HIRSCHMANN IT
A BELDEN BRAND

User manual
Installation

RAVEN 5000 Firewall
RAVEN 5700/RAVEN 5500/RAVEN 5300/RAVEN 5300-F

RAVEN 5000 Media Module
RAVEN 5000M-4T/RAVEN 5000M-4F/
RAVEN 5000M-8T/RAVEN 5000M-8F/
RAVEN 5000M-4T4F/RAVEN 5000M-2X/
RAVEN 5000M-4X/RAVEN 5000M-2Q

Installing RAVEN 4000 Firewall
Published on 01 10/2020

Technical support
http:// hirschmann-it.support.belden.com

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You may access the latest version of this manual at the product website of Hirschmann IT: https://hirschmann-it.support.belden.com
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Contents

Safety instructions

⚠ WARNING

UNCONTROLLED MACHINE ACTIONS

To avoid uncontrolled machine actions caused by data loss, configure all the data transmission devices individually.
Before you start any machine which is controlled via data transmission, be sure to complete the configuration of all data transmission devices.

Failure to follow this instruction can result in death, serious injury, or device damage.

General safety instructions

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

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

Qualification requirements for personnel

- ☐ Only allow qualified personnel to work on the device.
  Qualified personnel have the following characteristics:

  - ▶ Qualified personnel are properly trained. Training as well as practical knowledge and experience make up their qualifications. This is the prerequisite for grounding and labeling circuits, devices, and systems in accordance with current standards in safety technology.
  - ▶ Qualified personnel are aware of the dangers that exist in their work.
  - ▶ Qualified personnel are familiar with appropriate measures against these hazards in order to reduce the risk for themselves and others.
  - ▶ Qualified personnel receive training on a regular basis.

Correct usage

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

National and international safety regulations

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

Requirements for connecting electrical wires

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

The following requirements apply without restrictions:
▶ The electrical wires are voltage-free.
▶ The cables used are permitted for the temperature range of the application case.
▶ Connect the ground screw on the back of the device to the protective conductor before setting up other connections. When to remove connections, the protective conductor is the last to be removed.
▶ Exclusively switch on the device when it is installed.
▶ Relevant for North America: Use 60 °C / 75 °C (140 °F / 167 °F) or 75 °C (167 °F) copper (Cu) wires only.

Table 1: Requirements for connecting electrical wires

Ensure the integrity and consistency

▶ Check the bond on the packaging to assure it is sealed and not tampered by unauthorized party.

▶ Verify serial number of delivered products to make sure it is unified with a hardcopy serial number list provided by manufacturer. If it is necessary, please contact Belden representative to obtain a softcopy serial number list from manufacturer for double check.

Requirements for connecting the supply voltage

The following requirements apply without restrictions:	
All variants	All of the following requirements are complied with:

▶ The supply voltage corresponds to the voltage specified on the type plate of the device.
▶ The power supply conforms to overvoltage category I or II.
▶ The power supply has an easily accessible disconnecting device (for example a switch or a plug). This disconnecting device is clearly identified. So in the case of an emergency, it is clear which disconnecting device belongs to which power supply cable.
▶ When to connect a power supply voltage with a protective conductor: first connect the protective conductor, and then the power supply voltage. If the device contains such a second power supply voltage connection module: first connect the protective conductor, and then the power supply voltage.
▶ Supply with DC voltage: The wire diameter of the power supply cable is at least 1 mm² (North America: AWG16) on the supply voltage input.
▶ Supply with AC voltage: The wire diameter of the power supply cable is at least 0.75 mm² (North America: AWG18) on the supply voltage input.
▶ The cross-section of the ground conductor is the same size as or bigger than the cross-section of the power supply cables.
▶ The power supply cable is suitable for the voltage, the current and the physical load.
▶ The external fuse is installed in the conductor at the non-spot position.

Table 2: Requirements for connecting the supply voltage

Special conditions for safe use

- ☐ Install the basic device and modules in a suitable enclosure based on specific environmental conditions to provide at least IP54 protection according to the requirements of EN 60529.
- ☐ Take measures to prevent instantaneous interference from exceeding 140% of the rated voltage at the voltage input.

Shield grounding

The overall shield of a connected shielded twisted pair cable is connected to the grounding connector on the rear panel as a conductor.

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

ESD guide

The modules are equipped with electrostatic sensitive components. If the connection is touched, these sensitive components can be damaged or their service life shortened due to electric field or charge balance effects.
You may find information about electrostatic hazard components in DIN EN 61340-5-1 (2007-08) and DIN EN 61340-5-2 (2007-08).

Device casing

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

- ☐ Keep the cooling fins free to ensure good air circulation.
- ☐ Verify that there is at least 10 cm (3.94 in) of space around the cooling fins of the casing.
- ☐ Do not touch the housing during operation or shortly after switching off the device. Hot surfaces can cause injury.
- ☐ Install the device horizontally in the cabinet or vertically on a flat surface. Operating the device as a table unit is inadmissible.
  See “Installing and grounding the device” on page 26.
- ☐ Operate the device at the maximum ambient air temperature and in stacking: when to install the device, confirm that there is at least one available rack space (approximately 5 cm) above the device to allow heat to escape through the enclosure of the device.
- ☐ If you operate the device in 19” switch cabinet: install the slide / rails to support the weight of the device.

Installation site requirements

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

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

CE marking

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

- 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 device.
- 2014/30/EU (EMC)
  Directive of the European Parliament and of the Council on the harmonisation of the laws of the Member States relating to electromagnetic compatibility.
- 2014/35/EU
  Directive of the European Parliament and of the Council on the harmonisation of the laws of the Member States relating to the making available on the market of electrical equipment designed for use within certain voltage limits.

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

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

You find the EU conformity declaration as PDF file for downloading on the Internet at: https://catalog.belden.com

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.

Warning! When Ethernet cables are used in industrial environments, confirm that they are shielded.

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

LED or laser components

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

FCC note

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

MAMMUTHUS

U.S. Contact Information

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

This device complies with part 15 of the FCC rules.
Operation is subject to the following two conditions:

- This device may not cause harmful interference, and
- This device must accept any interference received, including interference that may cause undesired operation.

This device 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 interference with the device when used in commercial environments. This device generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. Use of the device in residential areas can also cause interference, in this case the user is obliged to pay to eliminate such interference.

