



**HIRSCHMANN**

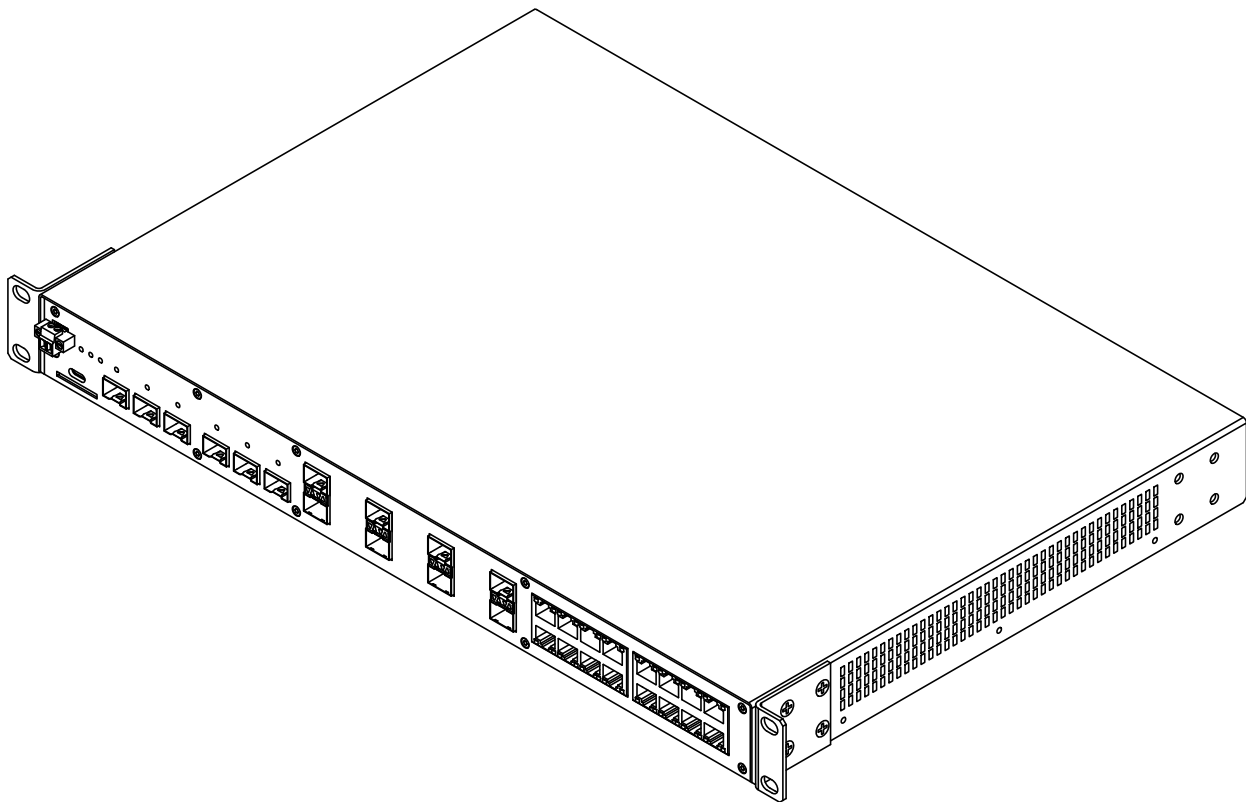
A **BELDEN** BRAND

# User Manual

## Installation

### Industrial Ethernet Workgroup Switch

### GRS105/GRS106



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# 1 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.

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

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

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>

## 2 General safety instructions

**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.

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.



### **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.**



## 2.1 Warning symbols



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



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 **may** result in equipment or environmental damage.

## 2.2 Intended use

- ☐ Use the product only for the application cases described in the Hirschmann product information, including this manual.
- ☐ Operate the product only according to the technical specifications.  
[See “Technical data” on page 61.](#)
- ☐ Connect to the product only components suitable for the requirements of the specific application case.

## 2.3 National and international safety regulations

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

## 2.4 Installation site requirements

Exclusively operate the device 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.  
[See “Technical data” on page 61.](#)
- ☐ If the device is not installed horizontally, it must be installed in a switch cabinet or other fire enclosure. The fire enclosure can be made of metal or plastic with fire protection properties of at least V-1 according to IEC 60695-11-10. The maximum diameter of bottom openings in the fire enclosure is 2 mm (0.078 in).

## 2.5 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.

## 2.6 Device casing

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

- ☐ Never insert sharp objects (small screwdrivers, wires, etc.) into the inside of the device.
- ☐ 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.
- ☐ Mount the device horizontally or vertically, either as a desktop device, in the switch cabinet ([figure 17 on page 46](#)) or on the wall ([figure 14 on page 42](#)).
- ☐ Exclusively use Hirschmann mounting brackets.
- ☐ Exclusively use the provided screws when you reposition the attached mounting brackets or install additional mounting brackets. You obtain the additional brackets as accessories.

[See "Accessories" on page 73.](#)

## 2.7 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.

## 2.8 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.

## 2.9 Electrical connections

### 2.9.1 Grounding the device

Before supplying your device with power, **always** verify that the device is grounded.

The device is grounded via 1 grounding screw. Power supply variants characteristic value G and M are additionally grounded via the power supply connection.

### 2.9.2 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.
- ▶ Only switch on the device when the casing is closed.
- ▶ Relevant for North America:  
Exclusively use 60/75 °C (140/167 °F) or 75 °C (167 °F) copper (Cu) wire.

### 2.9.3 Requirements for connecting the supply voltage

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

The supply voltage is electrically isolated from the casing.

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

#### Prerequisites:

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

- ▶ The supply voltage corresponds to the voltage specified on the type plate of the device.
- ▶ The power supply conforms to overvoltage category I or II.
- ▶ The power supply has an easily accessible disconnecting device (for example a switch or a plug). This disconnecting device is clearly identified. So in the case of an emergency, it is clear which disconnecting device belongs to which power supply cable.
- ▶ The cross-section of the ground conductor is the same size as or bigger than the cross-section of the power supply cables.
- ▶ The power supply cable is suitable for the voltage, the current and the physical load. Hirschmann recommends a conductor cross section of 0.5 mm<sup>2</sup> to 0.75 mm<sup>2</sup> (AWG20 up to AWG18).

### 2.9.4 Requirements for connecting the signal contact

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

#### The following requirements apply without restrictions:

- ▶ The connected voltage complies with the requirements for a safety extra-low voltage (SELV) as per IEC/EN 60950-1 or ES1 as per IEC/EN 62368-1.
- ▶ The connected voltage is limited by a current limitation device or a fuse. Observe the electrical threshold values for the signal contact.  
[See "Signal contact" on page 62.](#)

## 2.10 LED or laser components

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

CLASS 1 LASER PRODUCT

CLASS 1 LED PRODUCT

## **2.11 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.

## 3 Approvals

### 3.1 CE marking

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

2011/65/EU and 2015/863/EU (RoHS)

Directive of the European Parliament and of the Council on the restriction of the use of certain hazardous substances in electrical and electronic equipment.

2014/30/EU (EMC)

Directive of the European Parliament and of the Council on the harmonisation of the laws of the Member States relating to electromagnetic compatibility.

2014/35/EU

Directive of the European Parliament and of the Council on the harmonisation of the laws of the Member States relating to the making available on the market of electrical equipment designed for use within certain voltage limits.

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

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

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.

## **3.2 UKCA marking**

The labeled devices comply with the regulations contained in the following UK legislation:

S.I. 2012 No. 3032

Restriction of the Use of Certain Hazardous Substances in Electrical and  
Electronical Equipment Regulations

S.I. 2016 No. 1101

Electrical Equipment (Safety) Regulations 2016

S.I. 2016 No. 1091

Electromagnetic Compatibility Regulations 2016



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

Belden UK Ltd.

1 The Technology Centre, Station Road  
Framlingham, IP13 9EZ, United Kingdom



### **3.3 FCC note**

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

Full Gigabit Family GRS105-.../GRS106-...

#### **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.

### **3.4 Relevant for installations in 19" switch cabinets according to UL 60950-1/UL 62368-1**

- ▶ Higher ambient air temperature during operation: If installed in a closed switch cabinet or a multi-unit switch cabinet, the ambient air temperature inside the switch cabinet during operation can be higher than the ambient air temperature in the room. Install devices in environments that are compatible with the maximum ambient air temperature of the device.
- ▶ Reduced air flow: When you install the device in a switch cabinet, make sure that a sufficient air flow is guaranteed in order to safely operate your devices.
- ▶ Mechanical stress: Check for potential dangers resulting from unevenly distributed weight when you install the device in a switch cabinet.

- ▶ Electric circuit overloading: Observe the effects of electric circuit overloads on the overload current protection and the power supply cables when you connect devices to the power supply. Refer to the device parameters specified on the type plate of the device.
- ▶ Safe grounding: Make sure that devices installed in switch cabinets are grounded safely. When you install a device in a switch cabinet, also watch out for power supply connections other than the direct connections to the circuit branch (for example socket boards).

## 4 Key

The symbols used in this manual have the following meanings:

▶	Listing
□	Work step
■	Subheading

# 5 Description

## 5.1 General device description

The GRS105/GRS106 family provides you with a range of device variants. The device is designed for the special requirements of industrial automation. The device meets the relevant industry standards, provides very high operational reliability, even under extreme conditions, and also long-term reliability and flexibility.

The devices with software variant L2... allow you to set up switched industrial Ethernet networks that conform to the IEEE 802.3 standard.

The following installation options are available:

- ▶ 19" switch cabinet
- ▶ Flat surface mounting
- ▶ Vertical surface mounting

You have the option to choose from various media to connect your device to end devices and other network components:

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

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

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

- ▶ Web browser
- ▶ SSH
- ▶ Network management software (for example Industrial HiVision)
- ▶ Management interface (locally on the device)

The device provides you with a large range of functions, which the manuals for the operating software inform you about. You can download these manuals as PDF files from the Internet: <https://www.doc.hirschmann.com>  
The Hirschmann network components help you ensure continuous communication across every level of your company.

## 5.2 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.

Item	Characteristic	Characteristic value	Description
1 ... 3	Product	GRS	GREYHOUND Switch
4	Series	1	GREYHOUND Series 100
5	Technology	0	Standard
6	Data rate	5	6 × 1/2.5 GE (Port group I) + 8 × 1 GE (Port group II) + 16 × 1 GE (Port group III)
		6	6 × 1/2.5/10 GE (Port group I) + 8 × 1/2.5 GE (Port group II) + 16 × 1 GE (Port group III)
7	(hyphen)	–	
8 ... 9	Port group I	6F	6 × SFP slot
10 ... 11	Port group II	8F	8 × SFP slot
		8T	8 × Twisted Pair port
12 ... 14	Port group III	16T	16 × Twisted Pair port
15	Operating temperature range	S	Standard -10 °C ... +60 °C (+14 °F ... +140 °F)
		C	Standard with Conformal Coating -10 °C ... +60 °C (+14 °F ... +140 °F)
16	Power supply unit 1	G	Nominal voltage range 110 V AC ... 240 V AC
		M	Nominal voltage range 110 V DC ... 250 V DC
		L	Nominal voltage range 24 V DC ... 48 V DC
17	Power supply unit 2	G	Nominal voltage range 110 V AC ... 240 V AC
		M	Nominal voltage range 110 V DC ... 250 V DC
		L	Nominal voltage range 24 V DC ... 48 V DC
		9	No second power supply unit
18 ... 19	Certificates and declarations	Z9	CE, FCC, EN 61131, EN 62368-1
		Y9	Characteristic value Z9 + cUL 62368-1
		T9	Characteristic value Z9 + EN 50121-4
		TY	Characteristic value T9 + cUL 62368-1
20 ... 21	Customer-specific version	HH	Hirschmann standard
22	Hardware configuration	S	Standard
23	Software configuration	E	Entry (Hirschmann Standard)
24 ... 25	Software level	2S	HiOS Layer 2 Standard
		2A	HiOS Layer 2 Advanced
26 ... 27	Software package	99	Reserved

Table 1: Device name and product code

Item	Characteristic	Characte- ristic value	Description
28 ... 32	Software version	XX.X.	Current software version
		08.9.	Software version 08.9.

Table 1: Device name and product code

5.3 Device views

5.3.1 Front view device variant GRS106-6F8F16T...

The diagram shows the front view of the GRS106-6F8F16T device variant. It is a long, rectangular unit with various ports and indicators. Numbered callouts point to the following components: 1. Signal contact (2-pin terminal block) on the far left. 2. Status LED Power (P). 3. Status LED Device status (Status). 4. Status LED AutoConfiguration Adapter (ACA). 5. LED display elements (SFP slots Port group I). 6. Port group II, consisting of 8 SFP slots for 1/2.5 Gbit/s F/O connections. 7. Port group III, consisting of 16 RJ45 sockets for 10/100/1000 Mbit/s Twisted pair connections. 8. MAC address field. 9. Oblong hole. 10. Mounting bracket. 11. Port group I, consisting of 6 SFP slots for 1/2.5/10 Gbit/s F/O connections. 12. Management interface (MGMT), USB Type-C socket. 13. SD card slot (ACA31).

1	Signal contact (2-pin terminal block)
2	Status LED Power (P)
3	Status LED Device status (Status)
4	Status LED AutoConfiguration Adapter (ACA)
5	LED display elements (SFP slots Port group I)
6	Port group II     8 ×    SFP slot for 1/2.5 Gbit/s F/O connections
7	Port group III    16 ×  RJ45 socket for 10/100/1000 Mbit/s Twisted pair connections
8	MAC address field
9	Oblong hole
10	Mounting bracket
11	Port group I       6 ×    SFP slot for 1/2.5/10 Gbit/s F/O connections
12	Management interface (MGMT), USB Type-C socket
13	SD card slot (ACA31)

Table 2: Front view device variant GRS106-6F8F16T...

5.3.2 Front view device variant GRS106-6F8T16T...

The diagram shows the front view of the GRS106-6F8T16T device variant. It is a long, rectangular unit with various ports and indicators. Numbered callouts point to the following components: 1. Signal contact (2-pin terminal block) on the far left. 2. Status LED Power (P). 3. Status LED Device status (Status). 4. Status LED AutoConfiguration Adapter (ACA). 5. LED display elements (SFP slots Port group I).

