



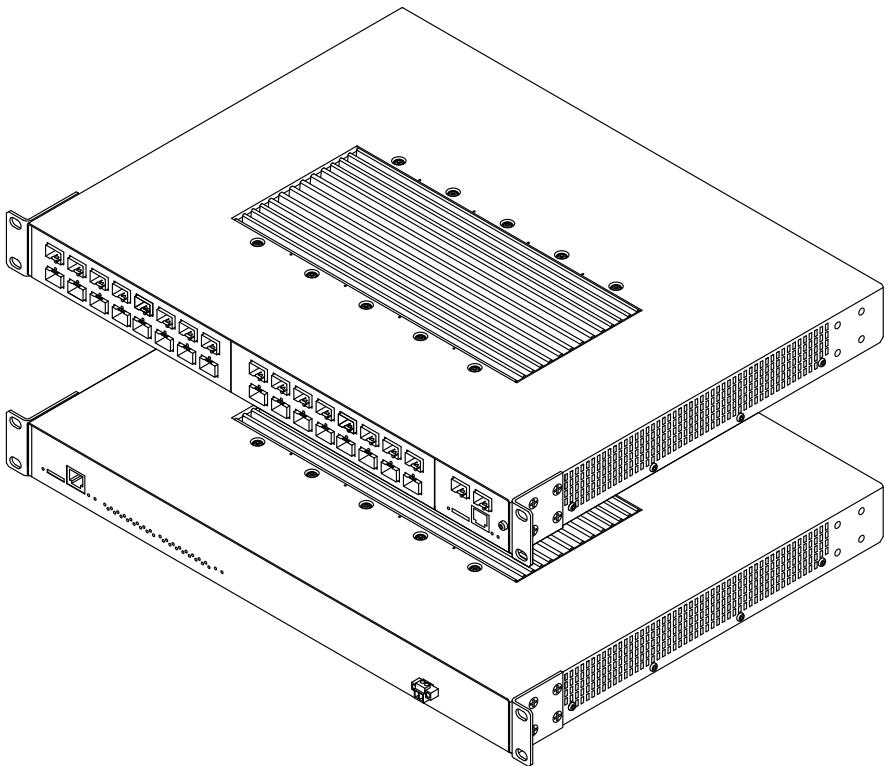
HIRSCHMANN
A **BELDEN** BRAND

User Manual

Installation

GREYHOUND Switch

GRS2000/GRS2100



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You can get the latest version of this manual on the Internet at:

<https://www.doc.hirschmann.com>

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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 “Installation” user manual that is not supplied with your device as a printout can be found at:

<https://www.doc.hirschmann.com>

The Network Management Software Industrial HiVision provides you with options for smooth configuration and monitoring. You find further information at:
<https://www.belden.com/products/industrial-networking-cybersecurity/software-solutions/network-management-software/industrial-hivision-network-management-software>

Important information

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.

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 do not involve the risk of injury.

Symboles d'avertissement



Il s'agit d'un symbole d'avertissement général. Ce symbole vous avertit des risques potentiels de blessures. Respectez les consignes accompagnant ce symbole afin d'éviter toute blessure ou accident mortel.



La présence de ce symbole sur une étiquette "Danger" ou "Avertissement" signale un risque d'électrocution qui provoquera des blessures physiques en cas de non-respect des consignes de sécurité.



Ce symbole indique le risque de surfaces chaudes sur l'équipement. En relation avec les consignes de sécurité, le non-respect des instructions entraînera inévitablement des blessures.

DANGER



DANGER indique une situation immédiatement dangereuse qui, si elle n'est pas évitée, entraînera la mort ou des blessures graves.

AVERTISSEMENT



AVERTISSEMENT indique une situation potentiellement dangereuse et susceptible d'entraîner la mort ou des blessures graves.

ATTENTION



ATTENTION indique une situation potentiellement dangereuse et susceptible d'entraîner des blessures d'ampleur mineure à modérée.

AVIS

AVIS indique des pratiques n'entraînant pas de risques corporels.

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1. Safety instructions

 WARNING	
	<p>UNCONTROLLED MACHINE ACTIONS Failure to follow these instructions can result in death, serious injury, or equipment damage.</p> <p>To avoid uncontrolled machine actions caused by data loss, configure all the data transmission devices individually.</p> <p>Before you start any machine which is controlled via data transmission, be sure to complete the configuration of all data transmission devices.</p>

 AVERTISSEMENT	
	<p>ACTIONS INCONTRÔLÉES DE LA MACHINE Le non-respect de ces instructions peut entraîner la mort, des blessures graves ou des dommages matériels.</p> <p>Pour éviter les actions incontrôlées de la machine causées par la perte de données, configurez tous les équipements de transmission de données individuellement.</p> <p>Avant de démarrer une machine commandée par transmission de données, veillez à terminer la configuration de tous les équipements de transmission de données.</p>

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.

- Verify that the electrical installation meets local or nationally applicable safety regulations.
- 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.
- If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

1.1. 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.

1.2. Intended use

- Use the product only for the application cases described in the Hirschmann Automation and Control GmbH product information, including this manual.
- Operate the product only according to the technical specifications, see [General data on page 80](#).
- Connect to the product only components suitable for the requirements of the specific application case.

1.3. 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 in [General data on page 80](#).

1.4. Device casing

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

- Never insert sharp objects (small screwdrivers, wires, or similar items) into connectors or device openings.
- Keep the ventilation slits and cooling fins clear to ensure good air circulation.
- Make sure there is at least 5 cm (2 in) of space in front of the ventilation slits and cooling fins of the casing.
- Mount the device horizontally or vertically in a switch cabinet (see [Mounting in a switch cabinet on page 58](#)) or on a flat surface (see [Mounting on a flat surface on page 55](#)).
- Exclusively use Hirschmann mounting brackets to fix the device in place.
- Exclusively use the provided screws when you reposition the attached mounting brackets or install additional mounting brackets.

You obtain additional brackets as accessories, see [Accessories on page 99](#).

1.5. 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.

1.6. Electrical connections

1.6.1. Grounding the device

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

The device is grounded via 1 separate grounding screw. The grounding screw is located next to the power supply connection on the front or rear side of the device, depending on device variant.

- Ground the device before connecting any other cables.
- Disconnect the grounding only after disconnecting all other cables.

1.6.2. Shielding ground

The overall shield of connectable twisted pair cables is connected to the ground connection of the device casing as a conductor.

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

1.6.3. General requirements for connecting electrical wires

Before connecting the electrical wires, **ALWAYS** verify that the requirements listed are complied with. The following requirements apply without restriction:

- The cables used are permitted for the temperature range of the application case.



Relevant for North America: Exclusively use +60/75 °C (+140/167 °F or +75 °C (+167 °F) copper wire (Cu wire).



Important pour l'Amérique du Nord : N'utilisez que des câbles en cuivre de +60/75 °C ou +75 °C.

1.6.4. General requirements for connecting the supply voltage

Before connecting the supply voltage, **ALWAYS** verify that the requirements listed are complied with. The following requirements apply without restrictions:

- The supply voltage corresponds to the voltage specified on the type plate of the device.
- The power supply cable is suitable for the required voltage, current, and physical load.
- The cross-section of the ground conductor is the same size as or larger than the cross-section of the power supply cables.
- The power supply conforms to overvoltage category I or II.
- The power supply conforms to NEC Class 2.
- The power supply has an easily accessible disconnecting device (for example a switch or a plug). This disconnecting device is clearly labelled and identifiable, so that in case of an emergency it is clear which power supply the disconnecting device belongs to.
- The power supply is potential-free.

DC voltage power supply:

- The device is rated for DC voltage.
- The conductor cross-section of the power supply cable is at least 1 mm² (16 AWG) on the supply voltage input of the device.
- A back-up fuse suitable for DC voltage is installed in **EVERY** plus conductor of the power supply.
- **EVERY** minus conductor is on ground potential. Otherwise, an additional back-up fuse is installed in **EVERY** minus conductor. Regarding the properties of this back-up fuse, see [General data on page 80](#).

AC voltage power supply:

- The device is rated for AC voltage.
- The conductor cross-section of the power supply cable is at least 0.75 mm² (18 AWG) on the supply voltage input of the device.
- A back-up fuse suitable for AC voltage is installed in **EVERY** outer conductor of the power supply.

1.6.5. 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 restriction:

- The connected voltage source is limited by a current limitation device or a fuse.
- The electrical threshold values for the signal contact are observed.

For more information, see [Signal contact on page 82](#).

1.7. LED or laser components

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

CLASS 1 LASER PRODUCT

CLASS 1 LED PRODUCT



Warning: Class 1 laser product according to IEC 60825-1:2014 and EN 0825-1:2014 + A11:2021.

Complies with 21 CFR 1040.10 and 1040.11 except for conformance with IEC 60825-1 Ed. 3., as described in "Laser Notice No. 56", dated May 8, 2019.

Avertissement : Produit laser de classe 1 selon les normes CEI 60825-1:2014 et EN 0825-1:2014 + A11:2021.
Conforme aux normes 21 CFR 1040.10 et 1040.11, à l'exception de la conformité à la norme CEI 60825-1 Éd. 3., comme décrit dans le document « Laser Notice No. 56 » du 8 mai 2019.

1.8. Recycling note



The symbol of a crossed-out wheeled bin shown on the device indicates that the device **MUST NOT** be disposed of with household waste at the end of its service life.

After its service life, the used device must be disposed of properly as electronic waste in accordance with the locally applicable disposal regulations.

End users are responsible for deleting personal data from the used device prior to disposal.

End users are obliged to separate used batteries and accumulators that are not enclosed by the used device from the used device in a non-destructive manner before disposing of the used device. The used batteries and accumulators must be handed in for separate collection. This does not apply if the used device is handed in for reuse.

2. Approvals

2.1. 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 available to the relevant authorities at the following address:

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

You can download the PDF file of the EU conformity declaration at: <https://www.doc.hirschmann.com/certificates.html>

The device can be used in industrial environments.

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

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

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.

Avertissement : Ce produit est un équipement de la classe A. À ce titre, il peut provoquer des perturbations radioélectriques dans les habitations. Dans ce cas, l'exploitant peut être tenu de procéder aux mesures appropriées.

2.2. FCC note

Supplier's Declaration of Conformity

47 CFR § 2.1077 Compliance Information

GRS2000/GRS2100

U.S. Contact Information

Belden Inc. – 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. Description

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

The device 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 level characteristic value 2A, 2S, or 3A provide you with the option to set up switched Industrial Ethernet networks that conform to the IEEE 802.3 standard.

The following installation options are available:

- Horizontal mounting in a 19" switch cabinet
- Horizontal mounting on a flat surface
- Vertical mounting on a flat surface

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

- Twisted pair cable
- Multimode F/O (Fiber Optic)
- Singlemode F/O (Fiber Optic)

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)

The Network Management Software Industrial HiVision provides you with options for smooth configuration and monitoring. For more information, see <https://www.belden.com/products/industrial-networking-cybersecurity/software-solutions/network-management-software/industrial-hivision-network-management-software>.

- V.24 interface (locally on the device via MGMT management interface)

The device provides you with a large range of functions, which the Manual Collection (User and Reference Manuals) for the operating software informs you about. For more information, see <https://www.doc.hirschmann.com>.

3.1. 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.

Table 1. Device name and product code: GRS2000/GRS2100

Item	Characteristic	Characteristic value	Description
1 ... 3	Product	GRS	GREYHOUND Switch Standard
4	Series	2	GREYHOUND 2000 Series
5	Port position	0	Front: Data cable connections, Management interfaces; Rear: Power supply connections
		1	Front: Management interfaces; Rear: Data cable connections, Power supply connections
6	Data rate	2	PG 1 ... PG 4: FE ¹
		3	PG 1 ... PG 4: FE, PG 5: GE ²
		4	PG 1 ... PG 4: FE/GE, PG 5: GE ²
		5	PG 1 ... PG 4: FE/GE, PG 5: 1/2.5 GE
		6	PG 1 ... PG 4: FE/GE, PG 5: 1/2.5/10 GE
7	Technology	0	Standard
8	-	-	(hyphen)
9	Port types: PG 1 + PG 3	A	PG 1: 4 × TP + 4 × SFP, PG 3: N/A
		B	PG 1: 4 × TP + 4 × SFP, PG 3: 8 × TP
		C	PG 1: 4 × TP + 4 × SFP, PG 3: 8 × SFP
		D	PG 1: 4 × TP + 4 × SFP, PG 3: 6 × DSx ³
		E	PG 1: 8 × SFP, PG 3: N/A
		F	PG 1: 8 × SFP, PG 3: 8 × TP
		G	PG 1: 8 × SFP, PG 3: 8 × SFP
		H	PG 1: 8 × SFP, PG 3: 6 × DSx
		I	PG 1: 6 × DSx, PG 3: N/A

- Exclusively applies to data rate characteristic value 2: All port groups exclusively support connection speeds up to 100 Mbit/s (FE).
- Exclusively applies to data rate characteristic values 3 and 4: Port group 5 exclusively supports connection speeds up to 1000 Mbit/s (GE).
- The letter "x" in "DSx" functions as a placeholder for all available DS-type connectors (DSC, DST, ...).