Recycling note

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

About this manual

The “Installation” user manual contains a device description, safety instructions, a description of the display, and the other information that you need to install the device.
Documentation mentioned in the “User Manual Installation” that is not supplied with your device as a printout can be found as PDF files for downloading on the Internet at: https://catalog.belden.com

Key

The symbols used in this manual have the following meanings:

▶	Listing
☐	Work step
■	Subheading

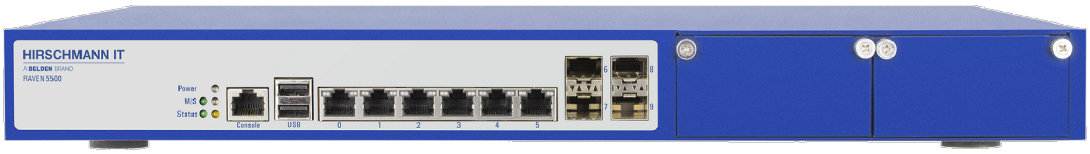
1 Description

1.1 General equipment description

RAVEN5000 series firewall utilizes advanced operating system, realizes the whole process an unpacking through the multi-core parallel processing, feature database scan tree storage, flow processing, zero copy, distributed hardware platform, which makes sure RAVEN5000 series firewall can ensure the safety with high speed and low delay after opening multiple protection function.

☐ **Basic device**

RAVEN 5700



RAVEN 5500

RAVEN 5300

RAVEN 5300-F

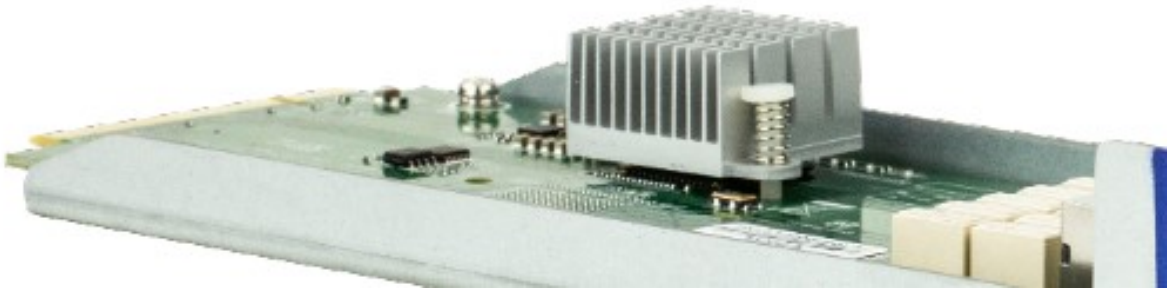
☐ **Media module**

RAVEN 5000M-8T

RAVEN 5000M-8F

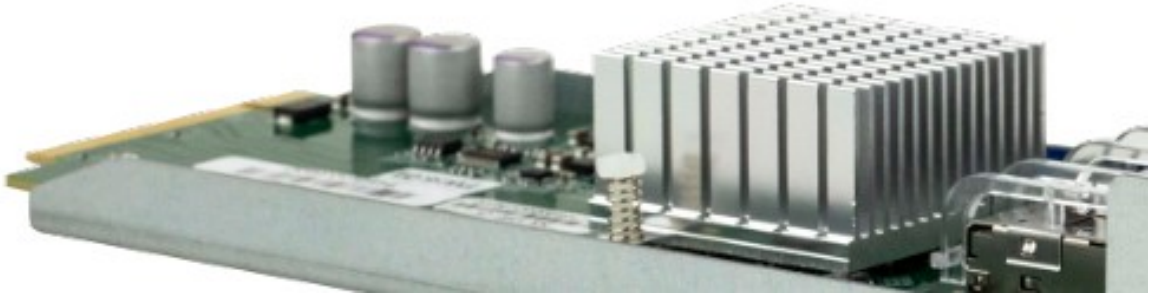
RAVEN 5000M-4X

RAVEN 5000M-4T4F

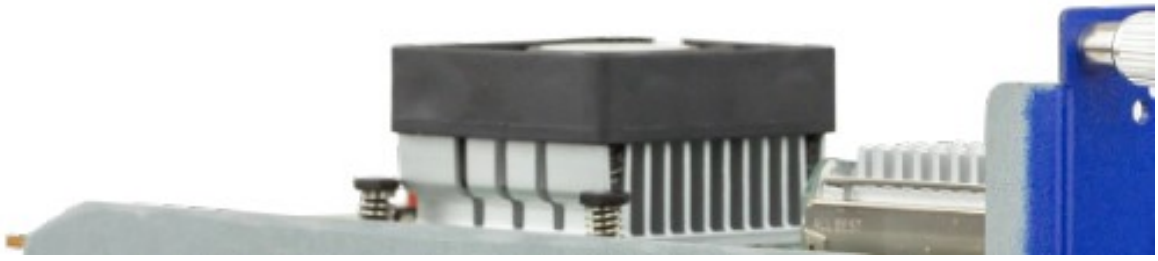


RAVEN 5000M-4T

RAVEN 5000M-4F



RAVEN 5000M-2X



RAVEN 5000M-2Q

Media modules are provided as accessories. Please refer to “Order number” on Page 68.

1.2 Equipment name and product code

The equipment name corresponds to the product code.

1.2.1 Basic device

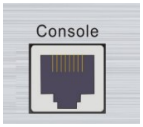
Order number	Product code	Description
942999701	RAVEN 5700	6×fixed GE TX ports and 4×fixed GE SFP ports, 2×extended slot
942999702	RAVEN 5500	6×fixed FE/GE TX ports, 2 × 100/1000M SFP ports, 2 × 1/10G SFP ports, 2 × extended slot, redundant PSU
942999703	RAVEN 5300	6×fixed GE TX ports, 1×extended slot
942999704	RAVEN 5300-F	6×fixed GE TX ports

1.2.2 Media module

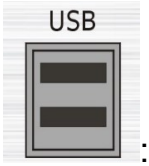
Order number	Product code	Description
942999705	RAVEN 5000M-4T	4×GE TX ports line card, applicable for all firewall products in RAVEN series
942999706	RAVEN 5000M-4F	4×GE SFP ports line card, applicable for all firewall products in RAVEN series
942999707	RAVEN 5000M-8T	8×GE TX ports line card, applicable for all firewall products in RAVEN series
942999708	RAVEN 5000M-8F	8×GE SFP ports line card, applicable for all firewall products in RAVEN series
942999709	RAVEN 5000M-4T4F	4×GE TX ports and 4*GE SFP ports line card, applicable for all firewall products in RAVEN series
942999710	RAVEN 5000M-2X	2×10GE SFP+ ports line card, applicable for all firewall products in RAVEN series
942999711	RAVEN 5000M-4X	4×10GE SFP+ ports line card, applicable for all firewall products in RAVEN series F

942999712	RAVEN 5000M-2Q	2×40GE QSFP+ ports line card, only applicable for RAVEN 5700

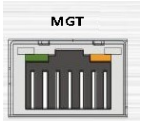
1.3 Equipment port view



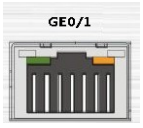
：RJ45 Console Port



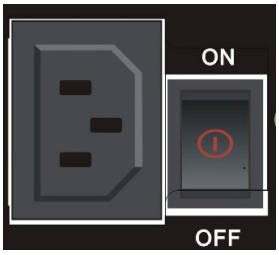
:2×USB Port



：MGT Port



：10/100/1000M Adaptive Ethernet Port



：Power sockets and power es at the rear of the chassis

：Media Module

1.4 Power supply

You may use the power module to supply voltage to the equipment:

See the “Power module” on page 17 for information about connecting supply voltage.