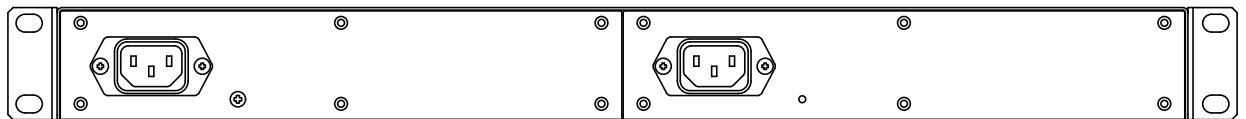
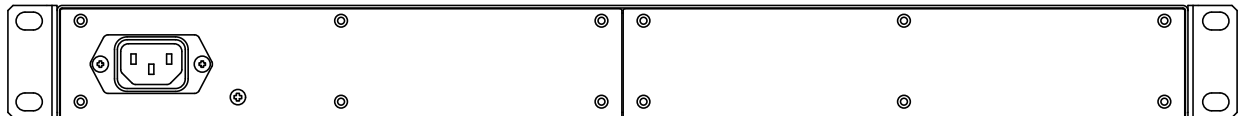
1	Signal contact (2-pin terminal block)
2	Status LED Power (P)
3	Status LED Device status (Status)
4	Status LED AutoConfiguration Adapter (ACA)
5	LED display elements (SFP slots Port group I)

Table 3: Front view device variant GRS106-6F8T16T...

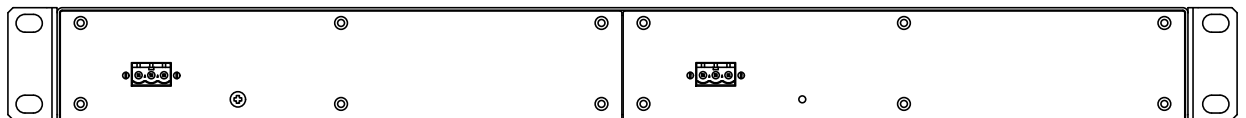
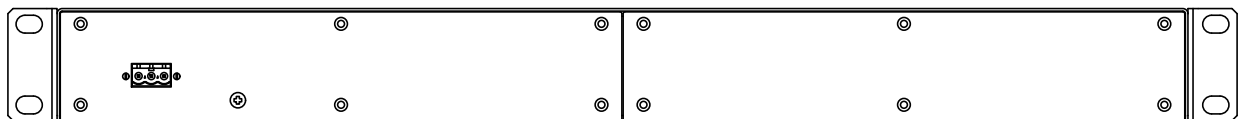
6	Port group II	8 ×	RJ45 socket for 100/1000/2500 Mbit/s Twisted pair connections
7	Port group III	16 ×	RJ45 socket for 10/100/1000 Mbit/s Twisted pair connections
8	MAC address field		
9	Oblong hole		
10	Mounting bracket		
11	Port group I	6 ×	SFP slot for 1/2.5/10 Gbit/s F/O connections
12	Management interface (MGMT), USB Type-C socket		
13	SD card slot (ACA31)		

*Table 3: Front view device variant GRS106-6F8T16T...*

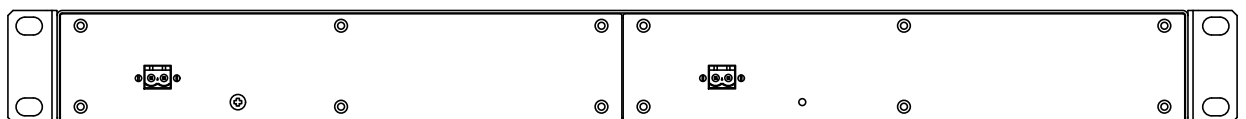
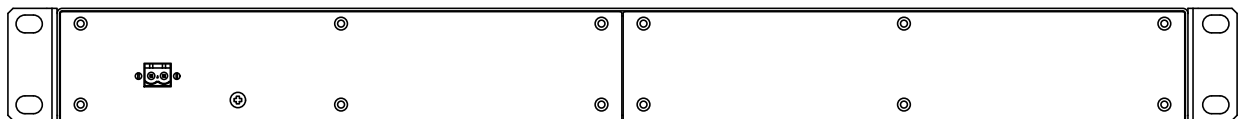
### 5.3.3 Rear views



*Table 4: Rear views: Power supply characteristic value G9 (non-redundant, 1 connector) and GG (redundant, 2 connectors)*



*Table 5: Rear views: Power supply characteristic value M9 (non-redundant, 1 connector) and MM (redundant, 2 connectors)*



*Table 6: Rear views: Power supply characteristic value L9 (non-redundant, 1 connector) and LL (redundant, 2 connectors)*

### 5.3.4 Port assignment

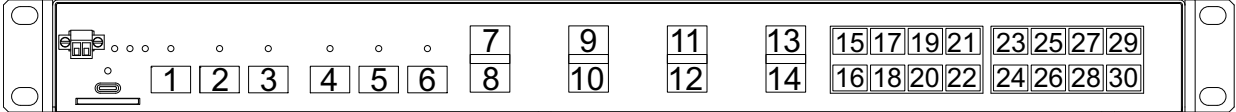
																													
Port	Description																												
1 ... 6	Port group I																												
7 ... 14	Port group II																												
15 ... 30	Port group III																												

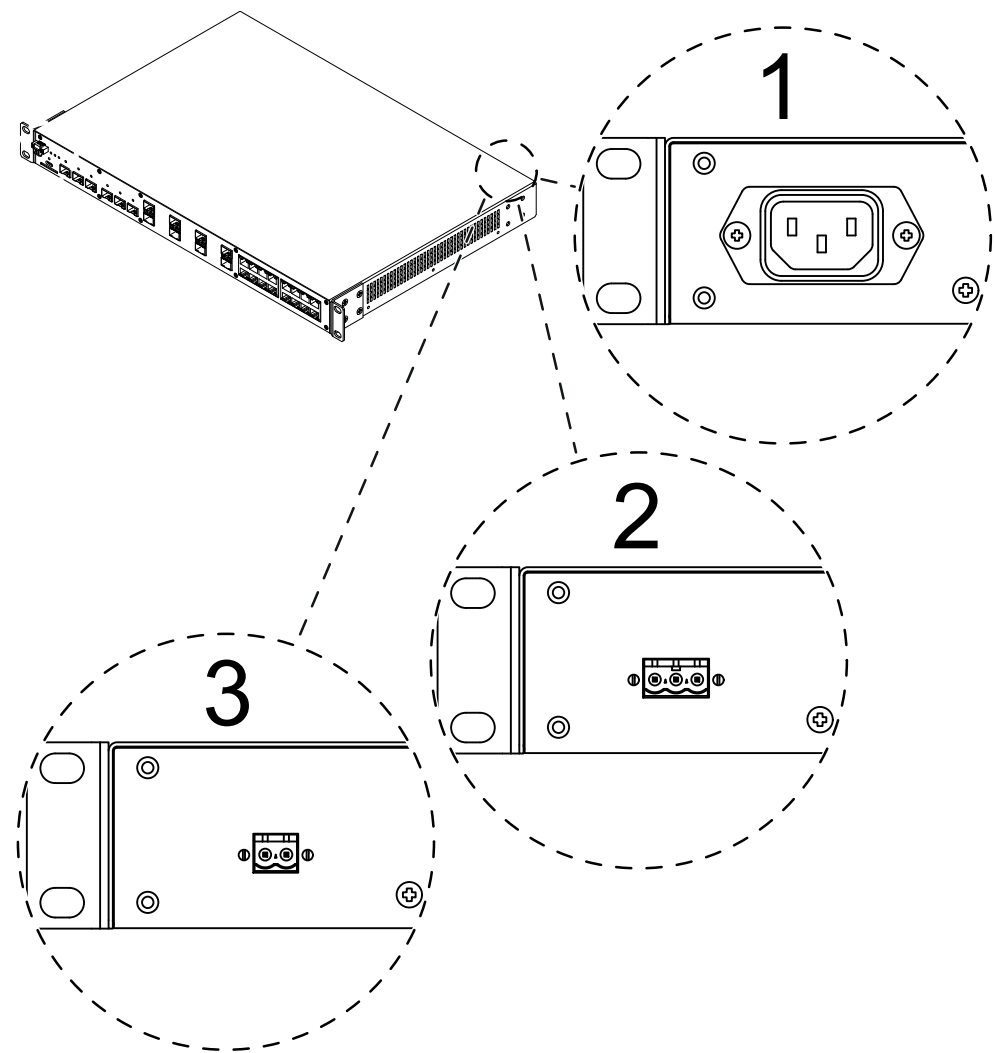
Table 7: Port assignment: Front view; numbering sequence identical for every device variant



# 5.4 Supply voltage

**Note:** Observe the safety instructions in [“Requirements for connecting electrical wires”](#) on page 12.

The following supply voltage characteristic value combinations are available:  
G9, GG, GM, GL, M9, MM, ML, L9, LL.



1	Supply voltage variant characteristic value G: Built-in C14 plug according to IEC 60320-1
2	Supply voltage variant characteristic value M: 3-pin terminal block
3	Supply voltage variant characteristic value L: 2-pin terminal block

*Table 8: Supply voltage: Supply voltage options, location on the device*

The supply voltage can be connected redundantly. Both inputs are electrically isolated from each other. When 2 power supply units are used, the load is distributed. The redundant power supply becomes active automatically if the standard power supply fails. Normally the redundant power supply runs in stand-by mode. Without redundant supply, the power supply unit supplies the device on its own.

The supply voltage is electrically isolated from the casing. The power supply units are protected against polarity reversal.

With a non-redundant supply of the supply voltage, the device reports the loss of a supply voltage. You can prevent this message by applying the supply voltage via both inputs, or by changing the configuration in the device management.

**5.4.1 Supply voltage characteristic value G**

You have the option of supplying the supply voltage redundantly, with load distribution.

The supply voltage is electrically isolated from the casing.

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

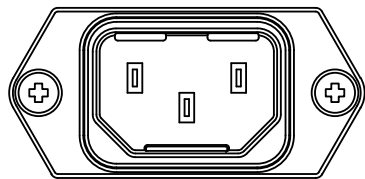


Figure 1: Supply voltage with characteristic value G: non-heating-appliance cable connection with built-in C14 plug (according to IEC 60320-1)


Type of the voltages that can be connected	Specification of the supply voltage	Pin assignment	
AC voltage	Rated voltage range 110 V AC ... 240 V AC, 50 Hz ... 60 Hz	L	Line conductor
		N	Neutral conductor
			Protective conductor

Table 9: Type and specification of the supply voltage, connections

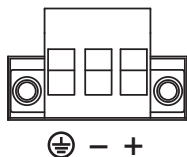
**5.4.2 Supply voltage characteristic value M**

You will find information on the characteristic values here:


[“Device name and product code” on page 21](#)

You have the option of supplying the supply voltage redundantly, with load distribution.

Both supply voltage inputs are electrically isolated.



*Figure 2: Supply voltage with characteristic value M: 3-pin terminal block with screw lock*

Type of the voltages that can be connected	Specification of the supply voltage	Pin assignment	
DC voltage	Rated voltage range	+/L	Plus terminal of the supply voltage
	110 V DC ... 250 V DC	-/N	Minus terminal of the supply voltage
	Voltage range incl. maximum tolerances 88 V DC ... 288 V DC		Protective conductor

*Table 10: Supply voltage with characteristic value M: type and specification of the supply voltage, pin assignment on the device*

### 5.4.3 Supply voltage characteristic value L

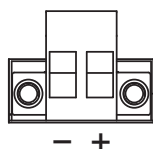
**Note:** Exclusively supply your device with SELV/ES1 voltage.

You will find information on the characteristic values here:

[“Device name and product code” on page 21](#)

You have the option of supplying the supply voltage redundantly, with load distribution.

Both supply voltage inputs are electrically isolated.



*Figure 3: Supply voltage with characteristic value L: 2-pin terminal block with screw lock*

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

*Table 11: Supply voltage with characteristic value L: type and specification of the supply voltage, pin assignment on the device*

# 5.5 Ethernet ports

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

## 5.5.1 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

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

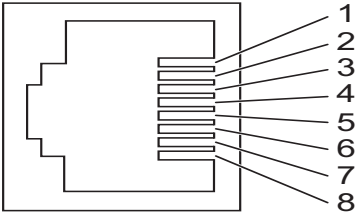
	Pin	Function
	1	BI_DB+
	2	BI_DB-
	3	BI_DA+
	4	BI_DD+
	5	BI_DD-
	6	BI_DA-
	7	BI_DC+
	8	BI_DC-

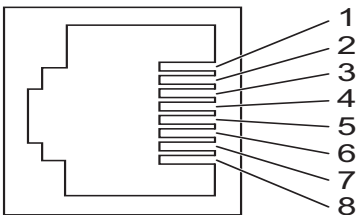
Table 12: Pin assignments of 10/100/1000 Mbit/s twisted pair port, RJ45 socket, MDI-X mode

## 5.5.2 100/1000/2500 Mbit/s twisted pair port

This port is an RJ45 socket.  
The 100/1000/2500 Mbit/s twisted pair port allows you to connect network components according to the IEEE 802.3 100BASE-TX/1000BASE-T and IEEE 802.3bz 2.5GBASE-T standards.

- This port supports:
- ▶ Autonegotiation
  - ▶ Autopolarity
  - ▶ Autocrossing (if autonegotiation is activated)
  - ▶ 100/1000/2500 Mbit/s full duplex

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

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

*Table 13: Pin assignments of 100/1000/2500 Mbit/s twisted pair port, RJ45 socket, MDI-X mode*

### 5.5.3 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 802.3bz 2.5GBASE-T.

This port supports:

Full duplex mode

Delivery state:

1 Gbit/s full duplex when using a Gigabit Ethernet SFP transceiver or

2.5 Gbit/s full duplex when using a 2.5 Gigabit Ethernet SFP transceiver.

**Note:** The F/O ports of the current device versions are not capable of Fast Ethernet.

### 5.5.4 1/2.5/10 Gbit/s F/O port

This port is an SFP slot.