Table 1. Device name and product code: GRS2000/GRS2100 (continued)

Item	Characteristic	Characteristic value	Description
		J	PG 1: 6 × DSx, PG 3: 8 × TP
		K	PG 1: 6 × DSx, PG 3: 6 × DSx
		L	PG 1: 8 × TP, PG 3: N/A
		M	PG 1: 8 × TP, PG 3: 8 × TP
10	F/O connections + SFPs: PG 1	0	N/A
		A	DSC: 100 Mbit/s MM
		B	DST: 100 Mbit/s MM
		C	DSC: 100 Mbit/s SM
		D	DST: 100 Mbit/s SM
		F	SFP: 100 Mbit/s MM/LC EEC
		H	SFP: 100 Mbit/s SM/LC EEC
		J	SFP: 1 Gbit/s SX/LC EEC
		L	SFP: 1 Gbit/s LX/LC EEC
11	Number of transceivers: PG 1	0	N/A
		2	2 × Pre-assembled transceivers
		4	4 × Pre-assembled transceivers
		6	6 × Pre-assembled transceivers
		8	8 × Pre-assembled transceivers
12	F/O connections + SFPs: PG 3	0	N/A
		A	DSC: 100 Mbit/s MM
		B	DST: 100 Mbit/s MM
		C	DSC: 100 Mbit/s SM
		D	DST: 100 Mbit/s SM
		F	SFP: 100 Mbit/s MM/LC EEC
		H	SFP: 100 Mbit/s SM/LC EEC
		J	SFP: 1 Gbit/s SX/LC EEC
		L	SFP: 1 Gbit/s LX/LC EEC
13	Number of transceivers: PG 3	0	N/A
		2	2 × Pre-assembled transceivers
		4	4 × Pre-assembled transceivers
		6	6 × Pre-assembled transceivers

Table 1. Device name and product code: GRS2000/GRS2100 (continued)

Item	Characteristic	Characteristic value	Description
		8	8 × Pre-assembled transceivers
14	-	-	(hyphen)
15	Port types: PG 2 + PG 4	0	PG 2: N/A, PG 4: N/A
		A	PG 2: 4 × TP + 4 × SFP, PG 4: N/A
		B	PG 2: 4 × TP + 4 × SFP, PG 4: 8 × TP
		C	PG 2: 4 × TP + 4 × SFP, PG 4: 8 × SFP
		D	PG 2: 4 × TP + 4 × SFP, PG 4: 6 × DSx
		E	PG 2: 8 × SFP, PG 4: N/A
		F	PG 2: 8 × SFP, PG 4: 8 × TP
		G	PG 2: 8 × SFP, PG 4: 8 × SFP
		H	PG 2: 8 × SFP, PG 4: 6 × DSx
		I	PG 2: 6 × DSx, PG 4: N/A
		J	PG 2: 6 × DSx, PG 4: 8 × TP
		K	PG 2: 6 × DSx, PG 4: 6 × DSx
		L	PG 2: 8 × TP, PG 4: N/A
		M	PG 2: 8 × TP, PG 4: 8 × TP
16	F/O connections + SFPs: PG 2	0	N/A
		A	DSC: 100 Mbit/s MM
		B	DST: 100 Mbit/s MM
		C	DSC: 100 Mbit/s SM
		D	DST: 100 Mbit/s SM
		F	SFP: 100 Mbit/s MM/LC EEC
		H	SFP: 100 Mbit/s SM/LC EEC
		J	SFP: 1 Gbit/s SX/LC EEC
		L	SFP: 1 Gbit/s LX/LC EEC
17	Number of transceivers: PG 2	0	N/A
		2	2 × Pre-assembled transceivers
		4	4 × Pre-assembled transceivers
		6	6 × Pre-assembled transceivers
		8	8 × Pre-assembled transceivers
18	F/O connections + SFPs: PG 4	0	N/A

Table 1. Device name and product code: GRS2000/GRS2100 (continued)

Item	Characteristic	Characteristic value	Description
		A	DSC: 100 Mbit/s MM
		B	DST: 100 Mbit/s MM
		C	DSC: 100 Mbit/s SM
		D	DST: 100 Mbit/s SM
		F	SFP: 100 Mbit/s MM/LC EEC
		H	SFP: 100 Mbit/s SM/LC EEC
		J	SFP: 1 Gbit/s SX/LC EEC
		L	SFP: 1 Gbit/s LX/LC EEC
19	Number of transceivers: PG 4	0	N/A
		A	2 × Pre-assembled transceivers
		B	4 × Pre-assembled transceivers
		C	6 × Pre-assembled transceivers
		D	8 × Pre-assembled transceivers
20	-	-	(hyphen)
21	Port types: PG 5	0	N/A
		A	PG 5: 2 × SFP
22	SFPs: PG 5	0	N/A
		J	SFP: 1 Gbit/s SX/LC EEC
		L	SFP: 1 Gbit/s LX/LC EEC
		M	SFP: 2.5 Gbit/s MM/LC EEC
		N	SFP: 2.5 Gbit/s SM/LC EEC
		P	SFP: 2.5 Gbit/s SM-/LC EEC
		Q	SFP: 10 Gbit/s SR/LC EEC
		R	SFP: 10 Gbit/s LR/LC EEC
23	Number of transceivers: PG 5	0	N/A
		2	2 × Pre-assembled transceivers
24	-	-	(hyphen)
25	Operating temperature range	S	Standard: 0 °C ... +60 °C (+32 °F ... +140 °F)
		C	Standard: 0 °C ... +60 °C (+32 °F ... +140 °F) with Conformal Coating (CC)

Table 1. Device name and product code: GRS2000/GRS2100 (continued)

Item	Characteristic	Characteristic value	Description
		T	Extended: -40 °C... +70 °C (-40 °F ... +158 °F) ⁴
		E	Extended: -40 °C ... +70 °C (-40 °F ... +158 °F) ⁴ with Conformal Coating (CC)
26	Voltage range PSU 1	K	60 V DC ... 250 V DC or 100 V AC ... 240 V AC
		F	24 V DC ... 48 V DC
27	Voltage range PSU 2	9	N/A
		K	60 V DC ... 250 V DC or 100 V AC ... 240 V AC
		F	24 V DC ... 48 V DC
28 ... 29	Approvals / Declarations	Z9	CE; FCC; EN 61131; EN 62368-1
		Y9	"Z9" + UL 62368-1
		X9	"Z9" + UL 62368-1 + UL 121201
		V9	"Z9" + IEC 61850-3, IEEE 1613
		VY	"V9" + UL 62368-1
		VU	"V9" + UL 62368-1 + DNV (GL)
		VT	"V9" + UL 62368-1 + EN 50121-4
		U9	"Z9" + DNV (GL)
		UY	"U9" + UL 62368-1
		UX	"U9" + UL 62368-1 + UL 121201
		UT	"U9" + UL 62368-1 + EN 50121-4
		T9	"Z9" + EN 50121-4
		TY	"T9" + UL 62368-1
30 ... 31	Customization	HH	Standard
		HG	GE on PG1
32	Software configuration	E	No configuration installed
		B	Diagnostic user (BDEW)
33 ... 34	Software level	2S	HiOS Layer 2 Standard
		2A	HiOS Layer 2 Advanced
		3A	HiOS Layer 3 Advanced
35 ... 36	Software packages	99	Reserved
		UR	IPv4 Unicast Routing Package

4. Under UL 62368-1, the maximum temperature is +65 °C (+149 °F)

Table 1. Device name and product code: GRS2000/GRS2100 (continued)

Item	Characteristic	Characteristic value	Description
	MR		IPv4 Multicast Routing Package

3.2. Device views

3.2.1. Front view

For the available number and types of connections and port groups on your device, check the product code in [Device name and product code on page 26](#).

Figure 1. Front view: Example of GRS2000... device variants (power supply characteristic value KK)

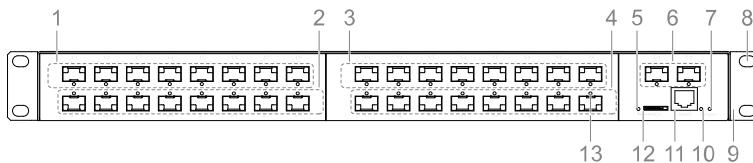


Table 2. Front view: Description of device elements - example of GRS2000... device variants (power supply characteristic value KK)

1	Port group 1 (PG 1)
2	Port group 2 (PG 2)
3	Port group 3 (PG 3)
4	Port group 4 (PG 4)
5	LED "ACA": AutoConfiguration Adapter (ACA) status
6	Port group 5 (PG 5): SFP slots/uplink
7	LED "Status": Device status
8	Oblong hole for mounting screws
9	Mounting bracket
10	LED "Power (P)": Power supply status
11	Management interface ("MGMT")
12	ACA41 interface (microSD card slot)

Table 2. Front view: Description of device elements - example of GRS2000... device variants (power supply characteristic value KK) (continued)

13 LED “[number]”: Port/Slot [number] status⁵

Figure 2. Front view: Example of GRS2100... device variants (power supply characteristic value KK)

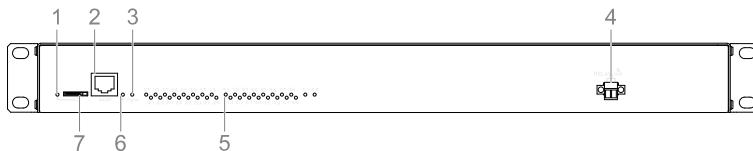


Table 3. Front view: Description of device elements - example of GRS2100... device variants (power supply characteristic value KK)

1 LED “ACA”: AutoConfiguration Adapter (ACA) status

2 Management interface (“MGMT”)

3 LED “Status”: Device status

4 Signal contact

5 LED “[number]”: Port/Slot [number] status⁶

6 LED “Power (P)": Power supply status

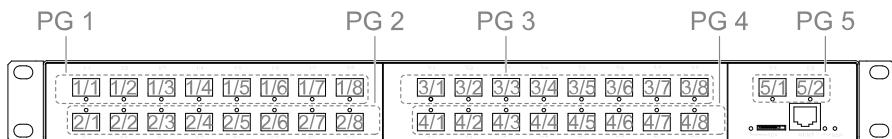
7 ACA41 interface (microSD card slot)

5. Number of display elements varies depending on device variant. For information on the available number and types of connections, see [Device name and product code on page 26](#).

6. Number of display elements varies depending on device variant. For information on the available number and types of connections, see [Device name and product code on page 26](#).

3.2.1.1. Port assignment

Table 4. Port assignment: Front view; numbering sequence identical for all device variants (exemplary)



Port	Description
1/1 ... 1/8	Port group 1 (PG 1)
2/1 ... 2/8	Port group 2 (PG 2)
3/1 ... 3/8	Port group 3 (PG 3)
4/1 ... 4/8	Port group 4 (PG 4)
5/1 ... 5/2	Port group 5 (PG 5)

3.2.2. Rear view

Figure 3. Rear view: Example of GRS2000... device variants (power supply characteristic value KK)

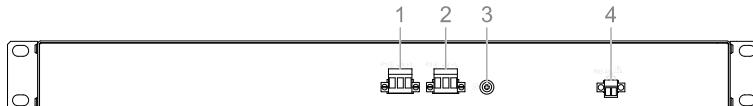


Table 5. Rear view: Description of device elements - example of GRS2000... device variants (power supply characteristic value KK)

1	Power supply connection 1 ("P1")
2	Power supply connection 2 ("P2")
3	Protective ground screw
4	Signal contact

Figure 4. Rear view: Example of GRS2100... device variants (power supply characteristic value KK)

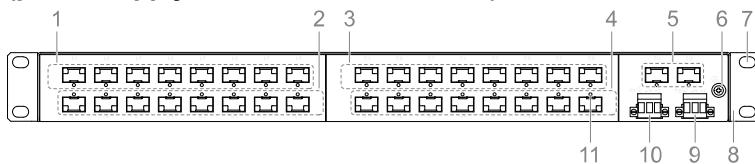


Table 6. Rear view: Description of device elements - example of GRS2100... device variants (power supply characteristic value KK)

1	Port group 1 (PG 1)
2	Port group 2 (PG 2)
3	Port group 3 (PG 3)
4	Port group 4 (PG 4)
5	Port group 5 (PG 5): SFP slots/uplink
6	Protective ground screw
7	Oblong hole for mounting screws
8	Mounting bracket
9	Power supply connection 2 ("P2")
10	Power supply connection 1 ("P1")
11	LED "[number]": Port/Slot [number] status

3.3. Power supply

The following options for power supply are available:

Figure 5. Supply voltage: Example for the supply voltage location on GRS20xx... device variants (rear side of the device)

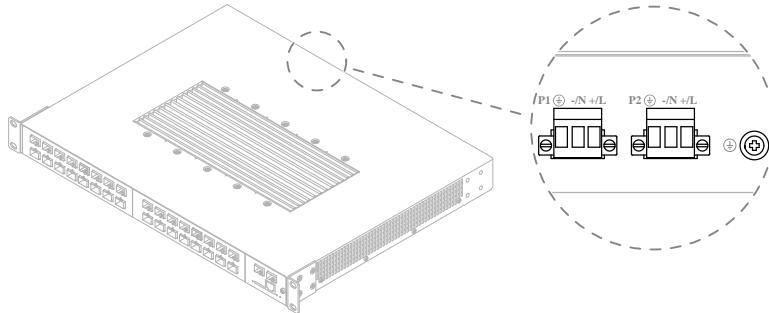
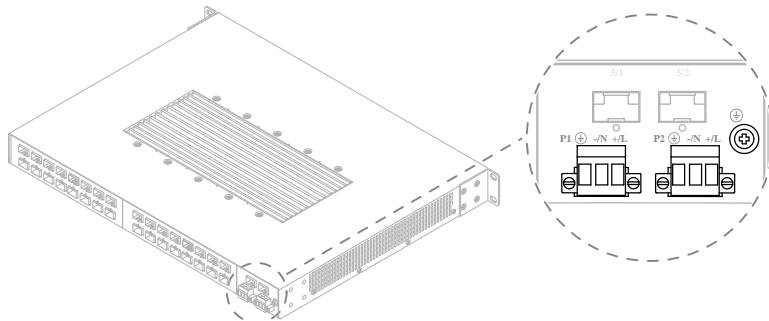


Figure 6. Supply voltage: Example for the supply voltage location on GRS21xx... device variants (rear side of the device)



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. 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.