1.5 Ethernet port

You may use twisted pair or fiber optic (F/O) cables to connect terminal devices and other network segments to the equipment and the media module ports.

1.5.1 Console port attribute

Attribute	Description
Interface standard	Asynchronous EIA/TIA-232
Connector type	RJ45
Baud rate	9600- 115200 (default as 9600)
Supported service	Connect with the serial port of local terminal (such as PC), and run the terminal simulation program on the terminal

1.5.2 USB Console port attribute

Attribute	Description
Interface standard	USB2.0
Connector type	Micro USB
Interface rate	12Mbps
Supported service	Connect with the USB of local terminal (such as PC), and run the terminal simulation program on the terminal (baud rate setting range is 9600bit/s-115200bit/s (default as 9600bit/s))

1.5.3 10/100/1000 Mbit/s twisted pair port

Attribute	Description
Interface standard	IEEE 802.3 、 IEEE802.3u 、 IEEE802.3ab、IEEE802.3az
Connector type	RJ45
Working mode	10Mbps/100Mbps/1000Mbps Half duplex/full duplex/auto-negotiation
Maximum transmission distance	100m
Connected cable	Cat. 5 and 5e twisted pairs

1.5.4 1000Base-X SFP optical interface attribute

Attribute	Description

Attribute	Description
Interface standard	IEEE 802.3z
Connector type	SFP
Working mode	1000Mbps full duplex/1000Mbps auto-negotiation
Support SFP interface	Support 1000Base-X
Connected cable	Single mode optical fiber of multimode optical fiber

1.5.5 10GBase-SR/LR/ER SFP+ optical interface attribute

Attribute	Description
Interface standard	IEEE 802.3ae
Connector type	SFP+
Working mode	10Gbps/1000Mbps full duplex
Support SFP+ interface	Support 10GBase-SR Support 10GBase-LR Support 10GBase-ER
Connected cable	Single mode optical fiber of multimode optical fiber

See the “Command line interface user manual” for more information. You may download the manual on the product page of Hirschmann IT at https://hirschmann-it.support.belden.com.

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1.6 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.

1.6.1 Device state

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

Indicator type	Indicator name	Indicator color	Status
System status LED	SYS	Green	Quick flashing (at frequency of 5Hz): indicating hardware starts to work after power on Slow flashing (at frequency of 0.5Hz): indicating the system is working normally On / off: indicating an exception to the system running
Power light	PWR	Green	ON: indicating all in-place power modules are working normally OFF: indicating an exception to the in-place power modules
Fan indicator	FAN	Green	ON: indicating all fan modules on the equipment are working normally OFF: indicating an exception to at least one fan module on the equipment

1.6.2 Port Status

These LEDs provide port information.

Indicator type	Indicator name	Indicator color	Status
Serial port indicator	TXD	RJ45 self-contained yellow LED	Flashing: indicating data sending on serial port OFF: indicating no data sending on serial port
	RXD	RJ45 Build-in green LED	Flashing: indicating data receiving on serial port OFF: indicating no data receiving on serial port
Port status LED	LINK/ACT	Green	ON: indicating successful connection establishment on Ethernet port Flashing: indicating data sending and receiving on Ethernet port OFF: indicating no connection establishment on Ethernet port

1.7 Management interface

1.7.1 Console interface

The serial interface is provided on RJ45 socket and thus you are allowed to establish the connection to the command line interface CLI and the system monitor.

1.7.2 MGT interface

An MGT management interface is provided. Through this interface, users can configure access to the Firewall Web interface using a PC (or laptop) with RJ45.

2 Installation

These devices are developed for use in commercial environments.
At the time of delivery, the device is ready for operation.

Perform the following work steps to install and configure the device:

- ☐ Checking the package contents
- ☐ Installing and grounding the device
- ☐ Operating the device
- ☐ Installing the SFP transceiver (optional)
- ☐ Connecting the data cables
- ☐ Filling out the inscription Label

2.1 Checking the package contents

- ☐ Check whether the box contains all the items specified in the section “Delivery items” on page **Error! Bookmark not defined.**.
- ☐ Check the individual parts for transport damage.

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2.2 Installing and grounding the device

Perform the following work steps:

- ☐ Installing the device in the switch cabinet
- ☐ Installing the device on a vertical flat surface
- ☐ Grounding the device

2.2.1 Installing the device in the switch cabinet

⚠ WARNING

ELECTRIC SHOCK
Install this device solely in a switch cabinet or in an operating site with restricted access, to which maintenance staff have exclusive access.

Failure to follow this instruction can result in death, serious injury, or device damage.

Note: When the device is operated in an environment with continuous vibration load greater than 0.7g, it must be fixed to the switch cabinet with the 2 fixed mounting brackets at the front and rear of the device.
Additional mounting brackets are provided as accessories.
See “Accessories” on the page **Error! Bookmark not defined.**.

Prerequisites:

- ☐ Install the device in a 19" switch cabinet by means of the slide or mounting rails. It improves the stability of the device in an environment affected by vibrations. For more information about the slide or mounting rails and how to install them, please contact the switch cabinet manufacturer.

- ☐ The device is designed to be installed in a 19" switch cabinet. At the time of delivery, 2 preinstalled fixed mounting brackets come with the device on the side.
- ☐ Make sure the device is well ventilated. If necessary, install a fan to prevent overheating.
- ☐ Measure the depth of the 19" cabinet for easy connection.

Perform the following work steps:

- ☐ Install the sliding or mounting rails in a 19" switch cabinet as specified by the manufacturer.
- ☐ Place the device on the rail in the switch cabinet.

☐ Attach the mounting bracket to the switch cabinet.

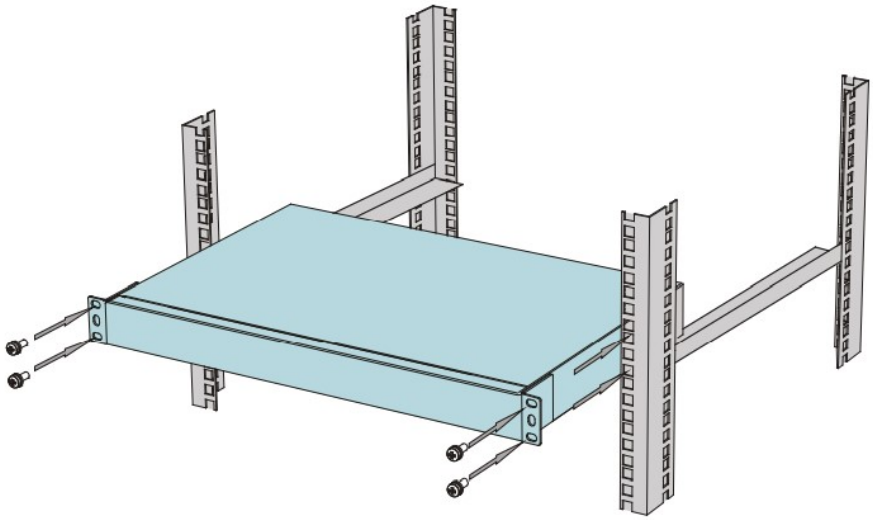


Figure 6: Installing the power module on a switch cabinet

2.2.1 Installing the device on a vertical flat surface

⚠ WARNING

FIRE RISK

In case of vertical installation, install the device in the fireproof enclosure.