The port allows you to connect network components according to the standards IEEE 802.3 1000BASE-SX/1000BASE-LX or IEEE 802.3 (Clause 49) 10GBASE-R.

This port supports:

Full duplex mode

Delivery state:

1 Gbit/s full duplex when using a Gigabit Ethernet SFP transceiver, or

2.5 Gbit/s full duplex when using a 2.5 Gigabit Ethernet SFP or 10 Gbit/s full duplex when using a Gigabit Ethernet SFP+ transceiver.

**Note:** The F/O ports of the current device versions are not capable of Fast Ethernet.

## 5.6 Management interfaces

### 5.6.1 Signal contact

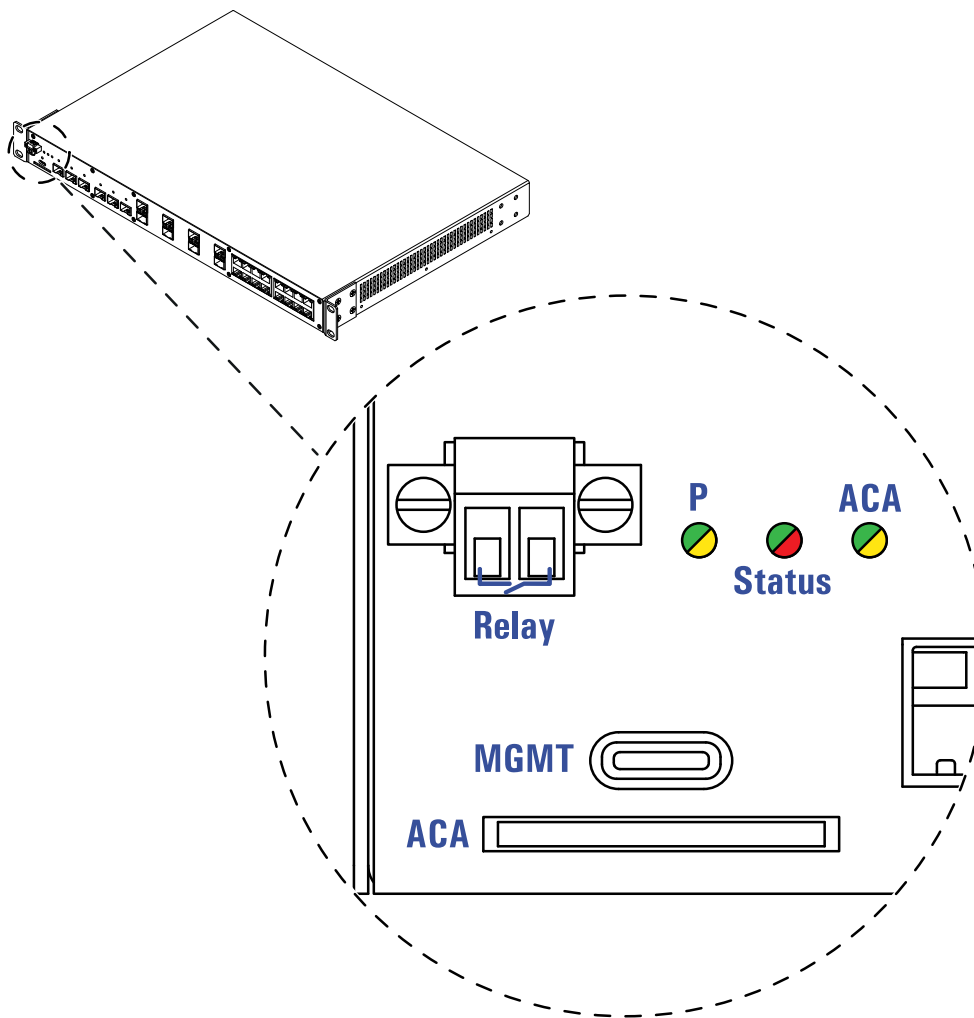


Figure 4: Signal contact: 2-pin terminal block with screw lock, location on the device (front of the device)

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

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

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

## 5.6.2 Management interface MGMT (external management)

**Note:** The MGMT interface exclusively supports CLI access via terminal emulation.

**Note:** When connecting an external USB-C to USB-C cable to the Management interface MGMT, the rotational symmetry feature of the connectors is not supported. For this reason, connections may not be operational. To fix this issue, remove the plugged-in USB-C connector from the device and plug it back in rotated by 180 °.

Name	Pin	Pin	Name
GND	B12	A1	GND
-	B11	A2	-
-	B10	A3	-
V BUS	B9	A4	V BUS
-	B8	A5	CC1
D-	B7	A6	D+
D+	B6	A7	D-
CC2	B5	A8	-
V BUS	B4	A9	V BUS
-	B3	A10	-
-	B2	A11	-
GND	B1	A12	GND

Figure 5: Management interface MGMT: Pin assignment of the USB-C interface.

This interface is a USB Type-C socket with shielding. This interface is electrically isolated from the power supply input.

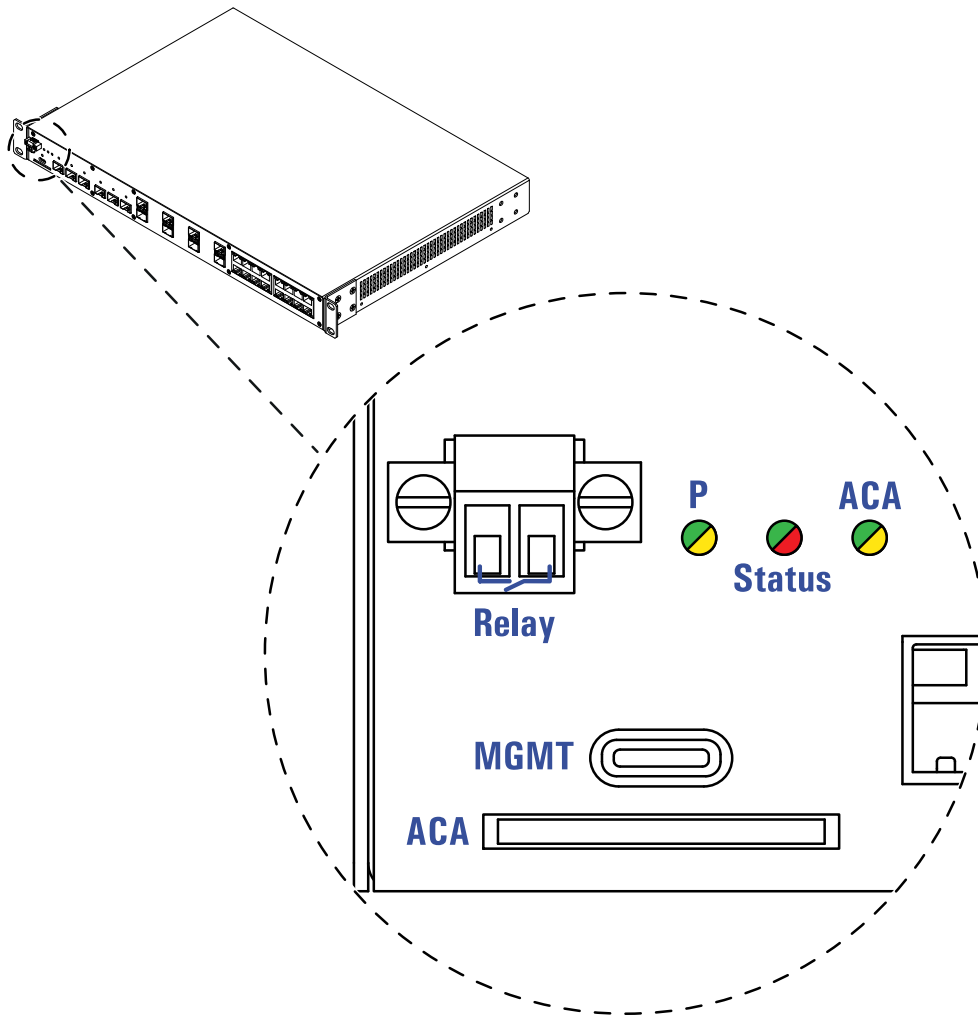


Figure 6: Management interface MGMT: Location on the device (front side of the device)

The interface allows you to connect your device temporarily via terminal emulation or network to an external device using an adapter cable. The adapter cable is available as an accessory ([see on page 73 “Accessories”](#)). The interface allows you to configure, manage and check your device.

The interface has the following properties:

- ▶ Supports USB Device mode
- ▶ Supports USB 2.0 (data rate max. 480 Mbit/s)
- ▶ Voltage **NOT** potential-separated

VT100 terminal settings	
Speed	115200 Baud
Data	8 bit
Stopbit	1 bit
Handshake	off
Parity	none



## ■ Configuration, management and checking via adapter cable

You have the option to configure, manage and check your device via the interface using an adapter cable. You find detailed information in the software user documentation. You find the software user documentation as PDF files on the Internet at <https://www.doc.hirschmann.com>. The adapter cable is available as an accessory (see on page 73 “Accessories”).

**Note:** The interface is electrically isolated from the power supply input. Exclusively connect adapter cables temporarily. Adapter cables may exclusively be used to configure, manage and check your device.

### 5.6.3 SD card interface

Prerequisite:

Only use Hirschmann SD cards.

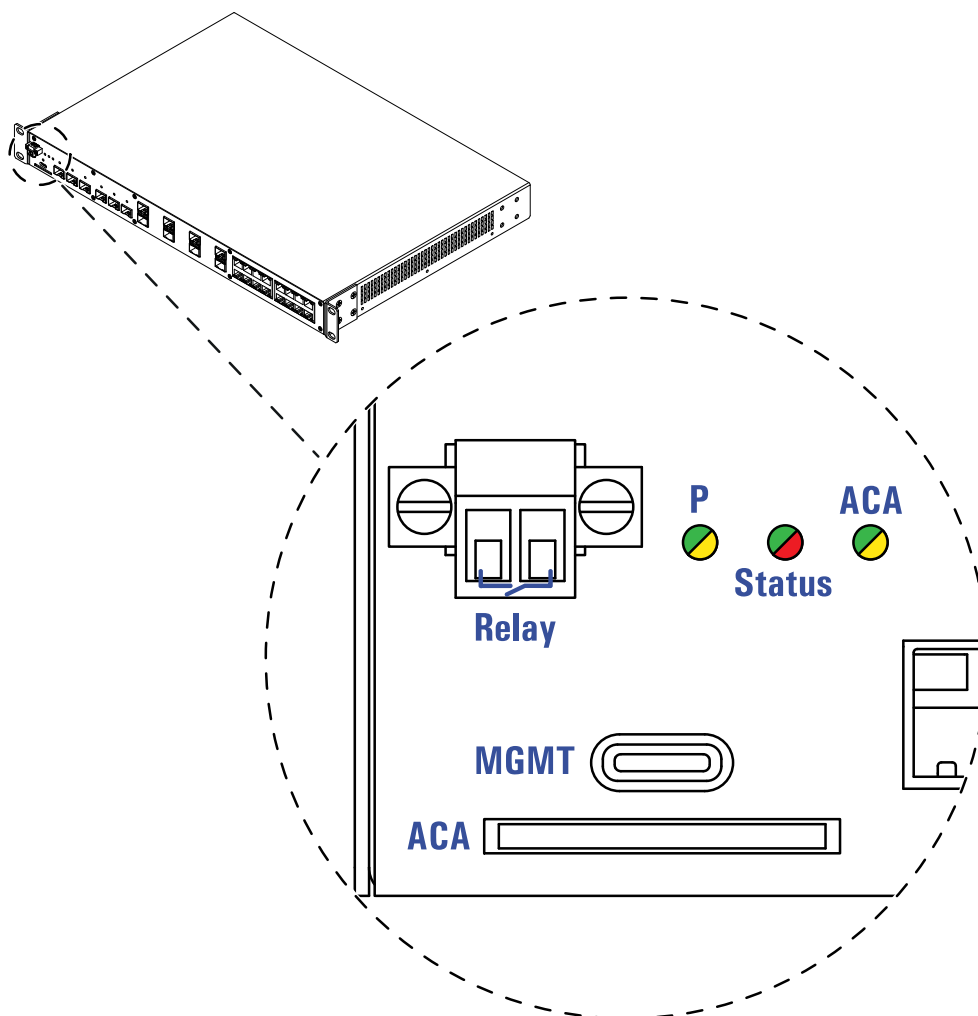


Figure 7: SD card interface: Location on the device (front side of the device)

The SD card interface allows you to connect the AutoConfiguration Adapter ACA31 storage medium. The storage medium ACA31 is used for saving/loading the configuration data and diagnostic information, and for loading the software.

On the front side of the device there are LEDs that inform you about the status of the interface.

