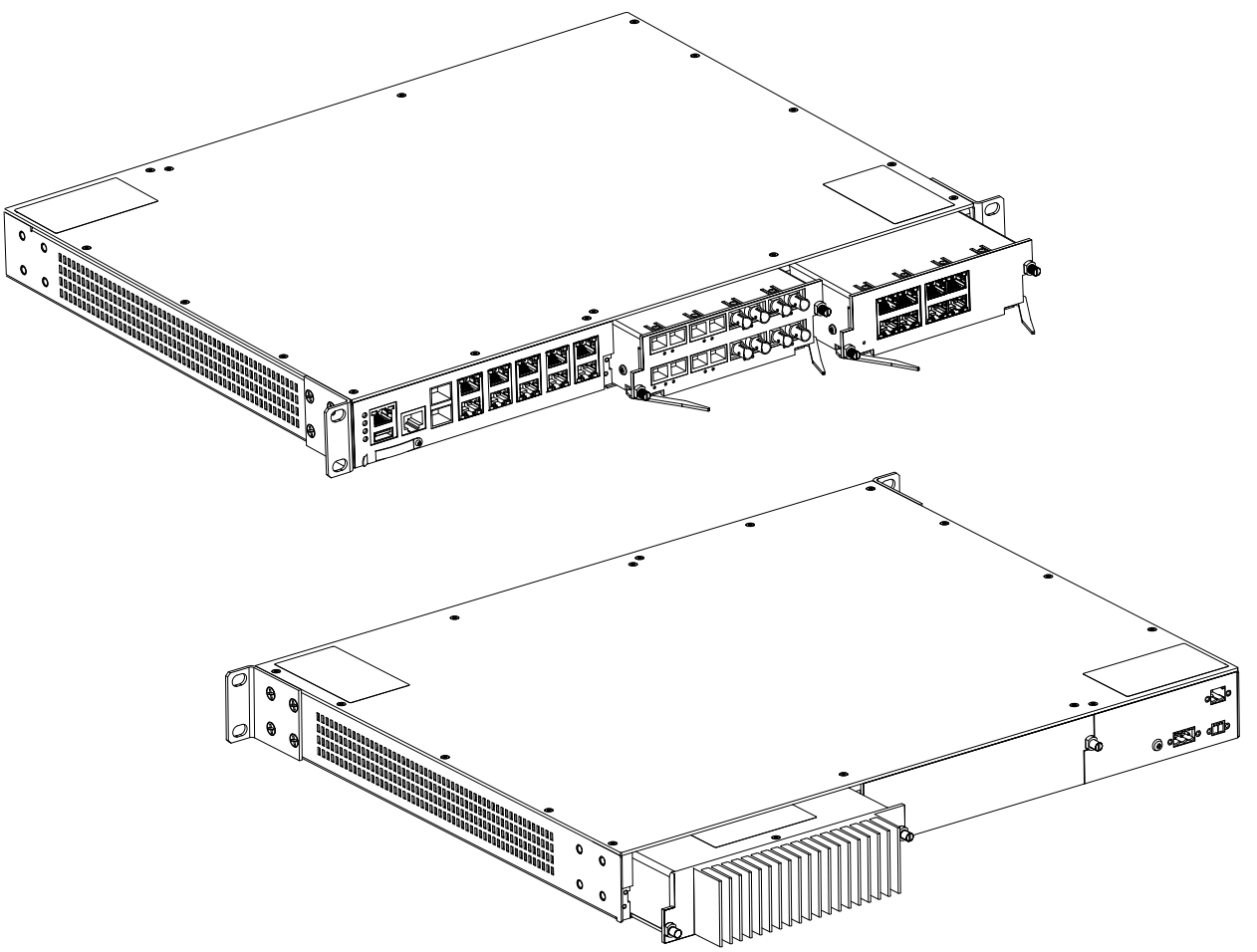
HIRSCHMANN
A BELDEN BRAND

User Manual

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



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

© 2023 Hirschmann Automation and Control GmbH

Manuals and software are protected by copyright. All rights reserved. The copying, reproduction, translation, conversion into any electronic medium or machine scannable form is not permitted, either in whole or in part. An exception is the preparation of a backup copy of the software for your own use.

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

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

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

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

Contents

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.

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.

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.
▶ 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.
▶ Exclusively switch on the device when it is installed.
▶ Relevant for North America: Exclusively use 60/75 °C (140/167 °F) or 75 °C (167 °F) copper (Cu) wire.

Table 1: Requirements for connecting electrical wires

Requirements for connecting the signal contact

The following requirements apply without restrictions:
▶ Limit the connected voltage with a current limitation or in accordance with its application. Observe the electrical threshold values for the signal contact. See “General technical data” on page 76.

Table 2: Requirements for connecting the signal contact

Requirements for connecting the supply voltage

Device variant	Prerequisites:
All variants	**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. ▶ 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. ▶ 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. ▶ 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. ▶ The cross-section of the ground conductor is the same size as or bigger than the cross-section of the power supply cables. ▶ Use a power supply cable which is suitable for the voltage, the current and the physical load. ▶ Install an external fuse in the conductor that is not on ground potential.
Power supply module characteristic value C	**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. ▶ Install a fuse suitable for DC voltage in the plus conductor of the power supply. Regarding the properties of this fuse: See “Technical data” on page 76.

Table 3: Requirements for connecting the supply voltage

Device variant	Prerequisites:
Power supply module characteristic value K	**All** of the following requirements are complied with: ▶ Supply with DC voltage: Install a fuse suitable for DC voltage in the plus conductor of the power supply. Connect the minus conductor to the ground potential. If the minus conductor is not connected to the ground potential, also install an external fuse in the minus conductor. Regarding the properties of this fuse: See “Technical data” on page 76. ▶ Supply with AC voltage: Install a fuse in the outer conductor of the power supply. Connect the neutral conductor to the ground potential. If the neutral conductor is not connected to the ground potential, also install an external fuse in the neutral conductor. Regarding the properties of this fuse: See “Technical data” on page 76.
Power supply module characteristic value P	**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. ▶ The power supply is potential-free. For power supply modules capable of PoE, exclusively use a potential-free SELV power supply. ▶ Install a fuse suitable for DC voltage in the plus conductor of the power supply. Regarding the properties of this fuse: See “Technical data” on page 76. ▶ With redundant power supply: A positive grounding is prohibited.

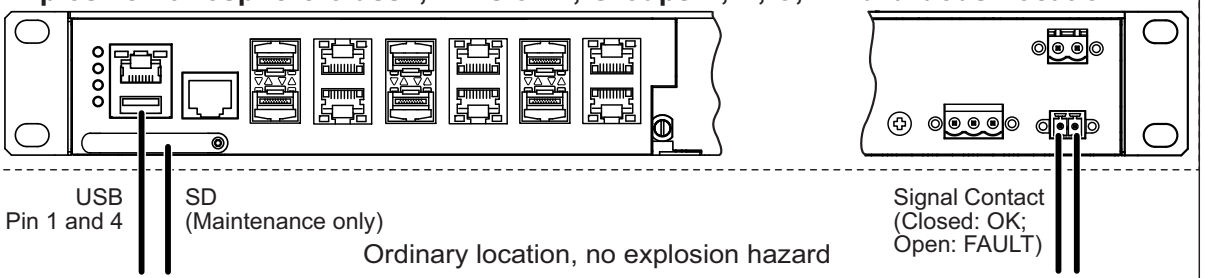
Table 3: Requirements for connecting the supply voltage

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

Ordinary Location, Non-Hazardous Area, Non-Explosive Atmosphere

Explosive Atmosphere Class I Division 2, Groups A, B, C, D Hazardous Location

Explosive Atmosphere Class I, Division 2, Groups A, B, C, D Hazardous Location



USB
Pin 1 and 4

SD
(Maintenance only)

Signal Contact
(Closed: OK;
Open: FAULT)

Ordinary location, no explosion hazard

USB connection:

Equipment with non-incendive field wiring parameters.

USB entity parameters:

$V_{OC} \leq 5.5$ V	$I_{SC} \leq 1.25$ A	$C_a \leq 10$ µF	$L_a \leq 10$ µH

Relay contacts:

Equipment with non-incendive field wiring parameters. The relay terminals are dependent upon the following entity parameters:

$V_{max} \leq 30$ V	$I_{max} \leq 90$ mA	$C_i \leq 2$ nF	$L_i \leq 1$ µH

The use in Hazardous Locations is only allowed for GRS 1042/1142 model numbers which are individually labelled:

“FOR USE IN CLASS I, DIVISION 2 HAZARDOUS LOCATIONS”

Nonincendive field wiring circuits must be wired in accordance with the National Electrical Code (NEC), NFPA 70 , article 501. CEC, Appendix J, Annex J 18.

The earth conductor must be at least the same wire size (mm² or AWG) as the supply conductors.

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

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

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

Avertissement – **R**isque d’explosion – La substitution de tout composant peut rendre ce matériel incompatible pour une utilisation en classe I, division 2.

Control Drawing for GRS 1042/1142 devices for use in Hazardous Locations according to ANSI/ISA12.12.01-2015 Class I, Division 2, Groups A, B, C, D		HIRSCHMANN A BELDEN BRAND
Rev.: 1	Document No.: 000205339DNR	Page 1/2

Capacitance and inductance of the field wiring from the non-incendive circuit to the associated apparatus shall be calculated and must be included in the system calculations as shown in **Table 1**.
Cable capacitance ($\mathbf{C_{cable}}$) plus non-incendive equipment capacitance ($\mathbf{C_i}$) must be less than the marked capacitance ($\mathbf{C_a}$ (or $\mathbf{C_o}$)) shown on any associated apparatus used.

The same applies for inductance ($\mathbf{L_{cable}}$, $\mathbf{L_i}$ and $\mathbf{L_a}$ or $\mathbf{L_o}$, respectively).
Where the cable capacitance and inductance per foot are not known, the following values shall be used:

C_{cable} = 60 pF/ft (196.85 pF/m)
L_{cable} = 0.2 µH/ft (0.66 µH/m)

Table 1:

Non-incendive Equipment		Associated Apparatus
V_{max} (or U_i)	≥	V_{oc} or V_t (or U_o)
I_{max} (or I_i)	≥	I_{sc} or I_t (or I_o)
P_{max} (or P_i)	≥	P_o
$C_i + C_{cable}$	≤	C_a (or C_o)
$L_i + L_{cable}$	≤	L_a (or L_o)

Suitability for installation in particular applications is at the discretion of the Authority Having Jurisdiction (AHJ).

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

The following applies to GRS1042/GRS1142 devices for use in explosive atmospheres:

☐ List of standards:
EN IEC 60079-0:2018
EN 60079-7:2015 + A1:2018
EN IEC 60079-15:2019

☐ Make sure that the device has the following label:

II 3G Ex ec nC IIC T4 Gc DEKRA 17ATEX0024 X

Temperature class and temperature code:
T4: 0 °C ≤ Ta ≤ +60 °C (+32 °F ≤ Ta ≤ +140 °F) for devices with characteristic value "S" or "C"
(Position 13 of the product code) or
T4: -40 °C ≤ Ta ≤ +70 °C (-40 °F ≤ Ta ≤ +158 °F) for devices with characteristic value "T" or "E"
(Position 13 of the product code).

☐ The equipment is suitable for use in an area with maximum pollution degree 2, as defined in IEC 60664-1.

☐ The modules shall be installed in a suitable enclosure according to EN IEC 60079-0 providing a degree of protection of at least IP54 according to EN 60529, taking into account the environmental conditions under which the equipment will be used.

☐ When the temperature under rated conditions exceeds +70 °C (+158 °F) at the cable or the conduit entry point, or +80 °C (+176 °F) at the branching point of the conductors, take measures so that the temperature specification of the selected cable and cable entries is in compliance with the actual measured temperature values.

☐ Make provisions to prevent transient disturbances from exceeding more than 140 % of the connected rated voltage at the voltage inputs.

☐ Connectors shall be connected or disconnected exclusively in dead-voltage state.

THE USB CONNECTOR MUST **NOT** BE USED WHEN THE DEVICE IS OPERATED IN EXPLOSIVE HAZARDOUS LOCATIONS.

UK regulation S.I. 2016 No. 1107 (as amended by S.I. 2019 No. 696) - Schedule 3A, Part 6

The following applies to GRS1042/GRS1142 devices for use in explosive atmospheres:

☐ List of standards:
EN IEC 60079-0:2018
EN 60079-7:2015 + A1:2018
EN IEC 60079-15:2019

☐ Make sure that the device has the following label:

II 3G Ex ec nC IIC T4 Gc DEKRA 21UKEX0073 X

Temperature class and temperature code:
T4: 0 °C ≤ Ta ≤ +60 °C (+32 °F ≤ Ta ≤ +140 °F) for devices with characteristic value "S" or "C"
(Position 13 of the product code) or
T4: -40 °C ≤ Ta ≤ +70 °C (-40 °F ≤ Ta ≤ +158 °F) for devices with characteristic value "T" or "E"
(Position 13 of the product code).

☐ The equipment is suitable for use in an area with maximum pollution degree 2, as defined in IEC 60664-1.

☐ The modules shall be installed in a suitable enclosure according to EN IEC 60079-0 providing a degree of protection of at least IP54 according to EN 60529, taking into account the environmental conditions under which the equipment will be used.

☐ When the temperature under rated conditions exceeds +70 °C (+158 °F) at the cable or the conduit entry point, or +80 °C (+176 °F) at the branching point of the conductors, take measures so that the temperature specification of the selected cable and cable entries is in compliance with the actual measured temperature values.

☐ Make provisions to prevent transient disturbances from exceeding more than 140 % of the connected rated voltage at the voltage inputs.

☐ Connectors shall be connected or disconnected exclusively in dead-voltage state.

THE USB CONNECTOR MUST **NOT** BE USED WHEN THE DEVICE IS OPERATED IN EXPLOSIVE HAZARDOUS LOCATIONS.

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

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 57.
- ☐ 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) 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.

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.

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.
Only for device variants featuring supply voltage with characteristic value H:	**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.
Only for device variants featuring supply voltage with characteristic value L and labeled with an ATEX certificate number: See “ATEX directive 2014/34/EU – specific regulations for safe operation” on page 14.	**2014/34/EU (ATEX)** Directive of the European Parliament and of the Council on the harmonisation of the laws of the Member States relating to equipment and protective systems intended for use in potentially explosive atmospheres.

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

You find the EU 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.

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
Only for device variants featuring supply voltage with characteristic value H:	**S.I. 2016 No. 1101** Electrical Equipment (Safety) Regulations 2016
Only for device variants featuring supply voltage with characteristic value L and labeled with a UKEX certificate number: See “UK regulation S.I. 2016 No. 1107 (as amended by S.I. 2019 No. 696) - Schedule 3A, Part 6” on page 15.	**S.I. 2016 No. 1107** Equipment and Protective Systems Intended for use in Potentially Explosive Atmospheres Regulations

UK
CA

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
GMM20-...

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

Key

The symbols used in this manual have the following meanings:

▶	Listing
☐	Work step
■	Subheading

1 Description

1.1 General device description

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.

Basic device

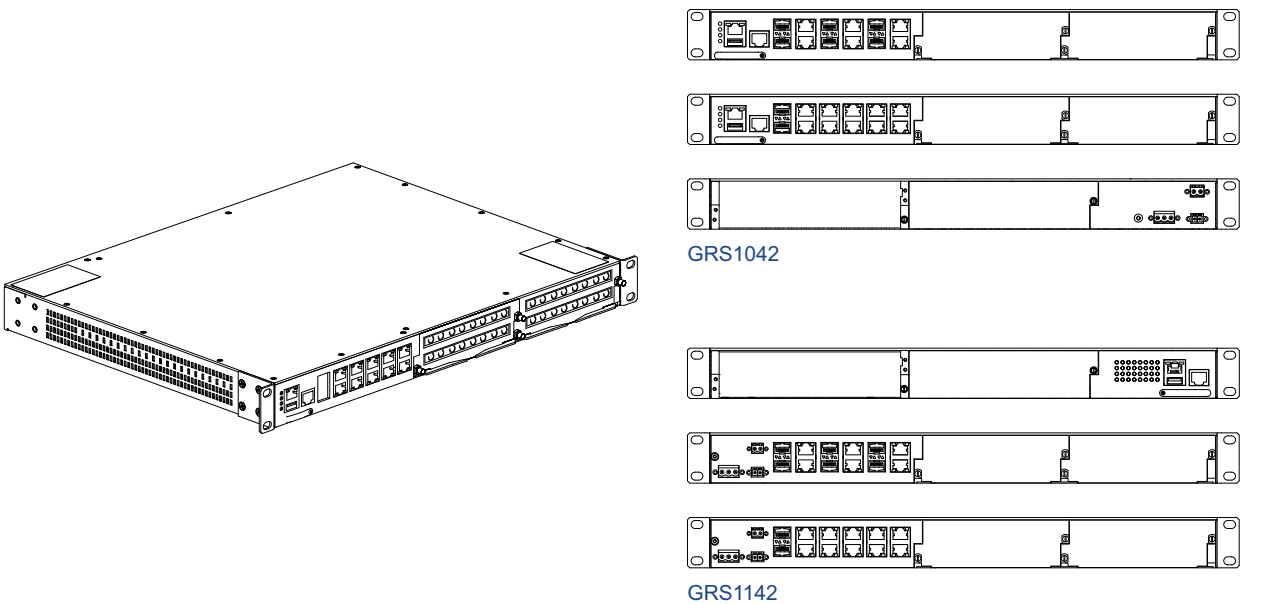


Figure 1: Basic device: Device variants

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

You have numerous options of combining the device characteristics. You can determine the possible combinations using the configurator which is available in the Belden Online Catalog https://catalog.belden.com on the web page of the device.

Power supply modules

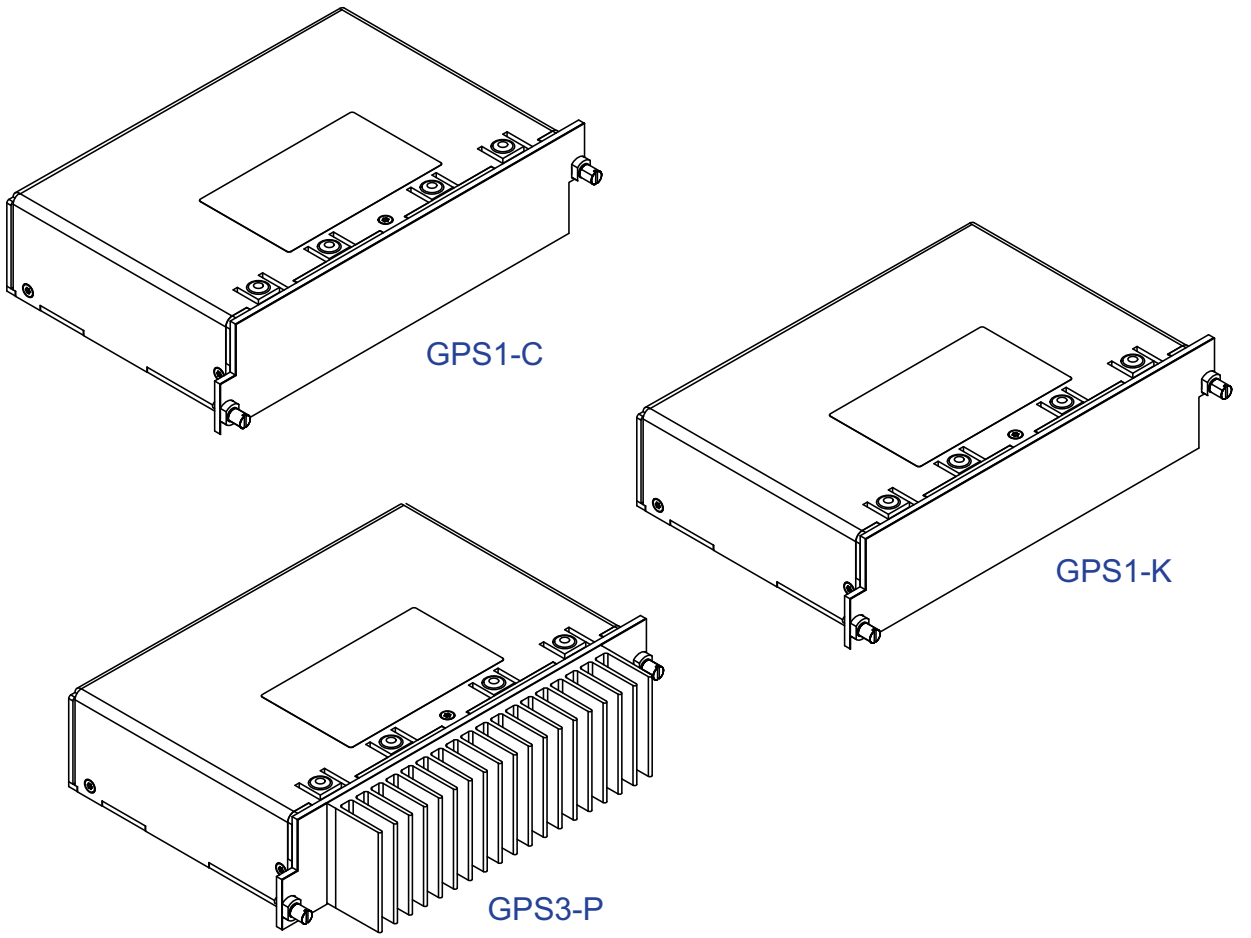


Figure 2: Power supply modules: Power supply module variants

You have the option to select either 1 or 2 power supply modules with different input voltages:

- Low Voltage / Power over Ethernet PoE(+)
- High Voltage

You obtain the power supply modules as accessories.