Failure to follow this instruction can result in death, serious injury, or device damage.

Perform the following work steps:

☐ Attach 2 mounting brackets to the rear of the device.
☐ Install the 2 screws to attach the mounting brackets to the wall.
☐ Tighten the 2 screws with the tightening specified in chapter “General technical data” on page **Error! Bookmark not defined.**.

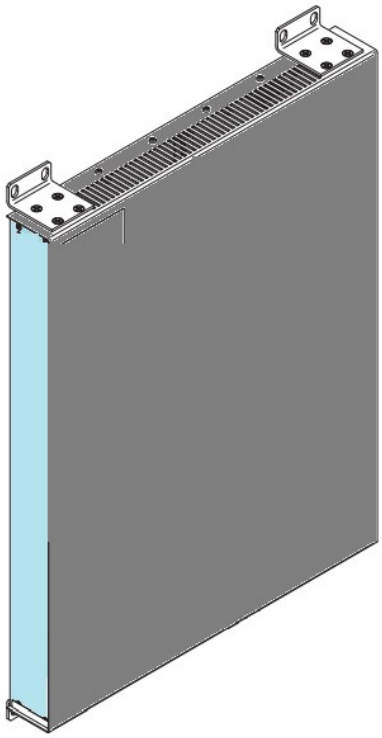


Figure 7: Installing the device on a vertical flat surface

2.2.2 Grounding the device

WARNING

ELECTRIC SHOCK

Ground the device before connecting any other cables.

Failure to follow this instruction can result in death, serious injury, or device damage.

The device has the connection of the protective grounding wire.
The device is grounded by the grounding screw and the power socket.
Perform the following work steps:

- ☐ Install the grounding screw at the rear of the device to the protective conductor, refer to figure 8, below.
- ☐ Tighten the grounding screw with the tightening torque specified in chapter “General technical data” on page **Error! Bookmark not defined.**.

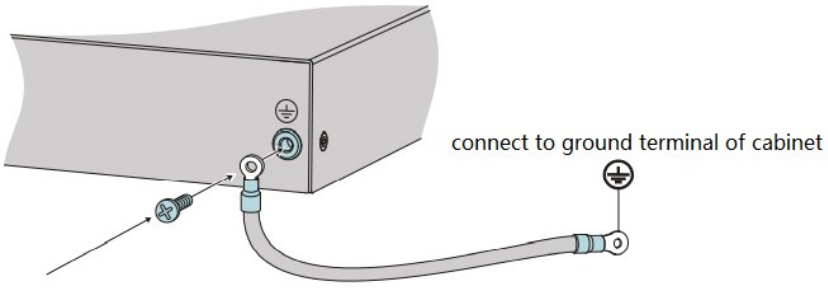


Figure 8: Grounding the device

2.3 Installing the SFP transceiver (optional)

Prerequisite:

Exclusively use Hirschmann IT SFP transceivers.

See “Accessories” on the page **Error! Bookmark not defined.**.

Perform the following work steps:

- ☐ Take the SFP transceiver out of the transport packaging, refer to figure 9 below.
- ☐ Remove the protection cap from the SFP transceiver, refer to figure 10 below.
- ☐ Push the SFP transceiver with the lock closed into the slot until it latches in, refer to figure 11 below.

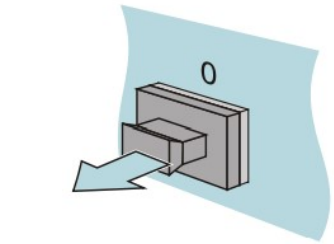


Figure 9: Take out the SFP transceiver

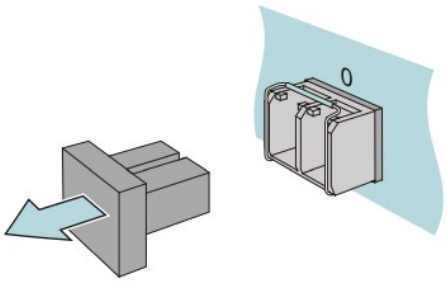


Figure 10: Remove the protective cap

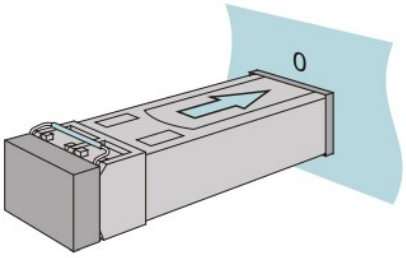


Figure 11: Install the SFP transceiver

2.4 Operating the device

Perform the following work step:

- ☐ Connect the power supply cable, refer to figure 12 below.
- ☐ Enable the power supply.

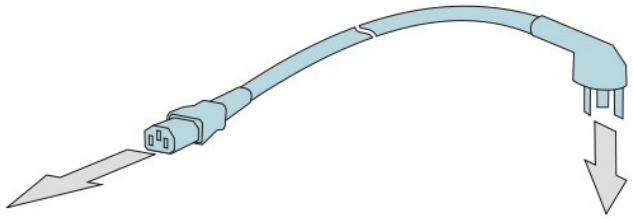


Figure 12: Connect the power supply

2.5 Connecting the data cables

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

- ☐ Keep the length of the data cables as short as possible.
- ☐ Use optical data cables for the data transmission between the buildings.
- ☐ When using copper cables, provide a sufficient separation between the power supply cables and the data cables. Ideally, install the cables in separate cable channels.
- ☐ Verify that power supply cables and data cables do not run parallel over longer distances. To reduce inductive coupling, verify that the power supply cables and data cables cross at a 90° angle. Use SF/UTP cables according to ISO/IEC 11801:2002.
- ☐ Connect the data cable according to your requirements.

See “Device name and product code” on the page Error! Bookmark not defined..

2.6 Fill in the Device Label

MAC address on the front helps you identify the equipment.

3 Make basic settings

Note: Configuring two or more devices with the same IP address may lead to the network's failure to function as expected.
Install and maintain a program, to assign a unique IP address to each device in the network.

IP parameters must be entered when the equipment is installed for the first time.

4 Monitor ambient air temperature

Please operate the equipment only below the specified maximum ambient air temperature.
Please refer to “General technical data” on Page 49.

