HIRSCHMANN IT

A BELDEN BRAND

User manual

Installation

RAVEN 4000Intrusion Detection and Management System
RAVEN 4500/RAVEN 4300

RAVEN4000 Media Module
RAVEN 4500M-8T/RAVEN 4500M-8F/RAVEN 4500M-4T4F
RAVEN 4300M-8T/RAVEN 4300M-8F/RAVEN 4300M-4T4F

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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 guidelines

Warning

Uncontrolled machine action

To avoid uncontrolled machine action due to data loss, configure all data transfer devices separately.
Before starting any machine controlled by data transfer, be sure to complete the configuration of all data transfer devices.

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

- **General safety guidelines**
  Hot-line work is required for the equipment. Improper use of the equipment may result in personal injury or great destruction of property. The proper and safe operation of the equipment depends on proper handling during transportation, reasonable storage and installation, as well as careful establishment and strict adherence to the operation and maintenance procedures.
  - Please read this manual as well as safety guidelines and warnings before connecting any cable.
  - Only operate the equipment without any damaged components.
  - Make sure there is no component to be repaired in the equipment. In case of any damage or failure to the equipment, off the power and return the equipment to Belden for inspection.

- **Qualification requirements for operators**
  - Only qualified personnel are allowed to operate the equipment.

  Qualified personnel have the following characteristics:
  - They shall receive appropriate training. Training and required practical knowledge and experience are prerequisites to be qualified for product operation. Only when these prerequisites are met can operators perform grounding and labeling operations on circuits, equipment and systems in accordance with current safety technical standards.
  - Qualified personnel shall be aware that there is danger in their work.
  - Qualified personnel shall know well how to deal with these hazards to reduce risks posed to themselves and others.
  - Qualified personnel shall receive training on a regular basis.

☐ Correct use

Use the equipment only for the purposes specified in the catalog and technical instructions. Only external devices and components recommended and permitted by the manufacturer can be used to operate the equipment.

The correct and safe operation of this product depends on the correct operation, storage, assembly and installation during transport, as well as careful operation and maintenance procedures.

☐ National and international safety regulations

Carry out validation to ensure that electrical installations comply with applicable local or national safety regulations.

☐ Wire connection requirements

Always make sure that all requirements listed are met before connecting the wires.

	The requirements below shall apply without limitation:
☐☐	The wires are voltage free.
☐☐	The cables used meet the temperature range required for a particular purpose.
☐☐	First, connect the ground screw on the back of the equipment to the protective conductor before setting up other connections. When to remove connections, the protective conductor shall be the last to be removed.
☐☐	Do not power up the equipment during installation.
☐☐	Requirements for North America: Use 60 / 75 ° C (140 / 167 ° F) or 75 ° C (167 ° F) copper (Cu) wires only.

Table *1*: Wire connection requirements

☐ Power voltage connection requirements

Device Model	**The requirements below shall apply without limitation:**	
All models	Meet **all** of the following requirements	
	☐☐	The supply voltage shall be consistent with the specified value on the equipment nameplate.
	☐☐	The power supply shall conform to overvoltage category I or II.
	☐☐	The power supply shall be equipped with an easy-to-operate disconnector (such as a or plug).
	☐☐	The disconnector shall be clearly marked, so that in an emergency, the operator knows at a glance the correspondence between the disconnector and the power 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 equipment contains such a second power supply voltage connection module: first connect the protective conductor, and then the power supply voltage.
	☐☐	Supply with DC voltage:
	☐☐	Power cord diameter at the power supply voltage input shall be at least 1mm² (North America: AWG16). Supply with AC voltage:

☐☐	Power cord diameter at the power supply voltage input shall be at least 0.75 mm² (North America: AWG18).
☐☐	The cross section of the grounding conductor shall be the same as or larger than that of the power cord.
☐☐	Power cables suitable for voltage, current and physical loads shall be used.
☐☐	The external fuse shall be installed in the conductor at the non-spot position.

Table 2: Power voltage connection requirements

⚠ Special conditions for safe use

- ☐ Install the basic equipment 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 shield grounding module of the twisted-pair cable shall be connected to the front panel as a conductor.

When connecting a cable segment with a conductive shield braid, pay attention to the possible short circuit.

☐ ESD guide

These modules are equipped with electrostatic sensitive components.

If the connection is touched, these sensitive components may be damaged or their service life shortened by 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).

☐ **Equipment enclosure**

Only technicians authorized by the manufacturer are allowed to open the enclosure.

- ☐ Keep vents open to ensure good air circulation.
- ☐ Ensure a minimum of 3.94 inches (10 cm) of space in front of the enclosure vent.
- ☐ Do not touch the enclosure during operation or shortly after shutting down the equipment. Hot surfaces may cause injury.
- ☐ Install the equipment horizontally in the cabinet or vertically on a flat surface.

  Do not place the equipment on the desktop for operation. See Page 40 for details of “Install equipment and ground”.
- ☐ Operate the equipment at the maximum ambient air temperature and in stacking: when to install the equipment, make sure that there is at least one available rack space (approx. 5 cm) above the equipment to allow heat to escape through the enclosure of the equipment.
- ☐ If you operate the equipment in 19” cabinet: install the slide / rails to support the weight of the equipment.

☐ **Installation site requirements**

The equipment can only be operated at the specified ambient temperature - the ambient air temperature at a distance of 2 inches (5 cm) from the equipment - with relative humidity.

- ☐ When selecting the installation position, be sure to comply with the climate thresholds set forth in the technical data.
- ☐ Please use the equipment in the environment where the maximum pollution level conforms to the technical data.

