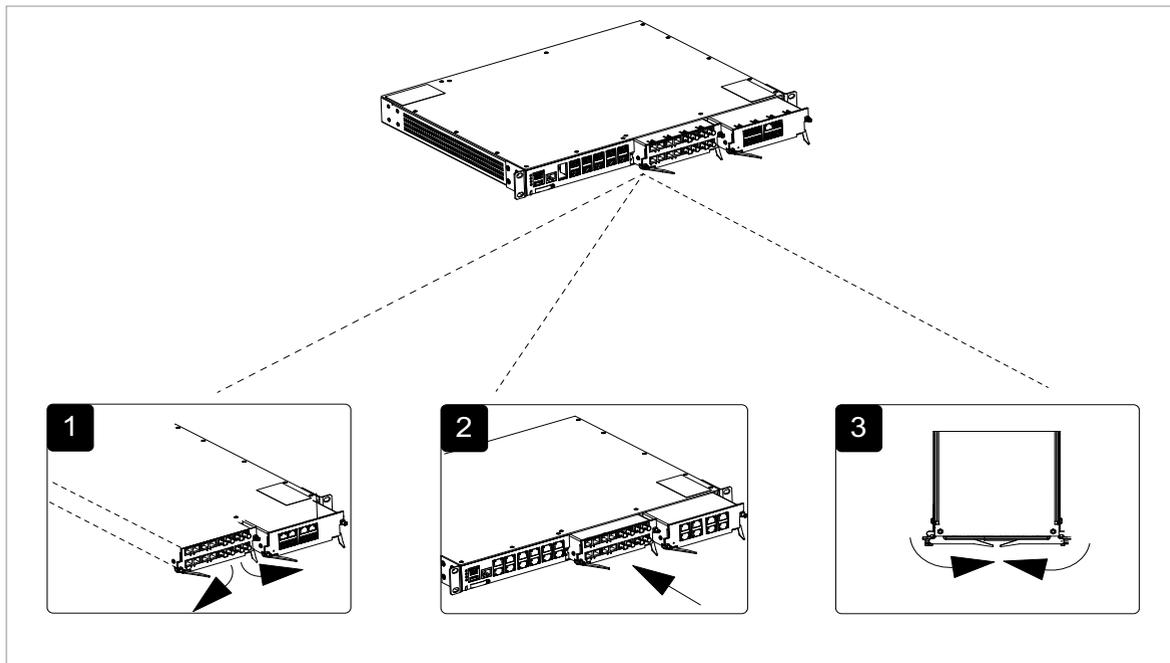
Proceed as follows:
- ☐ Remove the cover panel from the media module slot on the basic device.
- ☐ Open the lock of the media module by pressing the locking lever outwards (step **1**).
- ☐ Insert the media module straight into the media module slot (step **2**).
- ☐ Close the lock of the media module by pressing the locking lever inwards (step **3**).
- ☐ Fasten the media module with the screws in the front panel of the basic device.
  The tightening torque is 4.4 lb-in (0.5 Nm).

2.5 Installing and grounding the device

You have the following options for mounting your device:
- ▶ Mounting in a switch cabinet
- ▶ Mounting on a vertical flat surface

⚠ WARNING

ELECTRIC SHOCK
Install this device solely in a switch cabinet or in an operating site with restricted access, 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
When installing the device, ensure that the ventilation slots are not covered.

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

■ Mounting in a switch cabinet

Note: When operating the device in an environment with continuous vibration loads of greater than 0.7 g, you must additionally fasten the device to the switch cabinet using 2 holding brackets on the front and back of the device.
You obtain the additional brackets as accessories.

Prerequisites:
▶ 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 holding brackets on the sides of the device.
▶ Verify that there is sufficient ventilation. If required, install a fan to keep the device from overheating.
▶ Measure the depth of the 19" cabinet so that all the lines to be connected can be fed in easily.

Proceed as follows:
☐ 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 by screwing the brackets to the switch cabinet.
The tightening torque is 4.4 lb-in (0.5 Nm).

■ Mounting on a vertical flat surface

⚠ WARNING

FIRE HAZARD
Install the device in a fire protected shell if you are mounting it vertically.

Failure to follow these instructions can result in death, serious injury, or equipment damage.
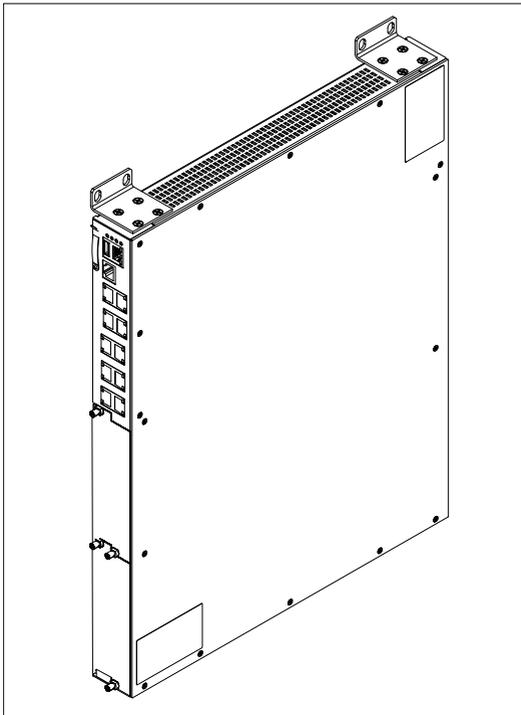
Proceed as follows:
☐ Use the pre-mounted brackets as shown below.
☐ Additionally attach 2 brackets to the back of the device.
  You obtain the additional brackets as accessories.
  See "Accessories" on page 71.
☐ Fasten the device by screwing the brackets to the wall.
  The tightening torque is 4.4 lb-in (0.5 Nm).

■ Grounding the device

The device variants have a connection for protective grounding.

Applies to device variants featuring supply voltage with characteristic value H:
The device is grounded via the ground screw and also via the power supply socket.

Proceed as follows:
☐ Ground the device via the ground screw.

2.6 Connecting the terminal blocks

2.6.1 Supply voltage

⚠ WARNING
ELECTRIC SHOCK Connect only a supply voltage that corresponds to the type plate of your device. Never insert sharp objects (small screwdrivers, wires, etc.) into the connection terminals for electric conductors, and do not touch the terminals. **Failure to follow these instructions can result in death, serious injury, or equipment damage.**

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

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

Note: The supply voltage for the power supply units is provided at terminal blocks P1 and P2 for the corresponding slots P1 and P2.