3.3.1. Supply voltage range 24 V DC ... 48 V DC

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

Corresponds to the supply voltage characteristic value F. For more information, see [Device name and product code on page 26](#).

Figure 7. 2-pin terminal block with screw lock

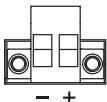


Table 7. Type and specification of the supply voltage, pin assignment on the device

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 including maximum tolerances 16.8 V DC ... 60 V DC	+ Plus terminal of the supply voltage - Minus terminal of the supply voltage

3.3.2. Description supply voltage 100 V AC ... 240 V AC (50 Hz ... 60 Hz), or 60 V DC ... 250 V DC

Corresponds to power supply characteristic value K in the product code.

This GRS2000/GRS2100 supply voltage characteristic value offers the following power supply option(s):

- 100 V AC ... 240 V AC (50 Hz ... 60 Hz) with 3-pin terminal block
- 60 V DC ... 250 V DC with 3-pin terminal block

Figure 8. Connecting supply voltage 100 V AC ... 240 V AC (50 Hz ... 60 Hz), or 60 V DC ... 250 V DC: 3-pin terminal blocks with screw lock

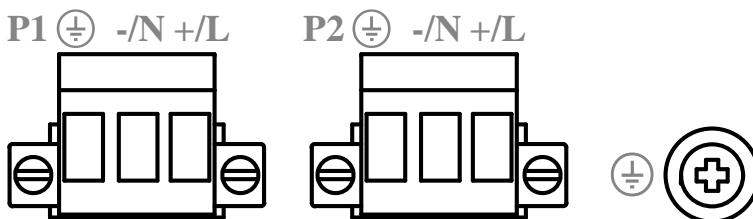


Table 8. Description supply voltage 100 V AC ... 240 V AC (50 Hz ... 60 Hz), or 60 V DC ... 250 V DC: Specifications

Type of supply voltage that can be connected	Specification of the supply voltage	Pin assignment	Meaning
AC voltage	Rated AC voltage range: 100 V AC ... 240 V AC, 50 Hz ... 60 Hz AC voltage range including maximum tolerances: 85 V AC ... 264 V AC, 47 Hz ... 63 Hz	PE	PE (Protective grounding)
		N	Neutral conductor
		L	Outer conductor (phase)
DC voltage	Rated DC voltage range: 60 V DC ... 250 V DC DC voltage range including maximum tolerances: 48 V DC ... 280 V DC	PE	PE (Protective grounding)
		+	Plus terminal of the supply voltage
		-	Minus terminal of the supply voltage

You find information on connecting the supply voltage in [Connecting the supply voltage on page 64](#).

3.4. Management Interfaces

3.4.1. Management interface MGMT (external management)

Figure 9. Management interface MGMT: Location on GRS2000... device variants (front side of the device).

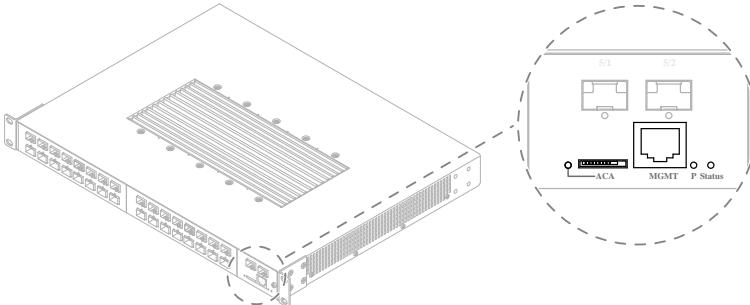
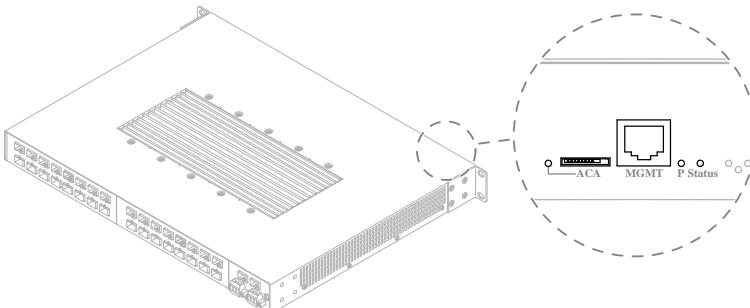


Figure 10. Management interface MGMT: Location on GRS2100... device variants (front side of the device).



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 [Accessories on page 99](#).

The interface allows you to configure, manage and check your device.

VT100 terminal settings

Speed	9600 Baud
Data	8 bit
Stopbit	1 bit

VT100 terminal settings

Handshake	off
Parity	none

3.4.1.1. ACA41 interface (microSD card)

Prerequisite:

Exclusively use Hirschmann microSD cards.

Figure 11. ACA41 interface (microSD card): Location on GRS2000... device variants (front side of the device).

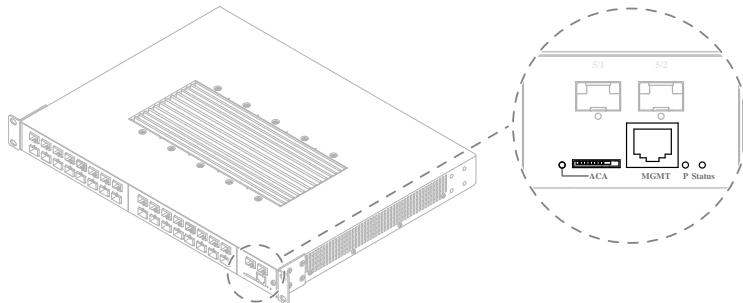
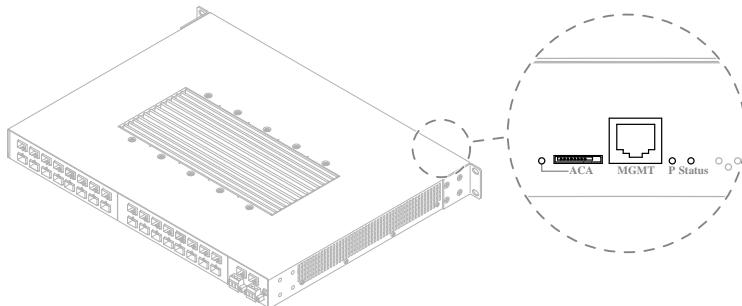


Figure 12. ACA41 interface (microSD card): Location on GRS2100... device variants (front side of the device).



The ACA41 microSD card interface allows you to connect the AutoConfiguration Adapter ACA41 storage medium. This storage medium is used for saving/loading the configuration data and diagnostic information, and for loading the software.

The LED display element next to the ACA41 microSD card interface informs you about the status of the interface.

3.5. Ethernet ports

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

Note: The port/slot speed available to you on each port group and the number of ports depends on the data rate characteristic value of your device variant and the individual types of the chosen port group(s). For more information, see item 6 in [Device name and product code on page 26](#).

3.5.1. Twisted pair port 10/100/1000 Mbit/s

This port is an RJ45 socket.

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

This port supports:

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

Delivery state: Autonegotiation activated

The port casing is electrically connected to the front panel.

The pin assignment corresponds to MDI and MDI-X mode.

Table 9. Pin assignments of the 10/100/1000 Mbit/s twisted pair port in 1000 Mbit/s mode, RJ45 socket, MDI-X mode

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-

Note: The port/slot speed available to you on each port group and the number of ports depends on the data rate characteristic value of your device variant and the individual types of the chosen port group(s). For more information, see item 6 in [Device name and product code on page 26](#).

3.5.2. F/O port 100/1000 Mbit/s

This port is an SFP slot.

The port allows you to connect network components according to standard IEEE 802.3 100BASE-FX/1000BASE-SX/1000BASE-LX.

This port supports:

- 100 Mbit/s full duplex mode
- 1000 Mbit/s full duplex mode

Delivery state:

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

Note: The F/O connection speed 100/1000 Mbit/s is **NOT** available on PG5.

Note: The port/slot speed available to you on each port group and the number of ports depends on the data rate characteristic value of your device variant and the individual types of the chosen port group(s). For more information, see item 6 in *Device name and product code on page 26*.

3.5.3. F/O port 1/2.5 Gbit/s

Note: Exclusively applies to device variants with Data rate characteristic value “5” (GRS2x50-...), PG 5.

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 2500BASE-X.

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 1 Gigabit or Fast Ethernet connections.

Note: The port/slot speed available to you on each port group and the number of ports depends on the data rate characteristic value of your device variant and the individual types of the chosen port group(s). For more information, see item 6 in the product code in *Device name and product code on page 26*.

3.5.4. F/O port 1/2.5/10 Gbit/s

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, IEEE 802.3 2500BASE-X or IEEE 802.3 (Clause 49) 10GBASE-R.

This port supports:

Full duplex mode

Delivery state:

Full duplex mode 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 10 Gigabit Ethernet SFP+ transceiver.

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

3.6. 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.

3.6.1. Device status

This LED provides information about conditions which affect the operation of the whole device.

Figure 13. Device status: Example for LED display element location on GRS2000... device variants (front side of the device)

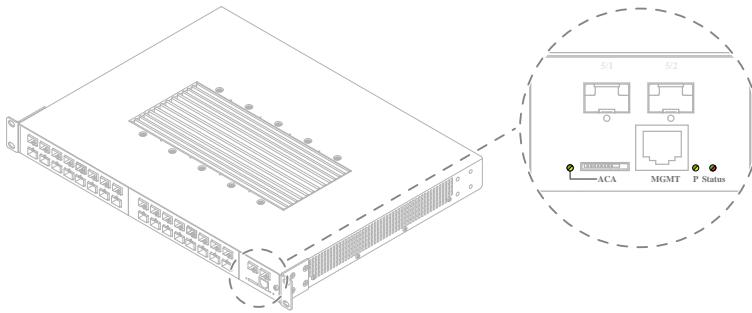


Figure 14. Device status: Example for LED display element location on GRS2100... device variants (front side of the device)

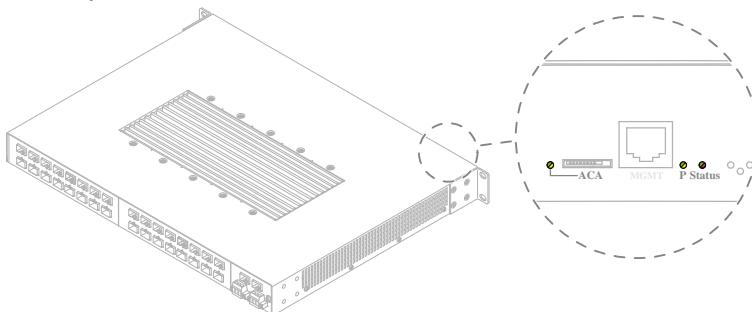


Table 10. Power LED: Color, activity and meaning

Color	Activity	Meaning
none	none	Supply voltage is too low or not available
yellow	lights up	Device variants with redundant power #supply Supply voltage 1 or 2 is on
yellow	flashes 4 x a period	Software update is running. Maintain the power supply
green	lights up	Device variants with redundant power #supply: Supply voltage 1 and 2 is on
green	lights up	Device variants with single power supply Supply voltage is on

Table 11. Status LED: Color, activity and meaning

Color	Activity	Meaning
none	none	Device is starting and/or is not ready for operation
red	lights up	Device is ready for operation Device has detected at least one error in the monitoring results
red	flashes 1 x a period	The boot parameters used when the device has been started differ from the boot parameters saved. Start the device again.
red	flashes 4 x a period	Device has detected duplicate IP address
red/ green	flashes alternately	Device is in recovery mode
green	lights up	Device is ready for operation Characteristics can be configured

Table 12. ACA LED: Color, activity and meaning

Color	Activity	Meaning
none	none	ACA storage medium not connected
yellow	lights up	ACA is not ready for operation
green	lights up	ACA storage medium connected
green	flashes 3 x a period	Device writes to/reads from the storage medium

3.6.2. Port status

Port status display elements provide port-related information.