## 5.7 Display elements

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

### 5.7.1 Device Status

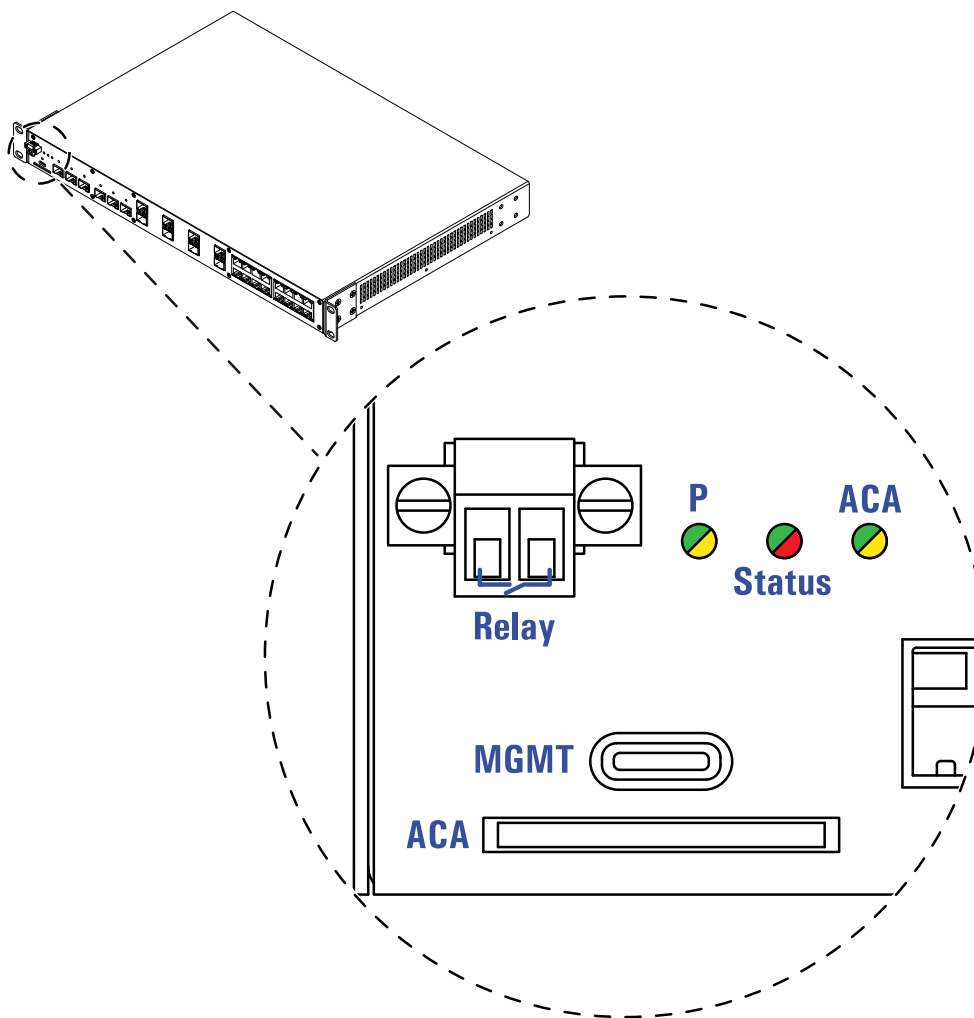


Figure 8: Device status: Location of the display elements on the device (front side of the device)

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

LED	Display	Color	Activity	Meaning
P (Power)	Supply voltage	–	none	Supply voltage is too low
		yellow	lights up	Device variants with redundant power supply: Supply voltage 1 <b>or</b> 2 is on
		green	lights up	Device variants with redundant power supply: Supply voltage 1 <b>and</b> 2 are on
				Device variants with single power supply: Supply voltage is on
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
		red/ green	flashing alternatively	Device is in recovery mode.
ACA	Storage medium 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

## 5.7.2 Port status

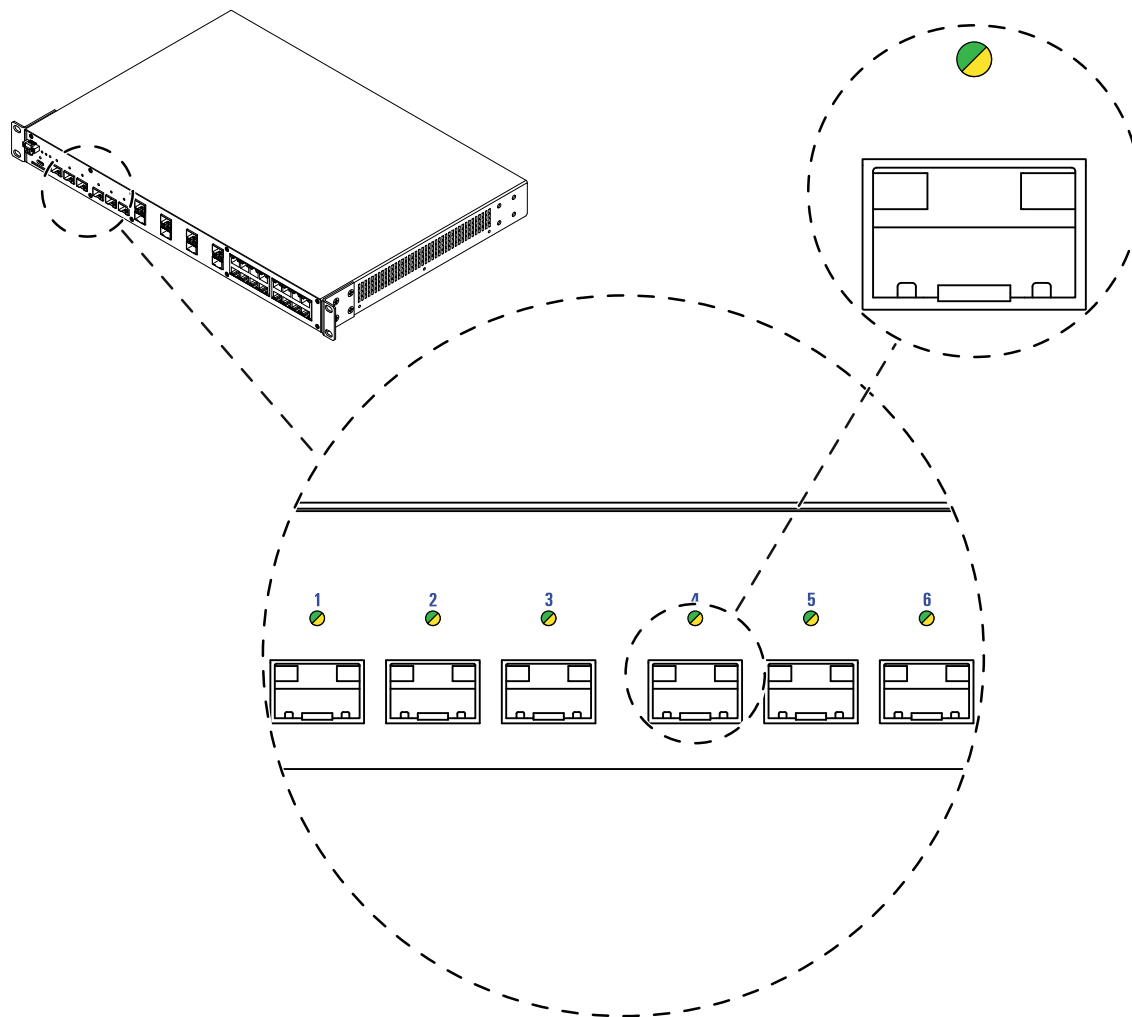


Figure 9: Port status: Location of the display elements of Port group I on the device (front side of the device)

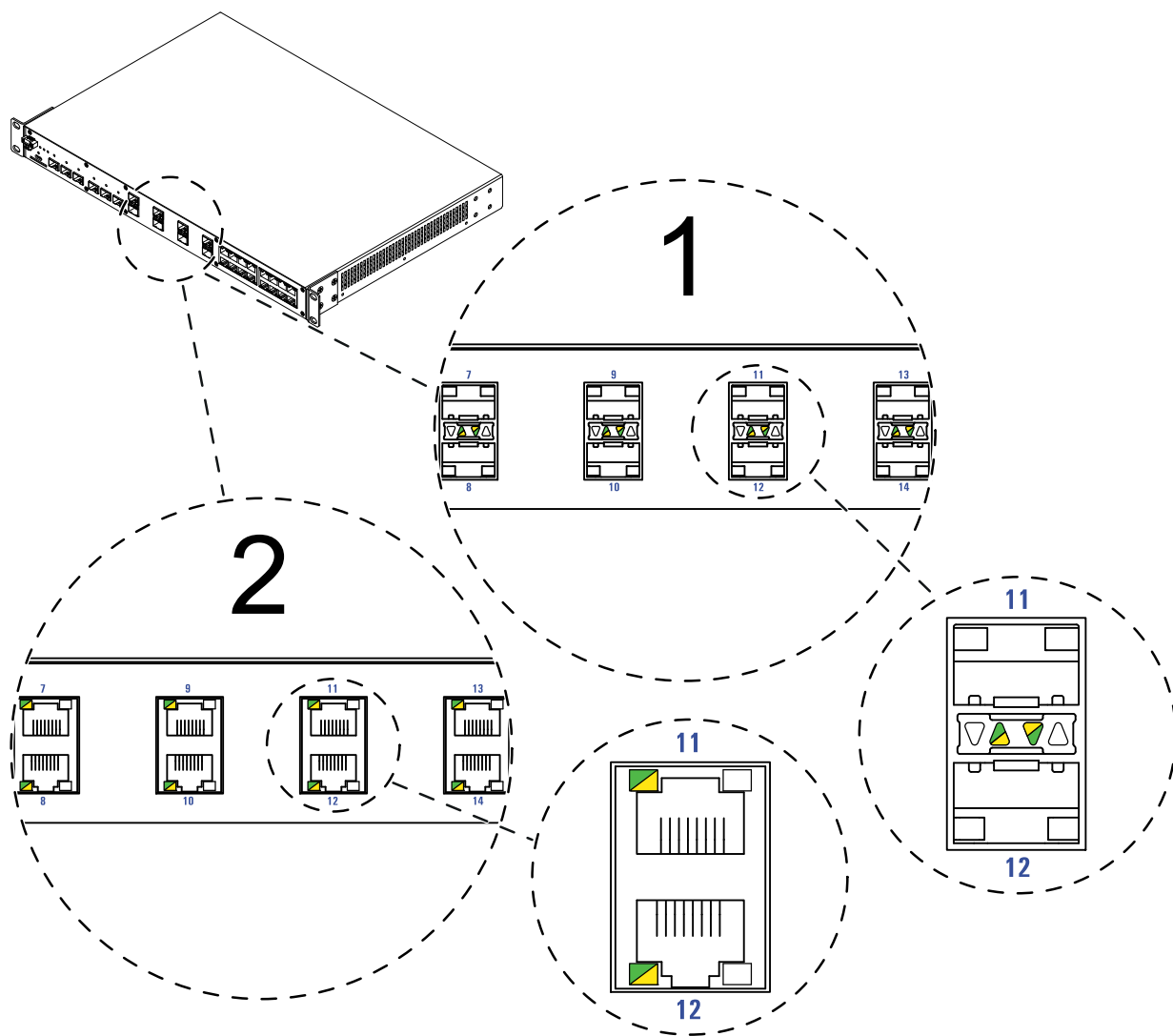


Figure 10: Port status: Location of the display elements of Port group II on the device (front side of the device)

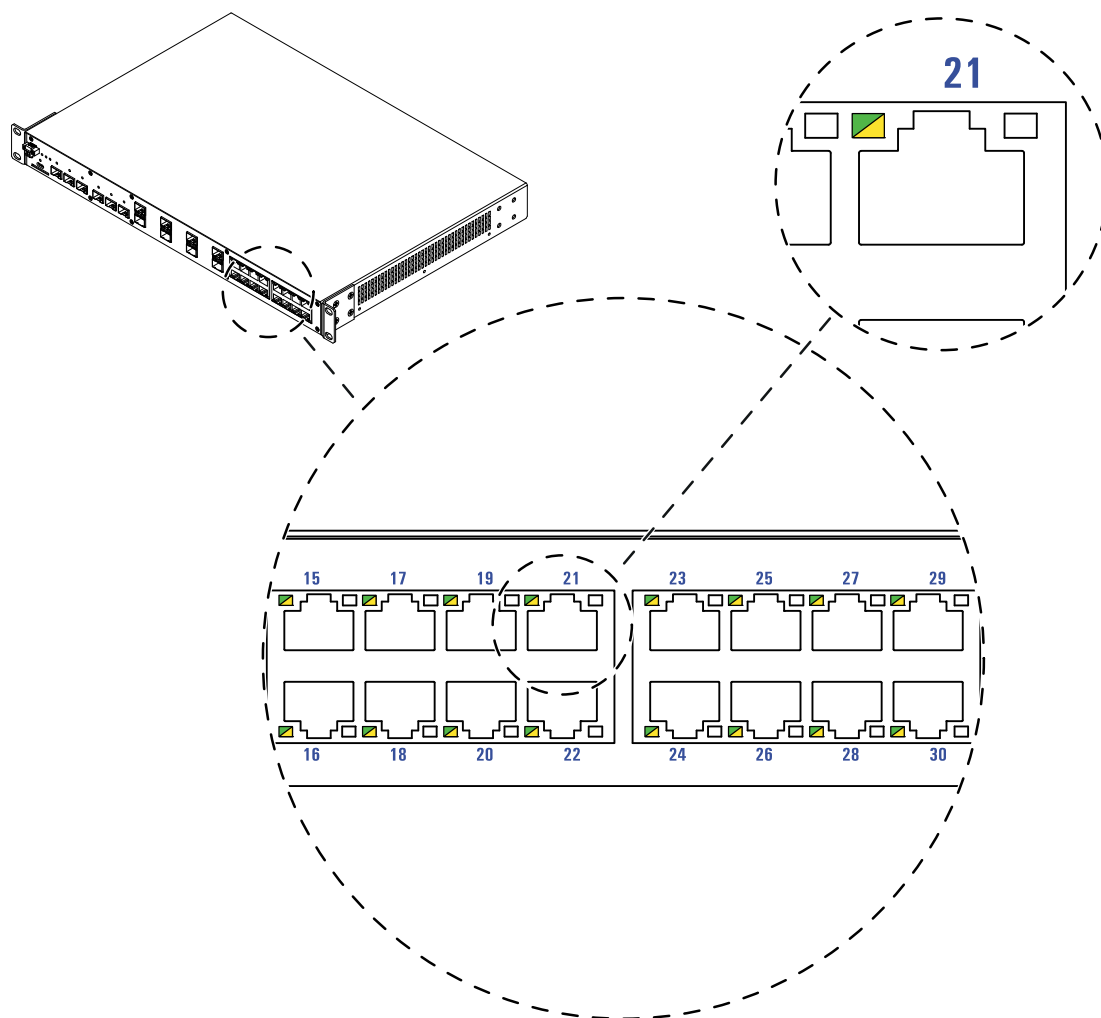


Figure 11: Port status: Location of the display elements of Port group III on the device (front side of the device)

These LEDs provide port-related information.