For **every** supply voltage to be connected, perform the following steps:
☐ Remove the power connector from the device.
☐ Connect the wires according to the pin assignment on the device with the clamps.
See Supply voltage with characteristic value LL.
See Supply voltage with characteristic value HH.
See Supply voltage with characteristic value HL.
☐ Fasten the wires connected by tightening the terminal screws.

■ Supply voltage with characteristic value LL
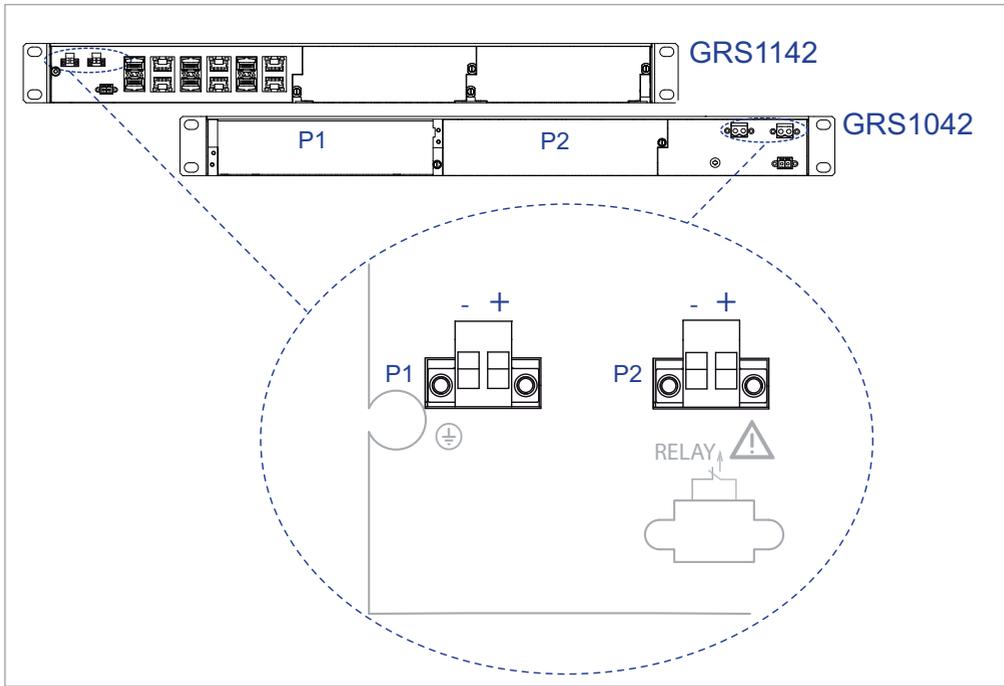
■ Supply voltage with characteristic value HH
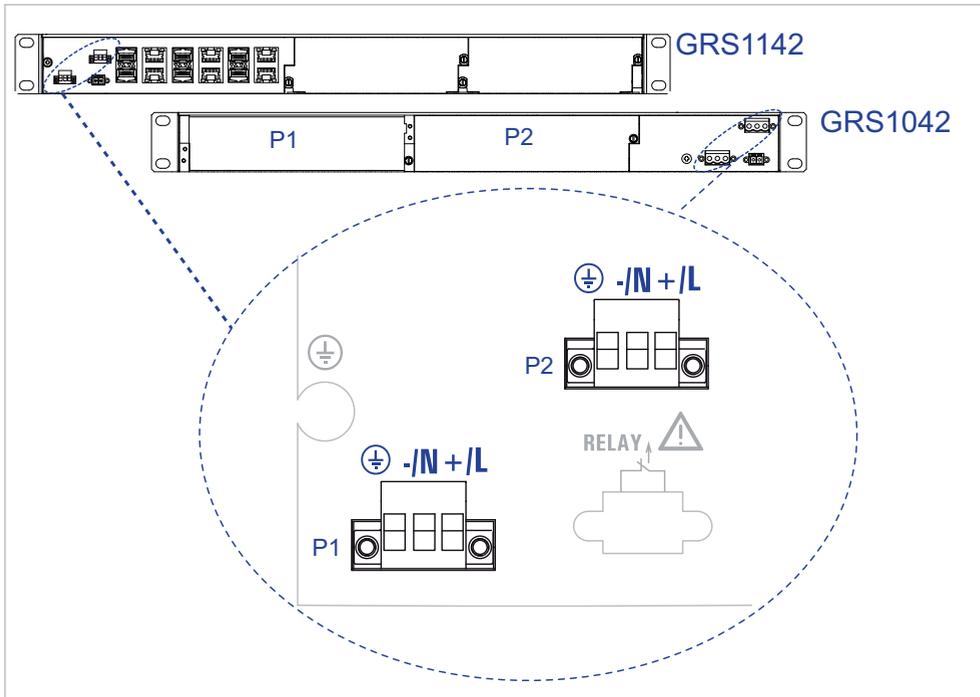
■ Supply voltage with characteristic value HL
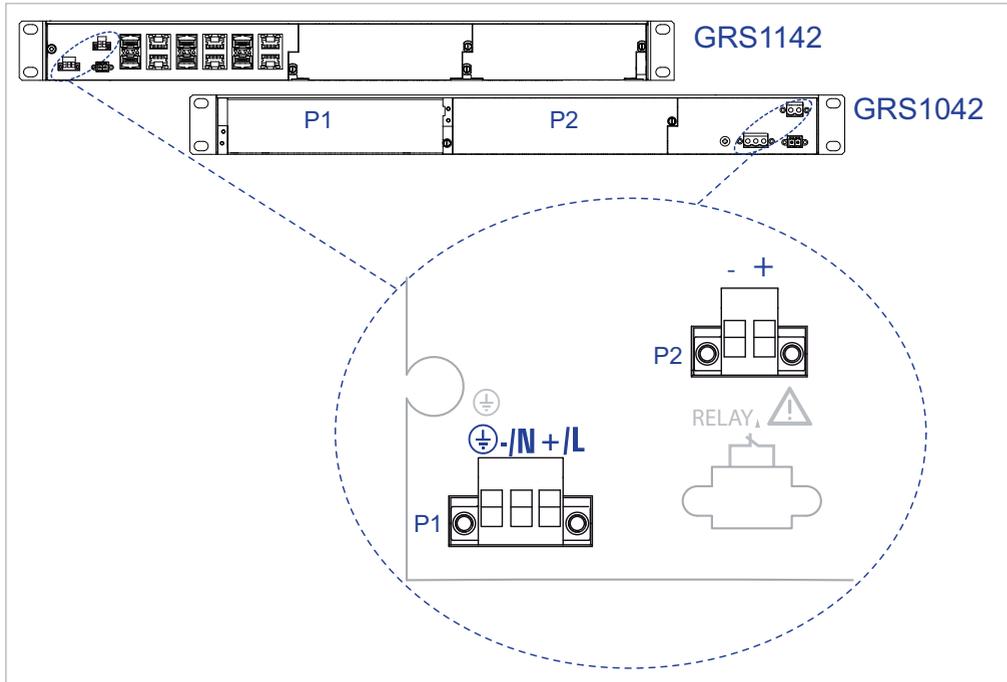
Type of the voltages that can be connected	Specification of the supply voltage	Connections	
DC voltage	Rated voltage range DC ▶ 24 V ... 48 V ▶ 48 V... 54 V	+	Plus terminal of the supply voltage
		−	Minus terminal of the supply voltage