Figure 15. Port status: Example for LED display element location on GRS2000... device variants (front side of the device)

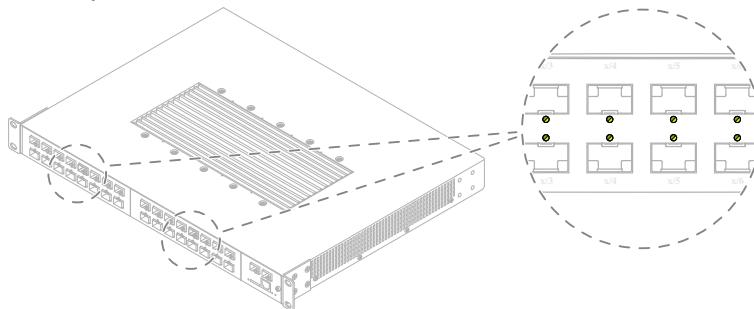
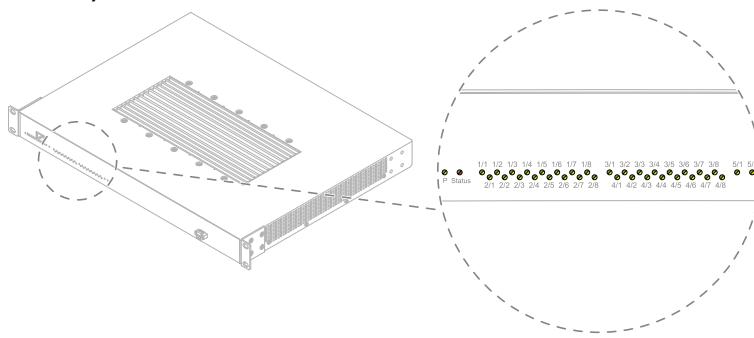


Figure 16. Port status: Example for LED display element location on GRS2100... device variants (front side of the device)



Note: Depending on the device variant, the position of the LED display elements vary. The LED display elements for PG 5 are located under the PG 5 SFP slots on the right hand side on the front of the device. For more information on the location of LED display elements, see [Device views on page 31](#).

Table 13. Port status LED: Color, activity and meaning

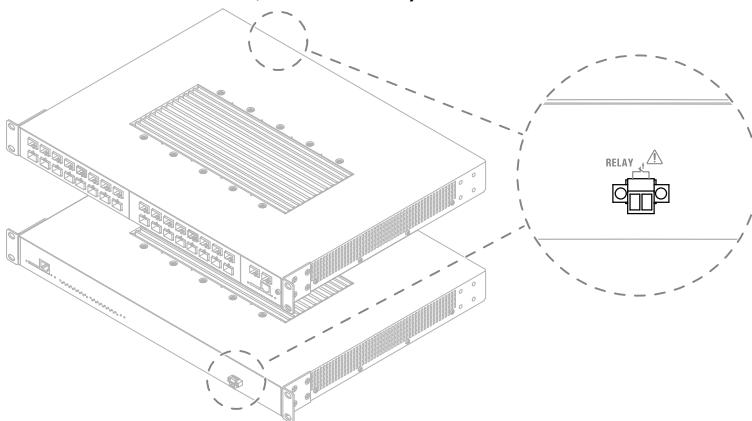
Color	Activity	Meaning
none	none	Device detects an invalid or missing link
yellow	flashing	Device is transmitting and/or receiving data
yellow	lights up	Device detects an unsupported SFP or a data rate mismatch

Table 13. Port status LED: Color, activity and meaning (continued)

Color	Activity	Meaning
green	lights up	Device detects a valid link
green	flashes 1 x a period	Port is switched to stand-by

3.7. Input/output interfaces

3.7.1. Signal contact

Figure 17. Signal contact: Location on the device (device variants GRS2000..., GRS2100...)**Table 14. Signal contact**

Signal contact		
Nominal value	Supply with AC voltage	$I_{max} = 2 \text{ A at } U_{max} = 250 \text{ V AC resistive load}$
	Supply with DC voltage	$I_{max} = 2 \text{ A at } U_{max} = 30 \text{ V DC resistive load}$ $I_{max} = 0.2 \text{ A at } U_{max} = 125 \text{ V DC}^7 \text{ resistive load}$ $I_{max} = 0.1 \text{ A at } U_{max} = 250 \text{ V DC}^7 \text{ resistive load}$
Connection type	2-pin terminal block	
	Tightening torque	0.34 Nm (3 lb-in)
	Minimum conductor cross-section	0.34 mm ² ... 1.3 mm ² (22 AWG ... 16 AWG)

7. Not UL 62368-1 certified

Table 14. Signal contact (continued)

Signal contact	
Maximum conductor cross-section	1.3 mm ² (16 AWG)

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

The potential-free signal contact (relay contact, closed circuit) reports through a break in contact:

- At least one power supply is inoperable.
- The device is not operational.
- Loss of connection to at least one port.

The link state can be masked for each port using the configuration. In the delivery state, link monitoring is inactive.

You have the option to specify how the device uses the signal contact in the device configuration.

See the software user documentation for detailed information on possible applications and the configuration of the signal contact. You find the software user documentation at <https://www.doc.hirschmann.com>.

4. Installation

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

On delivery, the device is ready for operation.

To install and configure the device, perform the following work steps:

- *Checking the package contents* on page 49
- *Selecting the installation location* on page 49
- *Installing the ACA41 microSD card (optional)* on page 51
- *Mounting the device* on page 52
- *Grounding the device* on page 61
- *Installing an SFP transceiver (optional)* on page 62
- *Connecting the signal contact* on page 63
- *Connecting the supply voltage* on page 64
- *Operating the device* on page 68
- *Connecting data cables* on page 69

4.1. Checking the package contents

- Check whether the package includes all items named in *Scope of delivery* on page 98.
- Check the individual parts for transport damage.

4.2. Selecting the installation location

Select the assembly location according to the safety guidelines, see *Safety instructions* on page 13.

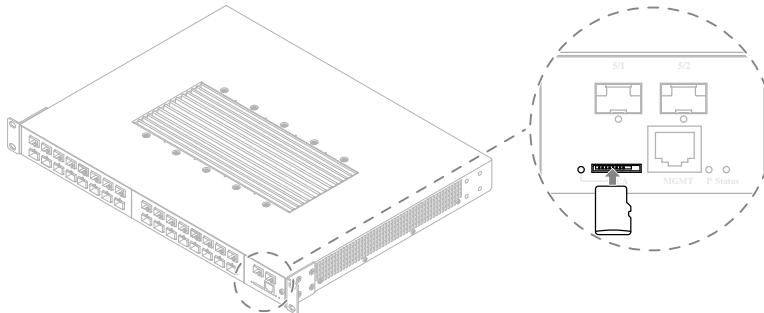
The device can be installed on a flat surface, vertically on a flat surface, or in a 19" standard switch cabinet.

When selecting the installation location, ensure the following requirements are met:

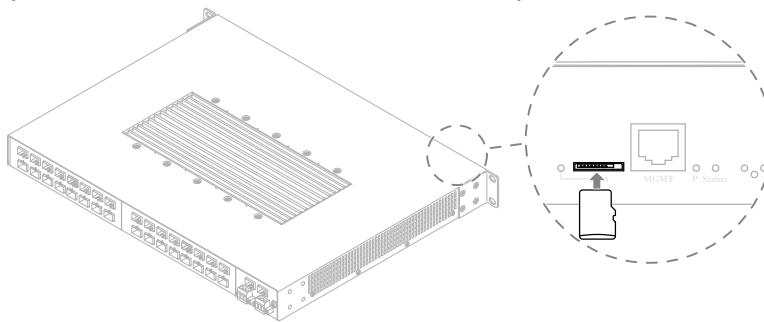
- The installation location is close to a power outlet.
- The climatic threshold values listed in the technical data are complied with at the installation location.
- Ventilation slits and cooling fins of the device are clear to ensure good air circulation.
- The installation location can be accessed for maintenance and repair work.
- The LED display elements are clearly visible when the device is installed at the installation location.
- Twisted pair cables can be routed in sufficient distance to potential sources of electrical interference, such as power supply cables.
- The device has a separate power source with a suitable ground connection. The power supply from this power source can be interrupted by means of a separate, easily accessible isolator or power switch. Hirschmann recommends the use of overvoltage protection for all devices.

4.3. Installing the ACA41 microSD card (optional)

**Figure 18. Installing the ACA41 microSD card (optional):
Mounting the microSD card and location on the device
(front side of device variants GRS2000...)**



**Figure 19. Installing the ACA41 microSD card (optional):
Mounting the microSD card and location on the device
(front side of device variants GRS2100...)**



Perform the following work steps:

- Carefully push the ACA41 microSD card into the ACA41 microSD card slot on the device until the microSD card locks in place with a click.

4.4. Mounting the device

⚠ WARNING



ELECTRIC SHOCK

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

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.

⚠ AVERTISSEMENT



CHOC ÉLECTRIQUE

Le non-respect de ces instructions peut entraîner la mort, des blessures graves ou des dommages matériels.

N'enfoncez jamais d'objets pointus (tournevis fins, fils ou autres) à l'intérieur de l'équipement ou dans les bornes de raccordement pour les cordons d'alimentation.

Ne touchez pas aux bornes de raccordement.

⚠ WARNING**ELECTRIC SHOCK**

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

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.

⚠ AVERTISSEMENT**CHOC ÉLECTRIQUE**

Le non-respect de ces instructions peut entraîner la mort, des blessures graves ou des dommages matériels.

Installez cet équipement exclusivement dans une armoire électrique ou dans un emplacement à accès restreint conformément à la norme CEI/EN 62368-1, auquel seul le personnel de maintenance a accès.

⚠ CAUTION**OVERHEATING OF THE DEVICE**

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

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

⚠ ATTENTION	
	<p>SURCHAUFFE DE L'ÉQUIPEMENT Le non-respect de ces instructions peut entraîner des blessures légères ou des dommages matériels.</p> <p>Vérifiez que toutes les fentes d'aération et les ailettes de refroidissement sont dégagées lors de l'installation de l'équipement. Évitez de toucher l'équipement lorsqu'il est en marche.</p>

You have the following option(s) for mounting your device:

- *Mounting on a flat surface* on page 55
- *Mounting in a switch cabinet* on page 58

4.4.1. Mounting on a flat surface

WARNING

FIRE HAZARD

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



When mounting the device on a steeply inclined or vertical flat surface (for example on a wall), ensure the device is installed in a way that the ports and management interfaces are oriented either upwards or downwards, as shown below.

If the device is mounted with a different orientation than described (for example with the ventilation slits facing upwards and downwards), burning debris and plastics may fall through the larger openings of the device casing in case of fire, causing further fire hazards. See IEC/EN 62368-1 for more information.

⚠ AVERTISSEMENT**RISQUE D'INCENDIE**

Le non-respect de ces instructions peut entraîner la mort, des blessures graves ou des dommages matériels.

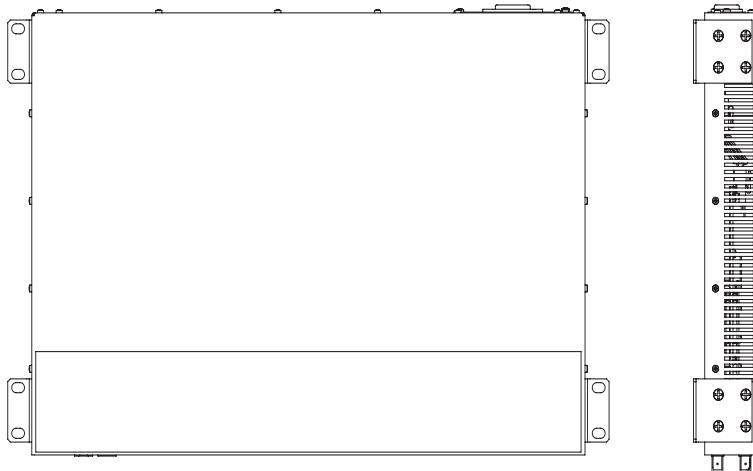


Lorsque vous installez l'équipement sur une surface plane fortement inclinée ou verticale (par exemple sur un mur), veillez à ce que les ports et les interfaces de gestion soient orientés vers le haut ou vers le bas, comme illustré ci-dessous.

Si l'équipement est monté dans une orientation différente de celle décrite (par exemple, avec les fentes d'aération orientées vers le haut et vers le bas), des débris et des plastiques en feu peuvent tomber à travers les ouvertures plus larges du boîtier de l'équipement en cas d'incendie, ce qui augmente les risques d'incendie. Pour plus d'informations, consultez la norme CEI/EN 62368-1.

Prerequisites:

- Prepare the holes in the flat surface for mounting the device. For more information on the dimensions for drilling and mounting the device, see [Dimension drawings on page 83](#) .
- Verify with the end user that the load-bearing capacity of the mounting points is in accordance with the weight, environment, and use case of the device.
- You need 4 mounting brackets for mounting the device on a flat surface. In the delivery state, there are 2 pre-mounted mounting brackets on the sides of the device. You get additional brackets as accessories, see [Accessories on page 99](#).