See “Order number” on page 93.

Media modules

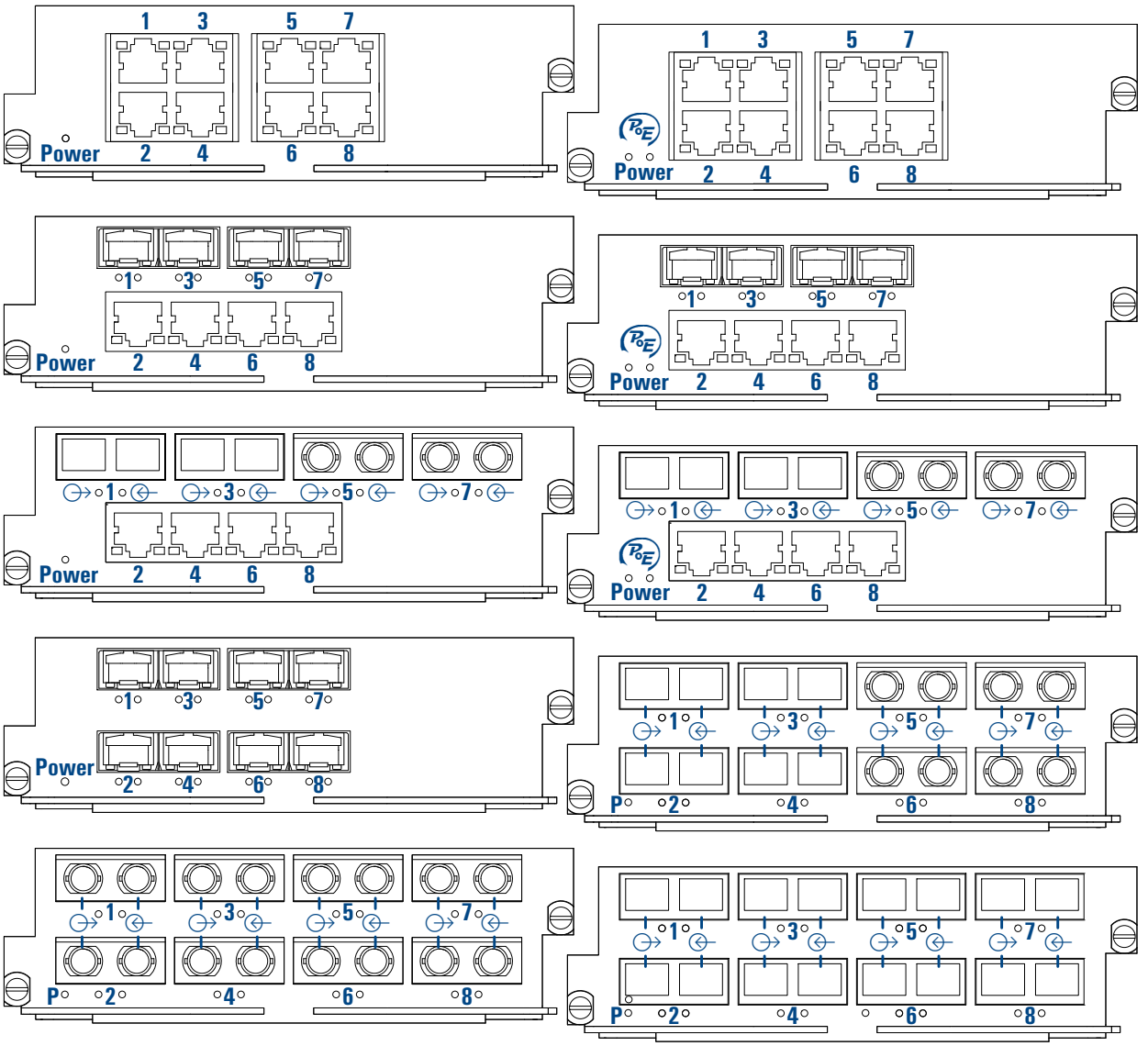


Figure 3: Media modules: Media module variants

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.
See “Order number” on page 93.

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)
		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	L	Voltage input: low voltage prepared for power supply module GPS1-C... GPS3-P...
			Rated voltage range ▶ 24 V DC ... 48 V DC ▶ 48 V DC ... 54 V DC
		H	Voltage input: high voltage prepared for power supply module GPS1-K...
			Rated voltage range ▶ 60 V DC ... 250 V DC ▶ 110 V AC ... 240 V AC, 50 Hz ... 60 Hz
15	Supply voltage 2		See position 14
16	Cover panel for power supply module slot	0	Not present
		1	1 × cover panel for slot 2

Item	Characteristic	Characteristic value	Description
17	Cover panel for media module slot	0	Not present
		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 4 on page 30.	
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 modules

Item	Characteristic	Characteristic value	Description	
1 ... 3	Product	GPS	GREYHOUND Power Supply Unit	
4	Type	1	Standard	Power supply for basic device
		3	PoE (+) basic device	Power supply for basic device and PoE(+)
5	(hyphen)	–		
6	Rated voltage range	C	Rated voltage range 24 V DC ... 48 V DC	
		K	Rated voltage range 60 V DC ... 250 V DC	
			Rated voltage range 110 V AC ... 240 V AC, 50 Hz ... 60 Hz	
		P	Rated voltage range 48 V DC (PoE) ... 54 V DC (PoE+)	
7	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)
8 ... 9	Certificates and declarations	You will find detailed information on the certificates and declarations applying to your device in a separate overview. See table 4 on page 30.		

Item	Characteristic	Characteristic value	Description	
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	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 4 on page 30.		
18 ... 19	Customer-specific version	HH	Hirschmann	
20	Hardware configuration	S	Standard	
21	Software configuration	9	without configuration	

Item	Characteristic	Characteristic value	Description
22 ... 26	Software version	XX.X.	Current software version
		99.9.	without software

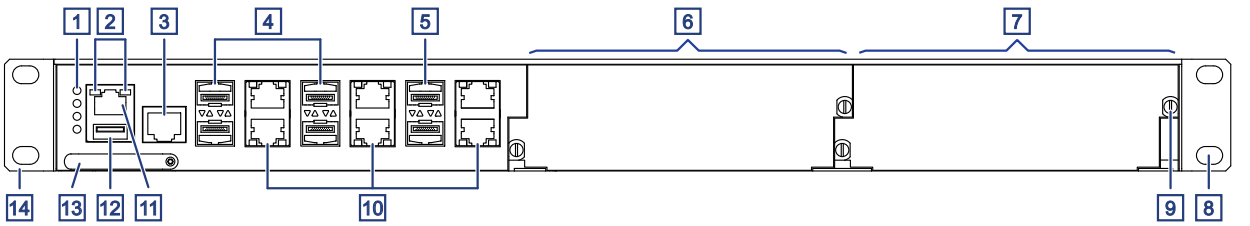
Application case	Certificates and declarations	Characteristic value[a]													
		Z9	Y9	X9	W9	V9	VY	U9	UY	UX	UW	T9	TY	S9	SY
Standard applications	ATEX (2014/34/EU)				X						X				
	CE	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	EN 62368-1	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	EN 61131-2	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	FCC	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		X
	NEMA TS 2											X	X	X	X
Substation applications	IEC 61850-3					X	X								
	IEEE 1613					X	X								
Navy applications	DNV							X	X	X	X				
Railway applications (trackside)	EN 50121-4											X	X	X	X

Table 4: Assignment: application cases, certificates and declarations, characteristic values

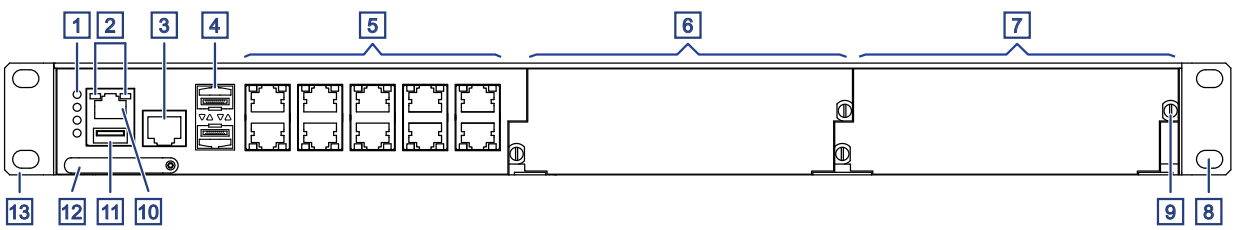
a. X = Approval or self-declaration present

1.3 Device views

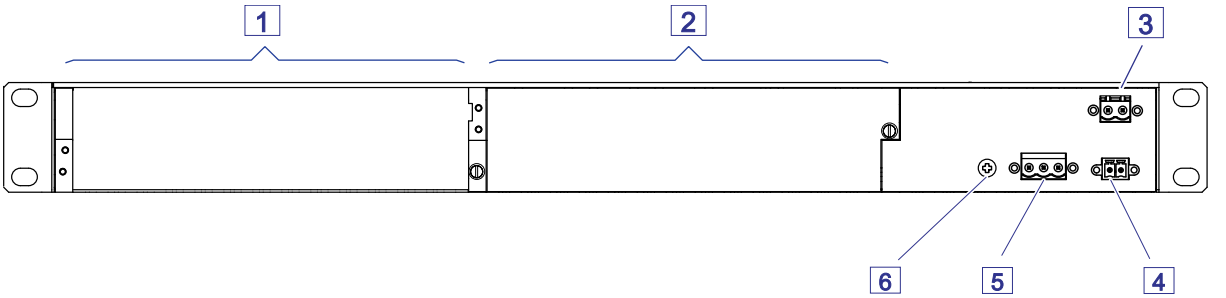
1.3.1 GRS1042



Front view - characteristic value 6T6Z		
1	LED display elements for device status	
2	Display elements for power supply module status	
3	Out-of-band management port	
4	SFP slot for 1/2.5 Gbit/s F/O connections	
5	SFP slot for 100/1000 Mbit/s F/O connections	
6	Cover panel for media module slot	1
7	Cover panel for media module slot	2
8	Oblong hole	
9	Screw	
10	RJ45 socket for 10/100/1000 Mbit/s Twisted Pair connections	
11	V.24 interface	
12	USB interface	
13	Slot for the SD card	
14	Brackets with fastening screws (pre-mounted)	

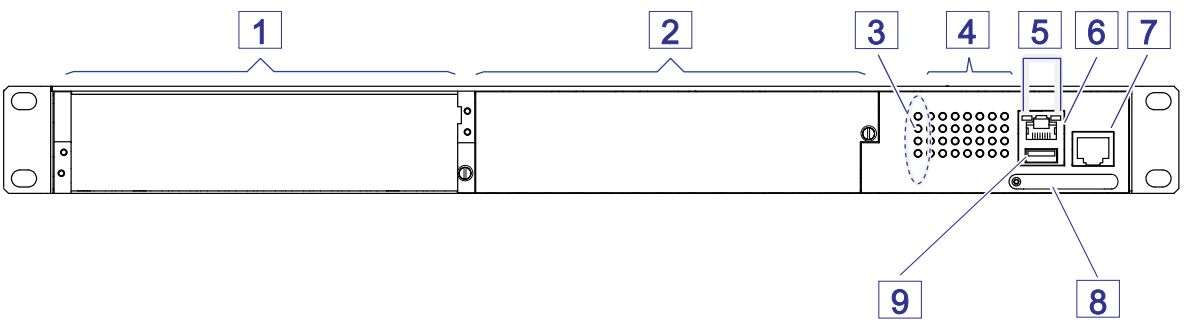


Front view - characteristic value AT2Z		
1	LED display elements for device status	
2	Display elements for power supply module status	
3	Out-of-band management port	
4	SFP slot for 1/2.5 Gbit/s F/O connections	
5	RJ45 socket for 10/100/1000 Mbit/s Twisted Pair connections	
6	Cover panel for media module slot	1
7	Cover panel for media module slot	2
8	Oblong hole	
9	Screw	
10	V.24 interface	
11	USB interface	
12	Slot for the SD card	
13	Brackets with fastening screws (pre-mounted)	

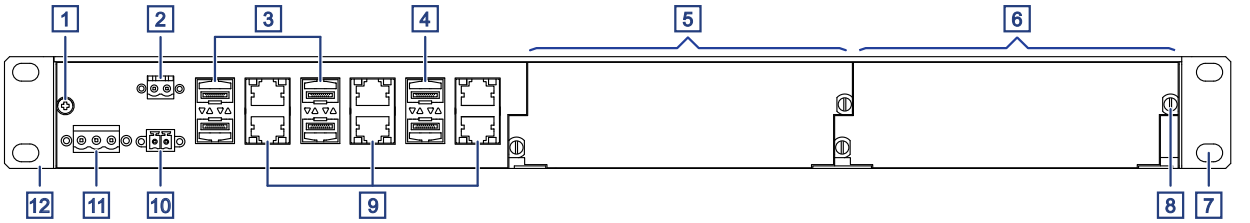


Rear view - characteristic value 6T6F and **AT2Z**	
1	Cover panel for power supply module slot 1
2	Cover panel for power supply module slot 2
3	2-pin terminal block for the supply voltage, characteristic value L
4	Connection for the signal contact
5	3-pin terminal block for the supply voltage, characteristic value H
6	Grounding screw

1.3.2 GRS1142

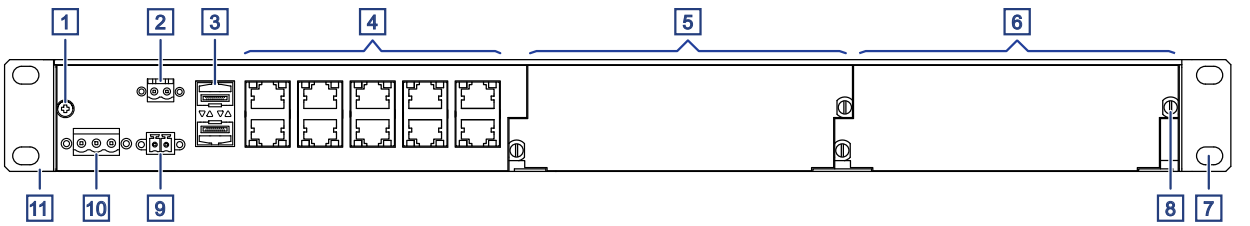


Front view - characteristic value 6T6F and **AT2Z**	
1	Cover panel for power supply module slot 1
2	Cover panel for power supply module slot 2
3	LED display elements for device status
4	LED display elements for port status
5	Display elements for power supply module status
6	V.24 interface
7	Out-of-band management port
8	Slot for the SD card
9	USB interface



Rear view - characteristic value 6T6Z

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	Cover panel for media module slot 1
6	Cover panel for media module slot 2
7	Oblong hole
8	Screw
9	RJ45 socket for 10/100/1000 Mbit/s Twisted Pair connections
10	Connection for the signal contact
11	3-pin terminal block for the supply voltage, characteristic value H
12	Brackets with fastening screws (pre-mounted)



Rear view - characteristic value AT2Z

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	RJ45 socket for 10/100/1000 Mbit/s Twisted Pair connections
5	Cover panel for media module slot 1
6	Cover panel for media module slot 2
7	Oblong hole
8	Screw
9	Connection for the signal contact
10	3-pin terminal block for the supply voltage, characteristic value H
11	Brackets with fastening screws (pre-mounted)

1.3.3 Power supply modules

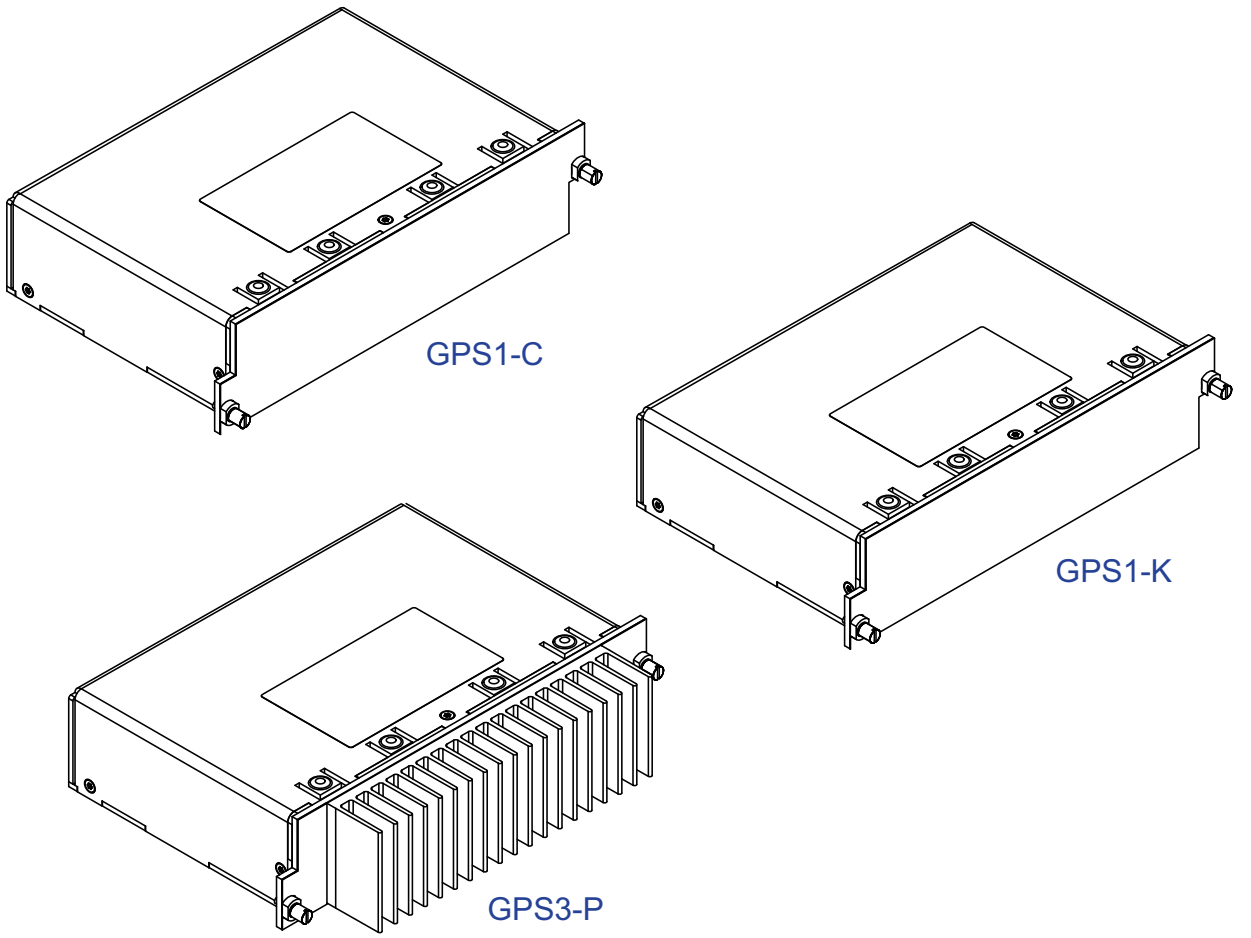
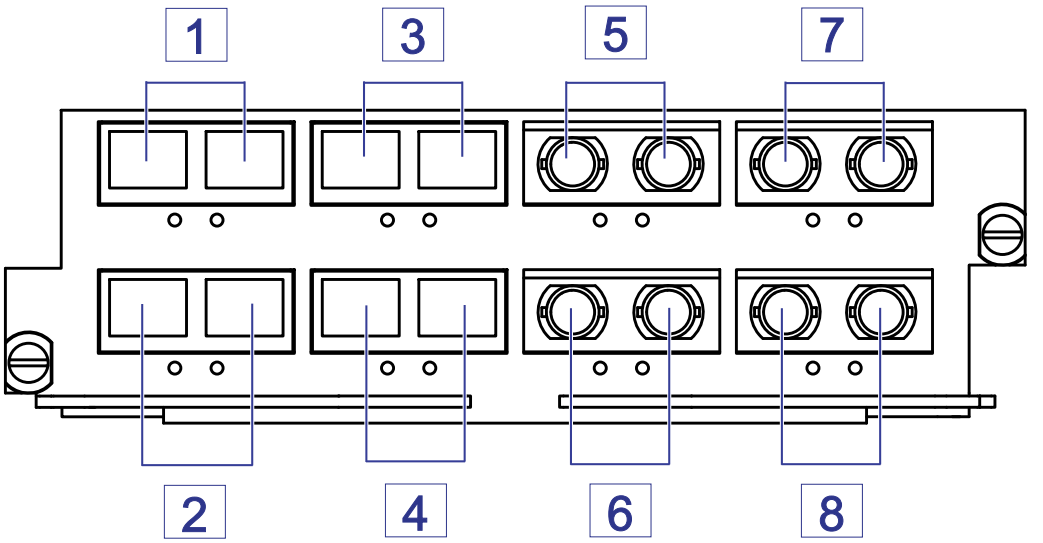