The ambient air temperature is the air temperature at a distance of 2 inches (5 cm) from the equipment, specifically depending on the installation conditions of the equipment, for example, the distance of the equipment from other devices or other objects, and the output of adjacent equipment.

5 Maintenance and repair

- ☐ Hirschmann IT has done its best to avoid the use of highly worn parts in the equipment design. Under normal operating conditions, wear-prone parts have a longer life than the product itself. Be sure to operate the equipment according to the product description.
- ☐ Relays are susceptible to natural wear. Such wear is decided by the ing frequency. Please check the resistance and function of the closed relay contacts according to the ing frequency.
- ☐ The internal fuse will be triggered only when the equipment detects an error. In case of any damage or failure to the equipment, off the power and return the equipment to the plant for inspection.
- ☐ Hirschmann IT has always been committed to improving and developing software. You are required to visit our website regularly to see if the updated software version that provides additional benefits is available. You may view the information and download software on the product page of Hirschmann IT at https://hirschmann-it.support.belden.com
- ☐ Depending on the pollution level in the operating environment, regularly check whether the ventilation slot in the equipment is blocked.

You may visit http://www.beldensolutions.com/en/Service/Repairs/index.phtml to view the handling of complaints

6 Disassembly

6.1 Remove media module

Follow the steps below:

- ☐ Remove screws on the front panel of the media module.
- ☐ Pull the media module out of the slot.
- ☐ Seal the media module slot on the basic device with a cover plate.
- ☐ Secure the cover plate with 2 screws on the basic device.
  You can refer to the tightening torque in the “General technical data” on page 49.

Note： Media module does not support hot swap. You can install or uninstall the interface card only when the device is powered off. Otherwise, the device may be damaged.

6.2 Remove SFP transceiver

Follow the steps below:

- ☐ Unlock and pull the SFP transceiver out of the slot.
- ☐ Seal the SFP transceiver with a protective cover.

6.3 Remove device

Warning

Electric shock

Please disconnect all other cables before disconnecting the ground wire.

Failure to comply with these guidelines may result in death, serious injury or equipment damage.

Follow the steps below:

- ☐ Disconnect the data cable.
- ☐ Disable the supply voltage.
- ☐ Disconnect the power cord.
- ☐ Disconnect the ground connection.
- ☐ To remove the equipment from the cabinet or wall, unscrew the equipment mounting bracket.

7 Technical data

7.1 General technical data

☐ Basic device

Size	Please refer to "Size diagram" on Page 40.	
Power supply	Rated voltage range	100 VAC...240 VAC ,50 Hz...60 Hz
		Maximum conductor diameter AWG12 (2.5 mm2)
Equipment ground	Tighten torque Protective grounding	3.5~6.1 lb-in (0.4~0.7 Nm)
Climatic conditions during operation	Ambient air temperature	0℃~40℃ (2000m) Note: The altitude is 2000m ~ 4000m, and the maximum working temperature decreases by 1℃ every 200m above sea level.
	Humidity	10%~90%/RH, no condensation
Climatic conditions during storage	Altitude Ambient air temperature	＜5000m -40℃ ~ 70℃
Pollution level		2
Protection Level	Laser protection	**Class 1 conforming to IEC 60825-1**
	Degree of protection	IP20

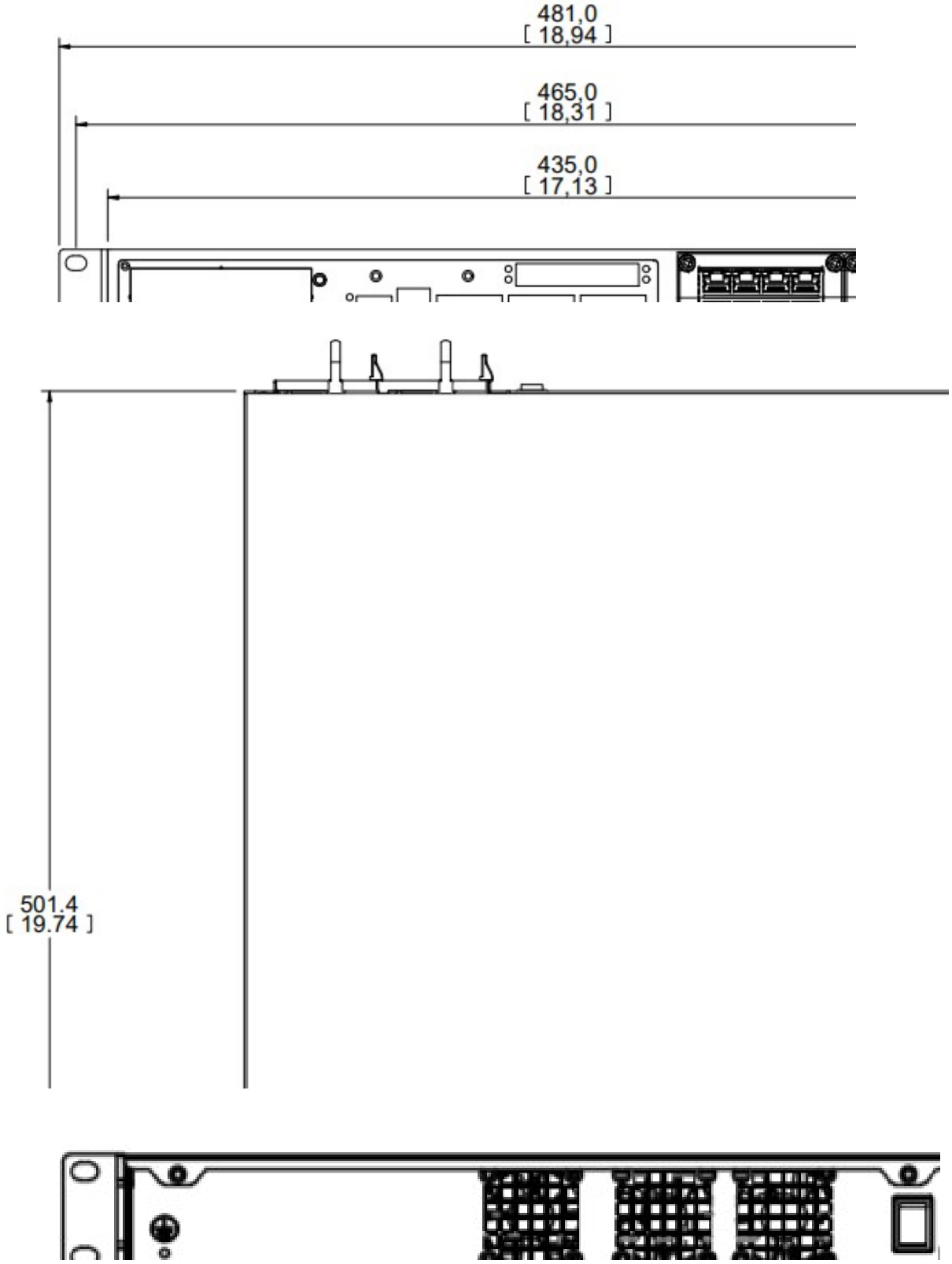
☐ Media module

Size	Please refer to "Size diagram" on Page 40.	
Install media module	Tighten torque	2.0~3.1 lb-in (0.2~0.3 Nm)
Mount cover plate	Tighten torque	2.0~3.1 lb-in (0.2~0.3 Nm)