Figure 20. Mounting on a flat surface**Perform the following work steps:**

- Remove the screws on the pre-installed mounting brackets.
- Move the 2 pre-installed mounting brackets into the position shown in *Figure 20: Mounting on a flat surface on page 57*.
- Use the screws to secure the mounting brackets on the device.
- Attach 2 additional mounting brackets to the back of the device.

You obtain the additional brackets as accessories, see [Accessories on page 99](#).

- 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 must **NOT** be used as a desktop device.

4.4.2. Mounting in a switch cabinet

⚠ CAUTION



OVERHEATING OF THE DEVICE

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

When installing the device, make sure any ventilation slots remain free.
Maintain a clearance of at least 5 cm (2 in).

⚠ ATTENTION



SURCHAUFFE DE L'ÉQUIPEMENT

Le non-respect de ces instructions peut entraîner des blessures ou des dommages matériels.

Lors de l'installation de l'équipement, veillez à ce que les fentes d'aération restent dégagées.
Laissez un espace libre d'au moins 5 cm.

Prerequisites:

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

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

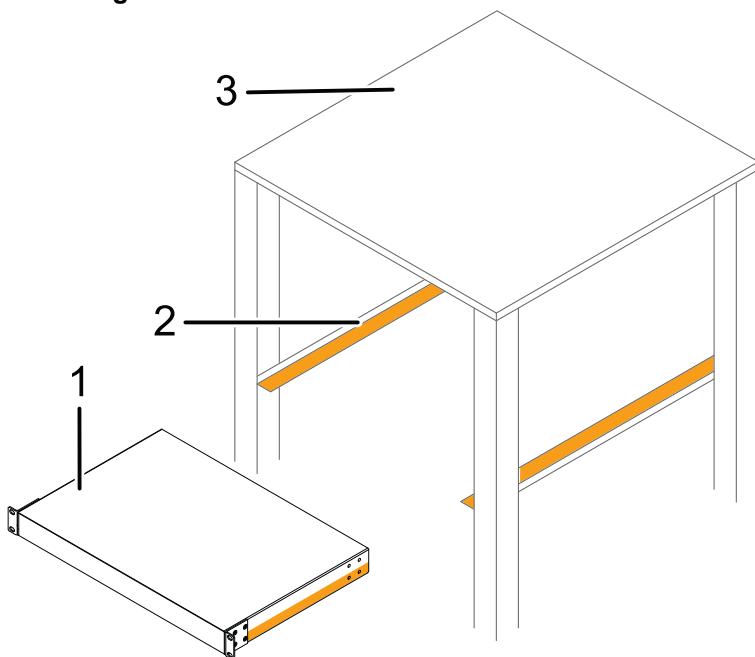
For more information on sliding/mounting rails and how to install them, please contact your switch cabinet manufacturer.

- 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 21. Assembly in a switch cabinet with sliding/mounting rails



1 Device

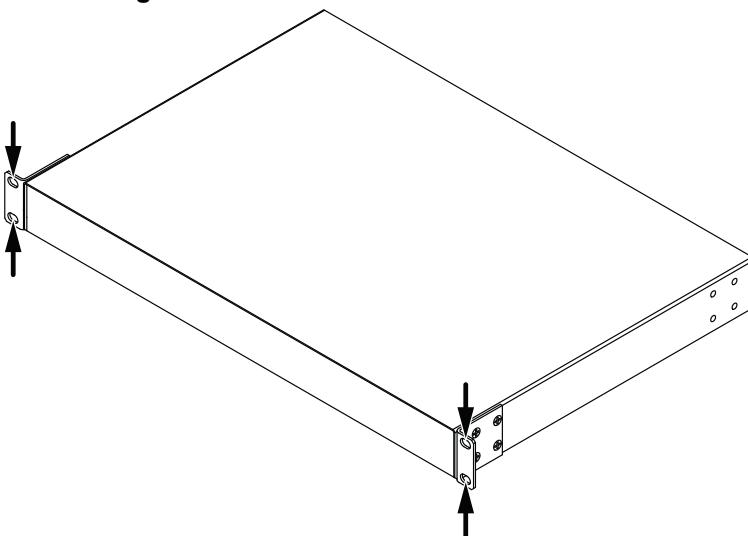
2 Sliding/mounting rail

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.

Figure 22. Mounting in a switch cabinet: Mounting brackets with oblong holes



Note: When operating the device in an environment with continuous vibration loads, Hirschmann recommends to additionally fasten the device to the switch cabinet using 2 mounting brackets on the front or rear side of the device. Additional brackets are available as accessories, see [Accessories on page 99](#).

4.5. Grounding the device

 **CAUTION**

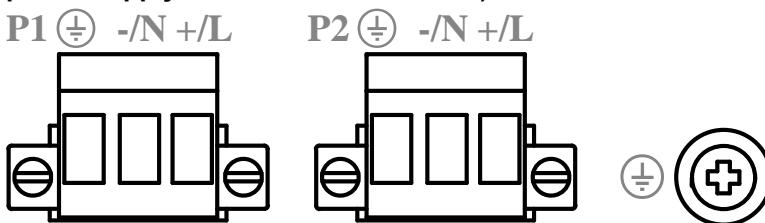


ELECTRIC SHOCK
Failure to follow these instructions can result in minor injury, or equipment damage.

Ground the device before connecting any other cables.



Figure 23. Grounding the device: Ground screw next to power supply connection(s) (exemplary view using device power supply characteristic value KK)



The device has a protective ground connection (protective ground screw) next to the power supply connection(s) on the front or rear side of the device, depending on device variant.

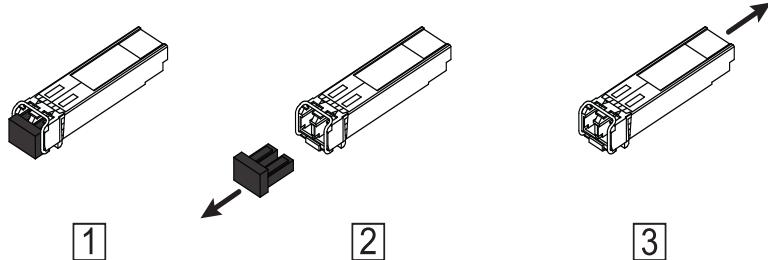
Perform the following work steps:

- Ground the device via the protective ground screw with a tightening torque of 0.34 Nm (3 lb-in).

4.6. Installing an SFP transceiver (optional)

Prerequisites:

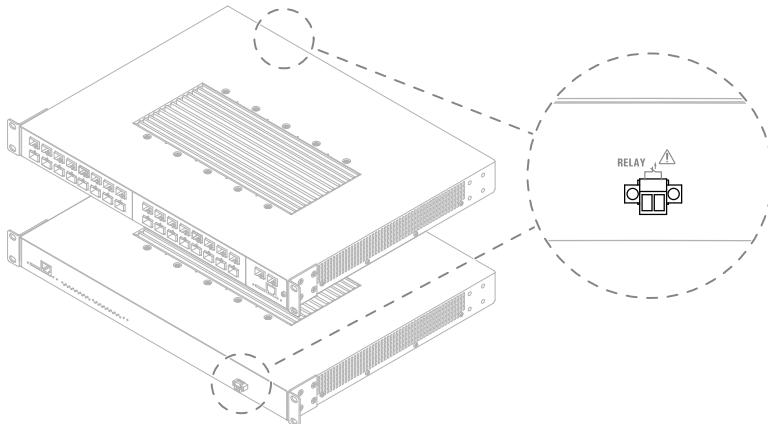
Exclusively use Hirschmann SFP transceivers. Transceivers are available as accessories, see [Accessories on page 99](#).

Figure 24. 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).

4.7. Connecting the signal contact

Figure 25. Connecting the signal contact: Location on the device (device variants GRS2000..., GRS2100...)

Perform the following work steps:

- Connect the signal contact lines with the terminal block connections.
 - Fasten the wires in the terminal block by tightening the terminal screws.
- For information on the prescribed tightening torque, see [General data on page 80](#).
- Mount the terminal block on the device using screws.

4.8. Connecting the supply voltage

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

 WARNING	
	<p>ELECTRIC SHOCK Failure to follow these instructions can result in death, serious injury, or equipment damage.</p> <p>Exclusively connect the supply voltage that corresponds with the type plate of your device.</p>

 AVERTISSEMENT	
	<p>CHOC ÉLECTRIQUE Le non-respect de ces instructions peut entraîner la mort, des blessures graves ou des dommages matériels.</p> <p>Ne branchez qu'une tension d'alimentation correspondant à la plaque signalétique de votre équipement.</p>

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

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.

⚠ AVERTISSEMENT**CHOC ÉLECTRIQUE**
Le non-respect de ces instructions peut entraîner la mort, des blessures graves ou des dommages matériels.

N'enfoncez jamais d'objets pointus (tournevis fins, fils ou autres) à l'intérieur de l'équipement ou dans les bornes de raccordement pour les cordons d'alimentation.

Ne touchez pas aux bornes de raccordement.

4.8.1. Connecting supply voltage 100 V AC ... 240 V AC (50 Hz ... 60 Hz), or 60 V DC ... 250 V DC

Corresponds to power supply characteristic value K in the product code.

Figure 26. Connecting supply voltage 100 V AC ... 240 V AC (50 Hz ... 60 Hz), or 60 V DC ... 250 V DC: 3-pin terminal blocks with screw lock

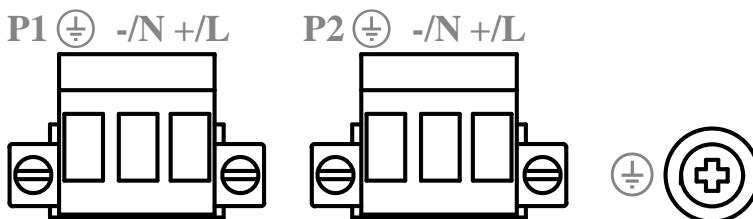


Table 15. Connecting supply voltage 100 V AC ... 240 V AC (50 Hz ... 60 Hz), or 60 V DC ... 250 V DC: Specifications

Type of supply voltage that can be connected	Specification of the supply voltage	Pin assignment	Meaning
AC voltage	Rated AC voltage range: 100 V AC ... 240 V AC, 50 Hz ... 60 Hz		PE (Protective grounding)
	AC voltage range including maximum tolerances: 85 V AC ... 264 V AC, 47 Hz ... 63 Hz	N	Neutral conductor
		L	Outer conductor (phase)
DC voltage	Rated DC voltage range: 60 V DC ... 250 V DC		PE (Protective grounding)
	DC voltage range including maximum tolerances: 48 V DC ... 280 V DC	+	Plus terminal of the supply voltage
		-	Minus terminal of the supply voltage

Perform the following work steps:

- For connecting the voltage supply, verify the required conditions in [General requirements for connecting the supply voltage on page 18](#).
- Ensure all connections are voltage-free.
- Connect the power supply conductor wires to the terminal block(s) according to the pin assignment .
- Secure the conductor wires in the terminal block(s) by tightening the screws on the terminal block(s).
- Install the terminal block(s) on the device.

4.8.2. Supply voltage range 24 V DC ... 48 V DC

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

Corresponds to the supply voltage characteristic value F. For more information, see [Device name and product code on page 26](#).

Figure 27. 2-pin terminal block with screw lock

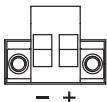


Table 16. Type and specification of the supply voltage, pin assignment on the device

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 including maximum tolerances 16.8 V DC ... 60 V DC	+ Plus terminal of the supply voltage - Minus terminal of the supply voltage

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.

For information on the prescribed tightening torque, see [General data on page 80](#).

4.9. Operating the device

⚠ WARNING



ELECTRIC SHOCK

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

Exclusively connect the supply voltage that corresponds with the type plate of your device.

⚠ AVERTISSEMENT



CHOC ÉLECTRIQUE

Le non-respect de ces instructions peut entraîner la mort, des blessures graves ou des dommages matériels.

Ne branchez qu'une tension d'alimentation correspondant à la plaque signalétique de votre équipement.

Note: Observe the instructions in [General requirements for connecting electrical wires on page 17](#).

When you connect the supply voltage, you start up the device.

Perform the following work steps:

- Enable the supply voltage.

You find detailed information on the operation of the device in the Manual Collection (User and Reference Manuals) at <https://www.doc.hirschmann.com>.

4.10. 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 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 ducts.
- To comply with EN 50121-4 EMC requirements, exclusively use shielded copper data cables.
- Verify that power supply cables and data cables do not run parallel over longer distances. If reducing the inductive coupling is necessary, verify that the power supply cables and data cables cross at a 90° angle.
- Connect the data cables according to your requirements. For more information, see [Ethernet ports on page 40](#).

Perform the following work steps:

- Connect the data cables.

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

5. Basic settings

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

Perform the following work step:

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 IP addresses:

- AutoConfiguration Adapter
- Configuration via BOOTP
- Configuration via DHCP (Option 82)
- Configuration via DHCP (state on delivery)
- Input via the V.24 interface
- Input via the Industrial HiVision application. You find further information about the application Industrial HiVision at:

Industrial HiVision

<https://www.belden.com/products/industrial-networking-cybersecurity/software-solutions/network-management-software/industrial-hivision-network-management-software>

For more information, see the Manual Collection (User and Reference Manuals) at <https://www.doc.hirschmann.com>.