Table 4:   Supply voltage with characteristic value LL: type and specification of the supply voltage, connections

Type of the voltages that can be connected	Specification of the supply voltage	Connections	
DC voltage	Rated voltage range DC 60 V ... 250 V	+/L −/N ⏚	Plus terminal of the supply voltage Minus terminal of the supply voltage Protective conductor
AC voltage	Rated voltage range AC 110 V ... 240 V, 50 Hz ... 60 Hz	+/L −/N ⏚	Outer conductor Neutral conductor Protective conductor

Table 5:   Supply voltage with characteristic value HH: type and specification of the supply voltage, connections

2.6.2   Signal contact

GRS1042

GRS1142
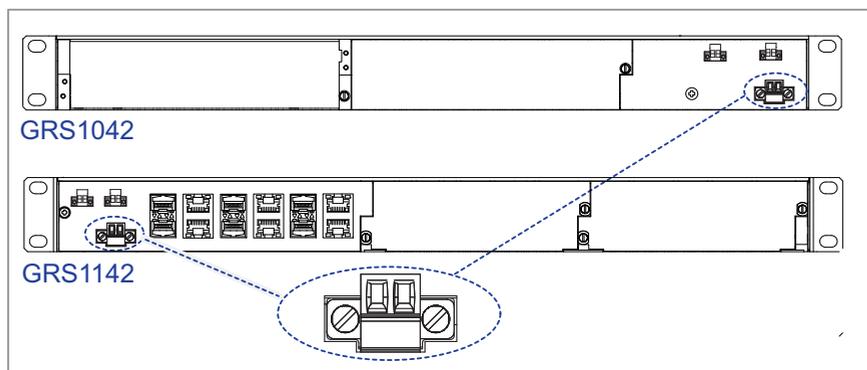
Figure 2:   Signal contact: 2-pin terminal block with screw locking

☐ Connect the signal contact wires with the connectors of the terminal block.
☐ Fasten the wires connected by tightening the terminal screws.

2.7 Installing an SFP transceiver (optional)

Prerequisite:
Only use Hirschmann SFP transceivers.
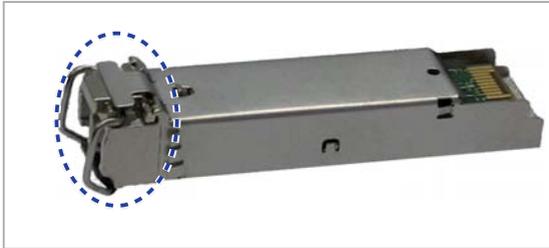
Proceed as follows:

- ☐ Remove the protection cap from the SFP transceiver.
- ☐ Push the SFP transceiver with the lock closed into the slot until it latches in.

2.8 Operating the device

Relevant for North America:
▶ The torque for tightening the supply voltage terminal block on the device is 4.5 lb-in (0.51 Nm).
▶ The torque for tightening the terminal block for the signal contact on the device is 3 lb-in (0.34 Nm).

Proceed as follows:
☐ Use screws to secure the connectors to the device.
☐ Enable the supply voltage.

2.9 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, and that ideally they are installed in separate cable channels. If reducing the inductive coupling is necessary, verify that the power supply cables and data cables cross at a 90° angle.
▶ Use shielded cables (SF/UTP cables as per ISO/IEC 11801:2002).
☐ Connect the data cables according to your requirements.

For further information see "Device name and product code" on page 15.

2.10 Filling out the inscription label

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

3 Making basic settings

Note: Two 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[a]
▶ Configuration via BOOTP[a]
▶ Configuration via DHCP [a]
▶ Configuration via DHCP Option 82 [a]
▶ AutoConfiguration Adapter

■ Default settings
▶ IP address: The device looks for the IP address using DHCP[a]
▶ Password for management:
  Login: user; password: public (read only)
  Login: admin; password: private (read and write)
▶ Parameters that can be set via the management are set to pre-defined values in accordance with the MIB
▶ V.24 data rate: 9,600 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
▶ Out-of-band management port:
  Default IP address: 192.168.1.1 / 255.255.255.0

---

a. Out-of-band management port excluded

4 Monitoring the ambient air temperature

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

The ambient air temperature is the temperature of the air at a distance of 2 in (5 cm) from the device. It depends on the installation conditions of the device, e.g. 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 (www.hirschmann.com).

☐ Depending on the degree of pollution in the operating environment, check at regular intervals that the ventilation slots in the device are not obstructed.