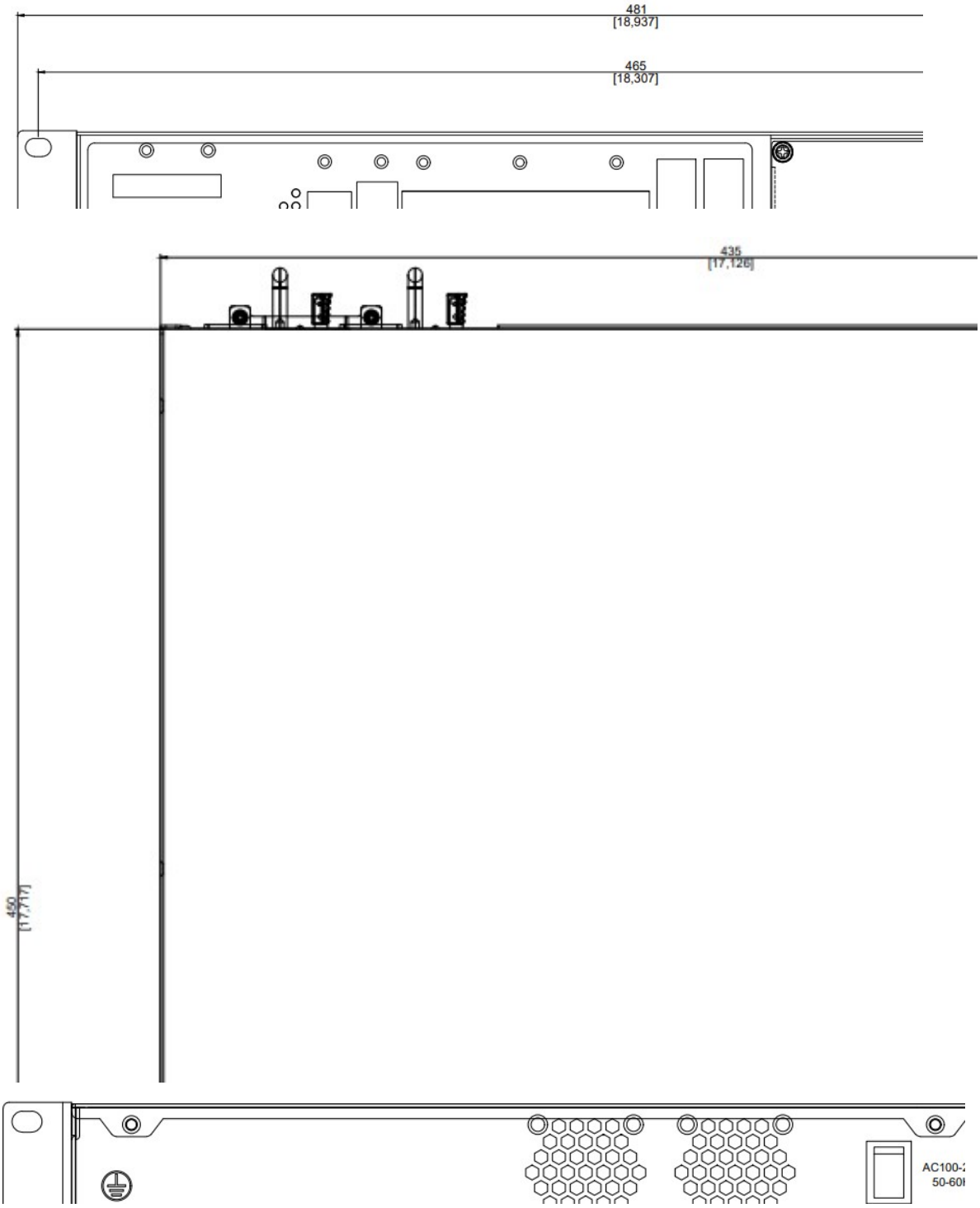
7.2 Dimension drawing

☐ Basic device

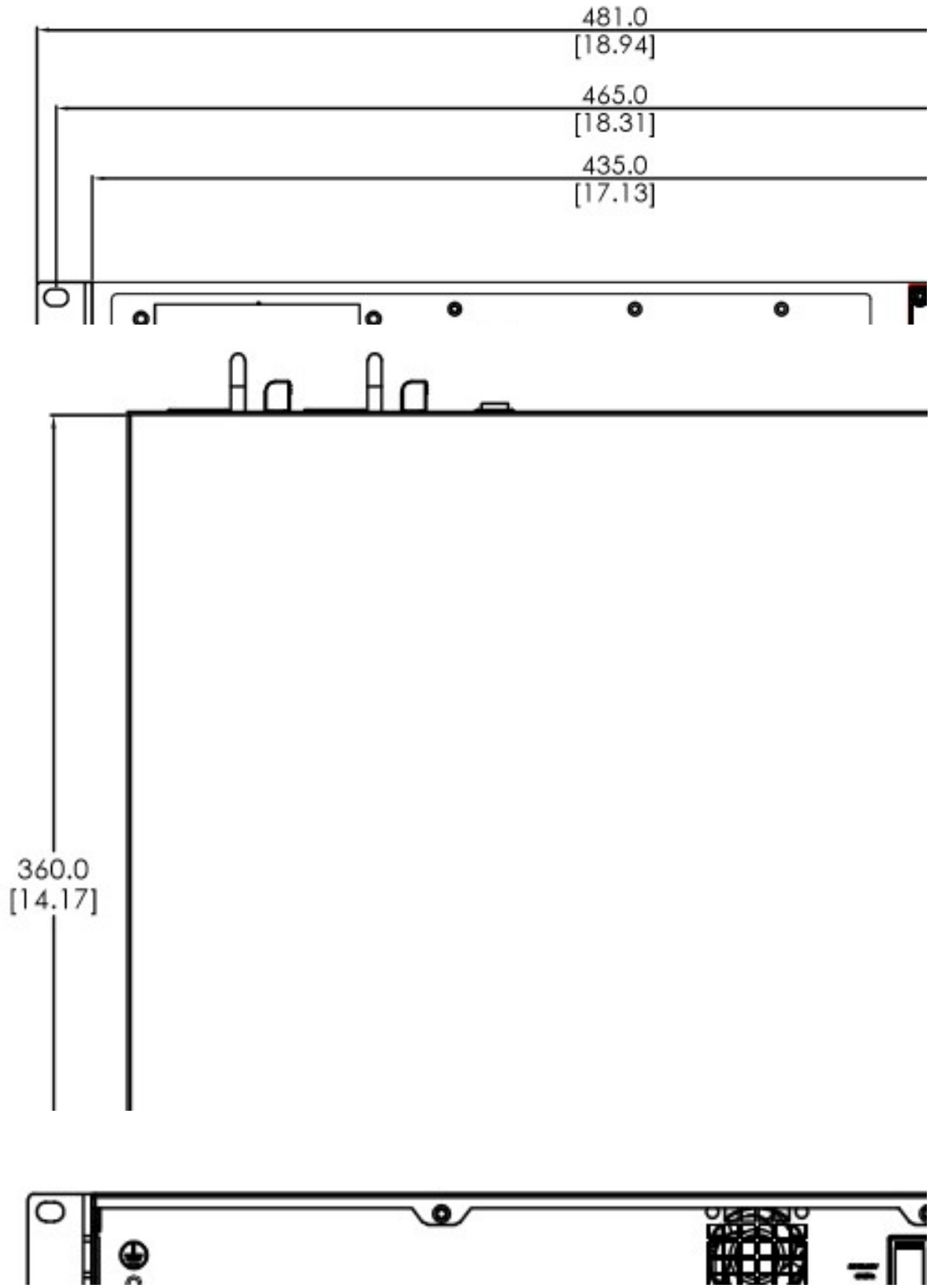
RAVEN 5700



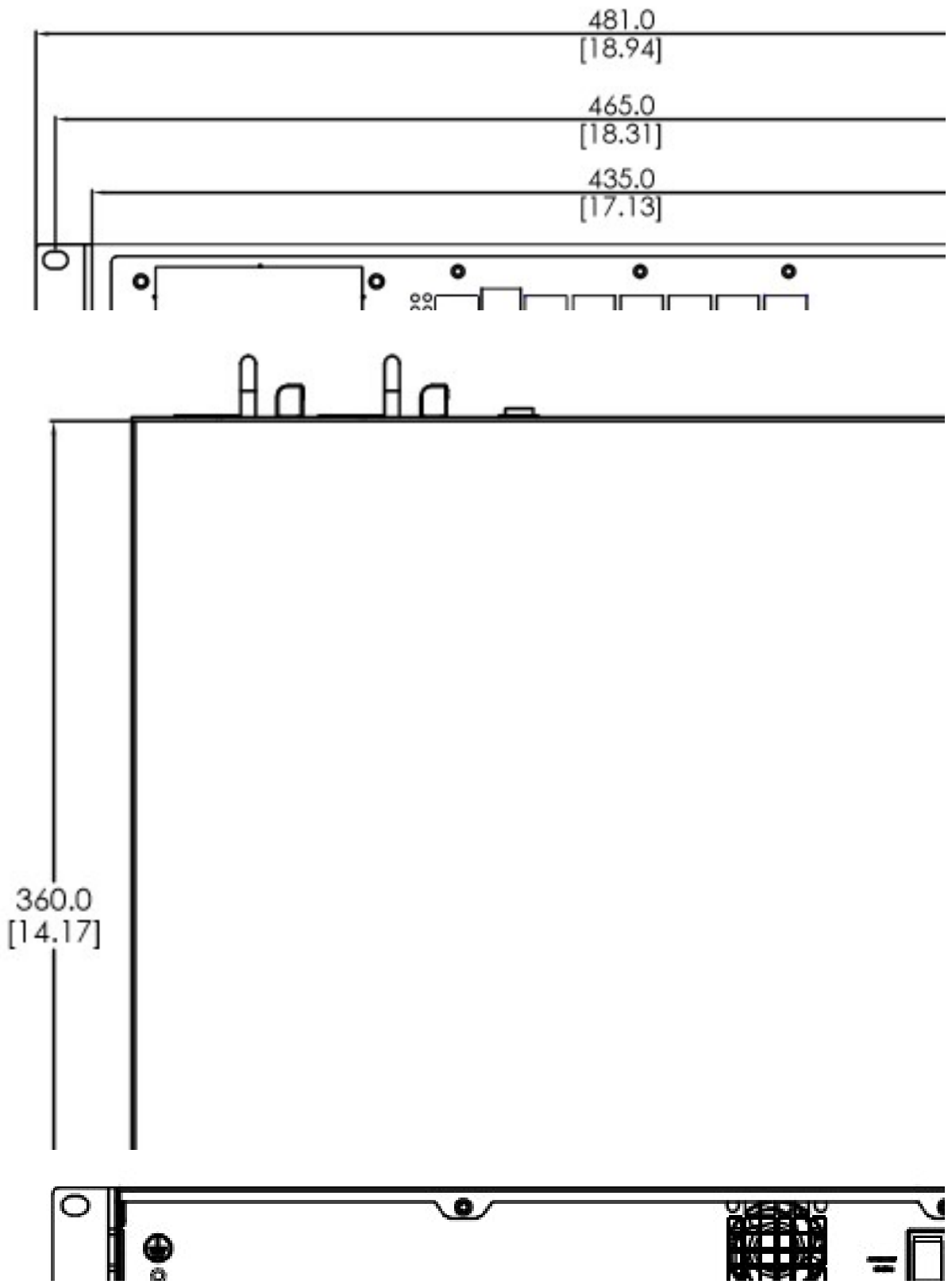
RAVEN 5500



RAVEN 5300



RAVEN 5300-F



7.3 EMC and immunity

EMC interference emission		Standard application
EN 55032		Class A
DNV GL Guide		—
FCC 47 CFR Part 15		Class A
EN 61000-6-4		Conforming
EN 55032	AC/DC Power Line	Class A
DNV GL Guide	AC/DC Power Line	—
FCC 47 CFR Part 15	AC/DC Power Line	Class A
EN 61000-6-4	AC/DC Power Line	Conforming
EN 55032	Signal Line	Class A
EN 61000-6-4	Signal Line	Conforming
Harmonic current		
EN 61000-3-2		Class A
Voltage flicker		
EN 61000-3-3		

EMC immunity		Standard application
Electrostatic discharge		
EN 61000-4-2 IEEE C37.90.3	Contact discharge	±4 kV
EN 61000-4-2 IEEE C37.90.3	Air discharge	±8 kV

EMC immunity		Standard application
Electromagnetic field		
EN 61000-4-3	80 MHz...1000 MHz 1000 MHz...6000 MHz	10 V/m 3 V/m
IEEE 1613	80 MHz...1000 MHz	—
Fast transient (burst)		
EN 61000-4-4 IEEE C37.90.1	AC/DC Power Line	±2 kV
EN 61000-4-4 IEEE C37.90.1	Data cable	±1 kV
EN 61000-4-5	Cable / ground	±2 kV
Voltage surge - power cable		
IEEE 1613	Cable / ground	—
EN 61000-4-5	Cable / cable	±1 kV
Voltage surge - data cable		
EN 61000-4-5	Cable / ground	±1 kV
Conducted immunity		
EN 61000-4-6	150 kHz...80 MHz	10 V