5.1. Default settings

- Ethernet ports: link status is not evaluated (signal contact)
- IP address: The device looks for its IP address parameters using DHCP
- Management password:
Login: user, password: public (read only)
Login: admin, password: private (read/write)
- Optical 1000 Mbit/s ports: 1000 Mbit/s full duplex⁸
- All other ports: autonegotiation
- Rapid Spanning Tree Protocol (RSTP): enabled
- V.24 data rate: 9600 Baud
- Redundancy manager: disabled
- Ring redundancy: disabled

5.2. First login (Password change)

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

8. Available port/slot speed depends on device variant.

Perform the following work steps:

- Open the Graphical User Interface, the Command Line Interface, or Provize Explorer the first time you log on to the device.
- Log on to the device with the default user name "admin" and the default password "private". On successful login, 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.

- Log on to the device again with your new password.

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

6. Monitoring ambient conditions

6.1. Monitoring the ambient air temperature

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

For more information, see [Climatic conditions during operation on page 84](#).

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 temperature displayed is thus only an approximate indication of the ambient conditions present during device operation.

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

6.2. Monitoring the ambient humidity

Exclusively operate the device within the specified ambient humidity range.

For more information, see [General data on page 80](#).

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, see the Manual Collection (User and Reference Manuals) at <https://www.doc.hirschmann.com>.

7. Maintenance and service

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

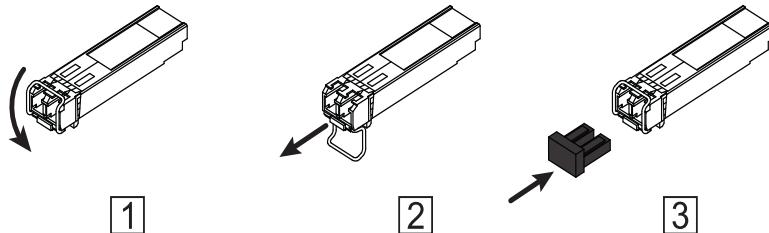
You find information on settling complaints at:

<https://my.belden.com>

8. Disassembly

8.1. 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).

8.2. Removing the device

⚠ WARNING



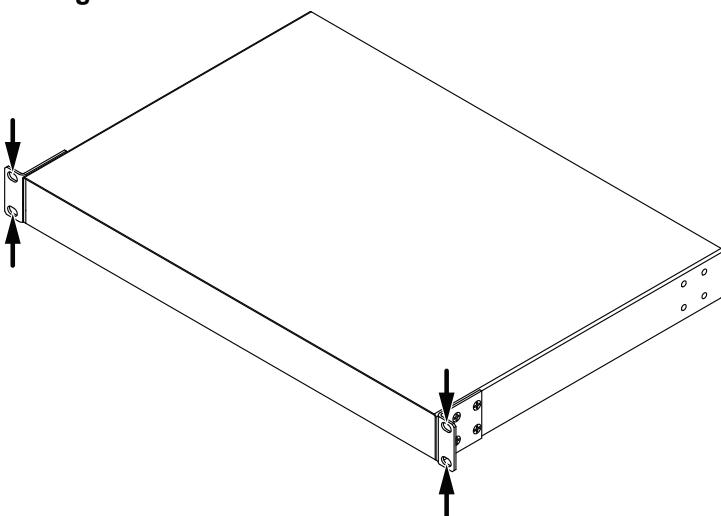
ELECTRIC SHOCK
Failure to follow these instructions can result in death, serious injury, or equipment damage.

Disconnect the grounding only after disconnecting all other cables.



Perform the following work steps:

Figure 29. Removing the device: Mounting brackets with oblong holes



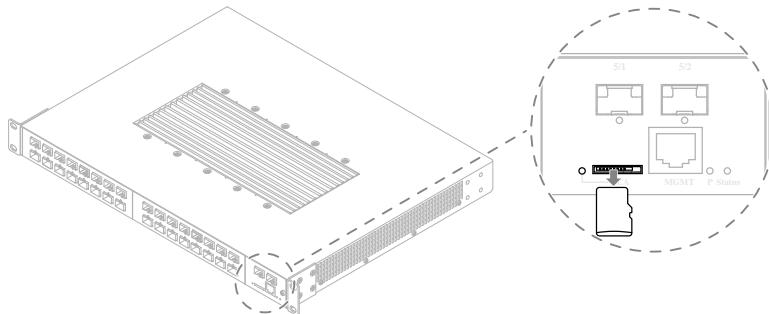
- Disconnect the data cables.
- Disable the supply voltage.

Note: The device contains a built-in energy storage. When you disable the supply voltage, the device may thus continue to run for a few seconds before switching off.

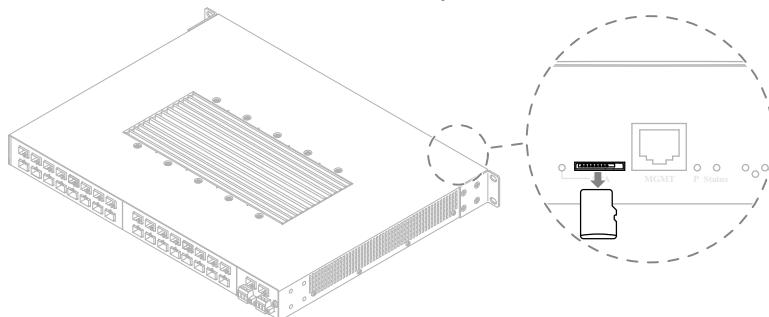
- Disconnect the supply voltage.
- Remove terminal blocks and power supply cables from the device.
- Disconnect the grounding.
- To detach the device from a switch cabinet or a plain surface, remove the screws from the mounting brackets on the device.

8.3. Removing the ACA41 microSD card (optional)

**Figure 30. Removing the ACA41 microSD card (optional):
Removing the microSD card and location on the device
(front side of device variants GRS2000...)**



**Figure 31. Removing the ACA41 microSD card (optional):
Removing the microSD card and location on the device (rear
side of device variants GRS2100...)**



Perform the following work steps:

- Carefully push the ACA41 microSD card into the ACA41 microSD card slot until the release mechanism clicks noticeably.
- As shown, pull the ACA41 microSD card out of the ACA41 microSD card slot on the device.

9. Technical data

9.1. General data

Dimensions	See <i>Dimension drawings</i> on page 83.	
Weight	Depending on device variant	5.7 kg ... 6.5 kg (12.6 lb ... 14.3 lb)
Pollution degree	2	
Laser protection		Class 1 in compliance with IEC 60825-1
Degree of protection	IP30	
Ground connection	Screw type	M3
	Tightening torque	0.34 Nm (3 lb-in)
	min. conductor cross-section	0.75 mm ² (18 AWG)

9.2. Supply voltage

9.2.1. Supply voltage range 24 V DC ... 48 V DC

Corresponds to power supply characteristic value F in the product code.

Table 17. Supply voltage

Power supply unit with supply voltage characteristic value F	Rated voltage	24 V DC ... 48 V DC
	Voltage range including 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 cross-section	1 mm ² (16 AWG)
	max. conductor cross-section	1.3 mm ² (16 AWG)
Power loss buffer	>100 ms	
Back-up fuse for each voltage input	Nominal rating: Characteristic:	20 A slow blow
Overload current protection on the device	Non-replaceable fuse	
Peak inrush current	<8 A	

9.2.2. Technical data supply voltage 100 V AC ... 240 V AC (50 Hz ... 60 Hz), or 60 V DC ... 250 V DC

Corresponds to power supply characteristic value K in the product code.

Rated voltage range AC:	100 V AC ... 240 V AC, 50 Hz ... 60 Hz	
Voltage range AC incl. maximum tolerances:	85 V AC ... 264 V AC, 47 Hz ... 63 Hz	
Rated voltage range DC:	60 V DC ... 250 V DC	
Voltage range DC incl. maximum tolerances:	48 V DC ... 280 V DC	
Connection type	3-pin terminal block	
	Tightening torque	0.5 Nm (4.4 lb-in)
	min. conductor cross-section	AC voltage: 0.75 mm ² (18 AWG) DC voltage: 1 mm ² (16 AWG)
	max. conductor cross-section	2.5 mm ² (12 AWG)
Power loss buffer	>100 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	

9.3. Power consumption/power output

Table 18. Power consumption/power output

Product code ⁹	Maximum power consumption	Maximum power output
GRS2.0-....-00000-...	34 W	116 Btu (IT)/h
GRS2.0-....-I-....-...	40 W	136 Btu (IT)/h
GRS2.0-....-L-....-...		
GRS2.0-....-E-....-...	49 W	167 Btu (IT)/h
GRS2.0-....-K-....-...		
GRS2.0-....-J-....-...		
GRS2.0-....-M-....-...		

9. Each character “.” in the product codes in this table is a placeholder for any other single valid character from the product code of the device.

Table 18. Power consumption/power output (continued)

Product code ⁹	Maximum power consumption	Maximum power output
GRS2.0-....-H....-...		
GRS2.0-....-G....-...		
GRS2.0-....-F....-....		

9.4. Signal contact

Table 19. Signal contact

Signal contact		
Nominal value	Supply with AC voltage	$I_{max} = 2 \text{ A at } U_{max} = 250 \text{ V AC resistive load}$
	Supply with DC voltage	$I_{max} = 2 \text{ A at } U_{max} = 30 \text{ V DC resistive load}$ $I_{max} = 0.2 \text{ A at } U_{max} = 125 \text{ V DC}^{10} \text{ resistive load}$ $I_{max} = 0.1 \text{ A at } U_{max} = 250 \text{ V DC}^{10} \text{ resistive load}$
Connection type	2-pin terminal block	
	Tightening torque	0.34 Nm (3 lb-in)
	Minimum conductor cross-section	0.34 mm ² ... 1.3 mm ² (22 AWG ... 16 AWG)
	Maximum conductor cross-section	1.3 mm ² (16 AWG)

9. Each character “.” in the product codes in this table is a placeholder for any other single valid character from the product code of the device.

10. Not UL 62368-1 certified

9.5. Dimension drawings

9.5.1. Dimension drawings

Figure 32. Dimension drawings: GRS2000... device variants

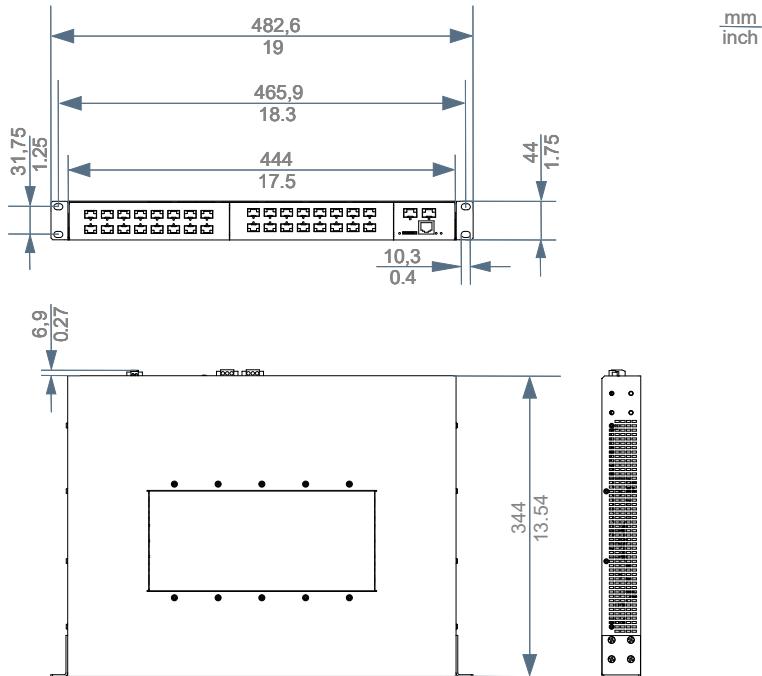
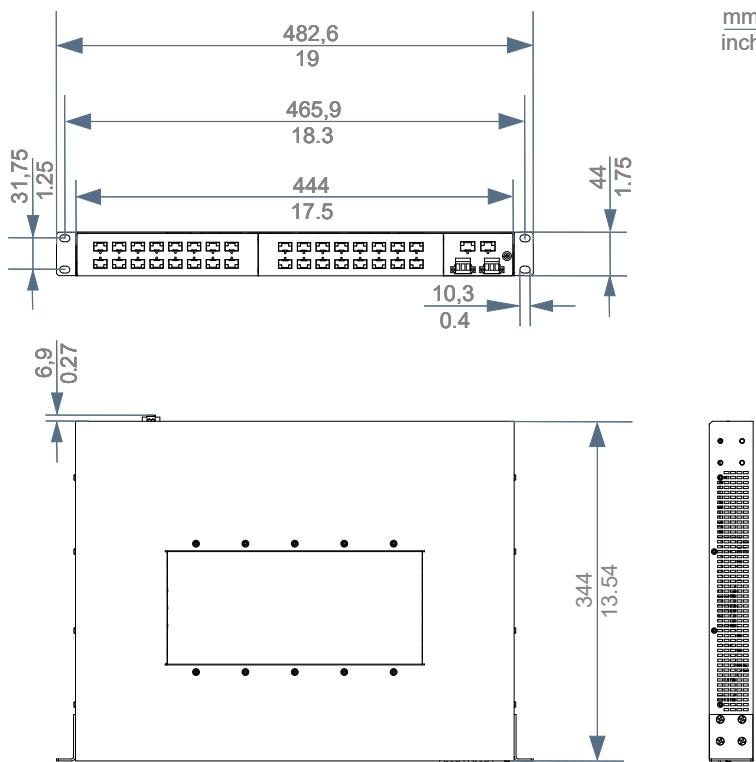