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

6 Disassembly

6.1 Removing a power supply unit
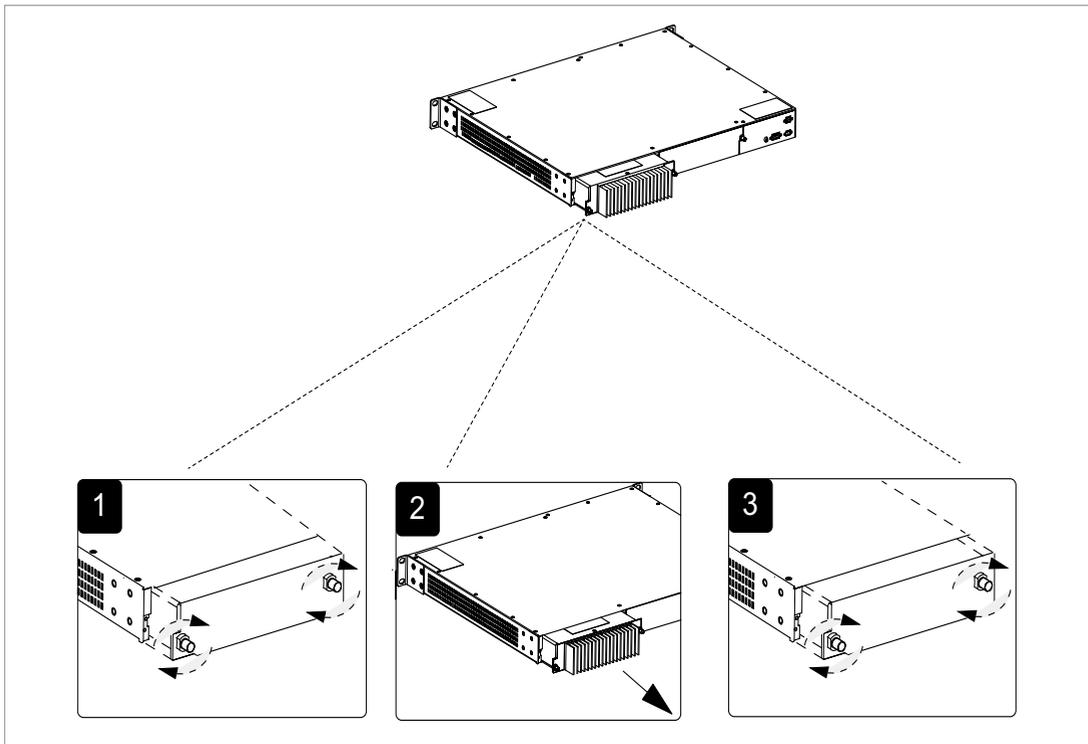
Proceed as follows:
- □ Remove the screws on the front panel of the power supply unit.
- □ Pull the power supply unit out of the slot.
- □ Close the power supply unit slot on the basic device using a cover panel.
- □ Fasten the cover panel using the 2 screws on the basic device.
  The tightening torque is 4.4 lb-in (0.5 Nm).

6.2   Removing a media module
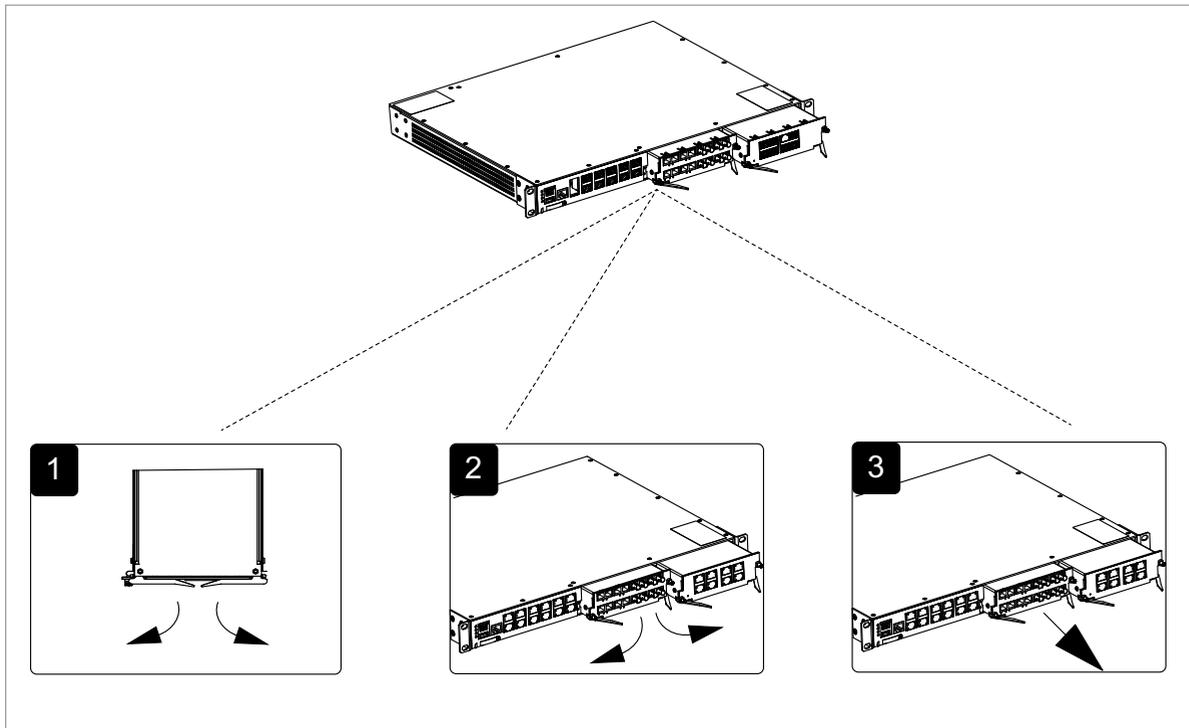
Proceed as follows:
- ☐ Loosen the screws in the front panel of the media module.
- ☐ Open the lock of the media module by pressing the locking lever outwards (steps **1** and **2**).
- ☐ Pull the media module out of the slot (step **3**).
- ☐ Close the media module slot on the basic device using a cover panel.
- ☐ Fasten the cover panel using the 2 screws on the basic device.
  The tightening torque is 4.4 lb-in (0.5 Nm).

6.3   Removing an SFP transceiver

Proceed as follows:
- ☐ Pull the SFP transceiver out of the slot by means of the opened lock.
- ☐ Close the SFP transceiver with the protective cap.

6.4 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.**

Proceed as follows:
- ☐ Disconnect the data cables.
- ☐ Disable the supply voltage.
- ☐ Disconnect the terminal blocks.
- ☐ Disconnect the grounding.
- ☐ 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