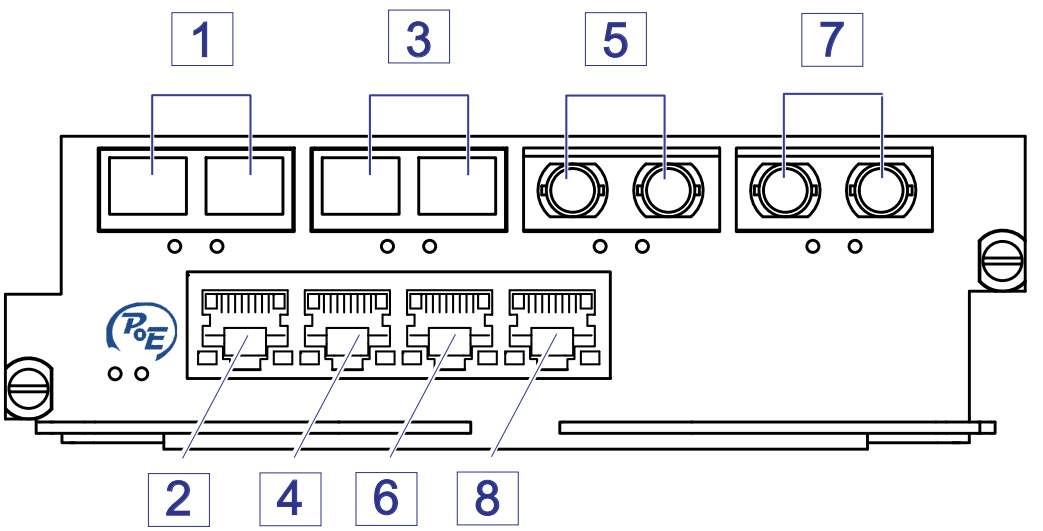
Figure 4: Power supply modules: Power supply module variants

1.3.4 Media modules

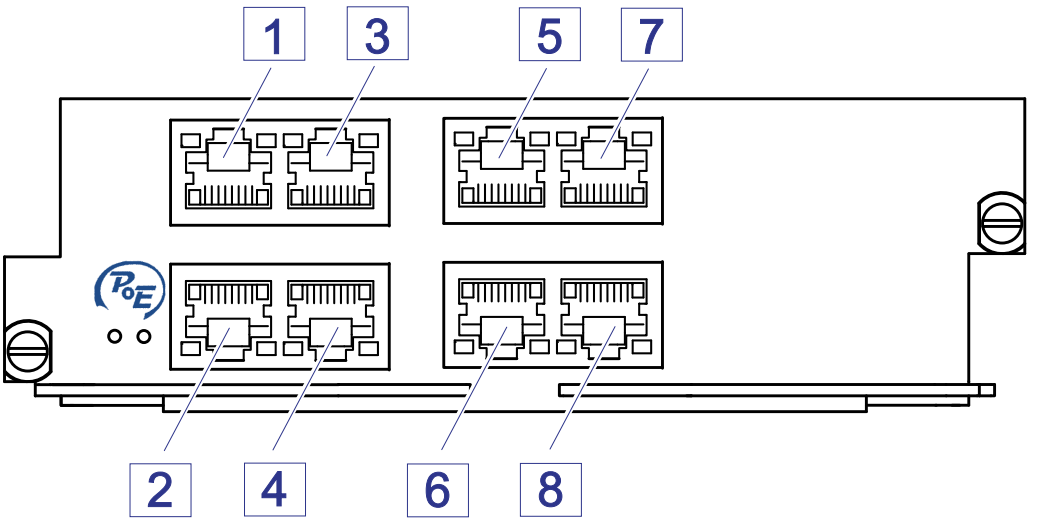
The specified media module configurations are examples. Other configurations are possible. See “Media modules” on page 28.



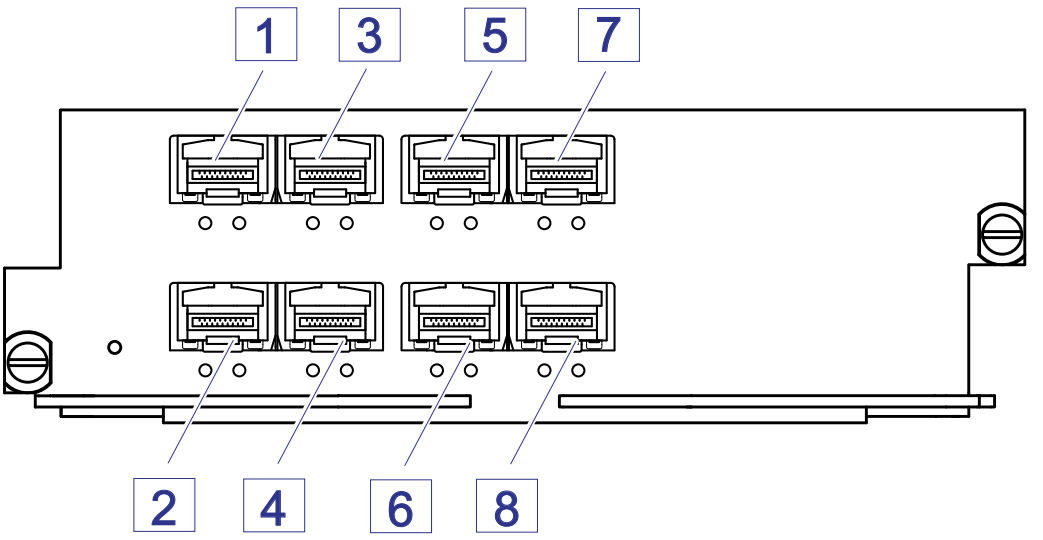
GMM20-VVUUMMNN	
Port	Port description
1, 3	2 × DSC singlemode socket
5, 7	2 × ST singlemode socket
2, 4	2 × DSC multimode socket
6, 8	2 × ST multimode socket



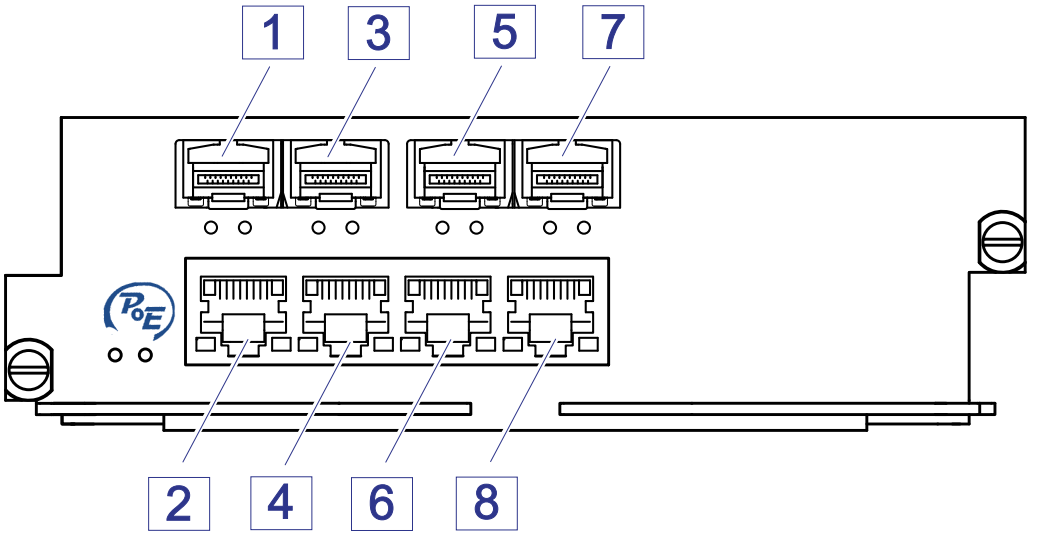
GMM30-MMNNTTTT / GMM32-MMNNTTTT	
Port	Port description
1, 3	2 × DSC multimode socket
5, 7	2 × ST multimode socket
2, 4	2 × RJ45 socket
6, 8	2 × RJ45 socket



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

1.3.5 Port assignments

Basic device

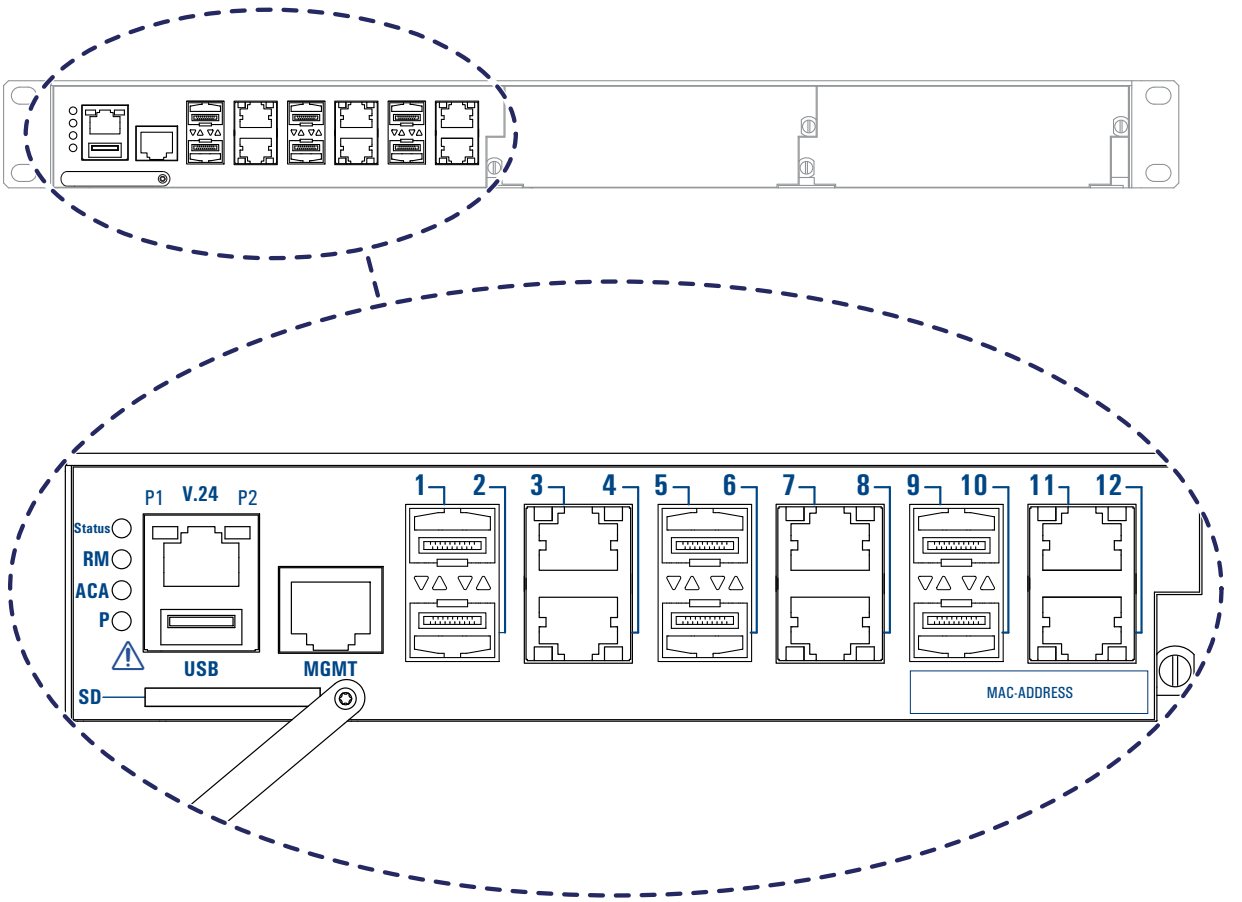


Figure 5: Port assignments: Basic device port assignments

Note: The port assignment pictured is exemplary. The sequence of the port numbering is identical for every device variant.

Media modules

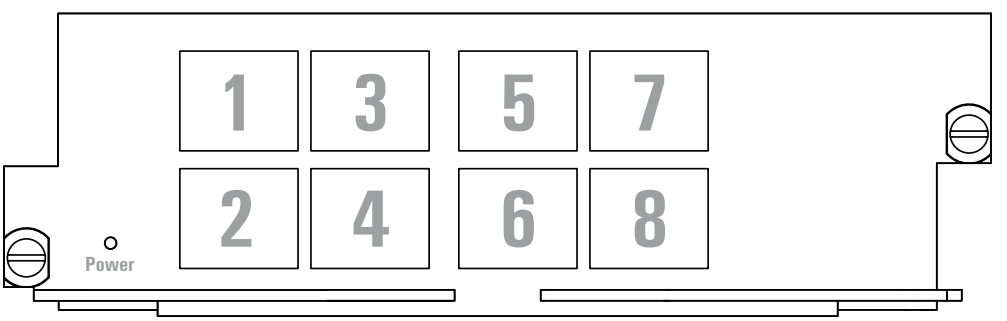


Figure 6: Port assignments: Media module port assignments

Note: The port assignment pictured is exemplary. The sequence of the port numbering is identical for every device variant.

1.4 Power supply

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

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

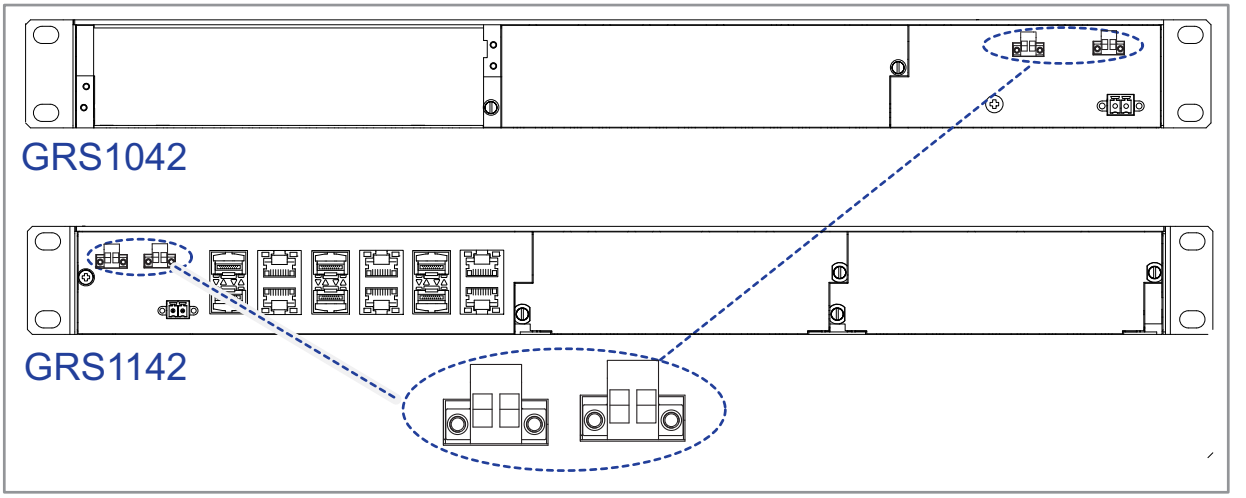


Figure 7: Power supply: Supply voltage characteristic value LL

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

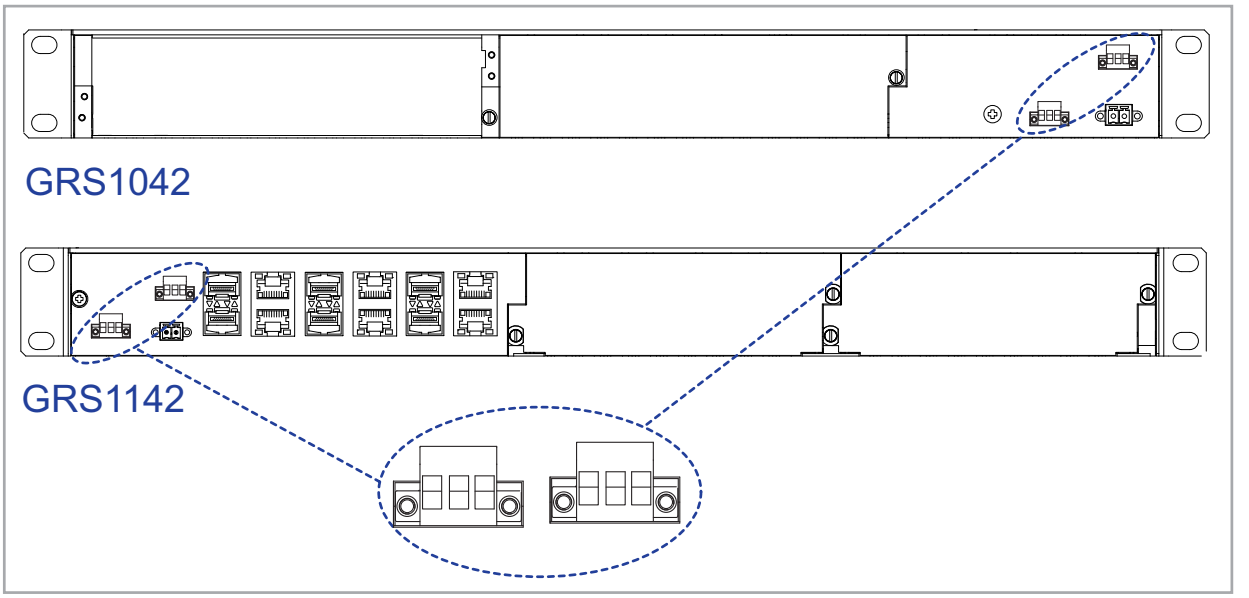


Figure 8: Power supply: Supply voltage characteristic value HH

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

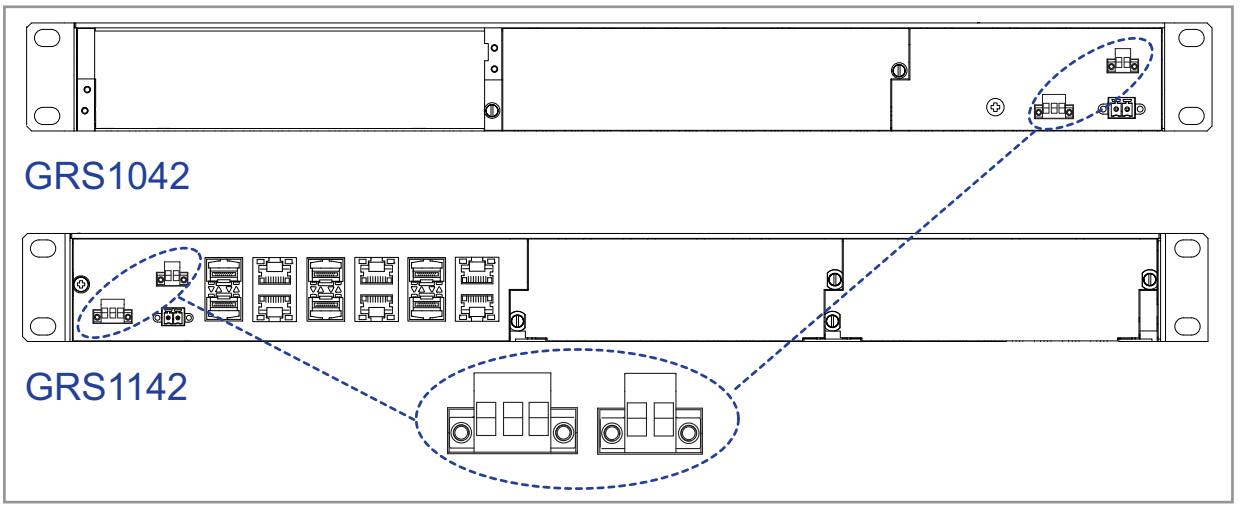


Figure 9: Power supply: Supply voltage characteristic value HL

You will find information on connecting the supply voltage here:
“Connecting the terminal blocks” on page 62.