Figure 33. Dimension drawings: GRS2100... device variants

9.6. Climatic conditions during operation

Table 20. Climatic conditions during operation

Climatic conditions during operation			
Ambient air temperature ¹¹	up to 2000 m ASL (6562 ft ASL)	Operating temperature range characteristic value S	Standard: 0 °C ... +60 °C (+32 °F ... +140 °F)
		Operating temperature range characteristic value C	Standard: 0 °C ... +60 °C (+32 °F ... +140 °F) with Conformal Coating (CC)
		Operating temperature range characteristic value T	Extended: -40 °C ... +70 °C (-40 °F ... +158 °F) ¹²

11. Temperature of the ambient air at a distance of 5 cm (2 in) from the device

12. Under UL 62368-1, the maximum temperature is +65 °C (+149 °F)

Table 20. Climatic conditions during operation (continued)

Climatic conditions during operation		
		-40 °C ... +85 °C (-40 °F ... +185 °F) for 16 hours (tested in accordance with IEC 60068-2-2) ¹³
Operating temperature range characteristic value E	Extended: -40 °C ... +70 °C (-40 °F ... +158 °F) ¹² with Conformal Coating (CC) -40 °C ... +85 °C (-40 °F ... +185 °F) for 16 hours (tested in accordance with IEC 60068-2-2) ¹³	
up to 4000 m ASL (13123 ft ASL)	Operating temperature range characteristic value S	Standard: 0 °C ... +50 °C (+32 °F ... +122 °F)
	Operating temperature range characteristic value C	Standard: 0 °C ... +50 °C (+32 °F ... +122 °F) with Conformal Coating (CC)
	Operating temperature range characteristic value T	Extended: -40 °C ... +60 °C (-40 °F ... +140 °F) ¹²
	Operating temperature range characteristic value E	Extended: -40 °C ... +60 °C (-40 °F ... +140 °F) ¹² with Conformal Coating (CC)
Humidity	5 % ... 95 % (non-condensing)	
Air pressure	min. 600 hPa (+4000 m ASL; +13123 ft ASL) max. 1060 hPa (-400 m ASL; -1312 ft ASL)	

9.7. Climatic conditions during storage

Table 21. Climatic conditions during storage

Climatic conditions during storage		
Ambient temperature	-40 °C ... +70 °C (-40 °F ... +158 °F)	up to 1 year
	-40 °C ... +50 °C (-40 °F ... +122 °F)	up to 2 years
	0 °C ... +30 °C (+32 °F ... +86 °F)	up to 10 years
Humidity	5 % ... 95 % (non-condensing)	
Air pressure	min. 600 hPa (+4000 m ASL; +13123 ft ASL) max. 1060 hPa (-400 m ASL; -1312 ft ASL)	

13. Exclusively use SFP transceivers with extension "EEC". If you use SFP transceivers without extension "EEC", the standard temperature range applies.

9.8. Derating

SFP transceivers become warm during operation. Depending on the type and number of SFP transceivers used, deratings are in place to keep the internal device temperature within permissible limits. If applicable, subtract the temperature derating in Kelvin (K) from the maximum device temperature in degrees Celsius (°C) to get the individual maximum operating temperature for your device. For derating purposes, SFP transceivers are classed into High Power (HP) and Low Power (LP) variants. For more information on the classification, see [Derating depending on SFP transceiver class on page 86](#).

9.8.1. Derating depending on SFP transceiver class

Exclusively applies to Operating temperature range characteristic values T and E.

Product code ¹⁴	Number and type of SFPs	Derating
GRS2..0-G....-G....-T...	25 ...32 × HP class SFP	5 K
GRS2..0-G....-G....-E...		

Note: Alternatively to a derating, the device can be installed with additional cooling. If a stable airflow of at least 100 LFM on the device can be provided, the derating is void.

9.8.1.1. Power class classification of SFP transceivers

Table 22. Power class classification of SFP transceivers: Fast Ethernet (100 Mbit/s) SFP transceivers

Fast Ethernet SFP transceiver	SFP power class	Order number
M-FAST SFP-MM/LC	HP	943865001
M-FAST SFP-MM/LC EEC	HP	943945001
M-FAST SFP-SM/LC	LP	943866001
M-FAST SFP-SM/LC EEC	LP	943946001

14. Each character “.” in the product codes in this table is a placeholder for any other single valid character from the product code of the device.

Table 22. Power class classification of SFP transceivers: Fast Ethernet (100 Mbit/s) SFP transceivers (continued)

Fast Ethernet SFP transceiver	SFP power class	Order number
M-FAST SFP-SM+/LC	HP	943867001
M-FAST SFP-SM+/LC EEC	HP	943947001
M-FAST SFP-LH/LC	HP	943868001
M-FAST SFP-LH/LC EEC	HP	943948001

Table 23. Power class classification of SFP transceivers: Gigabit Ethernet (1000 Mbit/s) SFP transceivers

Product code	SFP power class	Order number
M-SFP-SX/LC	LP	943014001
M-SFP-SX/LC EEC	LP	943896001
M-SFP-MX/LC EEC	HP	942108001
M-SFP-LX/LC	LP	943015001
M-SFP-LX/LC EEC	LP	943897001
M-SFP-LX+/LC	LP	942023001
M-SFP-LX+/LC EEC	LP	942024001
M-SFP-LH/LC	HP	943042001
M-SFP-LH/LC EEC	HP	943898001

Table 24. Power class classification of SFP transceivers: 2.5 Gigabit Ethernet (2500 Mbit/s) SFP transceivers

Product code	SFP power class	Order number
M-SFP-2.5-MM/LC EEC	LP	942162001
M-SFP-2.5-SM-/LC EEC	HP	942163001
M-SFP-2.5-SM/LC EEC	HP	942164001
M-SFP-2.5-LH/LC	HP	942220001

Table 25. Classification of 10 Gigabit Ethernet SFP+ transceivers

Product code	SFP power class	Order number
M-SFP-10-SR/LC-EEC	LP	942210001
M-SFP-10-LR/LC-EEC	HP	942211001

9.9. Immunity

Table 26. Immunity: Standard applications

EN 61131-2, CE, FCC – applies to all devices

Applicable standard	Behavior	Frequency
IEC 60068-2-6, test Fc	Vibration	5 Hz ... 8.4 Hz with 3.5 mm (0.14 in) amplitude
IEC 60068-2-6, test Fc	Vibration	8.4 Hz ... 150 Hz with 1 g
IEC 60068-2-27, test Ea	Shock	15 g at 11 ms

Table 27. Immunity: Marine applications

Applicable standard	Behavior	Frequency
IEC 60068-2-6, test Fc	Vibration	2 Hz ... 13.2 Hz with 1 mm (0.04 in) amplitude
IEC 60068-2-6, test Fc	Vibration	13.2 Hz ... 100 Hz with 0.7 g

Table 28. Immunity: Substation applications

EN 61850-3, IEEE 1613 – applies to devices with the approval code WW

Applicable standard	Behavior	Frequency
IEC 60068-2-6, test Fc	Vibration	2 Hz ... 9 Hz with 3 mm (0.11 in) amplitude
IEC 60068-2-6, test Fc	Vibration	9 Hz ... 200 Hz with 1.0 g
IEC 60068-2-6, test Fc	Vibration	200 Hz ... 500 Hz with 1.5 g
IEC 60068-2-27, test Ea	Shock	10 g at 11 ms
EN 60255-21-2	Bump	10 g at 16 ms

9.10. Electromagnetic compatibility (EMC)

9.10.1. EMC interference emission

Table 29. EMC interference emission: Standard applications

EN 61131-2, CE, FCC – applies to all devices

Applicable standard	Connection type	Specification
Radiated emission		
FCC 47 CFR Part 15		Class A
EN 55032		Class A
Conducted emission		
EN 55032		Class A

Table 30. EMC interference emission: Substation applications

Applicable standard	Connection type	Specification
Radiated emission		
FCC 47 CFR Part 15		Class A
EN 55032		Class A
EN 61000-6-4		Fulfilled
Conducted emission		
FCC 47 CFR Part 15	Supply connection	Class A
EN 55032	Supply connection	Class A
EN 55032	Telecommunication connections	Class A
EN 61000-6-4	Supply connection	Fulfilled
EN 61000-6-4	Telecommunication connections	Fulfilled

9.10.2. EMC interference immunity

Table 31. EMC interference immunity: Standard applications

Applicable standard	Connection type	Voltage
Electrostatic discharge		
EN 61000-4-2	Contact discharge	±4 kV
IEEE C37.90.3		
EN 61000-4-2	Air discharge	±8 kV

Table 31. EMC interference immunity: Standard applications (continued)

Applicable standard	Connection type	Voltage
IEEE C37.90.3		
Electromagnetic field		
EN 61000-4-3	80 MHz ... 6000 MHz	max. 10 V/m
Fast transients (burst)		
EN 61000-4-4	Power supply connection	±2 kV
Voltage surges - power supply connection		
EN 61000-4-5	line/ground	2 kV Supply voltage HV
EN 61000-4-5	line/line	1 kV Supply voltage HV
Conducted disturbances		
EN 61000-4-6	150 kHz ... 80 MHz	10 V

Table 32. EMC interference immunity: Railway applications (trackside)

Applicable standard	Connection type	Voltage
Electrostatic discharge		
EN 61000-4-2	Contact discharge	±4 kV
IEEE C37.90.3		
EN 61000-4-2	Air discharge	±8 kV
IEEE C37.90.3		
Electromagnetic field		
EN 61000-4-3	80 MHz ... 2700 MHz	max. 20 V/m
EN 61000-4-3	80 MHz ... 6000 MHz	max. 10 V/m
Fast transients (burst)		
EN 61000-4-4	Power supply connection	±2 kV
Voltage surges - power supply connection		
EN 61000-4-5	line/ground	2 kV Supply voltage HV
EN 61000-4-5	line/line	1 kV Supply voltage HV
Conducted disturbances		
EN 61000-4-6	150 kHz ... 80 MHz	10 V

Table 33. EMC interference immunity: Substation applications

Applicable standard	Connection type	Voltage
Electrostatic discharge		
EN 61000-4-2 IEEE C37.90.3	Contact discharge	±8 kV
EN 61000-4-2 IEEE C37.90.3	Air discharge	±15 kV
Electromagnetic field		
EN 61000-4-3	80 MHz ... 6000 MHz	max. 10 V/m
IEEE 1613	80 MHz ... 1000 MHz (continuous wave)	max. 20 V/m
Fast transients (burst)		
EN 61000-4-4 IEEE C37.90.1	Power supply connection	±4 kV
EN 61000-4-4 IEEE C37.90.1	Data line	±4 kV
Voltage surges - power supply connection		
EN 61000-4-5	line/ground	±2 kV
IEEE 1613	line/ground	±5 kV
EN 61000-4-5	line/line	±1 kV
Voltage surges - data line		
EN 61000-4-5	line/ground	±2 kV
Conducted disturbances		
EN 61000-4-6	150 kHz ... 80 MHz	10 V
Damped oscillation – power 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

9.11. Network range

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

Note: The port/slot speed available to you on each port group and the number of ports depends on the data rate characteristic value of your device variant and the individual types of the chosen port group(s). For more information, see item 6 in [Device name and product code on page 26](#).

9.11.1. Twisted pair port 10/100/1000 Mbit/s

Table 34. Network range: 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)

9.11.2. Gigabit Ethernet SFP transceiver

Table 35. F/O port 1000BASE-FX (SFP fiber optic Gigabit Ethernet Transceiver)

Product code	Mode ¹⁵	Wave length	Fiber	System attenua- tion	Example for F/O cable length ¹⁶	Fiber attenuation	BLP ¹⁷ /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 ... 0.50 km (0 mi ... 0.31 mi)	1.0 dB/km	500 MHz×km
M-SFP-MX/LC EEC	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 EEC	MM	1310 nm	62.5/125 µm	0 dB ... 12 dB	0 km ... 0.55 km (0 mi ... 0.34 mi)	1.0 dB/km	500 MHz×km
M-SFP-LX/LC...	MM	1310 nm ¹⁸	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 ¹⁸	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) ¹⁹	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)

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

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

17. Using the bandwidth-length product is inappropriate for expansion calculations.

18. With F/O adapter compliant with IEEE 802.3-2002 Clause 38 (single-mode fiber offset-launch mode conditioning patch cord).