Display	Color	Activity	Meaning
Link status	–	none	Device detects an invalid or missing link
	green	lights up	Device detects a valid link
		flashes 1 × a period	Port is switched to stand-by
	yellow	lights up	Device detects an unsupported SFP or a data rate mismatch
		flashing	Device is transmitting and/or receiving data

## 6 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 work steps to install the device:

- ☐ [Checking the package contents](#)
- ☐ [Installing the SD card \(optional\)](#)
- ☐ [Installing an SFP transceiver \(optional\)](#)
- ☐ [Installing the device](#)
- ☐ [Grounding the device](#)
- ☐ [Connecting the terminal blocks](#)
- ☐ [Connecting data cables](#)
- ☐ [Filling out the inscription label](#)

**Note:** Note the safety instructions in [“Requirements for connecting electrical wires”](#) on page 12.

### 6.1 Checking the package contents

- ☐ Check whether the package includes each item named in the section [“Scope of delivery”](#) on page 73.
- ☐ Check the individual parts for transport damage.

## 6.2 Installing the SD card (optional)

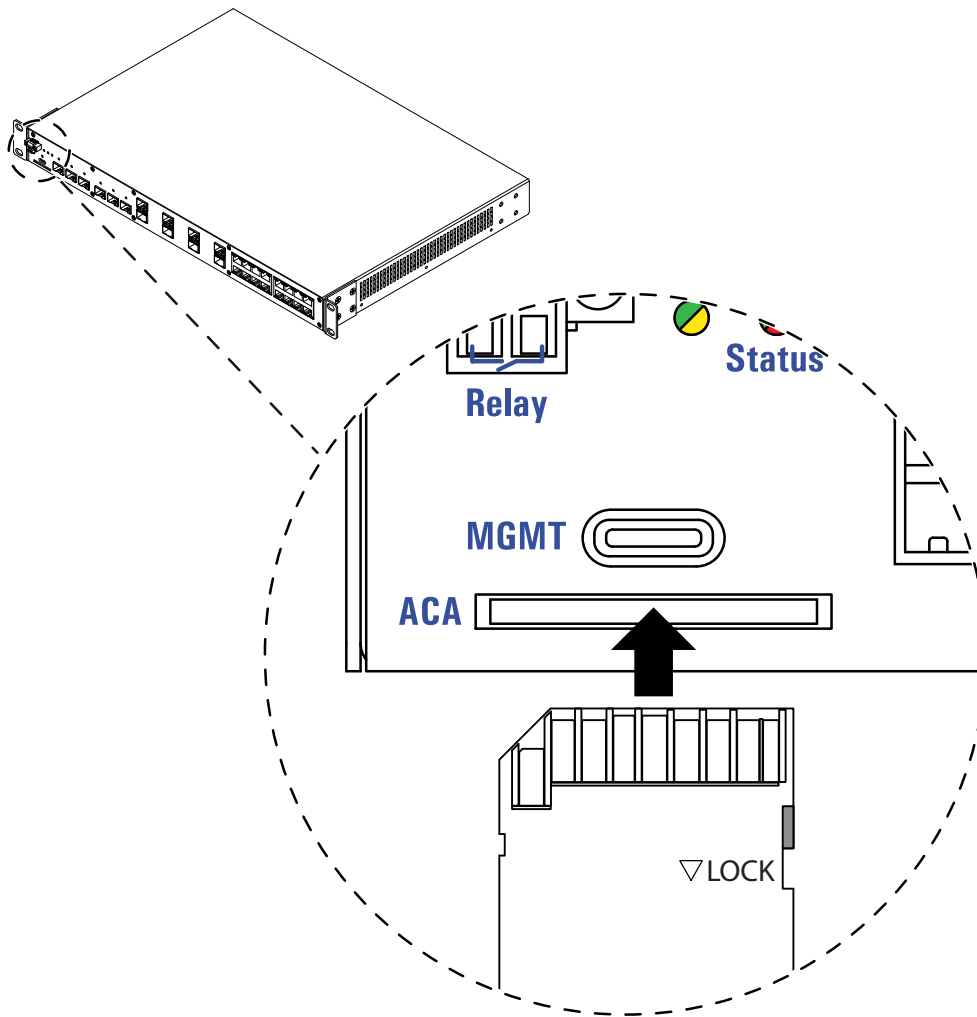


Figure 12: SD card interface: Location on the device (front side of the device)

Perform the following work steps:

- ☐ Deactivate the write protection on the SD card by pushing the write-protect lock towards the contacts of the card.
- ☐ Push the SD card into the slot with the beveled corner on the front left side.



## 6.3 Installing an SFP transceiver (optional)

### Prerequisites:

Exclusively use Hirschmann SFP transceivers.

See [“Accessories” on page 73](#).

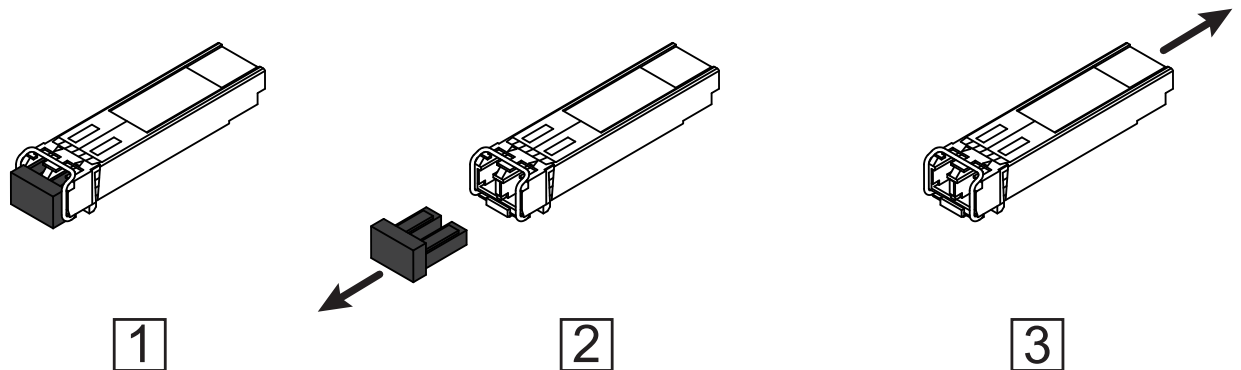


Figure 13: Installing SFP transceivers: Installation sequence

### 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).

## 6.4 Installing the device



### WARNING

#### ELECTRIC SHOCK

Exclusively install this device in a switch cabinet or in a restricted access location according to 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.**

### ■ Selecting the assembly location

Select the assembly location according to the safety guidelines ([see on page 8 “General safety instructions”](#)).

When selecting the assembly location, also make sure the following requirements are met:

- ▶ The assembly location can be accessed for maintenance and repair work.
- ▶ The LED display elements are clearly visible.
- ▶ Twisted pair cables are at a sufficient distance from potential sources of electrical interference, such as power supply cables.
- ▶ The device has a separate power source with a ground connection. The power supply can be interrupted by means of a separate isolator or power switch. We recommend using overvoltage protection for every device.

### ■ Mounting on a flat surface

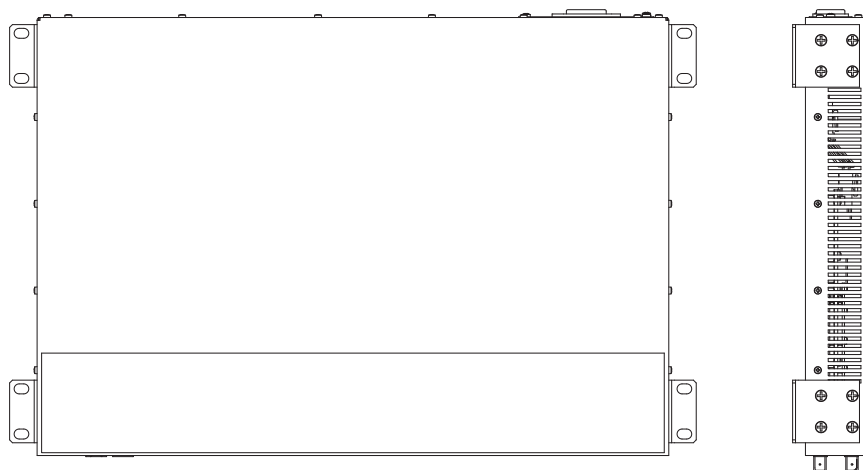


Figure 14: Mounting on a flat surface

- ☐ Remove the screws on the pre-installed mounting brackets.
- ☐ Move the 2 pre-installed mounting brackets on the front side into the position shown in [figure 14](#).

- ☐ Use the screws to secure the mounting brackets on the device.
- ☐ Additionally attach 2 brackets to the rear of the device as shown in [figure 14](#).  
You obtain the additional brackets as accessories.  
[See “Accessories” on page 73.](#)
- ☐ Fasten the device by screwing the brackets to the flat surface.  
Completely screw the device to the flat surface using screws through each mounting hole. Exclusively use screws suitable for the installation and application case to ensure flawless operation of the device.

**Note:** The device may be used as desktop device.

### ■ **Mounting vertically on a flat surface**

**Note:** Optionally, the device can be rotated by 90° to optimize ventilation: Mount the device on a vertical flat surface with the ventilation slits at the top and bottom of the device. [See figure 15.](#)

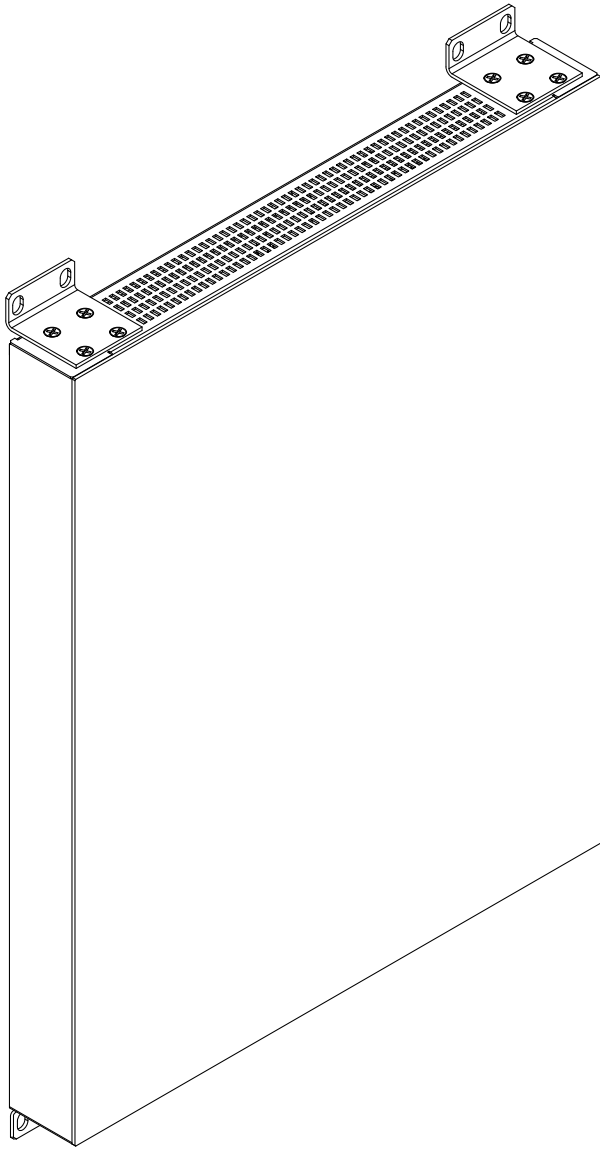


## **WARNING**

### **FIRE HAZARD**

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

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



*Figure 15: Mounting vertically on a flat surface: Optional mounting on a vertical flat surface.*