1.5 Signal contact

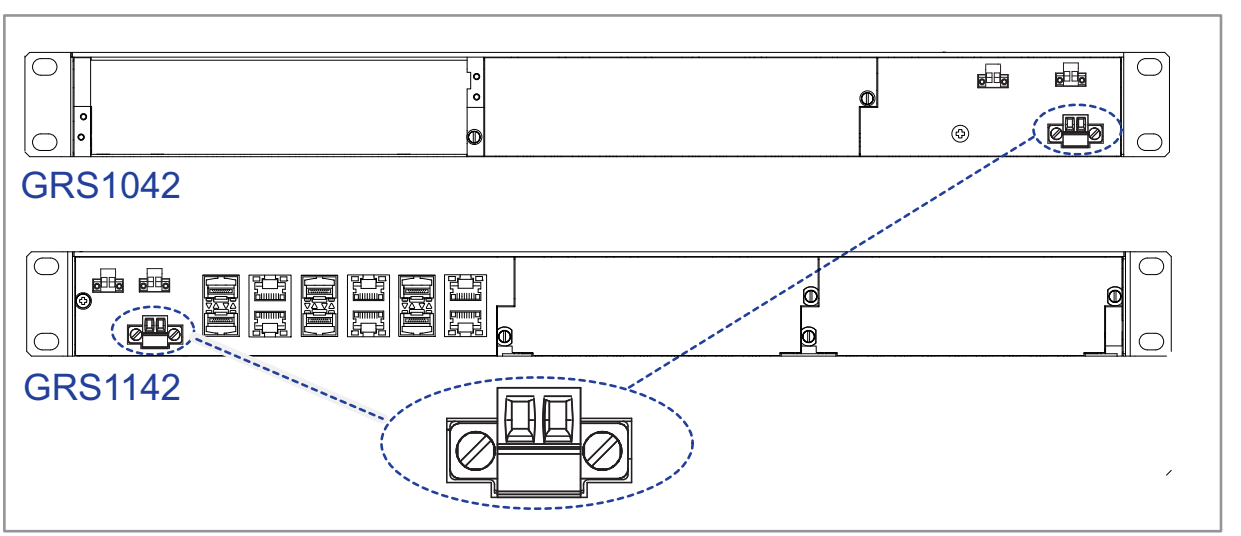


Figure 10: Signal contact: 2-pin terminal block with screw locking

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

This port is an SFP slot.
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 allows you 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

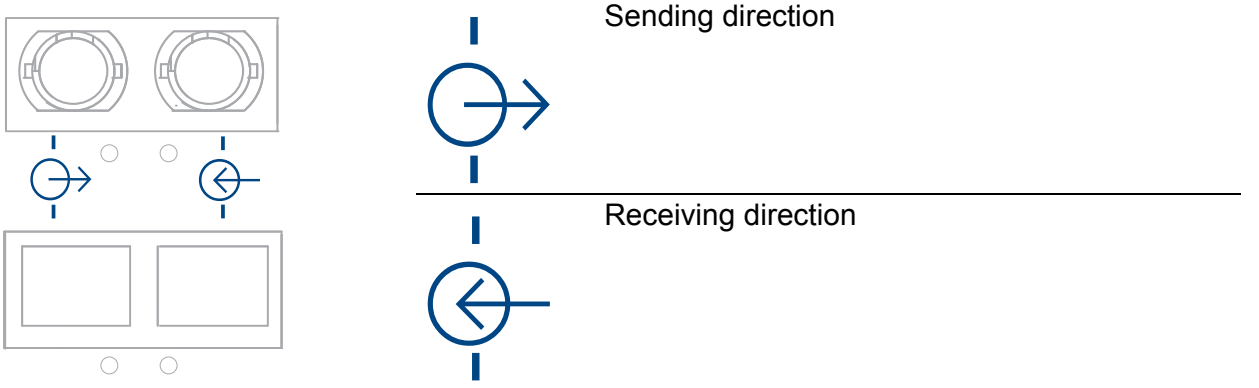
Delivery state:
- 100 Mbit/s full duplex when using a Fast Ethernet SFP transceiver
- 1000 Mbit/s full duplex when using a Gigabit Ethernet SFP transceiver

1.6.3 100 Mbit/s F/O port

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

Delivery state:
- Full duplex

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



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 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
You will find information on the pin assignment in a separate overview.
See “Pin assignments” on page 43.

1.6.5 Support of PoE(+)

Prerequisites for the support of PoE/PoE+:

- Minimum 1 power supply module GPS3-P is installed in the basic device.
- Minimum 1 media module with Poe/PoE+ functionality (GMM32 or GMM42) is installed in the basic device.

Note: PoE/PoE+ is exclusively available with PoE-capable media modules. The GREYHOUND basic device has no PoE-capable ports.

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).
For more details see chapter “General technical data” on page 76.

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

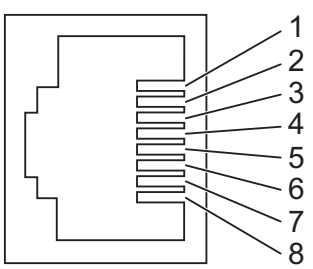
The port allows you to manage the device and upload configurations via the following protocols:

- SNMP
- SSH
- Telnet
- FTP
- SCP
- HTTP/HTTPS

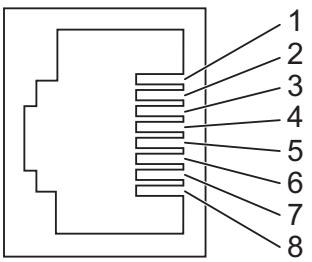
For more information see the **Command Line Interface reference manual**. You can download the manual on the Internet at https://www.doc.hirschmann.com.

1.7 Pin assignments

Basic device

RJ45	Pin	10/100 Mbit/s	1000 Mbit/s
	**MDI-X mode**		
	1	RX+	BI_DB+
	2	RX−	BI_DB−
	3	TX+	BI_DA+
	4	—	BI_DD+
	5	—	BI_DD−
	6	TX−	BI_DA−
	7	—	BI_DC+
	8	—	BI_DC−

Media modules

RJ45	Pin	10/100 Mbit/s	1000 Mbit/s	PoE[a]
	**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−	—

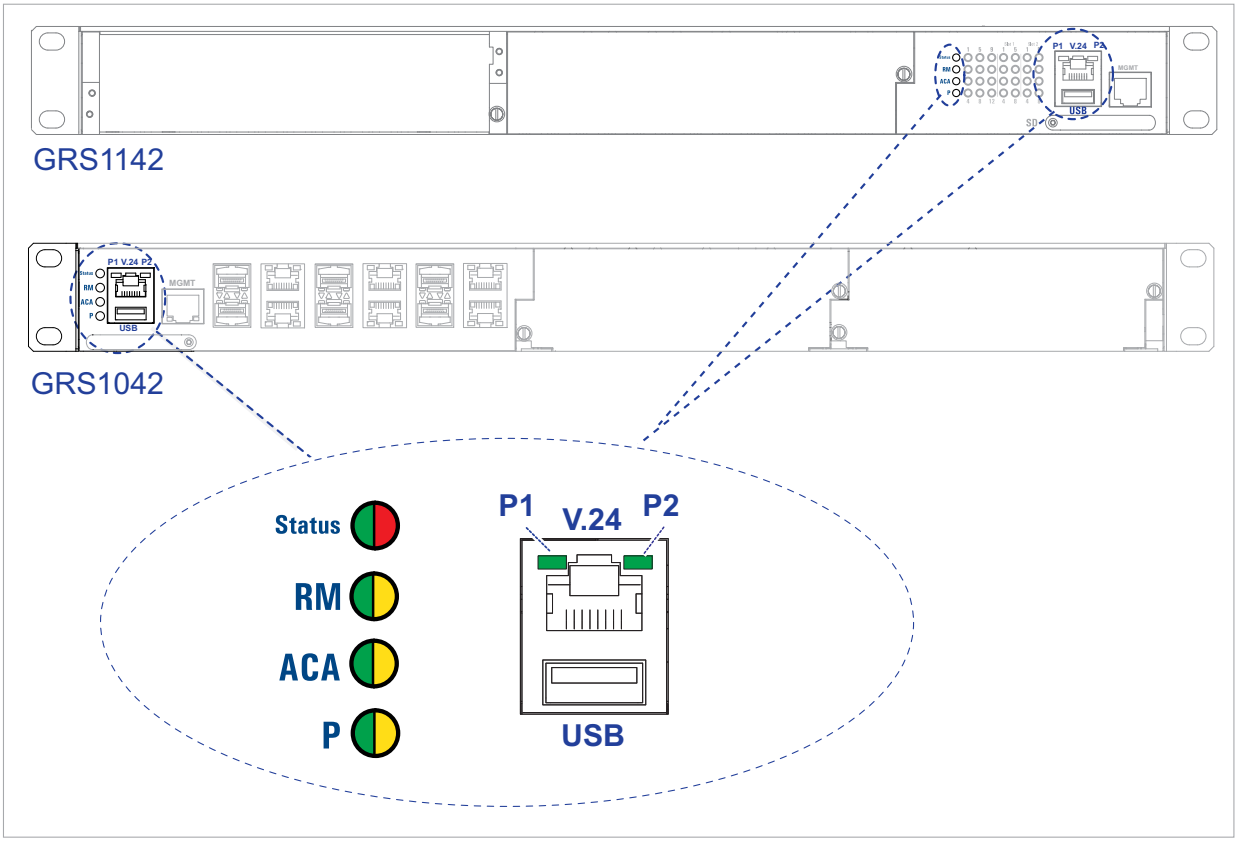
a. Exclusively on PoE-capable media modules.

1.8 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.

1.8.1 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 × a period	The boot parameters used when the device has been started differ from the boot parameters saved. Start the device again.
			flashes 4 × a period	Device has detected a multiple IP address
RM	Redundancy Manager	—	none	No redundancy configured
		green	lights up	Redundancy exists
			flashes 1 × 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 × 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 × 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
P1	Supply voltage	—	none	At least one of the following cases applies: ▶ Power supply module 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 module 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 module 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 module is connected to slot P2. ▶ Boot procedure started ▶ Valid supply voltage connected.

1.8.2 Port status

These LEDs provide port-related information.

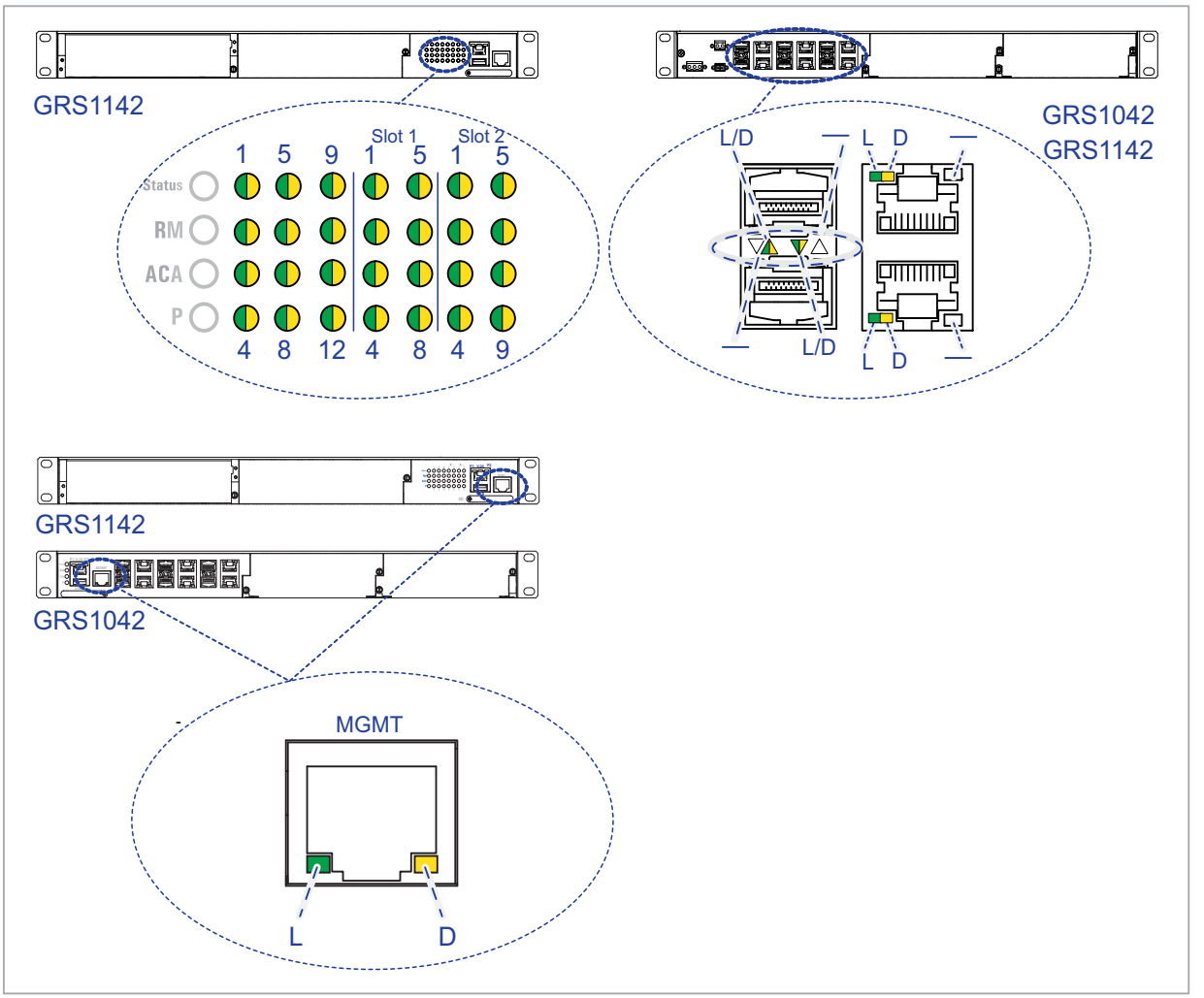
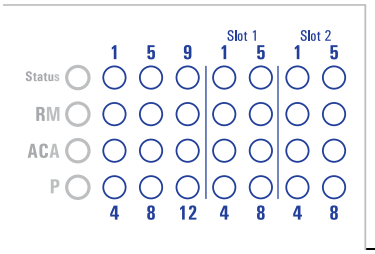
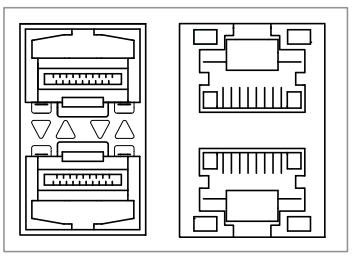


Figure 11: Port status: Location of the display elements on the basic device

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 × a period	Port is switched to stand-by
			flashes 3 × 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 × a period	Device detects at least one unauthorized MAC address (Port Security Violation) and sends a trap.
			flashes 3 × a period	The device deactivates the relevant port (auto-deactivation).

Switching LEDs

LED display		Position on the device
	Service panel	Only device variants GRS1142
	Port panel	GRS1042 GRS1142

With device variants GRS1142 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`	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`	Change to the privileged EXEC mode.
`configure`	Change to the configuration mode.
`system port-led-mode servicepanel`	Change LED display from port panel to service panel.