7.1.1 Basic device

Dimensions W × H × D	See "Dimension drawings" on page 62.	
Weight		7.93 lb (3.6 kg)
Power supply Supply voltage with characteristic value L	Nominal voltage DC	24 V ... 48 V 48 V... 54 V
	Back-up fuse for each voltage input	Nominal rating: 6.3 A Characteristic: slow blow
	Connection type	2-pin terminal block
Power supply Supply voltage with characteristic value H	Nominal voltage AC	110 V ... 240 V, 50 Hz ... 60 Hz
	Nominal voltage DC	60 V ... 250 V
	Back-up fuse for each voltage input	Nominal rating: 2.5 A Characteristic: slow blow
	Connection type	3-pin terminal block
Signal contact	Nominal value for AC	I_{max} = 2 A at U_{max} = 230 V
	Nominal value for DC	I_{max} = 2 A at U_{max} = 30 V I_{max} = 0.2 A at U_{max} = 125 V I_{max} = 0.1 A at U_{max} = 250 V
Climatic conditions during operation	Ambient air temperature[a]	Standard up to 6560 FASL +32 °F ... +140 °F (2000 m ü. NN) (0 °C ... +60 °C) over 6562 FASL +32 °F to +122 °F (2000 m) (0 °C ... +50 °C)
		Extended [b],[c] up to 6560 FASL −40 °F ... +158 °F (2000 m ü. NN) (−40 °C ... +70 °C) over 6562 FASL −40 °F ... +140 °F (2000 m) (−40 °C ... +60 °C)
		Extended with conformal coating [b,c] over 6562 FASL −40 °F ... +158 °F (2000 m) (−40 °C ... +70 °C) over 6562 FASL −40 °F ... +140 °F (2000 m) (−40 °C ... +60 °C)
	Humidity	5 % ... 95 % (non-condensing)
	Air pressure	minimum 700 hPa (+9842 ft; +3000 m)
		maximum 1060 hPa (−1312 ft; −400 m)
Climatic conditions during storage	Ambient temperature	−40 °F ... +185 °F (−40 °C ... +85 °C)
	Humidity	5 % ... 95 % (non-condensing)
	Air pressure	minimum 700 hPa (+9842 ft; +3000 m)
		maximum 1060 hPa (−1312 ft; −400 m)

Pollution degree		2
Protection classes	Laser protection	Class 1 in compliance with IEC 60825-1
	Degree of protection	IP30

a. Temperature of the ambient air at a distance of 2 inches (5 cm) 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.
c. 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.

7.1.2 Power supply units

Dimensions W × H × D		See "Power supply units" on page 63.
Weight	GPS1-C	21.16 oz (600 g)
	GPS1-K	25.04 oz (710 g)
	GPS3-P	26.46 oz (750 g)
Power supply unit Characteristic value C	Nominal voltage DC	24 V ... 48 V
	Voltage range DC incl. maximum tolerances:	min. 16.8 V ... max. 60 V
	Power loss buffer	> 10 ms at 20.4 V DC
	Overload current protection at input	Non-replaceable fuse
	Peak inrush current	< 7A (1ms)
	Current integral I^2T	0.4 A^2s
Power supply unit Characteristic value K	Nominal voltage AC	110 V ... 240 V, 50 Hz ... 60 Hz
	Nominal voltage DC	60 V ... 250 V
	Voltage range AC incl. maximum tolerances	88 V ... 276 V, 47 Hz ... 63 Hz
	Voltage range DC incl. maximum tolerances	48 V ... 288 V
	Power loss buffer	> 17 ms at 110 V AC > 20 ms at 230 V AC
	Overload current protection at input	Non-replaceable fuse
	Peak inrush current	< 3A (1ms)
	Current integral I^2T	0.3 A^2s
	Crest factor	< 1.8

Power supply unit Characteristic value P	The supply voltage inputs are designed for operation with safety extra-low voltage. Connect only SELV circuits with voltage restrictions in line with IEC/EN 60950-1 to the supply voltage connections. Make sure that the connected supply voltage complies the requirements of IEEE 802.3af or IEEE 802.3at: ▶ For the use of type-1-powered devices (PoE): Rated voltage DC: 48 V Max. voltage range DC: 45 V ... 57 V ▶ For the use of type-2-powered devices (PoE+): Rated voltage DC: 54 V Max. voltage range DC: 51 V ... 57 V	
Max. PoE power	In total:	185 W
Power loss buffer	> 10 ms at 40.8 V DC[a]	
Overload current protection at input	Non-replaceable fuse	
Peak inrush current	< 2.5A (1ms)	
Current integral I^2T	0.3 A^2s	

a. Only applies to the basic device, not to the connected powered devices.

7.1.3 Media modules

Dimensions	See "Dimension drawings" on page 62.	
Weight of media modules	GMM20-MMMMMMMM	16.72 oz (520 g) additional 150 g for media modules with temperature range characteristic value T and E
	GMM20-NNNNNNNN	
	GMM20-VVVVVVVV	
	GMM20-UUUUUUUU	
	GMM30-MMMMTTTT	19.4 oz (550 g)
	GMM30-NNNNTTTT	
	GMM30-VVVVTTTT	
	GMM30-UUUUTTTT	
	GMM40-TTTTTTTT	17.28 oz (490 g)
	GMM40-OOOOOOOO	22.93 oz (650 g)
	GMM40-OOOOTTTT	19.05 oz (540 g)
	GMM32-MMMMTTTT	19.75 oz (560 g)
	GMM32-NNNNTTTT	
	GMM32-VVVVTTTT	
	GMM32-UUUUTTTT	
	GMM42-OOOOTTTT	19.4 oz (550 g)
	GMM42-TTTTTTTT	17.99 oz (510 g)
Climatic conditions during operation	Ambient temperature	Devices with operating temperature characteristic value S (standard): +32 °F ... +140 °F (0 °C ... +60 °C) [a]
		Devices with operating temperature characteristic value E and T (extended) −40 °F ... +158 °F (−40 °C ... +70 °C) [b] −40 °F ... +185 °F (−40 °C ... +85 °C) for 16 hours (tested in accordance with IEC 60068-2-2)
	Humidity	5 % ... 95 % (non-condensing)
	Air pressure	at least 600 hPa (+13123 ft; +4000 m) maximum 1060 hPa (−1312 ft; −400 m)
Climatic conditions during storage	Ambient temperature	−40 °F ... +185 °F (−40 °C ... +85 °C)
	Humidity	5 % ... 95 % (non-condensing)
	Air pressure	at least 600 hPa (+13123 ft; +4000 m) maximum 1060 hPa (−1312 ft; −400 m)
Pollution degree		2
Protection classes	Laser protection	Class 1 in compliance with IEC 60825-1