19. Including 2.5 dB system reserve when compliance with the fiber data is observed.

9.11.3. Fast Ethernet SFP transceiver

Table 36. F/O port 100BASE-FX (SFP Fiber Optic Fast Ethernet Transceiver)

Product code	Mode ²⁰	Wave length	Fiber	System attenua- tion	Example for F/O cable length ²¹	Fiber attenuation	BLP/Dispersion
M-FAST-SFP-MM/L- C...	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/L- C...	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/L- C...	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/L- C...	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/L- C...	SM	1550 nm	9/125 µm	10 dB ... 29 dB	55 km ... 140 km (14.29 mi ... 86.99 mi)	0.18 dB/km ²²	18 ps/(nm×km)
SFP-FAST-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
SFP-FAST-MM/L- C EEC	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	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)

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

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

22. With ultra-low-loss optical fiber.

Table 36. F/O port 100BASE-FX (SFP Fiber Optic Fast Ethernet Transceiver) (continued)

Product code	Mode ²⁰	Wave length	Fiber	System attenua-tion	Example for F/O cable length ²¹	Fiber attenua-tion	BLP/Dispersion
SFP-FAST-SM/L- C EEC	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)

9.11.4. 2.5 Gigabit Ethernet SFP transceiver

Table 37. F/O port 2.5 Gbit/s (SFP fiber optic Gigabit Ethernet transceiver)

Product code	Mode ²³	Wave length	Fiber	System attenua-tion	Example for F/O cable length	Fiber attenua-tion	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)

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

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

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

Table 37. F/O port 2.5 Gbit/s (SFP fiber optic Gigabit Ethernet transceiver) (continued)

Product code	Mode ²³	Wave length	Fiber	System attenua-tion	Example for F/O cable length ²⁴	Fiber attenu-ation	BLP/Dispersion
M-SFP-2.5-LH/LC	SM	1551 nm	9/125 µm	14 dB ... 28 dB	80 km ²⁴ (49.70 mi)	0.25 dB/km	19 ps/(nm×km)

9.11.5. 10 Gigabit Ethernet SFP+ transceiver

Table 38. F/O port 10 Gbit/s (SFP+ fiber optic Gigabit Ethernet transceiver)

Product code	Mode ²⁵	Wave length	Fiber	System attenua-tion	Example for F/O cable length ²⁶	Fiber attenu-ation	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)
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

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

24. 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).

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

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

Table 38. F/O port 10 Gbit/s (SFP+ fiber optic Gigabit Ethernet transceiver) (continued)

Product code	Mode ²⁵	Wave length	Fiber	System attenu- ation	Example for F/O cable length ²⁶	Fiber attenu- ation	BLP/Dispersion
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)

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

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

10. Scope of delivery

Table 39. Scope of delivery

Amount	Article
1 x	Device
1 x	Safety and general information sheet
1 x or 2 x (depending on device variant)	Terminal block for the supply voltage (depending on number and type of PSUs)
1 x	2-pin terminal block for signal contact
2 x	Mounting bracket for installation on 19" devices, standard (pre-mounted)

11. Order numbers

11.1. Device variants

GRS2000/GRS2100 devices are available as fixed variants with fixed order numbers or open variants. You find the order numbers of all fixed device variants in [Table 40: Device variants: Fixed device variants on page 99](#).

Table 40. Device variants: Fixed device variants

Device name	Device product code	Order number
GRS2030-12TX/6SFP-1HV-2A	GRS2030-B0000-00000-A00-TK9VYHHE2A99	942336001
GRS2030-4TX/14SFP-1HV-2A	GRS2030-C0000-00000-A00-TK9VYHHE2A99	942336002
GRS2030-24TX/2SFP-1HV-2A	GRS2030-M0000-L0000-A00-TK9VYHHE2A99	942336003
GRS2030-26SFP-1HV-2A	GRS2030-G0000-E0000-A00-TK9VYHHE2A99	942336004
GRS2030-12TX/14SFP-1HV-2A	GRS2030-C0000-L0000-A00-TK9VYHHE2A99	942336005
GRS2030-32TX/2SFP-1HV-2A	GRS2030-M0000-M0000-A00-TK9VYHHE2A99	942336006
GRS2030-34SFP-1HV-2A	GRS2030-G0000-G0000-A00-TK9VYHHE2A99	942336007
GRS2030-16TX/18SFP-1HV-2A	GRS2030-G0000-M0000-A00-TK9VYHHE2A99	942336008
GRS2040-12TX/4SFP-2HV-2A	GRS2040-B0000-00000-000-TKKVYHHE2A99	942336025
GRS2040-4TX/12SFP-2HV-2A	GRS2040-C0000-00000-000-TKKVYHHE2A99	942336026
GRS2040-24TX/2SFP-2HV-2A	GRS2040-M0000-L0000-A00-TKKVYHHE2A99	942336027
GRS2040-26SFP-2HV-2A	GRS2040-G0000-E0000-A00-TKKVYHHE2A99	942336028
GRS2040-12TX/14SFP-2HV-2A	GRS2040-C0000-L0000-A00-TKKVYHHE2A99	942336029
GRS2040-32TX/2SFP-2HV-2A	GRS2040-M0000-M0000-A00-TKKVYHHE2A99	942336030

11.2. 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.

Table 41. General accessories

Article	Order number
2-pin terminal block with screw lock (10 pieces)	972272201
2-pin terminal block (50 pieces)	943845010
2-pin terminal block with screw lock (50 pieces)	943845009
3-pin High Voltage Interlock terminal block (50 pieces)	943845008
AutoConfiguration Adapter ACA41	942342001
Network management software Industrial HiVision	943156xxx
Terminal cable: RJ45 on Sub-D, 9-pin	942097001
Terminal cable: RJ45 on USB	942096001
Mounting bracket for installation on 19" devices, standard (2 pieces)	943943001
Mounting bracket for installation on 19" devices, long (+50 mm/1.97 in)(2 pieces)	943943101
Protection cap for RJ45 socket (50 pieces)	943936001
Protection cap for SFP slot (25 pieces)	943942001

11.2.1. Fast Ethernet SFP transceiver

Table 42. Accessories: Fast Ethernet SFP transceivers

Fast Ethernet SFP transceiver	Certification type ²⁷	Temperature range ²⁸	Order number
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The following operating conditions apply to twisted pair transceivers:

- Longer RSTP switching times and link loss detection times compared to twisted pair ports provided by the device directly.
- It is currently not possible to set autocrossing manually.

M-FAST SFP-MM/LC	Standard level	0 °C ... +60 °C (+32 °F ... +140 °F)	943865001
M-FAST SFP-MM/LC EEC	Standard level	-40 °C ... +70 °C (-40 °F ... +158 °F)	943945001
M-FAST SFP-SM/LC	Standard level	0 °C ... +60 °C (+32 °F ... +140 °F)	943866001
M-FAST SFP-SM/LC EEC	Standard level	-40 °C ... +70 °C (-40 °F ... +158 °F)	943946001
M-FAST SFP-SM+/LC	Standard level	0 °C ... +60 °C (+32 °F ... +140 °F)	943867001

27. Use Entry level SFP transceivers for industrial applications that exclusively require the following approvals: CE, FCC or UL 61010-2-201.

Use Standard level SFP transceivers for industrial applications that exclusively require the following approvals: CE, FCC, UL 61010-2-201, DNV, Lloyd's Register, Bureau Veritas, UL 121201 (Hazardous Locations), IEC 61850-3, EN 50121-4, ATEX or IECEx. For further information on certifications, see <https://www.belden.com>.

28. The temperature range specifications refer to the use in the GRS device.

Table 42. Accessories: Fast Ethernet SFP transceivers (continued)

Fast Ethernet SFP transceiver	Certification type ²⁷	Temperature range ²⁸	Order number
M-FAST SFP-SM+/LC EEC	Standard level	-40 °C ... +70 °C (-40 °F ... +158 °F)	943947001
M-FAST SFP-LH/LC	Standard level	0 °C ... +60 °C (+32 °F ... +140 °F)	943868001
M-FAST SFP-LH/LC EEC	Standard level	-40 °C ... +70 °C (-40 °F ... +158 °F)	943948001

11.2.2. Gigabit Ethernet SFP transceiver

Table 43. Accessories: Gigabit Ethernet SFP transceiver

Gigabit Ethernet SFP transceiver	Certification type	Temperature range ²⁹	Order number
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The following operating conditions apply to twisted pair transceivers:

- Longer RSTP switching times and link loss detection times compared to twisted pair ports provided by the device directly.
- Cannot be used with Fast Ethernet ports.
- Exclusively supports the autonegotiation mode including autocrossing.

M-SFP-SX/LC	Standard level	0 °C ... +45 °C (+32 °F ... +113 °F)	943014001
M-SFP-SX/LC EEC	Standard level	-10 °C ... +60 °C (+14 °F ... +140 °F)	943896001
M-SFP-MX/LC EEC	Standard level	-10 °C ... +60 °C (+14 °F ... +140 °F)	942108001
M-SFP-LX/LC	Standard level	0 °C ... +45 °C (+32 °F ... +113 °F)	943015001
M-SFP-LX/LC EEC	Standard level	-10 °C ... +60 °C (+14 °F ... +140 °F)	943897001
M-SFP-LX+/LC	Standard level	0 °C ... +45 °C (+32 °F ... +113 °F)	942023001
M-SFP-LX+/LC EEC	Standard level	-10 °C ... +60 °C (+14 °F ... +140 °F)	942024001

27. Use Entry level SFP transceivers for industrial applications that exclusively require the following approvals: CE, FCC or UL 61010-2-201.

Use Standard level SFP transceivers for industrial applications that exclusively require the following approvals: CE, FCC, UL 61010-2-201, DNV, Lloyd's Register, Bureau Veritas, UL 121201 (Hazardous Locations), IEC 61850-3, EN 50121-4, ATEX or IECEx. For further information on certifications, see <https://www.belden.com>.

28. The temperature range specifications refer to the use in the GRS device.

29. The temperature range specifications refer to the use in the GRS device.

Table 43. Accessories: Gigabit Ethernet SFP transceiver (continued)

Gigabit Ethernet SFP transceiver	Certification type	Temperature range ²⁹	Order number
M-SFP-LH/LC	Standard level	-5 °C ... +60 °C (+23 °F ... +140 °F)	943042001
M-SFP-LH/LC EEC	Standard level	-10 °C ... +60 °C (+14 °F ... +140 °F)	943898001

11.2.3. 2.5 Gigabit Ethernet SFP transceiver

Table 44. Accessories: 2.5 Gigabit Ethernet SFP transceiver

2.5 Gigabit Ethernet SFP transceiver	Certification type	Temperature range ³⁰	Order number
M-SFP-2.5-MM/LC EEC	Standard level	-40 °C ... +70 °C (-40 °F ... +158 °F)	942162001
M-SFP-2.5-SM/LC EEC	Standard level	-40 °C ... +70 °C (-40 °F ... +158 °F)	942163001
M-SFP-2.5-SM/LC EEC	Standard level	-40 °C ... +70 °C (-40 °F ... +158 °F)	942164001
M-SFP-2.5-LH/LC	Standard level	0 °C ... +60 °C (+32 °F ... +140 °F)	942220001

11.2.4. 10 Gigabit Ethernet SFP transceiver

Table 45. Accessories: 10 Gigabit Ethernet SFP transceiver

10 Gigabit Ethernet SFP transceiver	Certification type	Temperature range ³¹	Order number
M-SFP-10-SR/LC-EEC	Standard level	-10 °C ... +60 °C (+14 °F ... +140 °F)	942210001
M-SFP-10-LR/LC-EEC	Standard level	-10 °C ... +60 °C (+14 °F ... +140 °F)	942211001

29. The temperature range specifications refer to the use in the GRS device.

30. The temperature range specifications refer to the use in the GRS device.

31. The temperature range specifications refer to the use in the GRS device.

12. Underlying technical standards

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

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

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 at <https://www.belden.com> in the product information.

Table 46. List of technical standards

ANSI/ISA 12.12.01	Non-incendive Electrical Equipment for Use in Class I, Division 2 Hazardous Locations
UL 62368-1	Audio/video, information and communication technology equipment – Part 1: Safety requirements
DNV-CG-0339	Environmental test specification for electrical, electronic and programmable equipment and systems.
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
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
FCC 47 CFR Part 15	Code of Federal Regulations
IEC 60825-1	Laser product safety
IEC/EN 61850-3	Communication networks and systems for power utility automation - Part 3: General requirements.
IEC/EN 62368-1	Equipment for audio/video, information and communication technology - Part 1: Safety requirements
IEC 62443-4-2	Security for industrial automation and control systems.

Table 46. List of technical standards (continued)

IEC 60068-1	Environmental testing
IEEE 802.1D	Media access control (MAC) bridges (includes IEEE 802.1p Priority and Dynamic Multicast Filtering, GARP, GMRP)
IEEE 802.1Q	Virtual Bridged Local Area Networks
IEEE 802.1w	Rapid Reconfiguration
IEEE 802.3	Ethernet
IEEE 1613	IEEE Standard Environmental and Testing Requirements for Communication Networking Devices in Electric Power Substations
NEMA TS 2	Traffic Controller Assemblies with NTCIP Requirements (environmental requirements)

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.belden.com>

A list of local telephone numbers and email addresses for technical support directly from Hirschmann is available at:

<https://my.belden.com>

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

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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.

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



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