1.8.3 Media module status

GMM20/GMM30/GMM40

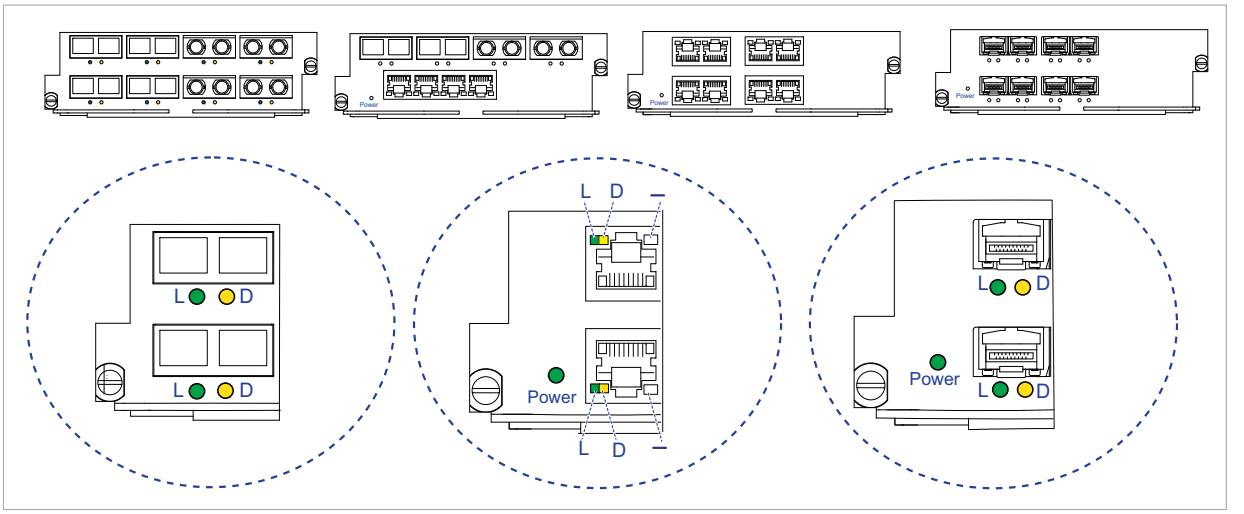


Figure 12: Media module status: Location of the display elements on the module

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 × a period	Port is switched to stand-by
			flashes 3 × 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 × a period	Device detects at least one unauthorized MAC address (Port Security Violation)

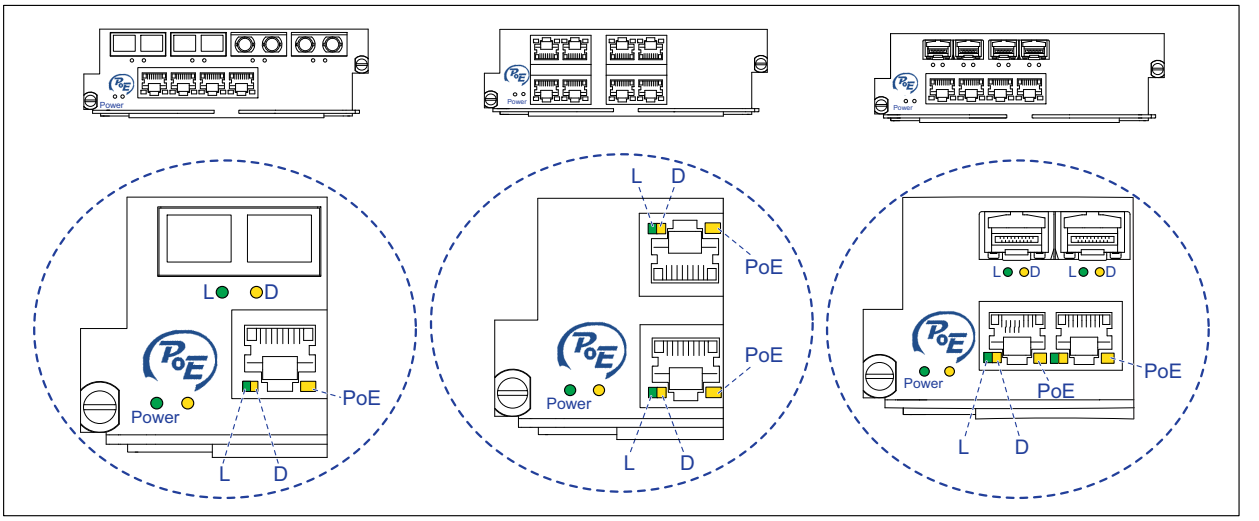


Figure 13: Media module status: Location of the display elements on the PoE module

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 × a period	Port is switched to stand-by
			flashes 3 × 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 × a period	Device detects at least one unauthorized MAC address (Port Security Violation)
PoE	PoE status	green	lights up	Powered device is supplied with PoE voltage.
		yellow	flashes 1 × a period	Output budget has been exceeded Device has detected a connected powered device
			flashes 3 × a period	PoE administrator status deactivated

1.9 Management interfaces

1.9.1 V.24 interface (external management)

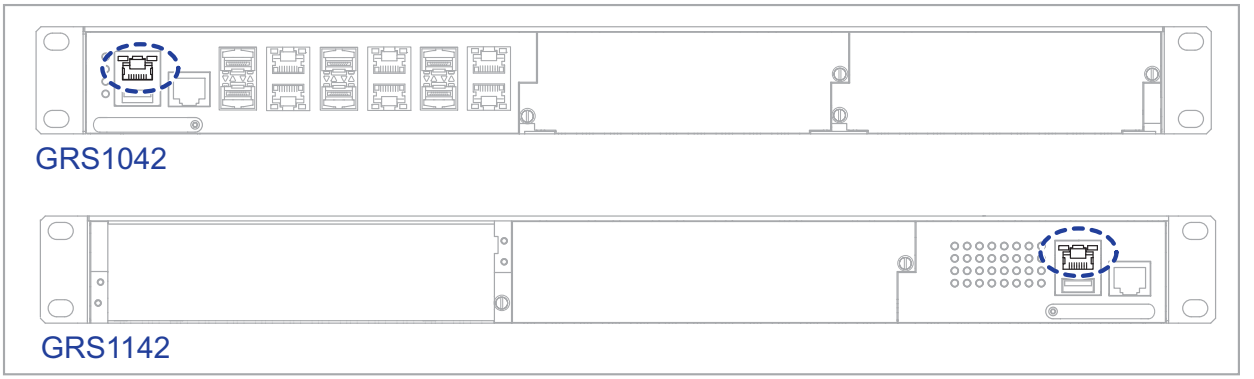


Figure 14: V.24 interface: Location on the device

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.

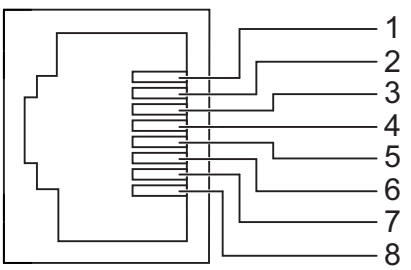
Figure	**Pin assignment**	**Function**
	1	—
	2	—
	3	TxD
	4	GND
	5	—
	6	RxD
	7	—
	8	—

Table 5: V.24 interface: Pin assignment of the V24 interface

1.9.2 USB interface

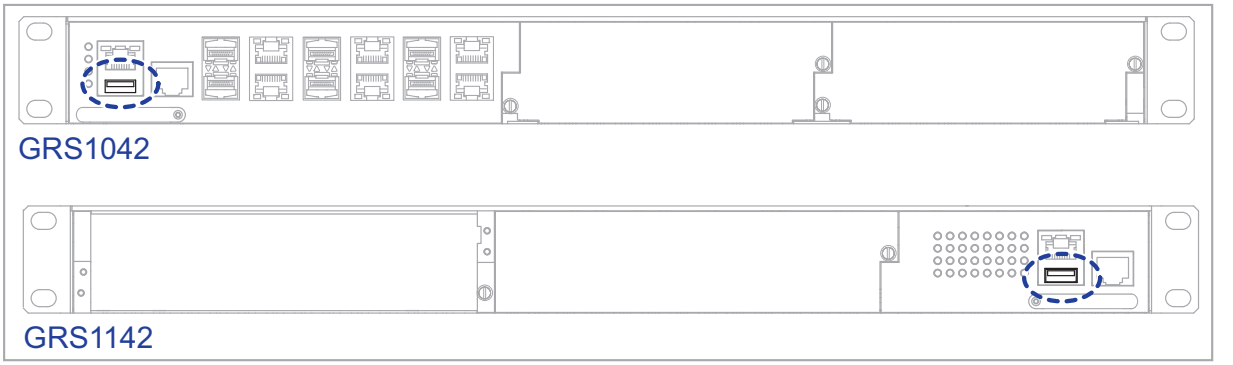


Figure 15: USB interface: Location on the device

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.
See “Accessories” on page 93.

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

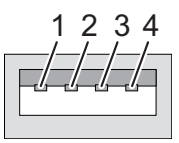
Figure	Pin	Function
	1	VCC (VBus)
	2	- Data
	3	+ Data
	4	Ground (GND)

Table 6: USB interface: Pin assignment of the USB interface

1.9.3 SD card interface

Prerequisite:
Only use Hirschmann SD cards.
See “Accessories” on page 93.

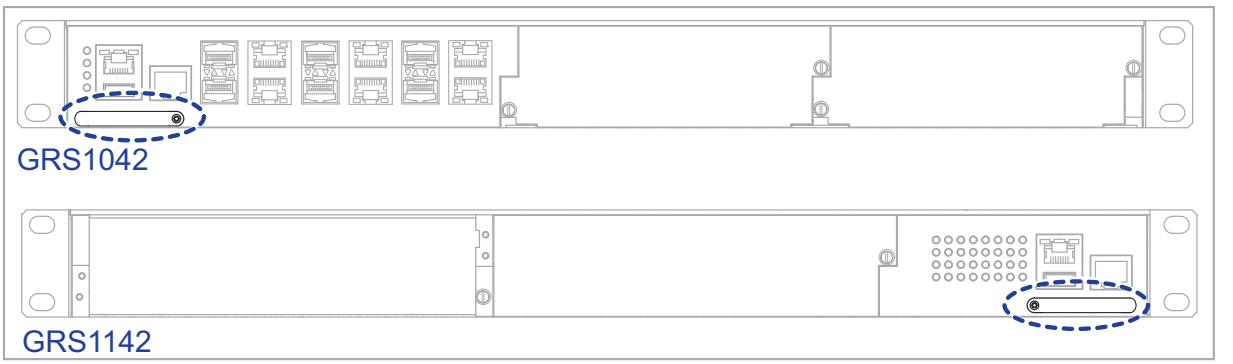


Figure 16: SD card interface: Location on the device

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)
- Installing a power supply module
- Installing a media module (optional)
- Installing a cover panel (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 93.
☐ 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 93.

Perform the following work steps:
☐ Deactivate the write protection on the SD card by pushing the write-protect lock away from the middle of the card.
☐ Push the SD card into the slot with the beveled corner on the right side.

2.3 Installing a power supply module

Hirschmann supplies the power supply modules in a ready-to-operate state. The power supply modules are hot-swappable.

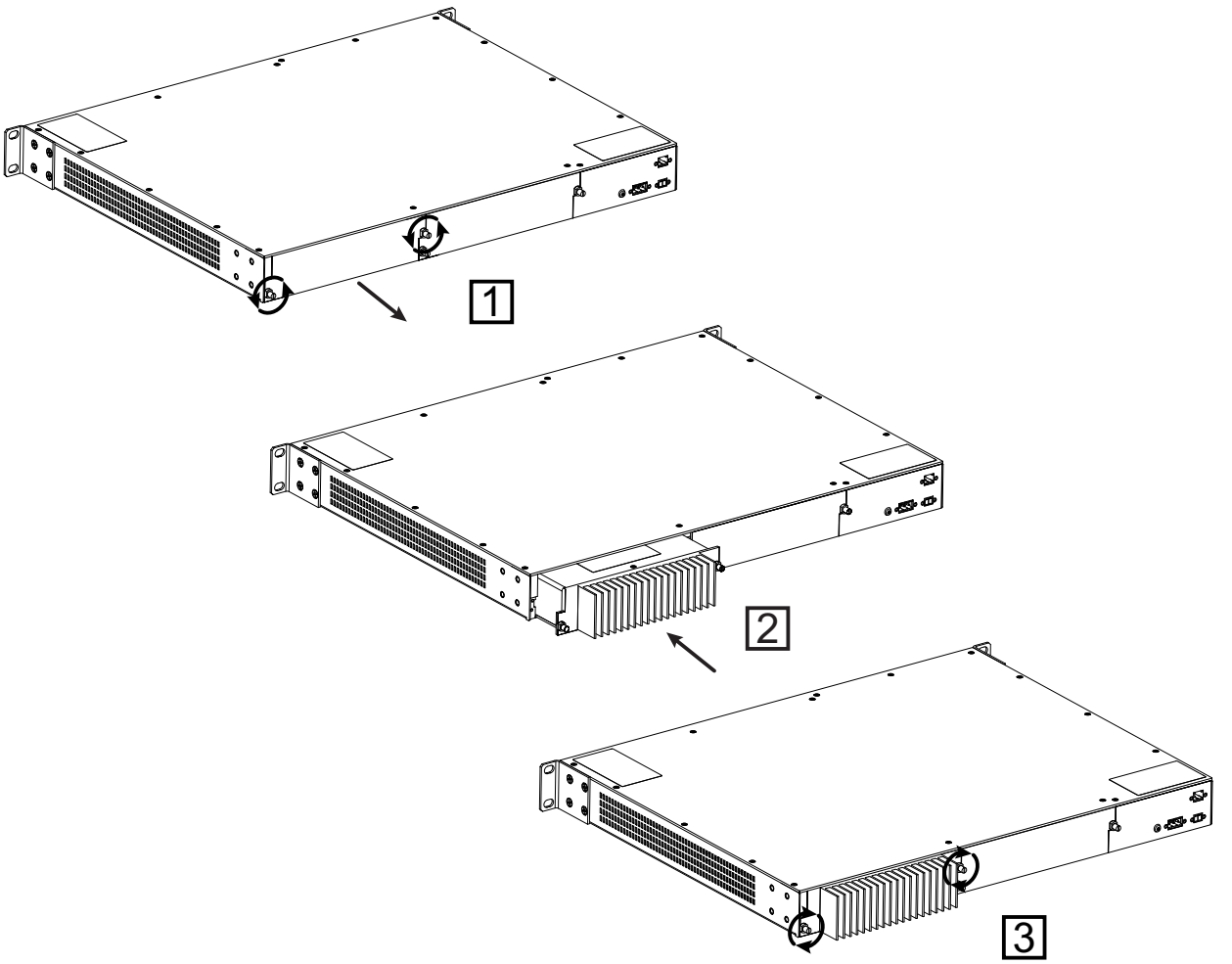


Figure 17: Installing a power supply module: Installation sequence

Perform the following work steps:

☐ Remove the cover panel (if mounted) from the power supply module slot on the device (1).

☐ Insert the power supply module straight into the slot (2).

☐ Fasten the power supply module to the device by tightening the 2 screws (3).
You find the prescribed tightening torque in chapter:
“General technical data” on page 76

2.4 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 and/ or Gigabit Ethernet ports. You have the option of mounting the media modules while the device is operating.

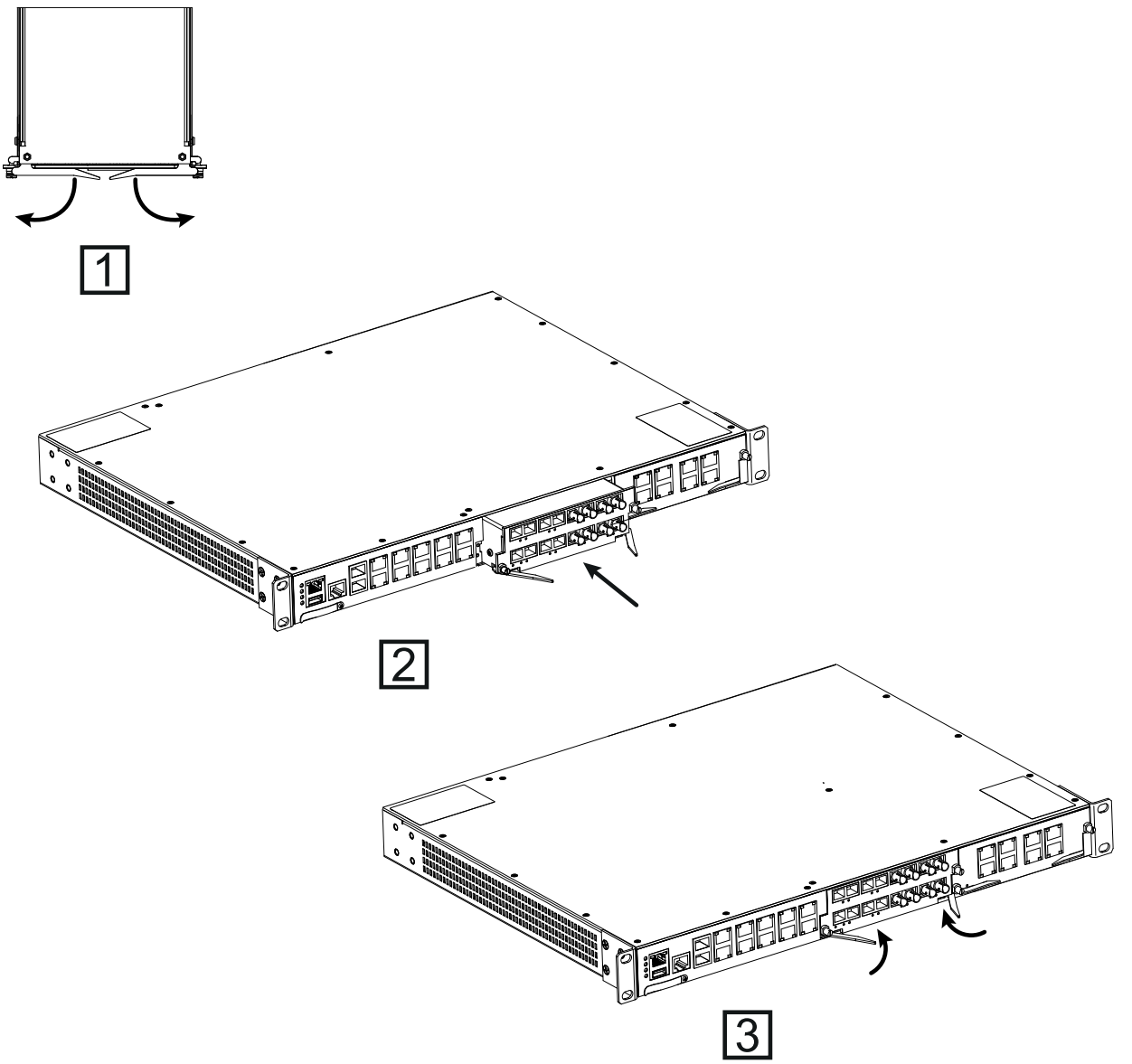


Figure 18: Installing a media module (optional): Installation sequence

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 76

2.5 Installing a cover panel (optional)

Prerequisite:
To comply with the EMC requirements, seal unused open slots with a cover panel; you obtain cover panels as an accessory.
See “Order number” on page 93.

Perform the following work steps:
☐ Place the matching cover panel over the power supply module slot or media module slot of the device.
☐ Fasten the cover panel to the device by tightening the 2 screws.
You find the prescribed tightening torque in chapter:
“General technical data” on page 76

2.6 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

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: When operating the device in an environment with continuous vibration loads, it is necessary to additionally fasten the device to the switch cabinet using 2 mounting brackets on the front or rear side of the device.
You obtain the additional brackets as accessories.
See “Accessories” on page 93.

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 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.

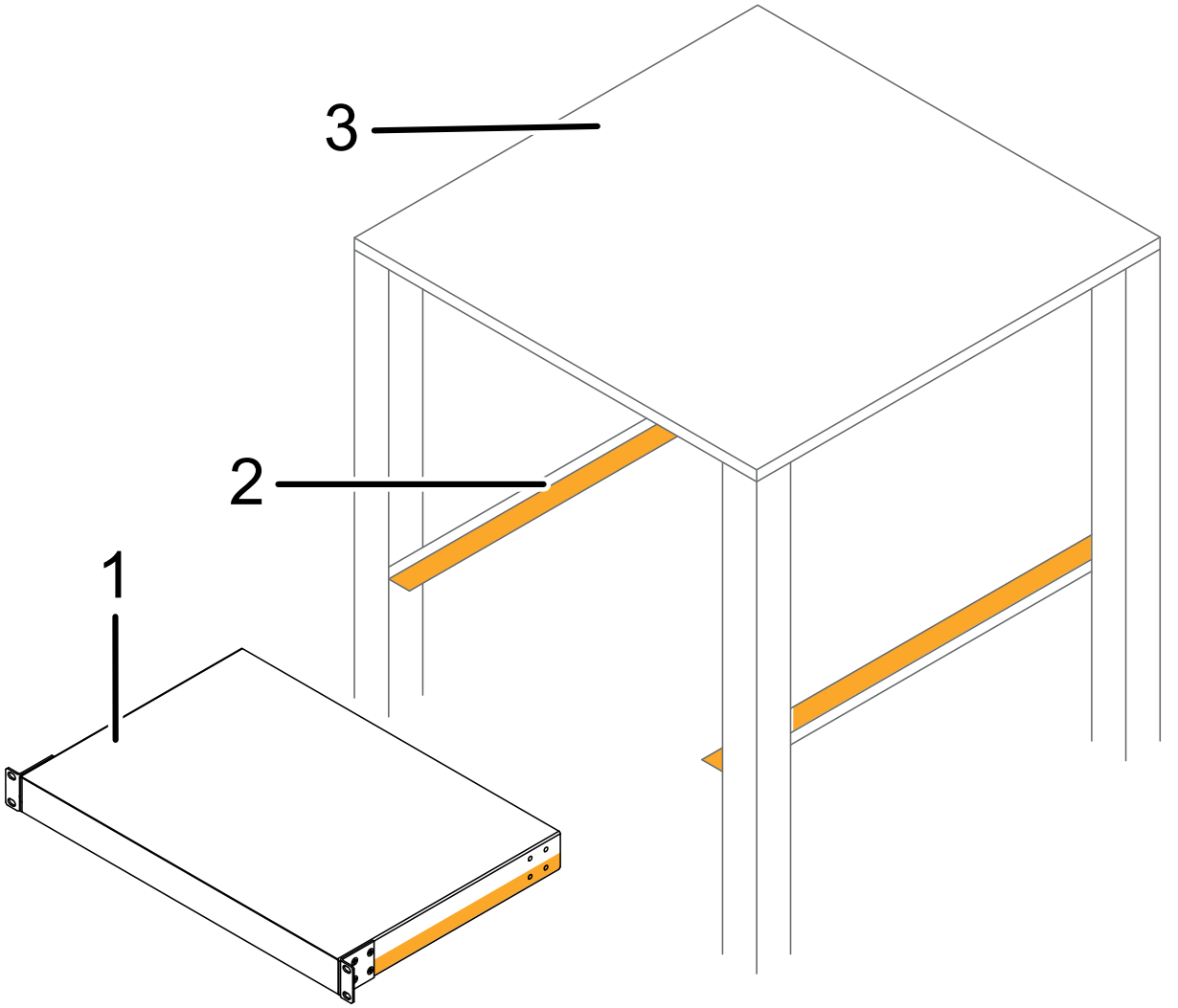


Figure 19: Assembly in a switch cabinet with sliding/mounting rails

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.