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

7.2 Dimension drawings

7.2.1 Basic device

7.2.2 Power supply units

mm
inch

173
6.8
167
6.6
42
1.65
109
4.3

173
6.8
167
6.6
42
1.65
8
0.3
141
5.5
109
4.3
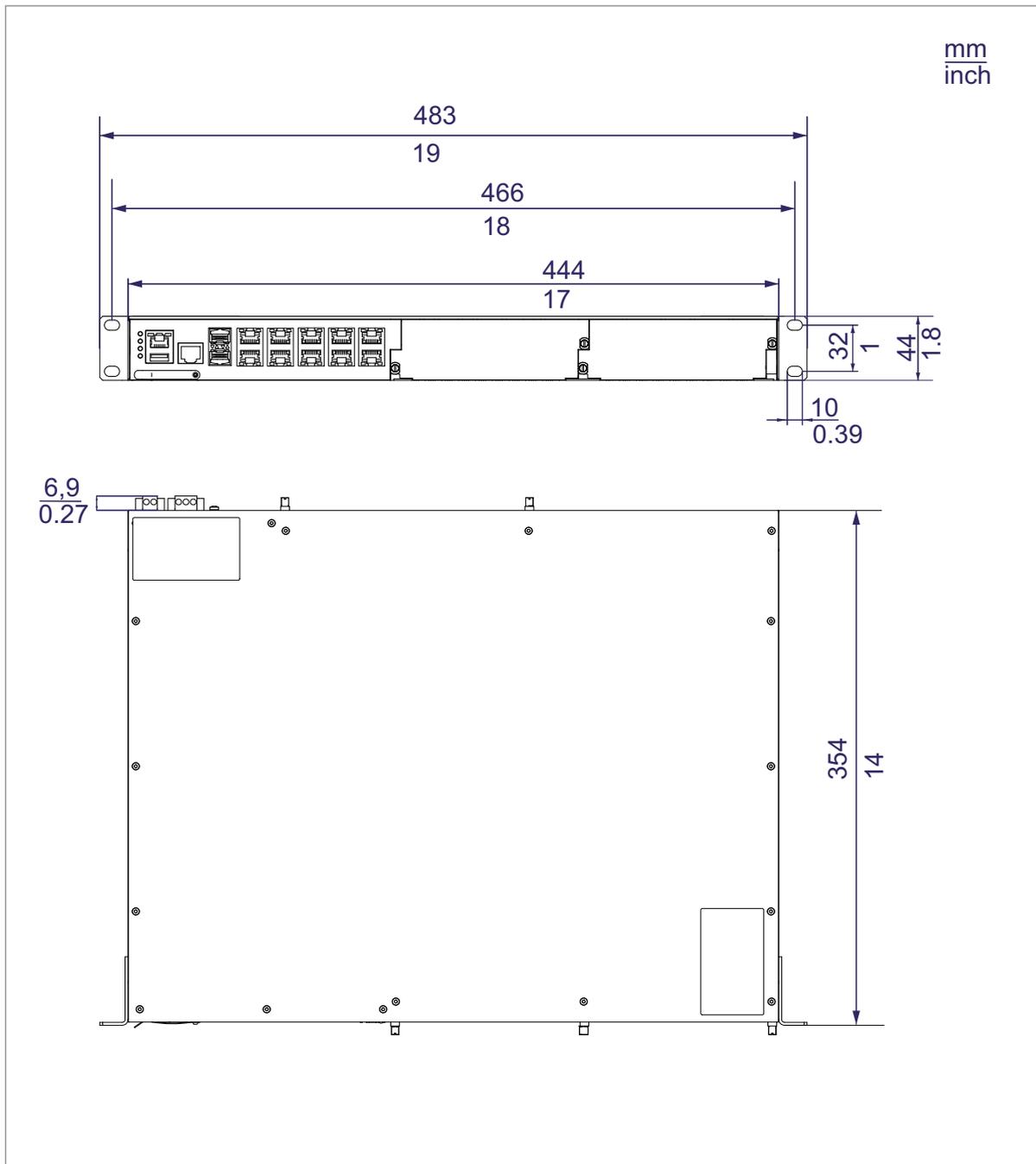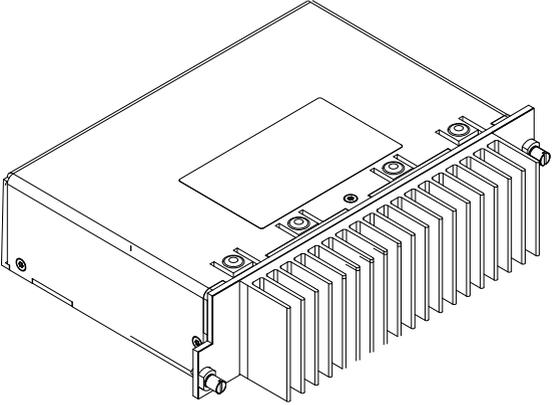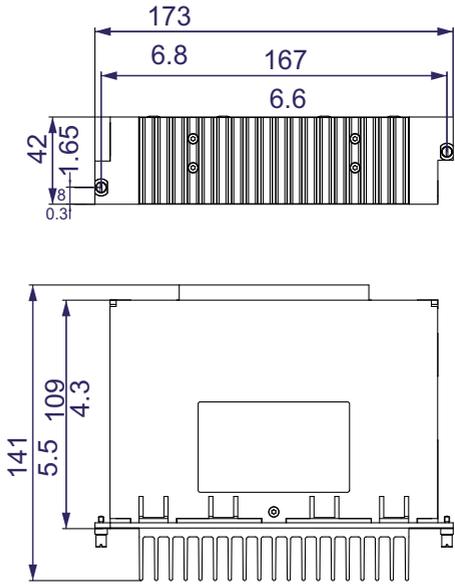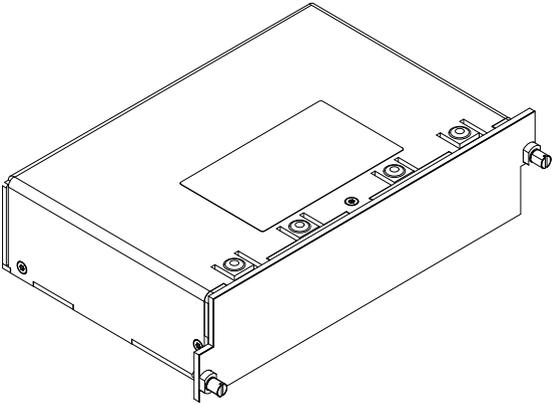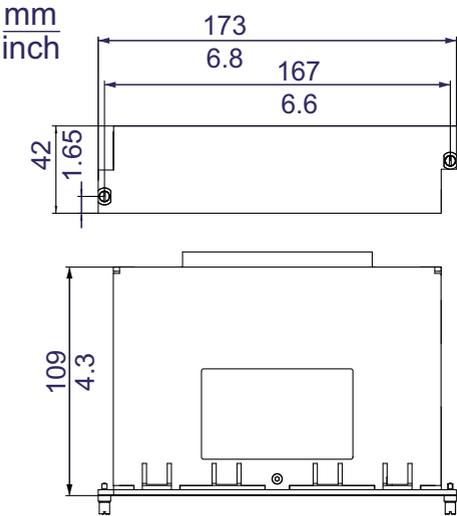
7.2.3   Media modules
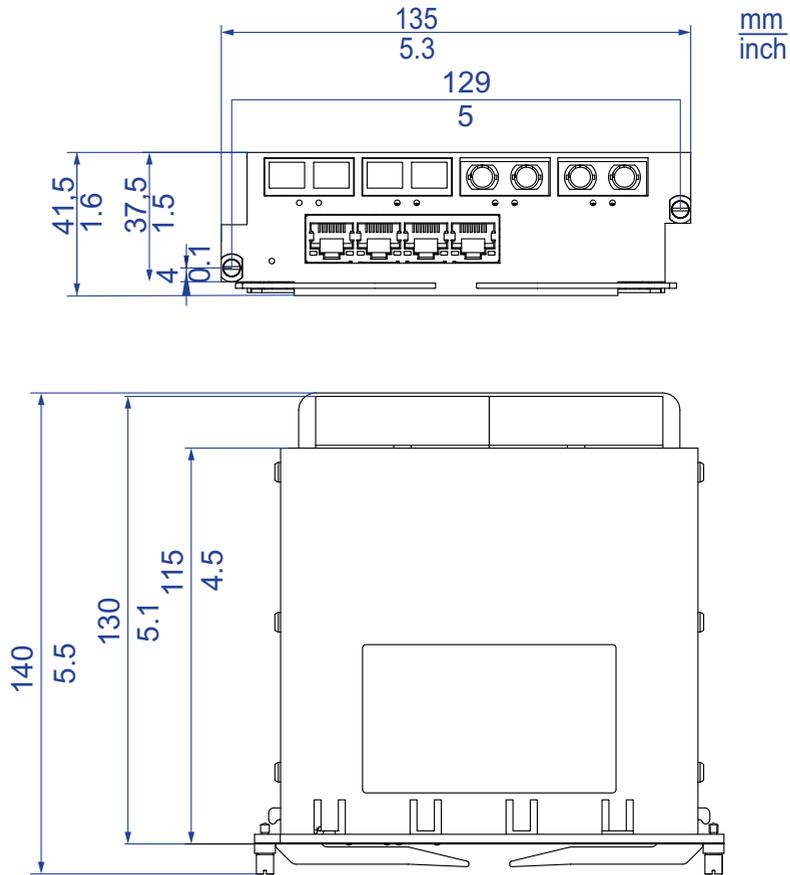
■ EMC and immunity