EMC immunity		Standard application
Damped vibration - AC/DC Power Line		
EN 61000-4-12 IEEE C37.90.1	Cable / ground	—
EN 61000-4-12 IEEE C37.90.1	Cable / cable	—
Damped oscillation - data cable		
EN 61000-4-12 IEEE C37.90.1	Cable / ground	—
EN 61000-4-12	Cable / cable	—
Pulsed magnet field		
EN 61000-4-9		—
Power frequency magnetic field		
EN 61000-4-8		30A/m
Voltage dips, short interruptions		
EN 61000-4-11	AC/DC Power Line	20 ms ΔU 100 % 200ms ΔU 60 % 500ms ΔU 30 % 5s ΔU 100 %

Stability		Standard application
IEC 60068-2-6, Test Fc	Vibration	5 Hz...8.4 Hz, amplitude 0.14 in.(3.5 mm)
		8.4 Hz...150 Hz / 1g
IEC 60068-2-27, Test Ea	Vibration	15 g / 11 ms

7.4 Network range

Note: The line length specified for the transceiver applies to the corresponding fiber data (fiber attenuation and BLP/dispersion).

Product code MTS-SFP-1G-...	Mode [a]	Wave length	F/O cable length example[b]	Optical attenuation	BLPc/dispersion
-TX/RJ45...	TX/RJ45	Full Duplex Negotiation	100 m	-	-
-SX/LC...	MM	850 nm	550 m (> 8 dB link budget at 850nm)	3.0 dB/km	-
-LX/LC…	SM	1310 nm	20 km (> 15 dB link budget at 1310nm)	0.32 dB/km	-
-LX+/LC…	SM	1310 nm	40 km (> 22 dB link budget at 1310nm)	0.32 dB/km	-
-LH/LC...	SM	1550 nm	80 km (> 22 dB link budget at 1550nm)	0.18 dB/km	18 ps/(nmxkm)
-LH+/LC	SM	1550 nm	120 km (> 32 dB link budget at 1550nm)	0.18 dB/km	18 ps/(nmxkm)
-BIDI-TypeA-LX/LC...	SM	TX1310 nm RX1550 nm	10 km (>14 dB link budget at 1310/1550 nm)	0.18 dB/km	18 ps/(nmxkm)
-BIDI-TypeB-LX/LC...	SM	TX1550 nm RX1310 nm	10 km (<14 dB link budget at 1550/1310 nm)	0.32 dB/km	-
-LX+/LC-1550...	SM	1550 nm	40 km (> 19 dB link budget at 1550nm)	0.18 dB/km	-

Table 3: Fiber port 1G SFP module

a. MM =multi-module, SM =simple module, LH =single mode long haul
b. When optical fiber data is observed, it includes 3dB system reserve

Product code MTS-SFP-10G-...	Mode [a]	Wavelength	F/O cable length example [b]	Optical fiber attenuation	BLPc/dispersion
-SR/LC...	MM	850 nm	300 m (> 5.1 dB link budget at 850nm)	3.0 dB/km	-
-LR/LC...	SM	1310 nm	10 km (> 6.6 dB link budget at 1310 nm)	0.32 dB/km	-
-ER/LC…	SM	1550 nm	40 km (> 15 dB link budget at 1550 nm)	0.18 dB/km	18 ps/(nmxkm)
-TX/RJ45…	TX/RJ45	Full-duplex adaptive	30 m	-	-

Table 4: 10G SFP module of optical fiber port

a. MM = multimode, SM = single mode

b. When observing the optical fiber data, 3 dB system reserve is included

7.5 Power consumption / power output

Name	Maximum power consumption	Power output
Basic device		
RAVEN 5700	150W	525 Btu (IT)/h
RAVEN 5500	80W	280 Btu (IT)/h
RAVEN 5300	75W	262.5 Btu (IT)/h
RAVEN 5300-F	70W	245 Btu (IT)/h

8 Delivery item, order number and accessories

☐ Delivery item

Quantity	Articles
1	Equipment
1	General safety guidelines
2	Bracket

☐ Order number

RAVEN 5700
RAVEN 5500
RAVEN 5300
RAVEN 5300-F
RAVEN 5000M-4T
RAVEN 5000M-4F
RAVEN 5000M-8T
RAVEN 5000M-8F

☐ Accessories

1G SFP module	Order number
MTS-SFP-1G-TX/RJ45	942 999 854
MTS-SFP-1G-SX/LC	942 999 855
MTS-SFP-1G-LX/LC	942 999 856
MTS-SFP-1G-LX+/LC	942 999 857
MTS-SFP-1G-LH/LC	942 999 858
MTS-SFP-1G-LH+/LC	942 999 859
MTS-SFP-1G-BIDI-TypeA-LX/LC	942 999 860
MTS-SFP-1G-BIDI-TypeB-LX/LC	942 999 861
MTS-SFP-1G-LX+/LC-1550	942 999 862

10G SFP module	Order number
MTS-SFP-10G-SR/LC	942 999 851
MTS-SFP-10G-LR/LC	942 999 852
MTS-SFP-10G-ER/LC	942 999 853
MTS-SFP-10G-TX/RJ45	942 999 867

a. You may access more information about certificates on the product page of Hirschmann IT (https://hirschmann-it.support.belden.com).

9 Basic technical standards

Name	
FCC 47CFR Part 15	Code of Federal Regulations
IEC 60825-1	Laser product safety
EN 55032	Electromagnetic compatibility of multimedia equipment - Emission requirements
EN 62368-1	Information technology equipment - Safety - Part 1: General requirements
EN 61000-3-2	Electromagnetic compatibility (EMC) – Part 3-2: Limits – Limits for harmonic current emissions (equipment input current ≤ 16 A per phase)
EN 61000-3-3	Electromagnetic compatibility (EMC) - Part 3-3: Limits - Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current Less than or equal to 16 A per phase and not subject to conditional connection
EN 61000-6-2	Electromagnetic compatibility (EMC)- Part 6-2: Generic standards - Immunity standard for industrial environments
EN 61000-6-4	Electromagnetic compatibility (EMC) - Part 6-4: Generic standards - Emission standard for industrial environments
EN 61131-2	Programmable controllers - Part 2: Equipment requirements and tests

Table 5: List of technical standards

The equipment usually meets the technical standards set forth in the latest version.
Only when the equipment shell has the certification mark, it means that the equipment is certified to a specific standard.

A More support

Technical issues

If you have any technical question, please contact your local Hirschmann IT dealer or Belden directly.
You may search our partners' addresses online at https://hirschmann-it.support.belden.com.
For the list of local telephone numbers and email addresses for you to get direct technical support from Hirschmann IT, please visit: https://hirschmann-it.support.belden.com. The website also contains free knowledge base and software download section.

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