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.

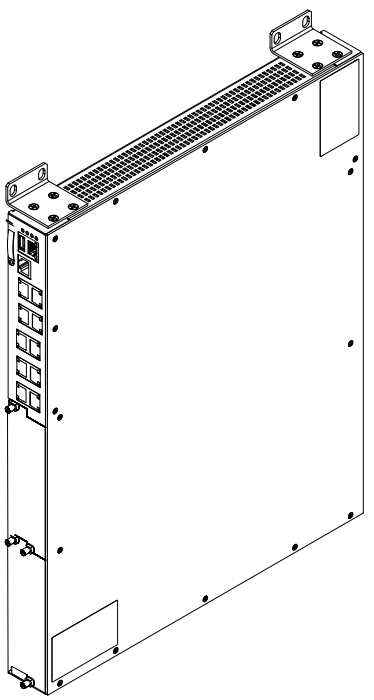


Figure 20: Mounting on a vertical flat surface

Perform the following work steps:

☐ 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 93.

☐ Fasten the device by screwing the brackets to the wall.

Grounding the device

The device variants have a connection for protective grounding.
Perform the following work steps:

☐ Ground the device via the ground screw.
You find the prescribed tightening torque in chapter:
“General technical data” on page 76

Note: Applies to device variants featuring supply voltage characteristic value P:
With redundant power supply with 2 power supply modules GPS3-P (supply voltage characteristic value P): The use of power sources with a grounded positive power supply conductor is prohibited.

Note: 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.

2.7 Connecting the terminal blocks

2.7.1 Supply voltage

⚠ WARNING

ELECTRIC SHOCK

Start connecting electrical wires only if all safety requirements listed in chapter “General safety instructions” are fulfilled.

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.

⚠ 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.

You have the option of supplying the supply voltage redundantly. With redundant supply via GPS3-P power supply modules (supply voltage characteristic value P) there is no load distribution.
With redundant power supply, the better supplied power supply module takes over the power supply of the device. In case of a failure of the supplying power supply module, the power supply is provided by the remaining power supply module.
In case of a redundant power supply with PoE-capable power supply modules, positive grounding is prohibited.

The supply voltage is electrically isolated from the casing.

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

Note: The supply voltage for the power supply modules 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 terminal 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 in the terminal block by tightening the terminal screws.

Supply voltage with characteristic value LL

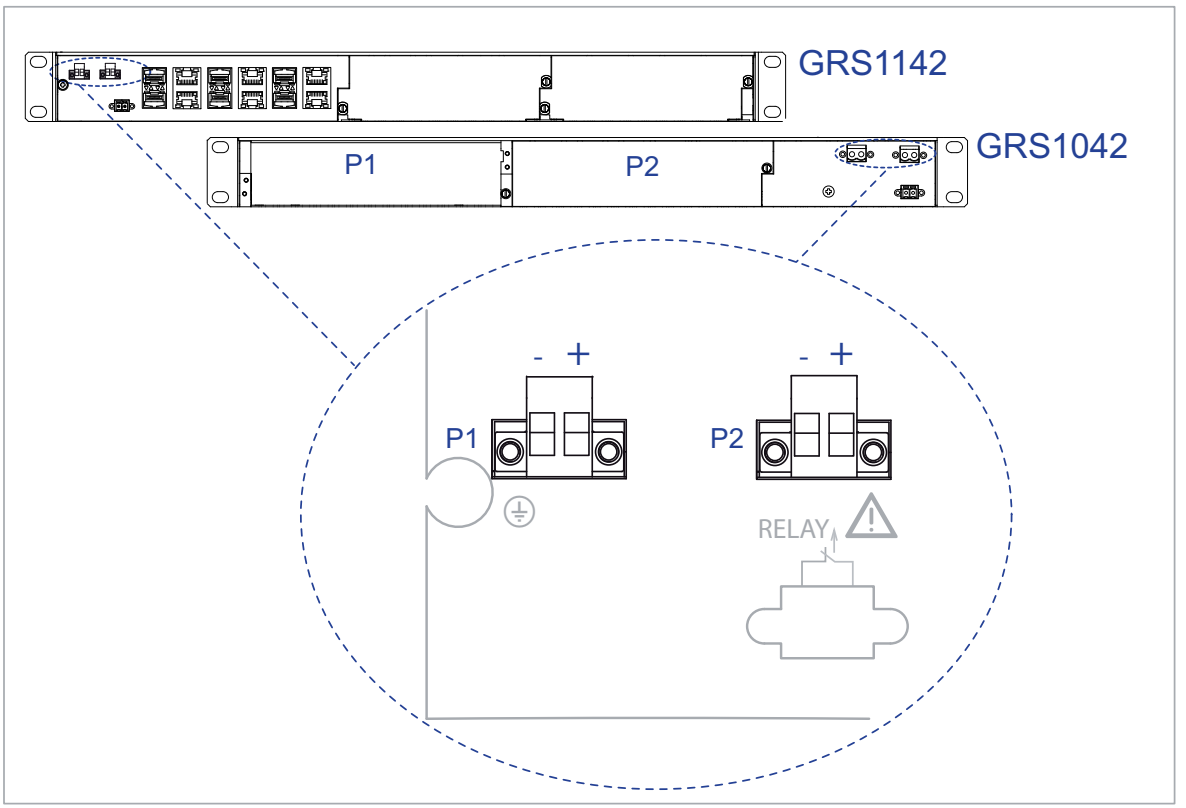


Figure 21: Supply voltage characteristic value LL: Location of the supply voltage connections

Type of the voltages that can be connected	Specification of the supply voltage	Pin assignment	
DC voltage	P1, P2 Rated voltage range ▶ 24 V DC ... 48 V DC ▶ 48 V DC ... 54 V DC	+ –	Plus terminal of the supply voltage Minus terminal of the supply voltage

Table 7: Supply voltage with characteristic value LL: type and specification of the supply voltage, connections

Supply voltage with characteristic value HH

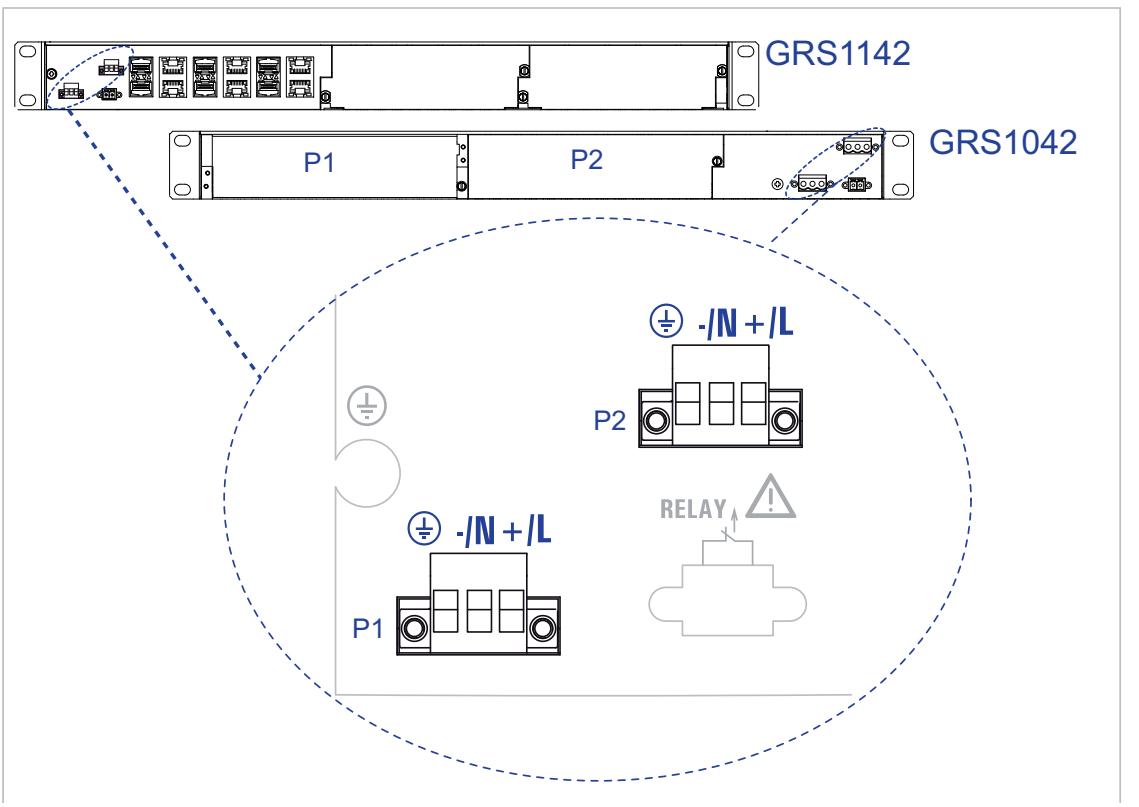


Figure 22: Supply voltage characteristic value HH: Location of the supply voltage connections

Type of the voltages that can be connected	Specification of the supply voltage	Pin assignment	
DC voltage P1, P2	Rated voltage range 60 V DC ... 250 V DC	+/L -/N ⏚	Plus terminal of the supply voltage Minus terminal of the supply voltage Protective conductor
AC voltage P1, P2	Rated voltage range 110 V AC ... 240 V AC, 50 Hz ... 60 Hz	+/L -/N ⏚	Outer conductor Neutral conductor Protective conductor

Table 8: Supply voltage with characteristic value HH: type and specification of the supply voltage, connections

Supply voltage with characteristic value HL

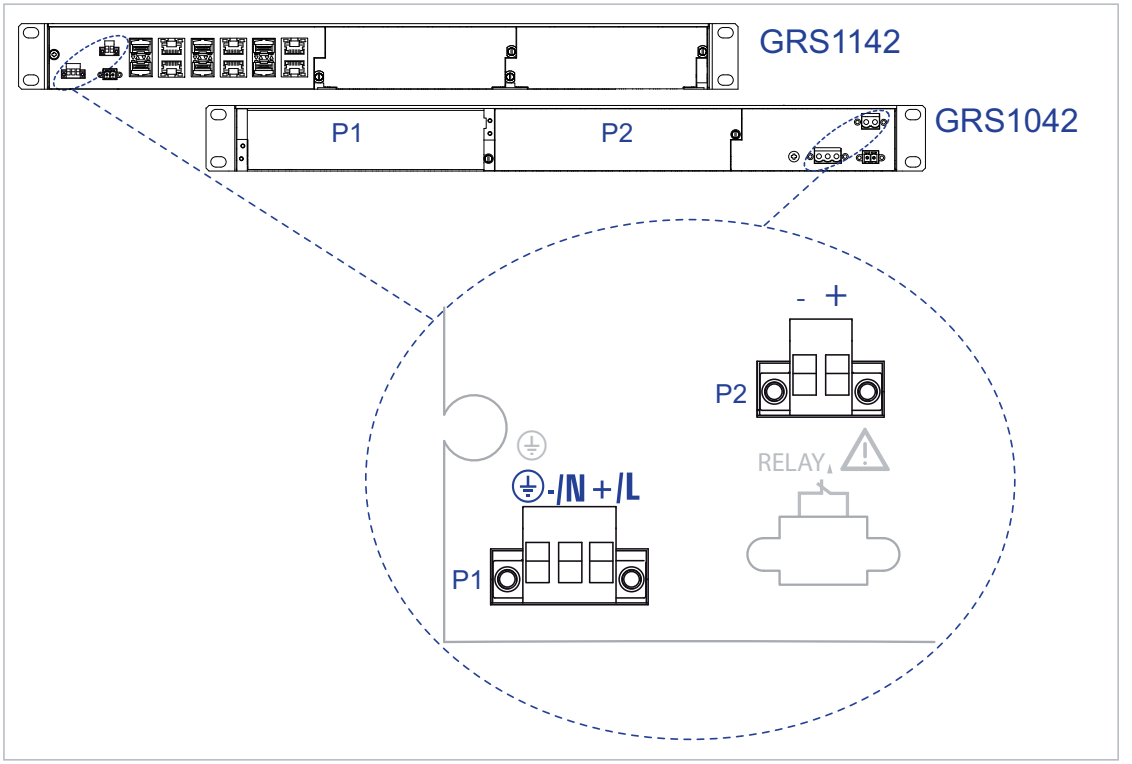


Figure 23: Supply voltage characteristic value HL: Location of the supply voltage connections

Type of the voltages that can be connected		Specification of the supply voltage	Pin assignment	
DC voltage	P1	Rated voltage range 60 V DC ... 250 V DC	+/L -/N ⏚	Plus terminal of the supply voltage Minus terminal of the supply voltage Protective conductor
AC voltage	P1	Rated voltage range 110 V AC ... 240 V AC, 50 Hz ... 60 Hz	+/L -/N ⏚	Outer conductor Neutral conductor Protective conductor
DC voltage	P2	Rated voltage range ▶ 24 V DC ... 48 V DC ▶ 48 V DC ... 54 V DC	+ –	Plus terminal of the supply voltage Minus terminal of the supply voltage

Table 9: Supply voltage characteristic value LL: type and specification of the supply voltage, pin assignment

2.7.2 Signal contact

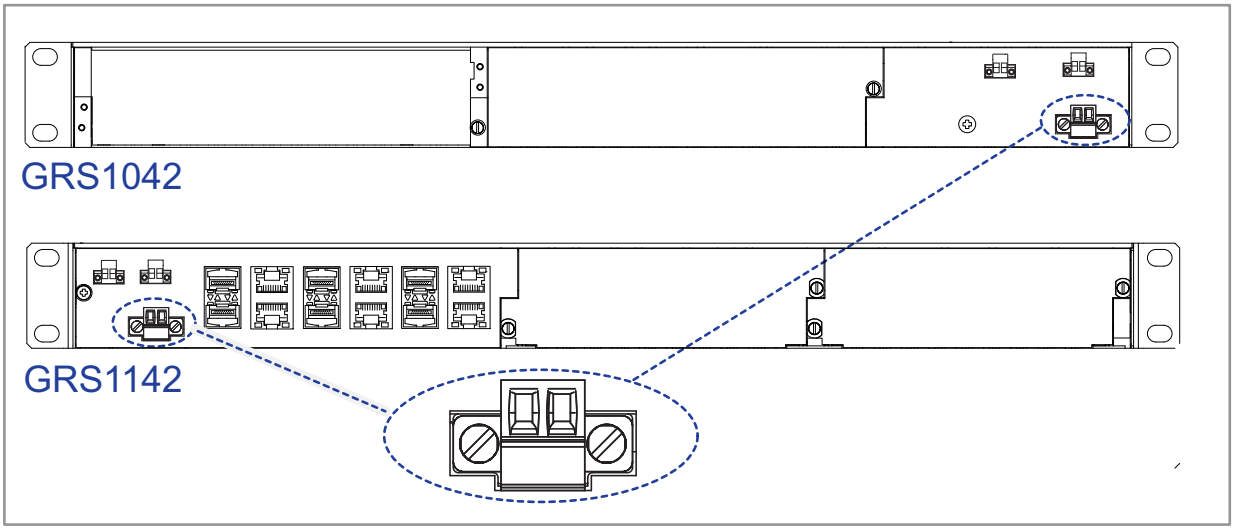


Figure 24: Signal contact: 2-pin terminal block with screw locking

☐ Connect the signal contact lines with the terminal block connections.
☐ Fasten the wires in the terminal block by tightening the terminal screws.

2.8 Installing an SFP transceiver (optional)

Prerequisites:
Exclusively use Hirschmann SFP transceivers.
See “Accessories” on page 93.

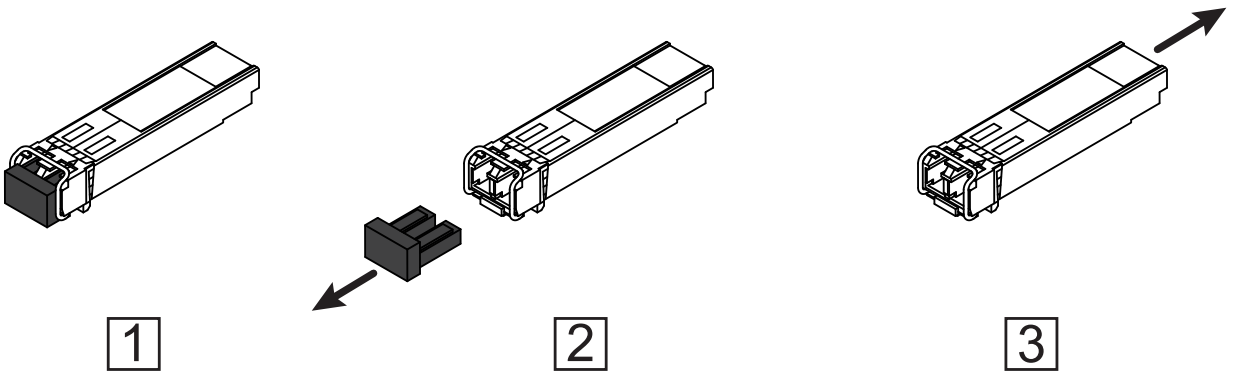


Figure 25: Installing SFP transceivers: Installation sequence

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).

2.9 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 76

☐ Enable the supply voltage.

2.10 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 41.

2.11 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 the following options for configuring the IP addresses:

- V.24 interface (Command Line Interface)
- BOOTP
- DHCP
- DHCP Option 82
- AutoConfiguration Adapter
- Input via the HiView or Industrial HiVision application. You find further information about the applications HiView or Industrial HiVision on the Internet at the Hirschmann product pages:
  HiView
  http://www.hirschmann.com/en/QR/INET-HiView
  Industrial HiVision
  http://www.hirschmann.com/en/QR/INET-Industrial-HiVision

Default settings

- IP address: The device looks for the IP address using DHCP
- 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: 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
- Out-of-band management port:
  Default IP address: 192.168.1.1 / 255.255.255.0

3.1 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 76.

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.

The temperature displayed in the CLI (Command Line Interface) and the GUI (Graphical User Interface) is the internal temperature of the device. It is higher than the ambient air temperature. The maximum internal temperature of the device named in the technical data is a guideline that indicates to you that the maximum ambient air temperature has possibly been exceeded.