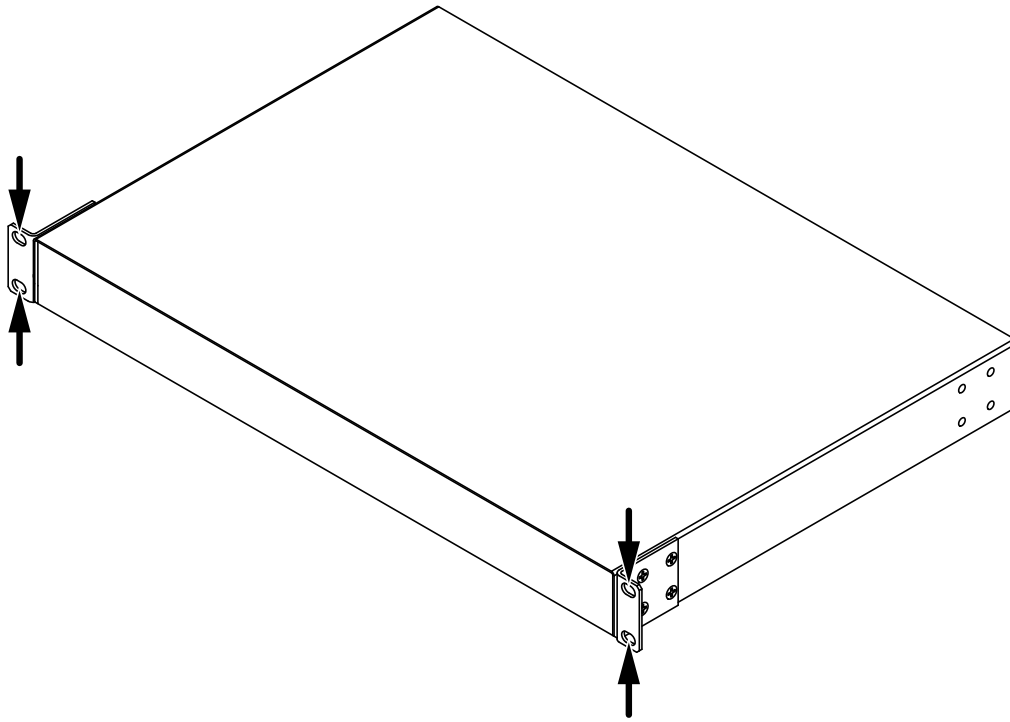
## ■ Mounting in a switch cabinet

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

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

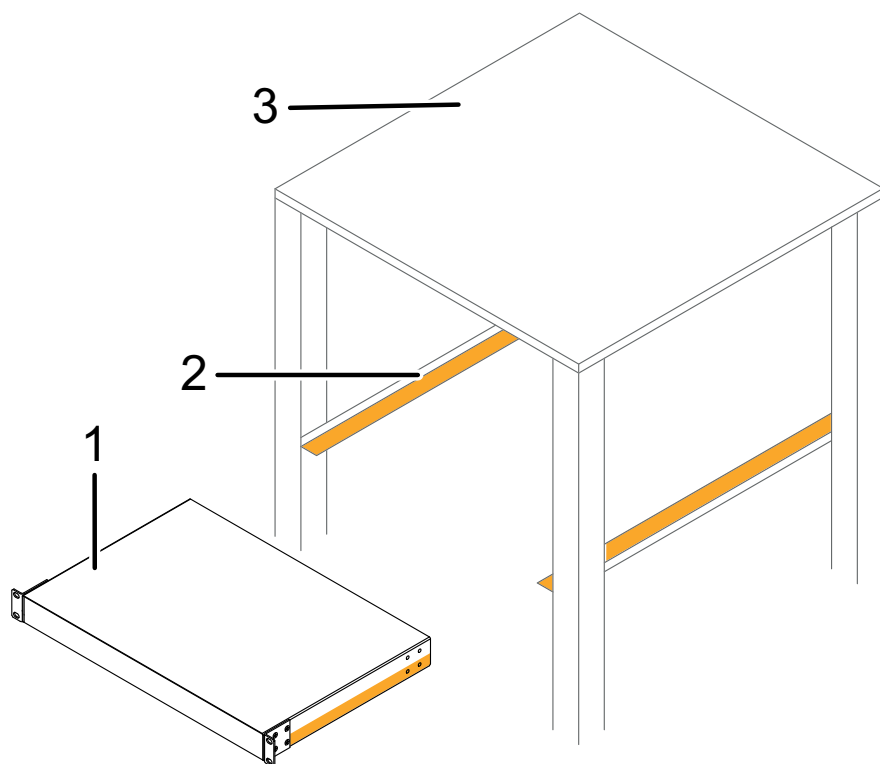
For more information on sliding/mounting rails and how to install them, please contact your switch cabinet manufacturer.

The devices are designed to be mounted in a 19" switch cabinet. In the delivery state, there are 2 pre-mounted mounting brackets on the sides of the device.



*Figure 16: Mounting in a switch cabinet: Mounting brackets with oblong holes*

- ☐ 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" switch cabinet so that all the lines to be connected can be fed in easily.



*Figure 17: Mounting in a switch cabinet: 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 by screwing the brackets to the switch cabinet.

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

## 6.5 Grounding the device



### WARNING

#### ELECTRIC SHOCK

Ground the device on the power supply unit with a grounding screw.

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

The power supply variants with characteristic value M9, MM, ML, G9, GG, and GL have a connection for protective grounding.

The power supply variants with characteristic value L9 and LL have a connection for functional grounding.

- ☐ Ground the device via a ground screw on the ground connection on the left side.

You find the prescribed tightening torque in chapter:

[“General technical data” on page 61](#)

**Note:** The power supply variants containing characteristic value G or M are grounded via the power supply connection and additionally via a ground screw.

## 6.6 Connecting the terminal blocks



### WARNING

#### ELECTRIC SHOCK

Connect only a supply voltage that corresponds to the type plate of your device.

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



### WARNING

#### ELECTRIC SHOCK

Never insert pointed objects (narrow screwdrivers, wires, etc.) into the device or into the connection terminals for electric conductors.  
Do not touch the connection terminals.

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

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

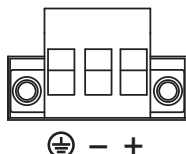
### 6.6.1 Supply voltage characteristic value M

You will find information on the characteristic values here:

[“Device name and product code” on page 21](#)


You have the option of supplying the supply voltage redundantly, with load distribution.

Both supply voltage inputs are electrically isolated.



*Figure 18: Supply voltage with characteristic value M: 3-pin terminal block with screw lock*



Type of the voltages that can be connected	Specification of the supply voltage	Pin assignment	
DC voltage	Rated voltage range 110 V DC ... 250 V DC Voltage range incl. maximum tolerances 88 V DC ... 288 V DC	+	Plus terminal of the supply voltage
		-	Minus terminal of the supply voltage
			Protective conductor

*Table 14: Supply voltage with characteristic value M: type and specification of the supply voltage, pin assignment on the device*

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

- ☐ Remove the terminal block from the device.
- ☐ Connect the wires according to the pin assignment on the device with the clamps.
- ☐ Fasten the wires in the terminal block by tightening the terminal screws.

You find the prescribed tightening torque in chapter:  
[“General technical data” on page 61](#)

## 6.6.2 Supply voltage characteristic value L

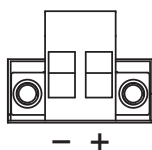
Exclusively supply your device with SELV/ES1 voltage.

You will find information on the characteristic values here:

[“Device name and product code” on page 21](#)

You have the option of supplying the supply voltage redundantly, with load distribution.

Both supply voltage inputs are electrically isolated.



*Figure 19: Supply voltage with characteristic value L: 2-pin terminal block with screw lock*

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

*Table 15: Supply voltage with characteristic value L: type and specification of the supply voltage, pin assignment on the device*

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

- ☐ Remove the terminal block from the device.
- ☐ Connect the wires according to the pin assignment on the device with the clamps.
- ☐ Fasten the wires in the terminal block by tightening the terminal screws.  
You find the prescribed tightening torque in chapter:  
[“General technical data” on page 61](#)

### 6.6.3 Signal contact

- ☐ Connect the signal contact lines with the terminal block connections.
- ☐ Fasten the wires in the terminal block by tightening the terminal screws.  
You find the prescribed tightening torque in chapter:  
[“General technical data” on page 61](#)

## 6.7 Connecting data cables

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

- ☐ Keep the length of the data cables as short as possible.
- ☐ Use optical data cables for data transmission between buildings.
- ☐ When using copper cables, provide 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. Exclusively use shielded data cables to meet EMC requirements according to EN 50121-4 and marine applications.
- ☐ Connect the data cables according to your requirements.  
[See “Ethernet ports” on page 28.](#)

**Note:** Verify that you connect only optical ports with the same optical transmission properties with each other.

## **6.8 Filling out the inscription label**

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

## 7 Operating the device



### 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.**

**Note:** Note the safety instructions in [“Requirements for connecting electrical wires” on page 12](#).

Perform the following work steps:

- ☐ Plug the non-heating-appliance cables into the device and a socket with an appropriate power source (supply voltage characteristic value G) and/or screw the terminal blocks onto the device (supply voltage characteristic value M or L).

You find the prescribed tightening torque in chapter:

[“General technical data” on page 61](#)

- ☐ Enable the supply voltage.

## 8 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.

When you install the device for the first time enter the IP parameters.

The device provides the following options for entering the IP parameters during the first installation:

- ▶ Configuration via DHCP (state on delivery)
- ▶ Input via the USB-C interface
- ▶ 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**

<https://www.hirschmann.com/en/QR/INET-HiView>

### **Industrial HiVision**

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

- ▶ Configuration via BOOTP
- ▶ Configuration via DHCP (Option 82)
- ▶ AutoConfiguration Adapter ACA31

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

### 8.1 Default settings

The device looks for the IP address using DHCP

- ▶ Management password:
  - user, password: public (read only)
  - admin, password: private (read and write)
- ▶ USB-C data rate: 115200 Baud
- ▶ Ring redundancy disabled
- ▶ Ethernet ports: link status is not evaluated (signal contact)
- ▶ Optical 1000 Mbit/s ports: 1000 Mbit/s full duplex
- ▶ Other ports: Autonegotiation
- ▶ Redundancy manager disabled
- ▶ Standby coupling disabled
- ▶ Port 3 = control port, Port 4 = coupling port for redundant ring coupling
- ▶ Rapid Spanning Tree enabled

## 8.2 First login (Password change)

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

Perform the following work 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.

For further information see:

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

## 9 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.  
[See “Technical data” on page 61.](#)
- ☐ Relays are subject to natural wear. This wear depends on the frequency of the switching operations. Check the resistance of the closed relay contacts and the switching function depending on the frequency of the switching operations.
- ☐ Hirschmann is continually working on improving and developing their software. Check regularly whether there is an updated version of the software that provides you with additional benefits. You find information and software downloads on the Hirschmann product pages on the Internet (<https://www.hirschmann.com>).
- ☐ Internal fuses are triggered only in the case of a detected error in the device. In case of damage or malfunction of the device, turn off the supply voltage and return the device to the plant for inspection.
- ☐ Depending on the pollution degree in the operating environment, check at regular intervals that the ventilation slots in the device are not obstructed.

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

## 10 Monitoring the ambient air temperature

Exclusively operate the device within the specified ambient air temperature range.

See [“General technical data” on page 61](#).

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 and the GUI 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.



# 11 Monitoring the ambient humidity

Exclusively operate the device within the specified ambient humidity range. See “General technical data” on page 61.

The humidity in the device is measured by an internal humidity sensor. The measurements of the sensor may vary depending on the installation conditions of the device, for example the distance from other devices or other objects, and the thermal output of neighboring devices.

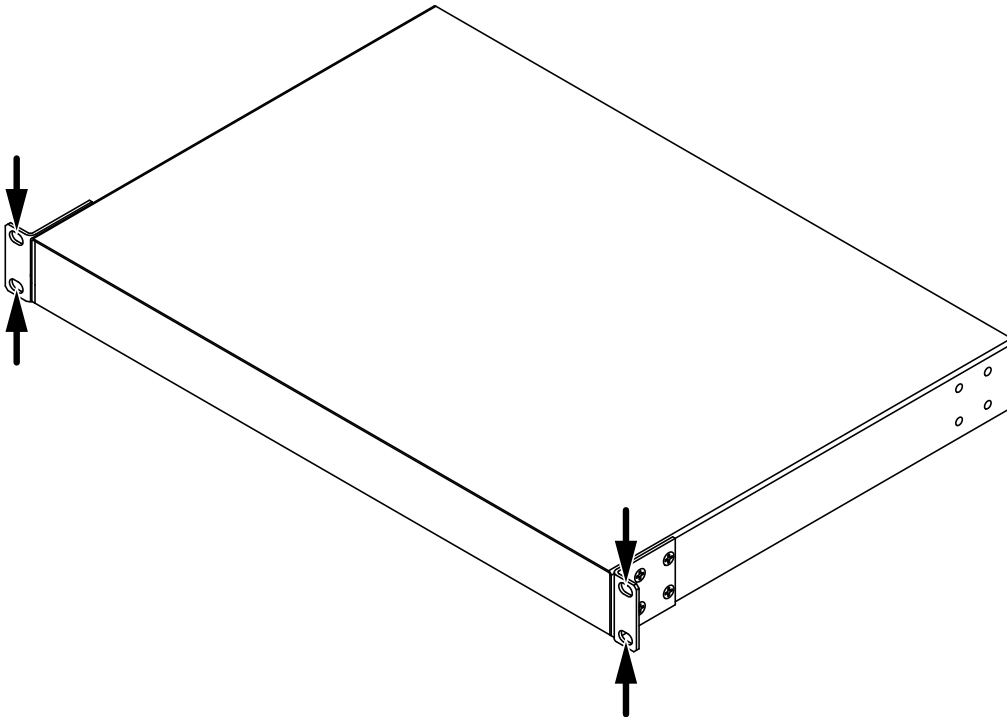
The measured humidity is displayed in the CLI and the GUI of the device. The measured humidity is a guideline that indicates to you whether the rated humidity thresholds were reached or possibly have been exceeded.

For more information refer to the software user manuals. You can download these manuals as PDF files from the Internet on the Hirschmann product pages (<https://www.doc.hirschmann.com>).

# 12 Disassembly

## 12.1 Removing the device

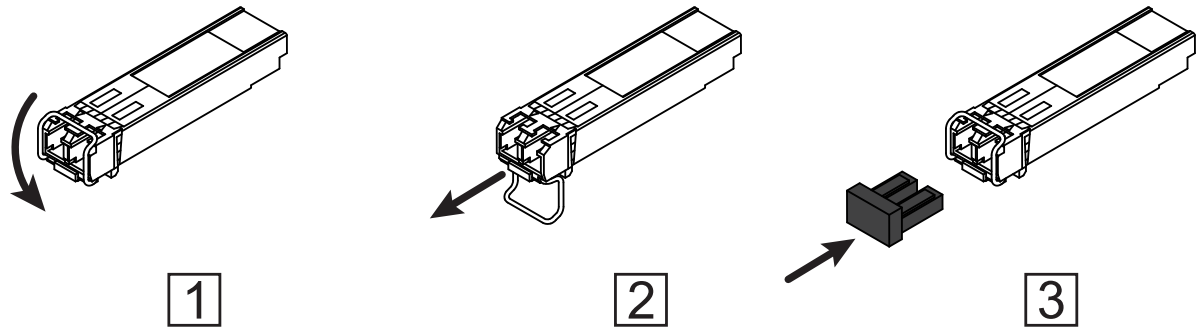
- ☐ Disconnect the data cables.
- ☐ Disable the supply voltage.
- ☐ Disconnect the supply voltage.
- ☐ Remove any terminal blocks and power supply cables from the device.



*Figure 20: Removing the device: Mounting brackets with oblong holes*

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

## 12.2 Removing an SFP transceiver (optional)



*Figure 21: Removing an SFP transceiver: Removal 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).