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

a. EN 61131-2, CE, FCC – applies to all devices
b. Merchant Navy – applies to devices with the approval codes U9, UT, UX, UY, VU
c. EN 50121-4, EN 50155 – applies to devices with the approval codes VT, T9, TY, S9, SY
d. EN 50155 – applies to devices with the approval codes S9, SY
e. EN 61850-3, IEEE 1613 – applies to devices with the certification codes V9, VY, VU, VT

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

EMC interference immunity		Standard applications[a]	Merchant Navy[b]	Railway applications (trackside)[c]	Substation applications[d]
EN 61000-4-3	80 MHz ... 3000 MHz	10 V/m	10 V/m	20 V/m	10 V/m
IEEE 1613	80 MHz ... 1000 MHz	—	—	—	35 V/m
Fast transients (burst)					
EN 61000-4-4 IEEE C37.90.1	DC supply connection	± 2 kV	± 2 kV	± 2 kV	± 4 kV
EN 61000-4-4 IEEE C37.90.1	Data line	± 4 kV	± 4 kV	± 2 kV	± 4 kV
Voltage surges - DC supply connection					
EN 61000-4-5	line/ground	± 2 kV	± 2 kV	± 2 kV	± 2 kV
IEEE 1613	line/ground	—	—	—	± 5 kV
EN 61000-4-5	line/line	± 1 kV	± 1 kV	± 1 kV	± 1 kV
Voltage surges - data line					
EN 61000-4-5	line/ground	± 1 kV	± 1 kV	± 2 kV	± 2 kV
Conducted disturbances					
EN 61000-4-6	150 kHz ... 80 MHz	10 V	10 V	10 V	10 V

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

a. EN 61131-2, CE, FCC – applies to all devices
b. Merchant Navy – applies to devices with the approval codes U9, UT, UX, UY, VU
c. EN 50121-4 – applies to devices with the approval codes VT, T9, TY, S9, SY
d. EN 61850-3, IEEE 1613 – applies to devices with the certification codes V9, VY, VU, VT

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

a. EN 61131-2, CE, FCC – applies to all devices
b. Merchant Navy – applies to devices with the approval codes U9, UT, UX, UY, VU
c. EN 50121-4 – applies to devices with the approval codes VT, T9, TY, S9, SY
d. EN 61850-3, IEEE 1613 – applies to devices with the certification codes V9, VY, VU, VT

■ Network range

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

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

Table 6:   Fiber port 1000BASE-FX (SFP fiber optic Gigabit Ethernet Transceiver)

a. including 3 dB system reserve when compliance with the fiber data is observed
b. Using the bandwidth length product is inappropriate for expansion calculations.
c. Distances of up to 3 km can be reached, 1000 MHz×km (1300 nm)
d. With F/O adapter compliant with IEEE 802.3-2002 clause 38 (single-mode fiber offset-launch mode conditioning patch cord)
e. Including 2.5 dB system reserve when compliance with the fiber data is observed

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

Table 7:   F/O port (bidirectional Gigabit Ethernet SFP Transceiver)

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

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

Table 8:   Fiber port 100BASE-FX (SFP fiber optic Fast Ethernet Transceiver)

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

Product code M-SFP-2.5-...		Wave length	Fiber	System attenuation	Example for F/O cable length	Fiber attenuation	BLP/ dispersion
MM/LC EEC	MM	850 nm	50/125 µm	0-4 dB	550 m	3.5 db/km	2000 MHz×km
MM/LC EEC	MM	850 nm	50/125 µm	0-4 dB	1312 ft (400 m)	3.5 db/km	500 MHz×km
MM/LC EEC	MM	850 nm	62.5/125 µm	0-4 dB	558 ft (170 m)	3.5 db/km	200 MHz×km
SM-/LC EEC	SM	1310 nm	9/125 µm	0-8.5 dB	5 km	0.55 db/km (GR-253 CORE)	
SM/LC EEC	SM	1310 nm	9/125 µm	0-13 dB	20 km	0.55 db/km (GR-253 CORE)	
SM+/LC EEC	SM	1310 nm	9/125 µm	12-25 dB	45 km	0.55 db/km (GR-253 CORE)	