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.
- ☐ 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.
- ☐ 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).
- ☐ 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 De-installing a power supply module

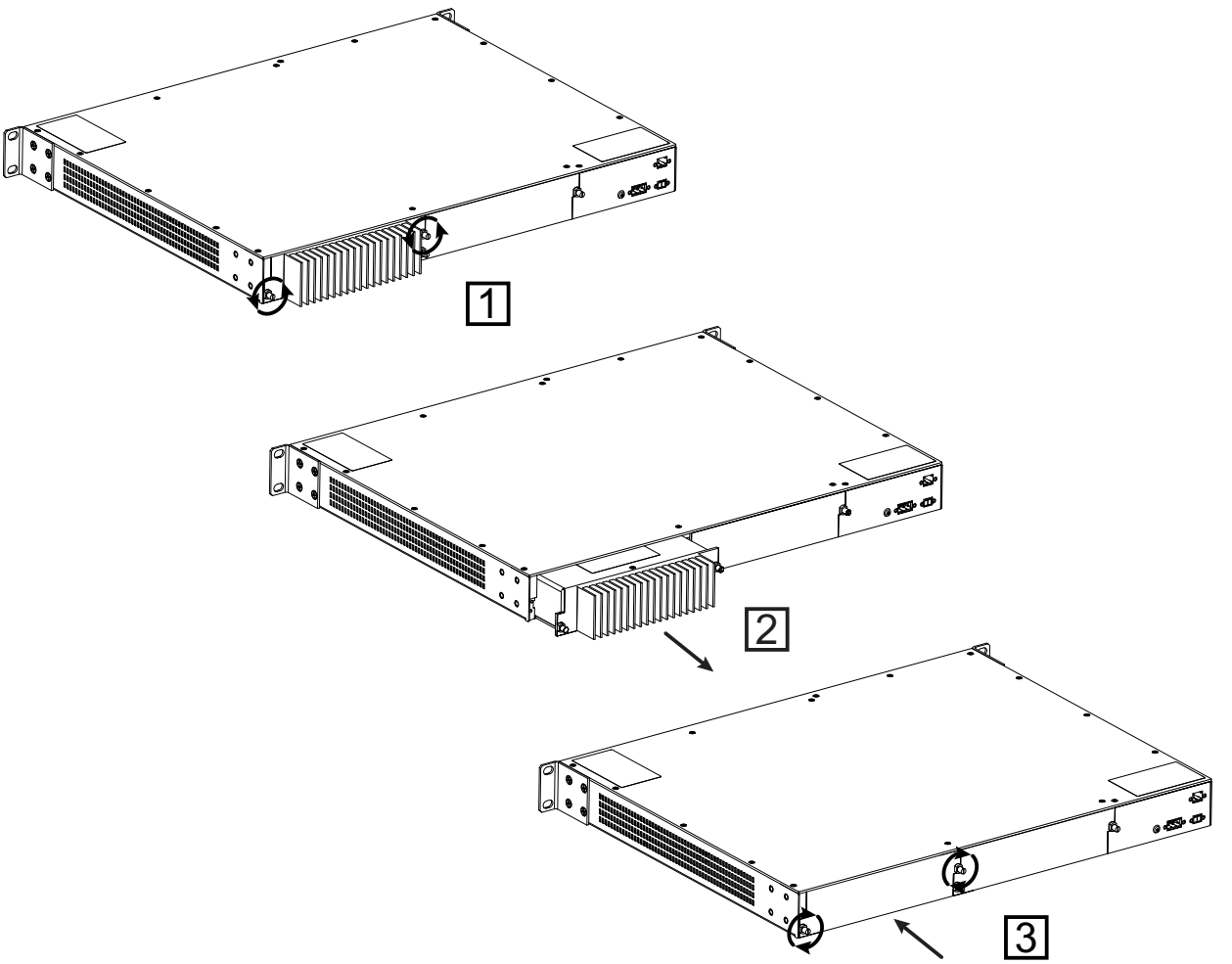


Figure 26: De-installing a power supply module: De-installation sequence

Perform the following work steps:

- ☐ Remove the screws on the front panel of the power supply module (1).
- ☐ Pull the power supply module out of the slot (2).
- ☐ Seal the power supply module slot on the basic device with a cover panel (3).
- ☐ 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 76

6.2 Removing a media module

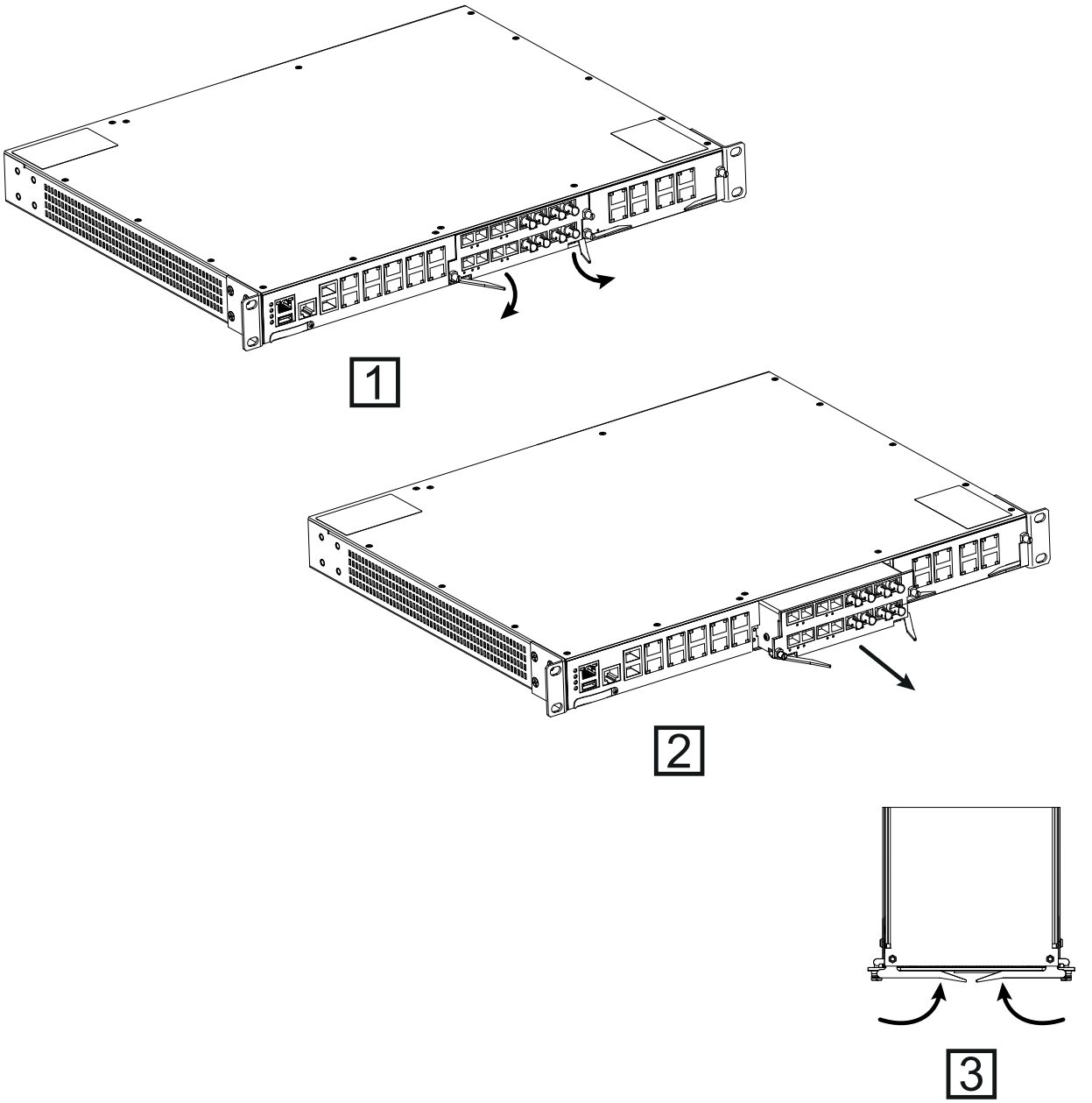


Figure 27: De-installing a media module: De-installation sequence

Perform the following work steps:

- ☐ 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 76

6.3 Removing an SFP transceiver (optional)

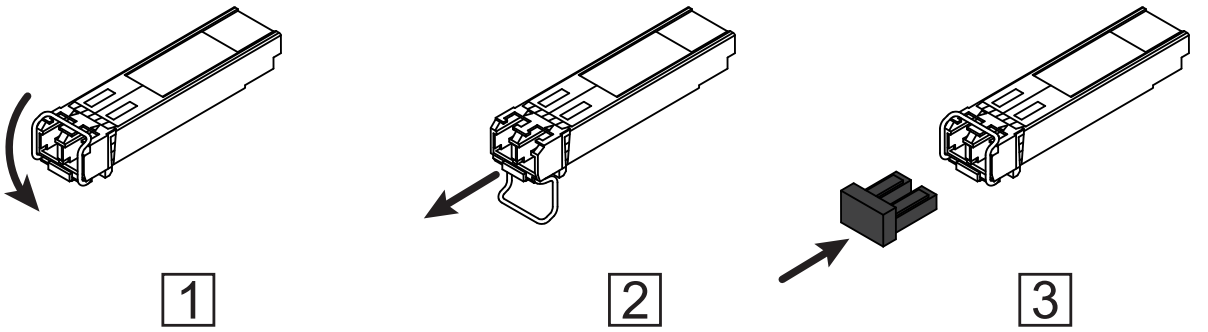


Figure 28: De-installing SFP transceivers: De-installation sequence

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).

6.4 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.

Perform the following work steps:

☐ 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	See “Dimension drawings” on page 81.		
Weight		3,6 kg (7.93 lb)	
Power supply Supply voltage with characteristic value L	Rated voltage range	24 V DC ... 48 V DC 48 V DC ... 54 V DC	
	Back-up fuse for each voltage input	Nominal rating: Characteristic:	6.3 A slow blow
	Connection type	2-pin terminal block	
		Tightening torque	0.5 Nm (4.4 lb-in)
		min. conductor diameter	1 mm² (AWG16)
		max. conductor diameter	2.5 mm² (AWG12)
Power supply Supply voltage with characteristic value H	Rated voltage range	110 V AC ... 240 V AC, 50 Hz ... 60 Hz	
		60 V DC ... 250 V DC	
	Back-up fuse for each voltage input	Nominal rating: Characteristic:	2.5 A slow blow
	Connection type	3-pin terminal block	
		Tightening torque	0.5 Nm (4.4 lb-in)
		min. conductor diameter	Supply with DC voltage: 1 mm² (AWG16)
			Supply with AC voltage: 0.75 mm² (AWG18)
		max. conductor diameter	2.5 mm² (AWG12)
Grounding the device	Tightening torque Protective grounding	0.5 Nm (4.4 lb-in)	
Signal contact	Nominal value	I_{max} = 2 A at U_{max} = 230 V AC	
		I_{max} = 2 A at U_{max} = 30 V DC I_{max} = 0.2 A at U_{max} = 125 V DC[a] I_{max} = 0.1 A at U_{max} = 250 V DC[b]	
	Connection type	2-pin terminal block	
		Tightening torque	0.34 Nm (3 lb-in)
		min. conductor diameter	Supply with DC voltage: 1 mm² (AWG16)
			Supply with AC voltage: 0.75 mm² (AWG18)
		max. conductor diameter	1.3 mm² (AWG16)

Climatic conditions during operation	Ambient air temperature[c]	Standard up to 2000 m ASL (6562 ft ASL) above 6562 ft ASL (2000 m ASL)	 0 °C ... +60 °C (+32 °F ... +140 °F) 0 °C ... +50 °C (+32 °F ... +122 °F)
		Standard with Conformal Coating up to 2000 m ASL (6562 ft ASL) above 6562 ft ASL (2000 m ASL)	 0 °C ... +60 °C (+32 °F ... +140 °F) 0 °C ... +50 °C (+32 °F ... +122 °F)
		Extended[de] up to 2000 m ASL (6562 ft ASL) above 6562 ft ASL (2000 m ASL)	 -40 °C ... +70 °C (-40 °F ... +158 °F) −40 °F ... +185 °F (−40 °C ... +85 °C) for 16 hours (tested in accordance with IEC 60068-2-2) -40 °C ... +60 °C (-40 °F ... +140 °F)
		Extended with Conformal Coating[fg] up to 2000 m ASL (6562 ft ASL) above 6562 ft ASL (2000 m ASL)	 -40 °C ... +70 °C (-40 °F ... +158 °F) -40 °C ... +60 °C (-40 °F ... +140 °F)
	Maximum inner temperature of device (guideline)		+95 °C (+203 °F)
	Humidity	5 % ... 95 % (non-condensing)	
	Air pressure	min. 700 hPa (+3000 m ASL; +9842 ft ASL)	
		max. 1060 hPa (-400 m ASL; -1312 ft ASL)	
Climatic conditions during storage	Ambient temperature	-40 °C ... +85 °C (-40 °F ... +185 °F)	
	Humidity	5 % ... 95 % (non-condensing)	
	Air pressure	min. 700 hPa (+3000 m ASL; +9842 ft ASL)	
		max. 1060 hPa (-400 m ASL; -1312 ft ASL)	
Pollution degree		2	
Protection classes	Laser protection	Class 1 in compliance with IEC 60825-1	
	Degree of protection	IP30	

a. Not UL 60950 certified.
b. Not UL 60950 certified.
c. Temperature of the ambient air at a distance of 5 cm (2 in) from the device
d. 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 93.
e. 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.
f. 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.
g. 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 modules

Dimensions	See “Dimension drawings” on page 81.	
Weight	GPS1-C	600 g (21.16 oz)
	GPS1-K	710 g (25.04 oz)
	GPS3-P	750 g (26.46 oz)
Mounting of the power supply modules	Tightening torque	0.5 Nm (4.4 lb-in)
Mounting of the cover panel	Tightening torque	0.5 Nm (4.4 lb-in)
Climatic conditions during operation	Air pressure (altitude)	min. 600 hPa (+4000 m; +13123 ft)
Power supply module characteristic value C	Rated voltage range	24 V DC ... 48 V DC
	Voltage range including maximum tolerances	min. 16.8 V ... max. 60 V
	Power loss buffer	>10 ms at 20.4 V DC
	Overload current protection on the device	Non-replaceable fuse
	Peak inrush current	< 7 A (1 ms)
	Current integral I^2t	0.4 A^2s
Power supply module characteristic value K	Rated voltage range	110 V AC ... 240 V AC, 50 Hz ... 60 Hz 60 V DC ... 250 V DC
	Voltage range including maximum tolerances	88 V AC ... 276 V AC, 47 Hz ... 63 Hz 48 V DC ... 288 V DC
	Power loss buffer	> 17 ms at 110 V AC > 20 ms at 230 V AC
	Overload current protection on the device	Non-replaceable fuse
	Peak inrush current	< 3 A (1 ms)
	Current integral I^2t	0.3 A^2s
	Crest factor	< 1.8
Power supply module 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: 48 V DC Max. voltage range: 45 V DC ... 57 V DC ▶ For the use of Type 2 Powered Devices (PoE+): Rated voltage: 54 V DC Max. voltage range: 51 V DC ... 57 V DC ▶ The power supply is potential-free. For power supply modules capable of PoE, exclusively use a potential-free SELV power supply.	
	Max. PoE power	In total: 185 W
	Power loss buffer	> 10 ms at 40.8 V DC[a]
	Overload current protection on the device	Non-replaceable fuse
	Peak inrush current	< 2.5 A (1 ms)
	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 81.	
Weight	GMM20-MMMMMMMM	520 g (16.72 oz) additional 150 g for media modules with temperature range characteristic value T and E
	GMM20-NNNNNNNN	
	GMM20-VVVVVVVV	
	GMM20-UUUUUUUU	
	GMM30-MMMMTTTT	550 g (19.4 oz)
	GMM30-NNNNTTTT	
	GMM30-VVVVTTTT	
	GMM30-UUUUTTTT	
	GMM40-TTTTTTTT	490 g (17.28 oz)
	GMM40-OOOOOOOO	650 g (22.93 oz)
	GMM40-OOOOTTTT	540 g (19.05 oz)
	GMM32-MMMMTTTT	560 g (19.75 oz)
	GMM32-NNNNTTTT	
	GMM32-VVVVTTTT	
	GMM32-UUUUTTTT	
	GMM42-OOOOTTTT	550 g (19.4 oz)
	GMM42-TTTTTTTT	510 g (17.99 oz)
Installing the media modules	Tightening torque	0.5 Nm (4.4 lb-in)
Mounting of the cover panel	Tightening torque	0.5 Nm (4.4 lb-in)
Max. PoE power	Per media module:	124 W
	In total:	185 W
Climatic conditions during operation	Ambient temperature	Devices with operating temperature characteristic value S (Standard): 0 °C ... +60 °C (+32 °F ... +140 °F)[a]
		Devices with operating temperature characteristic value C (standard with Conformal Coating): 0 °C ... +60 °C (+32 °F ... +140 °F)[b]
		Devices with operating temperature characteristic value E and T (extended) -40 °C ... +70 °C (-40 °F ... +158 °F)[c] -40 °C ... +85 °C (-40 °F ... +185 °F) for 16 hours (tested according to IEC 60068-2-2)[d]
	Humidity	5 % ... 95 % (non-condensing)
	Air pressure	min. 600 hPa (+4000 m; +13123 ft) max. 1060 hPa (-400 m ASL; -1312 ft ASL)
Climatic conditions during storage	Ambient temperature	-40 °C ... +85 °C (-40 °F ... +185 °F)
	Humidity	5 % ... 95 % (non-condensing)
	Air pressure	min. 600 hPa (+4000 m; +13123 ft) max. 1060 hPa (-400 m ASL; -1312 ft ASL)
Pollution degree		2
Protection classes	Laser protection	Class 1 in compliance with IEC 60825-1

a. Hirschmann recommends to use SFP transceivers with “EEC” extension.

b. Hirschmann recommends to use SFP transceivers with “EEC” extension.
c. Use SFP transceivers with the “EEC” extension only, otherwise the standard temperature range applies.
d. Use SFP transceivers with the “EEC” extension only, otherwise the standard temperature range applies.