## 12.3 Removing the SD card (optional)

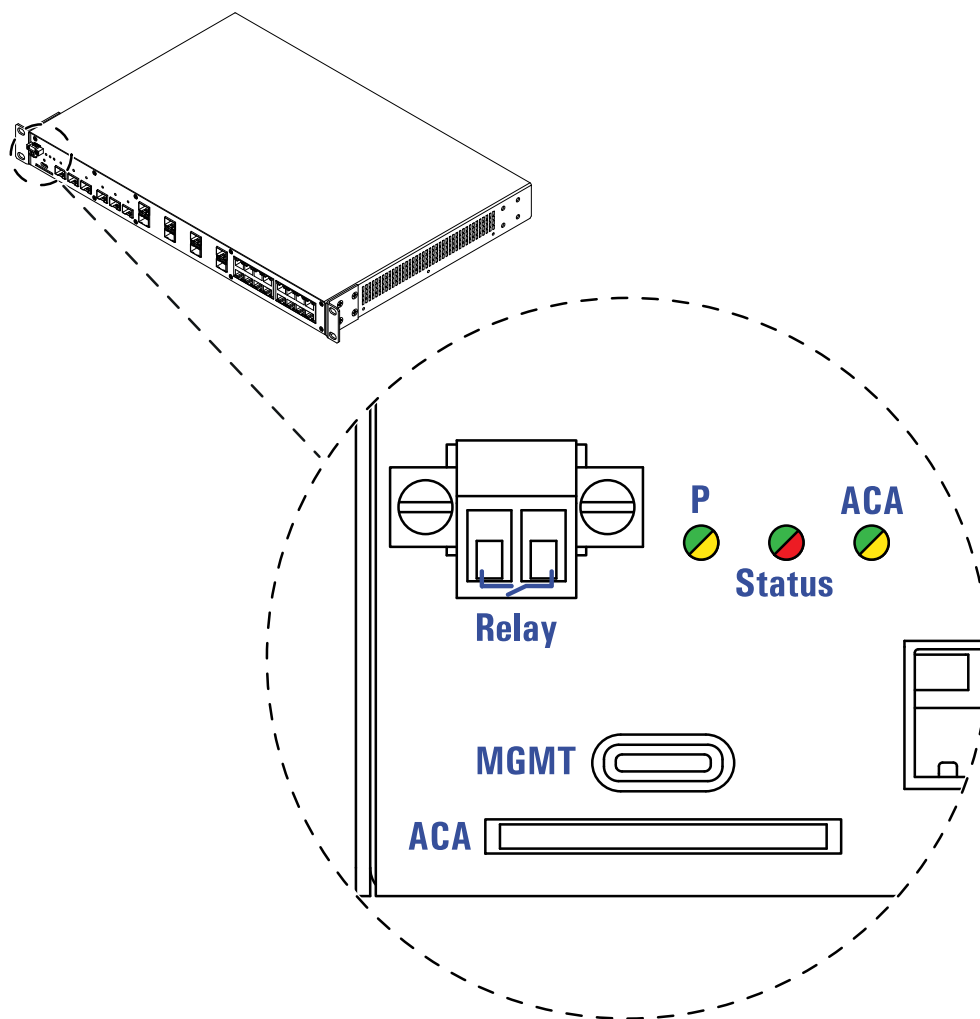


Figure 22: SD card interface: Location on the device (front side of the device)

Perform the following work steps:

- ☐ Pull the SD card out of the SD card slot.

# 13 Technical data

## 13.1 General technical data

Dimensions	See <a href="#">“Dimension drawings” on page 64.</a>	
Weight	GRS105/GRS106 with 1 Power supply unit	4.7 kg (10.36 lb)
	GRS105/GRS106 with 2 Power supply units	5.1 kg (11.24 lb)
Pollution degree	2	
Protection classes	Laser protection	Class 1 according to IEC 60825-1
	Degree of protection	IP30
Ground connection	Screw type	M3
	Tightening torque	0.34 Nm (3 lb-in)
	Minimum conductor diameter	0.75 mm <sup>2</sup> (AWG18)

Table 16: General technical data

## 13.2 Supply voltage

Power supply unit with supply voltage characteristic value G	Nominal voltage	110 V AC ... 240 V AC, 50 Hz ... 60 Hz	
	Voltage range incl. maximum tolerances	88 V AC ... 276 V AC	
	Connection type	Built-in non-heating-appliance connection (built-in C14 plug according to IEC 60320-1)	
		Minimum conductor diameter	0.75 mm <sup>2</sup> (AWG18)
		Maximum conductor diameter	2.5 mm <sup>2</sup> (AWG12)
	Power loss buffer	110 V AC: >26 ms 230 V AC: >140 ms	
	Back-up fuse for each voltage input	Nominal rating:	20 A
		Characteristic:	slow blow
	Overload current protection on the device	Non-replaceable fuse	
	Peak inrush current	<5 A	

Table 17: Supply voltage

Power supply unit with supply voltage characteristic value M	Nominal voltage	110 V DC ... 250 V DC	
	Voltage range incl. maximum tolerances	88 V DC ... 288 V DC	
	Connection type	3-pin terminal block	
	Tightening torque	0.5 Nm (4.4 lb-in)	
	min. conductor diameter	1 mm <sup>2</sup> (AWG16)	
	max. conductor diameter	2.5 mm <sup>2</sup> (AWG12)	
	Power loss buffer	110 V AC: >11 ms 250 V AC: >82 ms	
	Back-up fuse for each voltage input	Nominal rating:	20 A
		Characteristic:	slow blow
	Overload current protection on the device	Non-replaceable fuse	
Power supply unit with supply voltage characteristic value L	Peak inrush current	<5 A	
	Nominal voltage	24 V DC ... 48 V DC	
	Voltage range incl. maximum tolerances	16.8 V DC ... 60 V DC	
	Connection type	2-pin terminal block	
	Tightening torque	0.34 Nm (3 lb-in)	
	min. conductor diameter	1 mm <sup>2</sup> (AWG16)	
	max. conductor diameter	1.3 mm <sup>2</sup> (AWG16)	
	Power loss buffer	20.4 V DC: >25 ms	
	Back-up fuse for each voltage input	Nominal rating:	6.3 A
		Characteristic:	slow blow
	Overload current protection on the device	Non-replaceable fuse	
	Peak inrush current	<7 A	

Table 17: Supply voltage

## 13.3 Power consumption/power output

Name	Maximum power consumption	Maximum power output
GRS105-...	31 W	107 Btu (IT)/h
GRS106-...	32 W	110 Btu (IT)/h

Table 18: Power consumption/power output

## 13.4 Signal contact

Signal contact		
Nominal value	Switching current	max. 2 A, SELV/ES1
	Switching voltage	max. 30 V DC or max. 30 V AC, SELV/ES1

Table 19: Signal contact

Signal contact	
Connection type	2-pin terminal block
Tightening torque	0.34 Nm (3 lb-in)
Minimum conductor diameter	0.08 mm <sup>2</sup> (AWG28)
Maximum conductor diameter	2.5 mm <sup>2</sup> (AWG12)

Table 19: Signal contact

## 13.5 Climatic conditions during operation

Climatic conditions during operation	
Ambient air temperature <sup>a</sup>	-10 °C ... +60 °C (+14 °F ... +140 °F)
Maximum internal air temperature <sup>b</sup>	+65 °C (+149 °F)
Humidity	5 % ... 95 % (non-condensing)
Air pressure	min. 600 hPa (+4000 m/+13123 ft ASL), max. 1060 hPa (-400 m/-1312 ft ASL)

Table 20: Climatic conditions during operation

- a. Temperature of the ambient air at a distance of 5 cm (2 in) from the device.
- b. Temperature measured by the temperature sensor within the device.

## 13.6 Climatic conditions during storage

Climatic conditions during storage	
Ambient air temperature	-10 °C ... +60 °C (+14 °F ... +140 °F)
Humidity	5 % ... 90 % (non-condensing)
Air pressure	min. 600 hPa (+4000 m/+13123 ft ASL), max. 1060 hPa (-400 m/-1312 ft ASL)

Table 21: Climatic conditions during storage

## 13.7 Dimension drawings

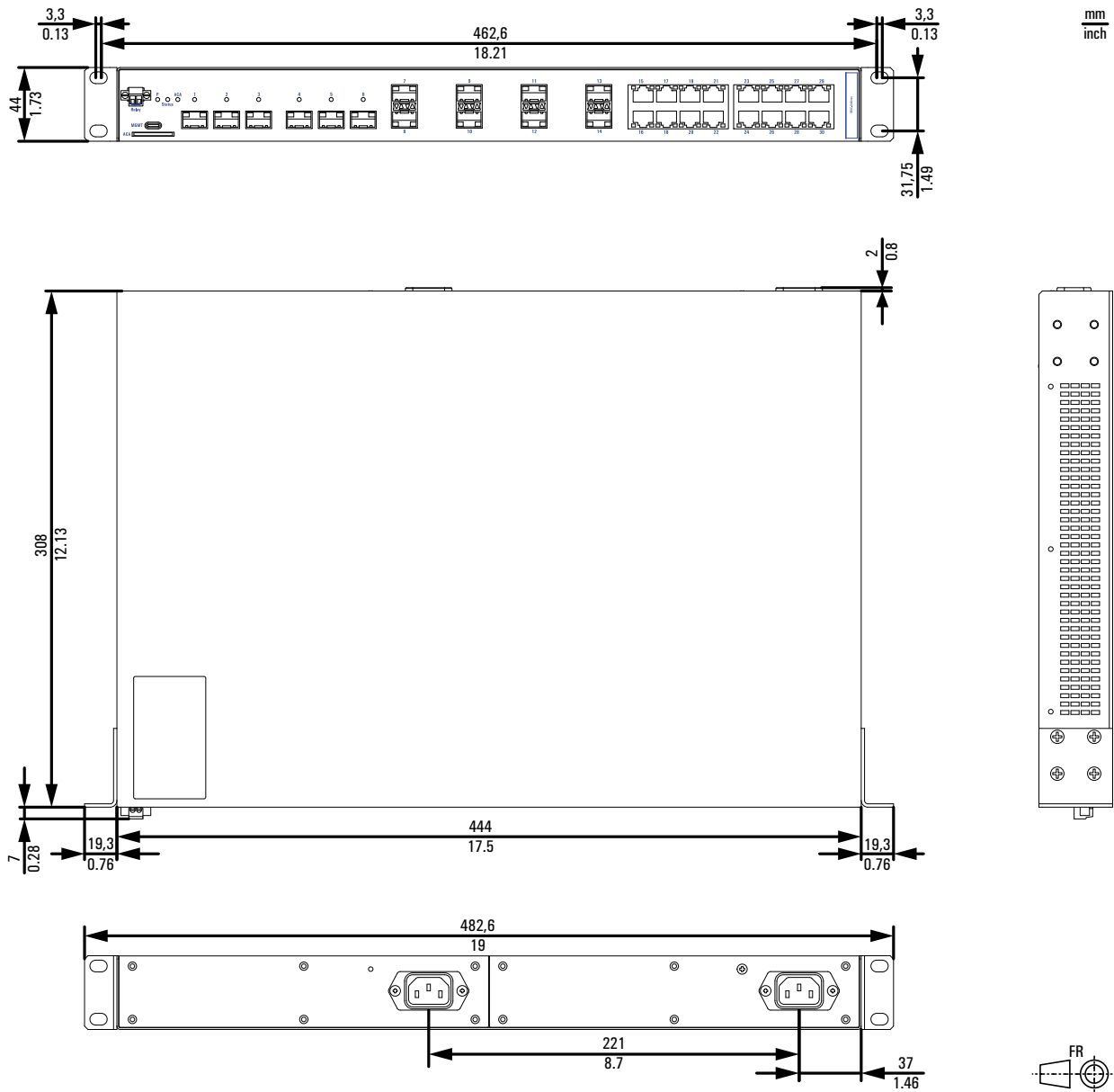


Figure 23: Dimension drawings: Dimensions for GRS105/GRS106 device variants  
(Example: GRS106-6F8F16TSGG...)



## 14 EMC and immunity

EMC interference emission		Standard applications	Railway applications (trackside)
EN 55032	Class A	Fulfilled	Fulfilled
FCC 47 CFR Part 15	Class A	Fulfilled	Fulfilled
EN 61000-6-4		Fulfilled	Fulfilled

Table 22: EMC and immunity: EMC interference emission

EMC interference immunity		Standard applications <sup>a</sup>	Railway applications (trackside) <sup>b</sup>
<b>Electrostatic discharge</b>			
EN 61000-4-2	Contact discharge	±4 kV	±6 kV
EN 61000-4-2	Air discharge	±8 kV	±8 kV
<b>Electromagnetic field</b>			
EN 61000-4-3	80 MHz ... 6000 MHz	max. 10 V/m	max. 20 V/m
<b>Fast transients (burst)</b>			
EN 61000-4-4	Supply voltage connection	±2 kV	±2 kV
EN 61000-4-4	Data line	±4 kV	±2 kV
<b>Voltage surges - AC supply connection</b>			
EN 61000-4-5	line/ground	±2 kV	±2 kV
EN 61000-4-5	line/line	±1 kV	±1 kV
<b>Voltage surges - data line</b>			
EN 61000-4-5	line/ground	±1 kV	±2 kV
<b>Conducted disturbances</b>			
EN 61000-4-6	150 kHz ... 80 MHz	10 V	10 V

Table 23: EMC and immunity: EMC interference immunity

a. According to EN 61000-6-2.

b. According to EN 50121-4.