Table 9:   F/O port 2.5 Gbit/s (SFP fiber optic Gigabit Ethernet transceiver)

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

■ Power consumption/power output

Name	Maximum power consumption	Maximum power output
Basic devices + 1 PSU		
GRS1042 AT2Z...	32 W	110 Btu (IT)/h
GRS1142 AT2Z...		
GRS1042 6T6Z...		
GRS1142 6T6Z...		
Power supply units		
GPS1-K	+ 2.5 W	9 Btu (IT)/h
GPS1-C	+ 3.5 W	12 Btu (IT)/h
GPS3-P	+ 5.5 W	19 Btu (IT)/h
Media modules		
GMM20-XXXXXXXX	10 W	34 Btu (IT)/h
GMM30-XXXXTTTT	6.5 W	22 Btu (IT)/h
GMM32-XXXXTTTT	8.5 W	29 Btu (IT)/h
GMM40-OOOOTTTT	5.5 W	19 Btu (IT)/h
GMM42-OOOOTTTT	7.5 W	26 Btu (IT)/h
GMM40-OOOOOOOO	7.5 W	26 Btu (IT)/h
GMM40-TTTTTTTT	3.5 W	12 Btu (IT)/h
GMM42-TTTTTTTT	5.5 W	19 Btu (IT)/h

■ Scope of delivery

Number	Article
1 ×	Device
1 ×	General safety instructions
1 ×	2-pin terminal block for signal contact
2 ×	Bracket
2 ×	2-pin terminal block for the supply voltage (only for device variants featuring supply voltage with characteristic value LL)
2 ×	3-pin terminal block for the supply voltage (only for device variants featuring supply voltage with characteristic value HH)
1 ×	2-pin terminal block for the supply voltage 3-pin terminal block for the supply voltage (only for device variants featuring supply voltage with characteristic value HL)

■ Order number

GREYHOUND Switch	942 135-999
GREYHOUND power supply units	942 136-999
GREYHOUND media modules	942 134-999
Cover panel for media module slot	942 198-001
Cover panel for power supply unit slot	942 198-002

■ Accessories

Note that products recommended as accessories may have different characteristics to those of the device, which may limit the application range of the overall system. For example, if you add an accessory with IP 20 to a device with IP 65, the IP of the overall system is reduced to 20.

Gigabit Ethernet SFP transceiver	Order number
M-SFP-TX/RJ45	943 977-001
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
SFP-GIG-LX/LC[a]	942 196-001
SFP-GIG-LX/LC EEC[a]	942 196-002

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

2.5 Gigabit Ethernet SFP transceiver (only applies to the basic device)	Order number
M-SFP-2.5-MM/LC EEC	942 162-001
M-SFP-2.5-SM-/LC EEC	942 163-001
M-SFP-2.5-SM/LC EEC	942 164-001
M-SFP-2.5-SM+/LC EEC	942 165-001

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

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.
▶ To set autocrossing manually is currently not possible.

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	943 947-501
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

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

Other accessories	Order number
AutoConfiguration Adapter ACA 22-USB (EEC)	942 124-001
AutoConfiguration Adapter ACA 31	942 074-001
Terminal cable: RJ45 on Sub-D, 9-pin	942 097-001
Terminal cable: RJ45 on USB	942 096-001
3-pin High Voltage Interlock terminal block (50 pcs.)	943 845-008
2-pin Low Voltage Interlock terminal block (50 pcs.)	943 845-010
Bracket for fastening the housing	943 943-001
Dust protection cap (50 pieces) for RJ 45 sockets	943 936-001
Dust protection cap (25 pieces) for SFP slot	943 942-001
Network management software Industrial HiVision	943 156-xxx

■ Underlying technical standards

Name	
ATEX (2014/34/EU)	ATEX – Intended use of equipment and protection systems in potentially explosive areas.
RCM	Australian Regulatory Compliance Mark (RCM) Australian Radiocommunications Standard 2008, Radiocommunications Act 1992
FCC 47 CFR Part 15	Code of Federal Regulations
DNVGL-CG-0339	Environmental test specification for electrical, electronic and programmable equipment and systems.
ISA 12.12.01, CSA C22.2 No. 213	Nonincendive Electrical Equipment for Use in Class I, Division 2 Hazardous Locations
IEC 60825-1	Laser product safety
IEC 60945	Navigation and wireless communication devices and systems for maritime transport - General requirements - Test procedure and required test results.
IEC/EN 61850-3	Communication networks and systems in substations – Part 3: General requirements
IEEE 1613	IEEE Standard Environmental and Testing Requirements for Communication Networking Devices in Electric Power Substations
IEEE 802.3	Ethernet
EN 50121-4	Railway applications – EMC – Emission and immunity of the signaling and telecommunications apparatus (Rail Trackside)
EN 50155	Railway applications - Electronic equipment used on rolling stock
EN 55022	Information technology equipment – Radio disturbance characteristics – Limits and methods of measurement
EN 60950-1	Information technology equipment – Safety – Part 1: General requirements
EN 61000-3-2	Electromagnetic compatibility (EMC) – part 3-2: Threshold values – threshold values for harmonic currents (device input current <= 16 A per connection line)
EN 61000-3-3	Electromagnetic compatibility (EMC) – part 3-3: Threshold values – limitation of voltage changes, voltage fluctuations and flickering in public low voltage supply networks for devices with a rated current <= 16 A per wire that are not subject to any special connection condition
EN 61000-6-2	Electromagnetic compatibility (EMC) – Part 6-2: Generic standards – Immunity for industrial environments
EN 61000-6-4	Electromagnetic compatibility (EMC) – Part 6-4: Generic standards – Emission standard for industrial environments
EN 61131-2	Programmable controllers – Part 2: Equipment requirements and tests
NEMA TS 2	Traffic Controller Assemblies with NTCIP Requirements (environmental requirements)
UL/IEC 61010-1, UL/IEC 61010-2-201	Safety for Control Equipment

Table 10: 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 only if the approval indicator appears on the device casing.
If your device has a shipping approval according to Germanischer Lloyd, you find the approval mark printed on the device label. You will find out whether your device has other shipping approvals on the Hirschmann website under www.hirschmann.com in the product information.

A   Further Support

■ Technical Questions

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

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

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

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