7.2 Dimension drawings

Basic device

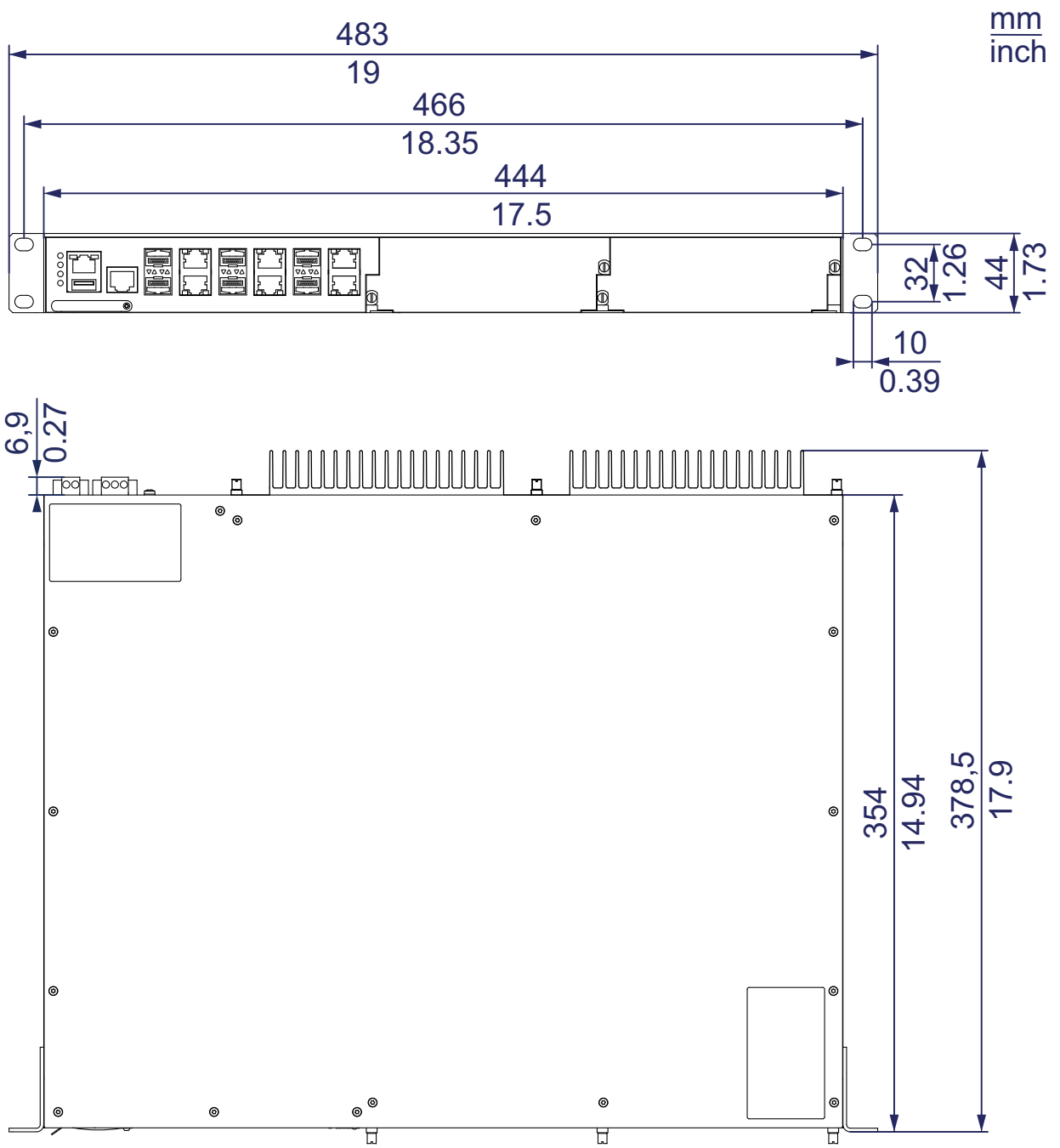


Figure 29: Basic device: Dimension drawing device variant characteristic value 6T6Z with 2 × power supply module GPS3-P

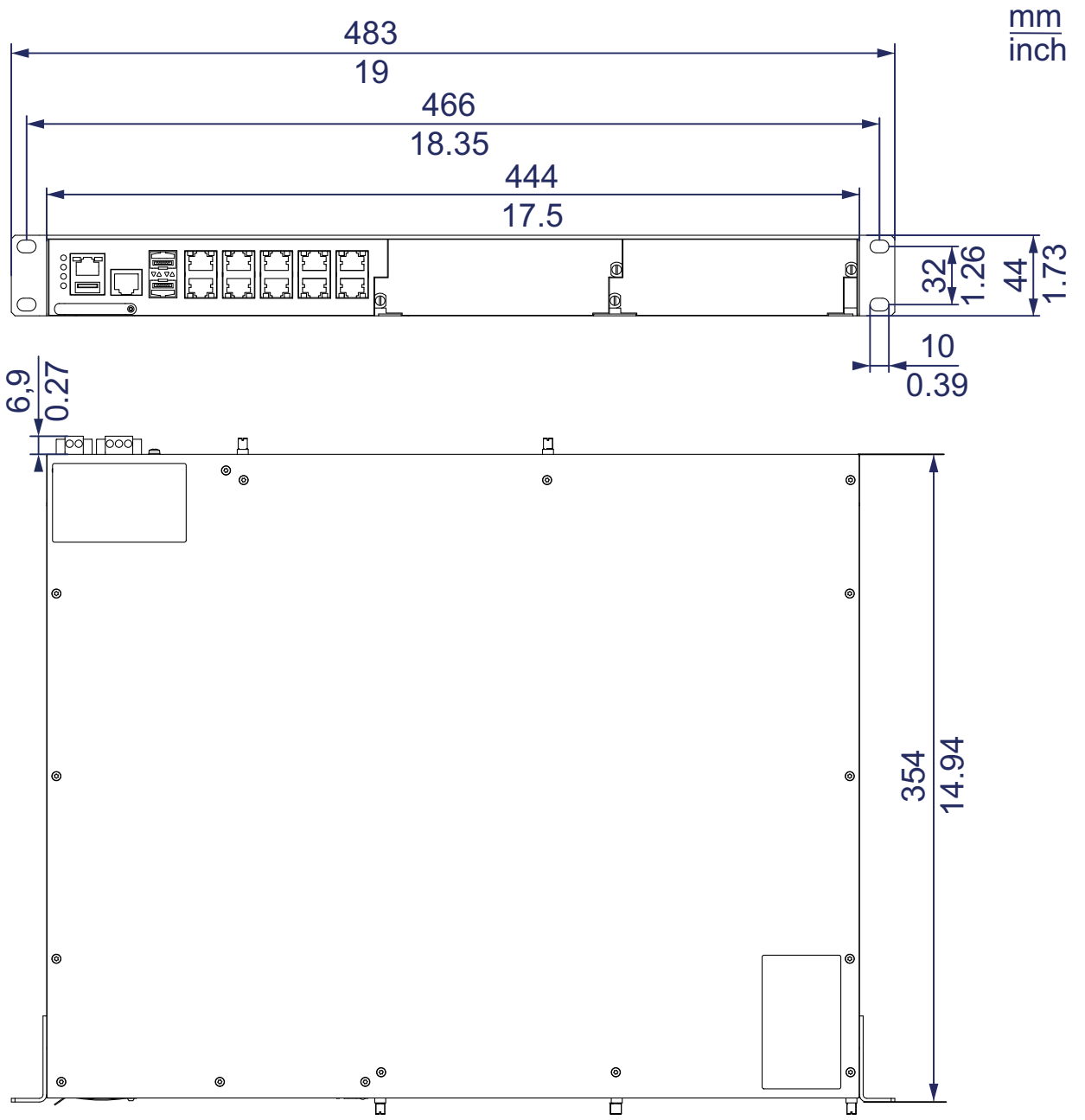


Figure 30: Basic device: Dimension drawing device variant characteristic value AT2Z with 2 × power supply module GPS1-C

Note: The dimensions of the basic device is identical for every device variant. Differences result exclusively from the different dimensions of the power supply module variants.

Power supply modules

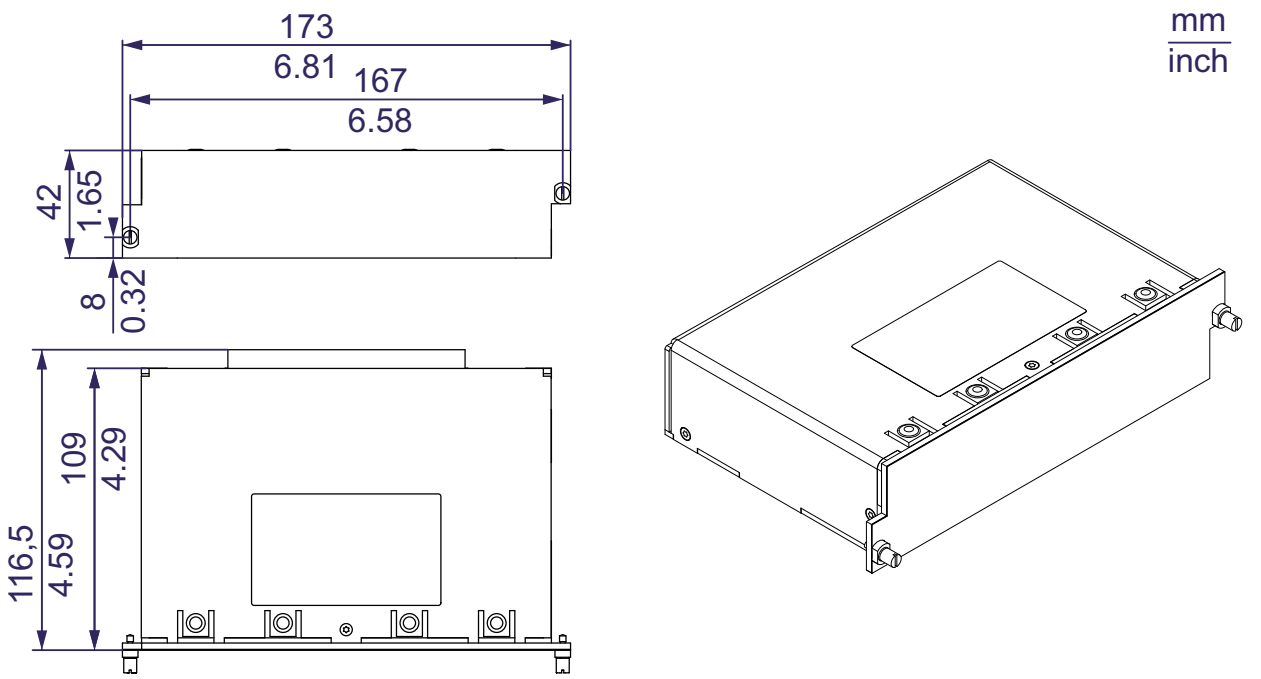


Figure 31: Power supply modules: Dimension drawing power supply module GPS1-C/GPS1-K

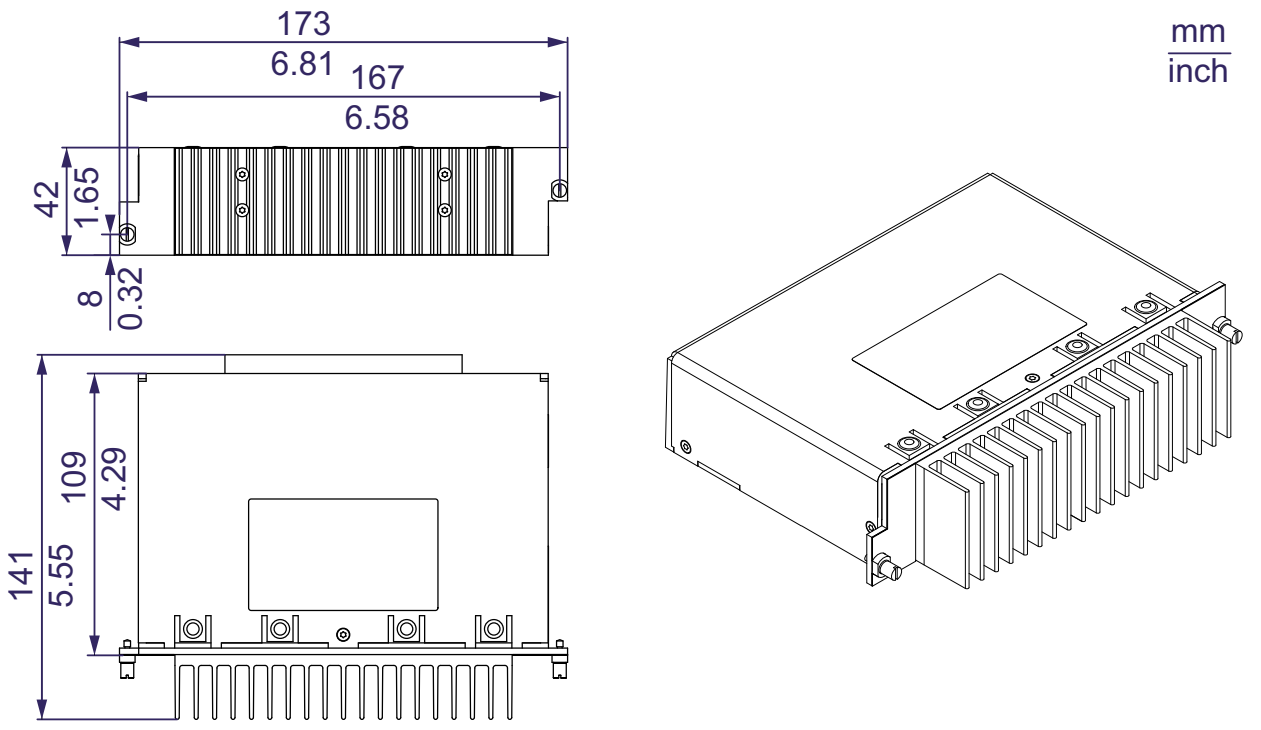


Figure 32: Power supply modules: Dimension drawing power supply module GPS3-P

Media modules

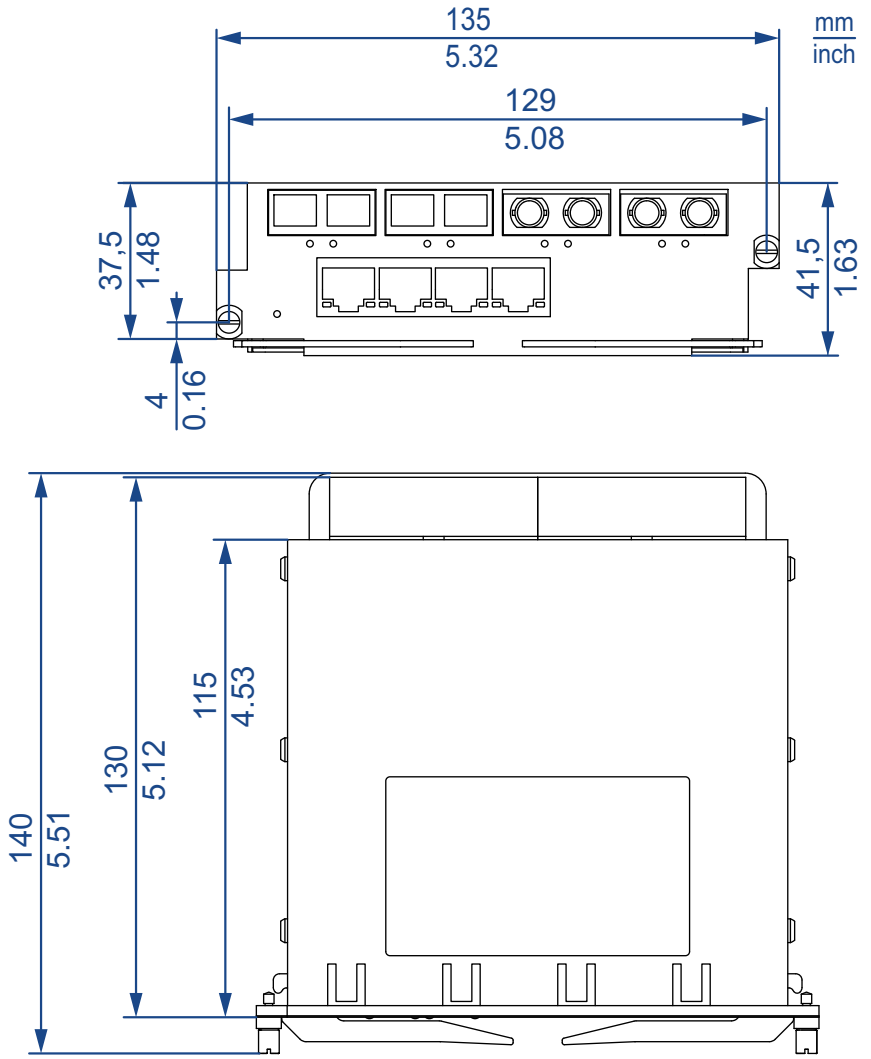


Figure 33: Media modules: Dimension drawing media modules (exemplary)

7.3 EMC and immunity

EMC interference emission		Standard applications[a]	Marine applications[bc]	Railway applications (trackside)[d]	Substation applications[e]
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. Exclusively use shielded data cables in DNV GL EMC Class B areas.
d. EN 50121-4 – applies to devices with the approval codes VT, T9, TY, S9, SY
e. 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					

EMC interference immunity		Standard applications[a]	Marine applications[b]	Railway applications (trackside)[c]	Substation applications[d]
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 approval codes VT, T9, TY, S9, SY
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 3.5 mm (0.14 in) amplitude	2 Hz ... 13.2 Hz with 1 mm (0.04 in) amplitude	—	2 Hz ... 9 Hz with 3 mm (0.11 in) 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 approval codes V9, VY, VU, VT

7.4 Network range

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

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
-MX/LC...	MM	1310 nm	62,5/125 µm	0 dB ... 12 dB	0 km ... 0.50 km (0 km ... 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)

Table 10: 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
-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 10: 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.

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 11: 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.

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

Table 12: F/O 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.
d. You will find further information on certifications on the Internet on the Hirschmann product pages (www.hirschmann.com).

Product code M-SFP-2.5-...	Mode[a]	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 dB ... 4 dB	0.55 km (0.34 mi)	3.5 dB/km	2000 MHz×km (OM3)
MM/LC EEC	MM	850 nm	50/125 µm	0 dB ... 4 dB	0.4 km (0.25 mi)	3.5 dB/km	500 MHz×km (OM2)
MM/LC EEC	MM	850 nm	62.5/125 µm	0 dB ... 4 dB	0.17 km (0.11 mi)	3.5 dB/km	200 MHz×km (OM1)
SM-/LC EEC	SM	1310 nm	9/125 µm	0 dB ... 8.5 dB	5 km (3.11 mi)	0.4 dB/km	3.5 ps/(nm×km)
SM/LC EEC	SM	1310 nm	9/125 µm	0 dB ... 13 dB	20 km (12.43 mi)	0.4 dB/km	3.5 ps/(nm×km)
SM+/LC EEC	SM	1310 nm	9/125 µm	12 dB ... 25 dB	45 km (27.96 mi)	0.4 dB/km	3.5 ps/(nm×km)
LH/LC	SM	1551 nm	9/125 µm	14 dB ... 28 dB	80 km[b] (49.70 mi)	0.25 dB/km	19 ps/(nm×km)

Table 13: F/O port 2.5 Gbit/s (SFP fiber optic Gigabit Ethernet transceiver)

a. MM = Multimode, SM = Singlemode, LH = Singlemode Longhaul
b. Typically the DWDM (Dense Wave Division Multiplexing) links have filters because the remaining attenuation budget is consumed by the filters.For point-to-point connections without filters and with max. 1.5 dB of connector losses you can cover up to 95 km (59 mi).

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

Table 14: Network range: 10/100/1000 Mbit/s twisted pair port

7.5 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 modules		
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

8 Scope of delivery, order numbers and accessories

Scope of delivery

Amount	Article
1 ×	Device
1 ×	Safety and general information sheet
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 modules	942 136-999
GREYHOUND media modules	942 134-999
Cover panel for media module slot	942 198-001
Cover panel for power supply module 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 IP20 to a device with IP65, the degree of protection of the overall system is reduced to IP20.

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

2.5 Gigabit Ethernet SFP transceiver (applies exclusively 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
M-SFP-2.5-LH/LC	942 220-001

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

Table 15: Accessory: Bidirectional Gigabit 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

Table 16: Accessory: Fast Ethernet SFP transceiver

Fast Ethernet SFP transceiver	Order number
SFP-FAST-SM/LC[a]	942 195-001
SFP-FAST-SM/LC EEC[a]	942 195-002

Table 16: Accessory: Fast Ethernet SFP transceiver

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

Other accessories	Order number
AutoConfiguration Adapter ACA22-USB (EEC)	942 124-001
AutoConfiguration Adapter ACA31	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.)	943 845-009
2-pin terminal block for signal contact (50 pieces)	943 845-010
Bracket for fastening the housing	943 943-001
Protection cap for RJ45 socket (50 pieces)	943 936-001
Protection cap for SFP slot (25 pieces)	943 942-001
Network management software Industrial HiVision	943 156-xxx

9 Underlying technical standards

Name	
RCM	Australian Regulatory Compliance Mark (RCM) Australian Radiocommunications Standard 2008, Radiocommunications Act 1992
FCC 47 CFR Part 15	Code of Federal Regulations
DNV-CG-0339	Environmental test specification for electrical, electronic and programmable equipment and systems.
ANSI/UL 121201	Nonincendive Electrical Equipment for Use in Class I and II, Division 2 and Class III, Divisions 1 and 2 Hazardous (Classified) Locations
CAN/CSA C22.2 No. 213	Non-incendive 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 for power utility automation - 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 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: Threshold values – threshold values for harmonic currents (device input current ≤ 16 A per conductor)
EN 61000-3-3	Electromagnetic compatibility (EMC) – part 3-3: Threshold values – limitation of voltage changes, voltage fluctuations and flickering in public low power supply networks for devices with a rated current ≤ 16 A per conductor 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 – Emitted interference in industrial environments
EN 61131-2	Programmable controllers – Part 2: Equipment requirements and tests
NEMA TS 2	Traffic Controller Assemblies with NTCIP Requirements (environmental requirements)

Table 17: 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.

Customer Innovation Center

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

- Consulting incorporates comprehensive technical advice, from system evaluation through network planning to project planning.
- Training offers you an introduction to the basics, product briefing and user training with certification.
  You find the training courses on technology and products currently available at https://www.belden.com/solutions/customer-innovation-center.
- Support ranges from the first installation through the standby service to maintenance concepts.

With the Customer Innovation Center, you decide against making any compromises in any case. Our client-customized package leaves you free to choose the service components you want to use.

Internet:
https://www.belden.com/solutions/customer-innovation-center

HIRSCHMANN

A BELDEN BRAND