Immunity		Standard applications	Railway applications (trackside)
IEC 60068-2-6, test Fc	Vibration	5 Hz ... 8.4 Hz with 0.14 in (3.5 mm) amplitude	—
		8.4 Hz ... 150 Hz with 1 g	—
IEC 60068-2-27, test Ea	Shock	15 g at 11 ms	—

*Table 24: EMC and immunity: Immunity*

## 15 Network range

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

### 15.1 10/100/1000 Mbit/s twisted pair port

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

*Table 25: Network range: 10/100/1000 Mbit/s twisted pair port*

### 15.2 100/1000/2500 Mbit/s twisted pair port

100/1000/2500 Mbit/s twisted pair port	
Length of a twisted pair segment	max. 100 m (328 ft) (for Cat5e cable)

*Table 26: Network range: 100/1000/2500 Mbit/s twisted pair port*

## 15.3 Gigabit Ethernet SFP transceiver

Product code	Mode <sup>a</sup>	Wave length	Fiber	System attenuation	Example for F/O line length <sup>b</sup>	Fiber attenuation	BLP/Dispersion
M-SFP-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
M-SFP-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
M-SFP-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
M-SFP-MX/LC...	MM	1310 nm	62.5/125 μm	0 dB ... 12 dB	0 km ... 50 km (0 mi ... 31.06 mi)	1.0 dB/km	500 MHz×km
M-SFP-LX/LC...	MM	1310 nm <sup>c</sup>	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
M-SFP-LX/LC...	MM	1310 nm <sup>d</sup>	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
M-SFP-LX/LC...	SM	1310 nm	9/125 μm	0 dB ... 10.5 dB	0 km ... 20 km (0 mi ... 12.43 mi) <sup>e</sup>	0.4 dB/km	3.5 ps/(nm×km)
M-SFP-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)
M-SFP-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)
M-SFP-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)
M-SFP-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)
M-SFP-LH+/LC EEC	LH	1550 nm	9/125 μm	13 dB ... 32 dB	62 km ... 116 km (38.52 mi ... 72.07 mi)	0.25 dB/km	19 ps/(nm×km)
M-SFP-LH+/LC EEC	LH	1550 nm	9/125 μm	13 dB ... 32 dB	62 km ... 138 km (38.52 mi ... 85.75 mi)	0.21 dB/km (typically)	19 ps/(nm×km)

Table 27: F/O port 1000BASE-FX (SFP fiber optic Gigabit Ethernet Transceiver)

Product code	Mode <sup>a</sup>	Wave length	Fiber	System attenuation	Example for F/O line length <sup>b</sup>	Fiber attenuation	BLP/Dispersion
SFP-GIG-LX/LC...	MM	1310 nm <sup>f</sup>	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
SFP-GIG-LX/LC...	MM	1310 nm <sup>g</sup>	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
SFP-GIG-LX/LC...	SM	1310 nm	9/125 µm	0 dB ... 10.5 dB	0 km ... 20 km (0 mi ... 12.43 mi) <sup>h</sup>	0.4 dB/km	3.5 ps/(nm×km)

Table 27: 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. With F/O adapter compliant with IEEE 802.3-2002 Clause 38 (single-mode fiber offset-launch mode conditioning patch cord).
- d. With F/O adapter compliant with IEEE 802.3-2002 Clause 38 (single-mode fiber offset-launch mode conditioning patch cord).
- e. Including 2.5 dB system reserve when compliance with the fiber data is observed.
- f. With F/O adapter compliant with IEEE 802.3-2002 Clause 38 (single-mode fiber offset-launch mode conditioning patch cord).
- g. With F/O adapter compliant with IEEE 802.3-2002 Clause 38 (single-mode fiber offset-launch mode conditioning patch cord).
- h. Including 2.5 dB system reserve when compliance with the fiber data is observed.

## 15.4 Bidirectional Gigabit Ethernet SFP transceiver

Product code	Mode <sup>a</sup>	Wave length TX	Wave length RX	Fiber	System attenuation	Example for F/O line length <sup>b</sup>	Fiber attenuation	BLP/Dispersion
M-SFP-BIDI 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)
M-SFP-BIDI 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)
M-SFP-BIDI 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)

Table 28: F/O port (bidirectional Gigabit Ethernet SFP transceiver)

Product code	Mode <sup>a</sup>	Wave length TX	Wave length RX	Fiber	System attenuation	Example for F/O line length <sup>b</sup>	Fiber attenuation	BLP/Dispersion
M-SFP-BIDI 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)
SFP-GIG-BA LX/LC EEC	SM	1310 nm	1550 nm	9/125 µm	0 dB ... 15 dB	0 km ... 20 km (0 mi ... 12.43 mi)	0.4 dB/km	3.5 ps/(nm×km)
SFP-GIG-BB LX/LC EEC	SM	1550 nm	1310 nm	9/125 µm	0 dB ... 15 dB	0 km ... 20 km (0 mi ... 12.43 mi)	0.25 dB/km	19 ps/(nm×km)
SFP-GIG-BA LX+/LC EEC	SM	1310 nm	1550 nm	9/125 µm	3 dB ... 20 dB	12 km ... 40 km (7.45 mi ... 24.86 mi)	0.4 dB/km	3.5 ps/(nm×km)
SFP-GIG-BB LX+/LC EEC	SM	1550 nm	1310 nm	9/125 µm	3 dB ... 20 dB	12 km ... 40 km (7.45 mi ... 24.86 mi)	0.25 dB/km	19 ps/(nm×km)
SFP-GIG-BA LH/LC EEC	LH	1490 nm	1550 nm	9/125 µm	4 dB ... 24 dB	19 km ... 80 km (11.80 mi ... 49.71 mi)	0.25 dB/km	19 ps/(nm×km)
SFP-GIG-BB LH/LC EEC	LH	1550 nm	1490 nm	9/125 µm	4 dB ... 24 dB	19 km ... 80 km (11.80 mi ... 49.71 mi)	0.25 dB/km	19 ps/(nm×km)

*Table 28: 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.

## 15.5 2.5 Gigabit Ethernet SFP transceiver

Product code	Mode <sup>a</sup>	Wave length	Fiber	System attenuation	Example for F/O line length <sup>b</sup>	Fiber attenuation	BLP/Dispersion
M-SFP-2.5-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)
M-SFP-2.5-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)
M-SFP-2.5-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)
M-SFP-2.5-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)
M-SFP-2.5-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)
M-SFP-2.5-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)
M-SFP-2.5-LH/LC	LH	1551 nm	9/125 µm	14 dB ... 28 dB	80 km (49.71 mi) <sup>c</sup>	0.25 dB/km	19 ps/(nm×km)

Table 29: F/O port 2.5 Gbit/s (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. 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 59 mi (95 km).

## 15.6 10 Gigabit Ethernet SFP+ transceiver

Product code	Mode <sup>a</sup>	Wave length	Fiber	System attenuation	Example for F/O line length <sup>b</sup>	Fiber attenuation	BLP/dispersion
M-SFP-10-SR/LC EEC	MM	850 nm	50/125 µm	0 dB ... 8.1 dB	0.066 km (0.041 mi)	3 dB/km	400 MHz×km
M-SFP-10-SR/LC EEC	MM	850 nm	50/125 µm	0 dB ... 8.1 dB	0.082 km (0.051 mi)	3 dB/km	500 MHz×km (OM2)
M-SFP-10-SR/LC EEC	MM	850 nm	50/125 µm	0 dB ... 8.1 dB	0.3 km (0.186 mi)	3 dB/km	2000 MHz×km (OM3)

Table 30: F/O port 10 Gbit/s (SFP+ fiber optic Gigabit Ethernet transceiver)

Product code	Mode <sup>a</sup>	Wave length	Fiber	System attenuation	Example for F/O line length <sup>b</sup>	Fiber attenuation	BLP/dispersion
M-SFP-10-SR/LC EEC	MM	850 nm	50/125 µm	0 dB ... 8.1 dB	0.4 km (0.25 mi)	3 dB/km	4700 MHz×km (OM4)
M-SFP-10-SR/LC EEC	MM	850 nm	62.5/125 µm	0 dB ... 8.1 dB	0.026 km (0.016 mi)	3.2 dB/km	160 MHz×km
M-SFP-10-SR/LC EEC	MM	850 nm	62.5/125 µm	0 dB ... 8.1 dB	0.033 km (0.021 mi)	3.2 dB/km	200 MHz×km (OM1)
M-SFP-10-LR/LC EEC	SM	1310 nm	9/125 µm	0 dB ... 7.4 dB	10 km (6.21 mi)	0.4 dB/km	3.5 ps/(nm×km)
M-SFP-10-ER/LC EEC	LH	1550 nm	9/125 µm	3 dB ... 15 dB	10 km ... 40 km (6.21 mi ... 24.86 mi)	0.25 dB/km	19 ps/(nm×km)
M-SFP-10-ZR/LC	LH	1550 nm	9/125 µm	11 dB ... 22 dB	40 km ... 80 km (24.86 mi ... 49.71 mi)	0.25 dB/km	19 ps/(nm×km)

*Table 30: F/O port 10 Gbit/s (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.

## 15.7 DAC cables

The maximum cable length of a DAC cable corresponds to its maximum network range.

Product code	Cable length	Maximum network range
SFP-10-DAC-05m (Direct Attach Copper)	0.5 m (1.64 ft)	0.5 m (1.64 ft)
SFP-10-DAC-1m (Direct Attach Copper)	1 m (3.28 ft)	1 m (3.28 ft)
SFP-10-DAC-2m (Direct Attach Copper)	2 m (6.56 ft)	2 m (6.56 ft)
SFP-10-DAC-4m (Direct Attach Copper)	4 m (13.12 ft)	4 m (13.12 ft)

*Table 31: Network range: DAC cables*



## 16 Scope of delivery

Amount	Article
1 ×	GRS105/GRS106 device
1 ×	2-pin terminal block for signal contact
1 ×	General safety instructions and information sheet
2 ×	Mounting bracket (pre-mounted)
Exclusively for devices with supply voltage characteristic value M: 1 × or 2 × (depending on device variant)	3-pin terminal block for power supply
Exclusively for devices with supply voltage characteristic value L: 1 × or 2 × (depending on device variant)	2-pin terminal block for power supply

## 17 Order numbers

GRS105/GRS106 device	Order number
GRS105-...	942 287-999
GRS106-...	942 287-999
GRS105-24TX/6SFP-1HV-2A	942 287-001
GRS105-24TX/6SFP-2HV-2A	942 287-002
GRS105-24TX/6SFP-2HV-3A	942 287-003
GRS105-16TX/14SFP-1HV-2A	942 287-004
GRS105-16TX/14SFP-2HV-2A	942 287-005
GRS105-16TX/14SFP-2HV-3A	942 287-006
GRS106-24TX/6SFP-1HV-2A	942 287-007
GRS106-24TX/6SFP-2HV-2A	942 287-008
GRS106-24TX/6SFP-2HV-3A	942 287-009
GRS106-16TX/14SFP-1HV-2A	942 287-010
GRS106-16TX/14SFP-2HV-2A	942 287-011
GRS106-16TX/14SFP-2HV-3A	942 287-012

## 18 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

<b>Gigabit Ethernet SFP transceiver</b>	<b>Order number</b>
M-SFP-SX/LC	943 014-001
M-SFP-SX/LC EEC	943 896-001
M-SFP-MX/LC EEC	942 108-001
M-SFP-LX/LC	943 015-001
M-SFP-LX/LC EEC	943 897-001
M-SFP-LX+/LC	942 023-001
M-SFP-LX+/ LC EEC	942 024-001
M-SFP-LH/LC	943 042-001
M-SFP-LH/LC EEC	943 898-001
M-SFP-LH+/LC	943 049-001
M-SFP-LH+/LC EEC	942 119-001
SFP-GIG-LX/LC <sup>a</sup>	942 196-001
SFP-GIG-LX/LC EEC <sup>a</sup>	942 196-002

a. You will find further information on certifications on the Internet on the Hirschmann product pages (<https://www.hirschmann.com>).

<b>Bidirectional Gigabit Ethernet SFP transceiver</b>	<b>Order number</b>
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
SFP-GIG-BA LX/LC EEC <sup>a</sup>	942 207-001
SFP-GIG-BB LX/LC EEC <sup>a</sup>	942 207-002
SFP-GIG-BA LX+/LC EEC <sup>a</sup>	942 208-001
SFP-GIG-BB LX+/LC EEC <sup>a</sup>	942 208-002
SFP-GIG-BA LH/LC EEC <sup>a</sup>	942 209-001
SFP-GIG-BB LH/LC EEC <sup>a</sup>	942 209-002

a. You will find further information on certifications on the Internet on the Hirschmann product pages (<https://www.hirschmann.com>).

<b>2.5 Gigabit Ethernet SFP transceiver (applies exclusively to the basic device)</b>	<b>Order number</b>
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

<b>10 Gigabit Ethernet SFP+ transceiver (only applies to the basic device)</b>	<b>Order number</b>
M-SFP-10-SR/LC-EEC	942 210-001
M-SFP-10-LR/LC-EEC	942 211-001
M-SFP-10-ER/LC-EEC	942 212-001

<b>10 Gigabit Ethernet SFP+ transceiver (only applies to the basic device)</b>	<b>Order number</b>
M-SFP-10-ZR/LC	942 213-001
SFP-10-DAC-05m (Direct Attach Copper)	942 280-001
SFP-10-DAC-1m (Direct Attach Copper)	942 280-002
SFP-10-DAC-2m (Direct Attach Copper)	942 280-003
SFP-10-DAC-4m (Direct Attach Copper)	942 280-004

<b>Other accessories</b>	<b>Order number</b>
AutoConfiguration Adapter ACA31	942 074-001
Network management software Industrial HiVision	943 156-xxx
Bracket for fastening the casing (2 pcs.)	943 943-001
Bracket, long (+50 mm/1.97 in), for fastening the casing (2 pcs.)	943 943-101
Non-heating-appliance cable (Euro model)	942 271-001
2-pin terminal block (50 pieces)	943 845-010
2-pin terminal block with screw lock (50 pieces)	943 845-009
3-pin High Voltage Interlock terminal block (50 pcs.)	943 845-008
Protection cap for RJ45 socket (50 pieces)	943 936-001
Protection cap for SFP slot (25 pieces)	943 942-001

# 19 Underlying technical standards

Name	
EN 55032	Electromagnetic compatibility of multimedia equipment – Emission Requirements
FCC 47 CFR Part 15	Code of Federal Regulations
IEC/EN 62368-1	Equipment for audio/video, information and communication technology - Part 1: safety requirements
IEEE 802.1D	MAC Bridges (switching function)
IEEE 802.1Q	Virtual LANs (VLANs, MRP, Spanning Tree)
IEEE 802.1w	Rapid Reconfiguration
IEEE 802.3	Ethernet
UL 62368-1	Standard for audio/video, information and communication technology - Part 1: safety requirements
IEC 60825-1	Laser product safety
EN 50121-4	Railway applications – EMC – Emission and immunity of the signaling and telecommunications apparatus (Rail Tracksides)
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

*Table 32: 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.

You will find out whether your device has other approvals on the Hirschmann website under <https://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 <https://www.hirschmann.com>.

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

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

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