☐ **CE mark**

Marked equipment shall comply with the European directives below:

Device Model	Instruction
All models	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 electron.
All models	2014/30/EU (EMC) Directive of the European Parliament and of the Council on electromagnetic compatibility among standardization members.

Please submit the EU compliance statement to the authorities at the following address in accordance with the above EU directives:

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

Warning! As Class A equipment, it may cause interference to the living area. In such case, the operator may need to take appropriate actions.

Warning! When Ethernet cables are used in industrial environments, they must be shielded.

Note: It is required to strictly comply with the assembly guidelines provided in these guidelines to observe EMC thresholds.

☐ **LED or Laser Component**

LED or Laser Component conforming to IEC 60825-1 (2014):
Class 1 laser products
Class 1 LED products

☐ **FCC description:**

The equipment complies with Section 15 of FCC. The equipment shall be operated in line with the following two requirements: (1) the equipment causes no harmful interference; (2) the equipment must accept any interference it receives, including interference that may result in accidental operation. Appropriate testing has confirmed that the equipment meets the requirements for Class A digital equipment in Section 15 of FCC.

These requirements are intended to provide adequate protection against interference with the equipment when used in commercial environments. The equipment creates and uses high frequencies and may also radiate them. Failure to observe this user manual in installation or use of the equipment may cause interference with radio transmission. Use of the equipment in residential areas may also cause interference, in which case the user is obliged to pay to eliminate such interference.

☐ **Recovery instructions**

At the end of use, you must properly dispose of the equipment as e-waste in accordance with the current disposal regulations of your county, state and country.

About the manual

This user manual about “Installation” contains equipment instructions, safety instructions, display instructions, and other information required for equipment installation.

Legend

The symbols used in this manual have the following meanings:

☐☐	Item list
☐☐	Work step
☐	Subtitle

1 Description

1.1 General equipment description

RAVEN4000 Intrusion Detection and Management System is a threat detection, analysis and management product that Hirschmann IT creates independently and owns completely independent intellectual property rights。The product has a high-precision detection capability for viruses, worms, Trojans, DDoS, scanning, SQL injection, XSS, buffer overflow, deception hijacking and other attacks, as well as network resource abuse (such as P2P upload/download, network games, video/audio, network stock trading) and other threats. At the same time, the traffic module in this product has very accurate and effective ability to find abnormal situations of network traffic. On the basis of accurate detection, this product emphasizes the manageability of threats (such as threat analysis and threat processing), especially the intelligent filtering of a large number of possible events. It only shows the threats that users really need to pay attention to, and at the same time reduces the workload of users, it ensures the timeliness of threat processing.

☐ Basic device

RAVEN 4500

RAVEN 4300

☐ **Media module**

RAVEN 4500M-8T

RAVEN 4500M-8F

RAVEN 4500M-4T4F

RAVEN 4300M-8T

RAVEN 4300M-8F

RAVEN 4300M-4T4F

You can select 1 media module.
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.

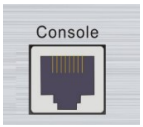
1.2.1 Basic device

Order number	Product code	Description
942999713	RAVEN 4500	5xGE TX ports, 1×RJ45 console port, 1×extended slot
942999714	RAVEN 4300	5xGE TX ports, 1×RJ45 console port, 1×extended slot

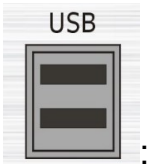
1.2.2 Media module

Order number	Product code	Description
942999715	RAVEN 4500M-8T	8×GE TX ports line card for RAVEN 4500
942999716	RAVEN 4500M-8F	8×GE SFP ports line card for RAVEN 4500
942999717	RAVEN 4500M-4T4F	4×GE TX ports and 4×GE SFP ports line card for RAVEN 4500
942999718	RAVEN 4300M-8T	8×GE TX ports line card for RAVEN 4300
942999719	RAVEN 4300M-8F	8×GE SFP ports line card for RAVEN 4300
942999720	RAVEN 4300M-4T4F	4×GE TX ports and 4×GE SFP ports line card for RAVEN 4300

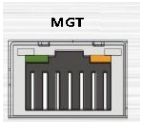
1.3 Equipment view



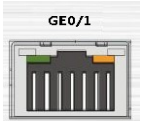
：RJ45 Console Port



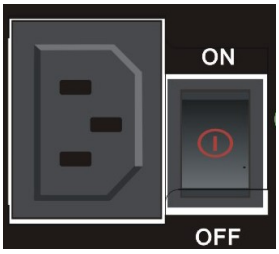
:2×USB Port



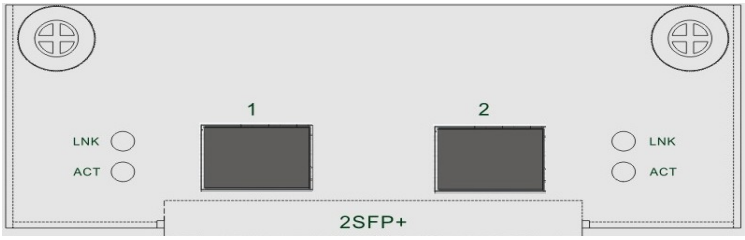
：MGT Port



：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
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

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 unit

After the power supply voltage is set, the software will start automatically and complete initialization. And then the equipment performs self-test. All LED indicators will come on in this process.

1.6.1 Equipment status

These LEDs provide information about the conditions that affect the operation of the equipment.

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 IDS 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

2.5 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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2.6 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.

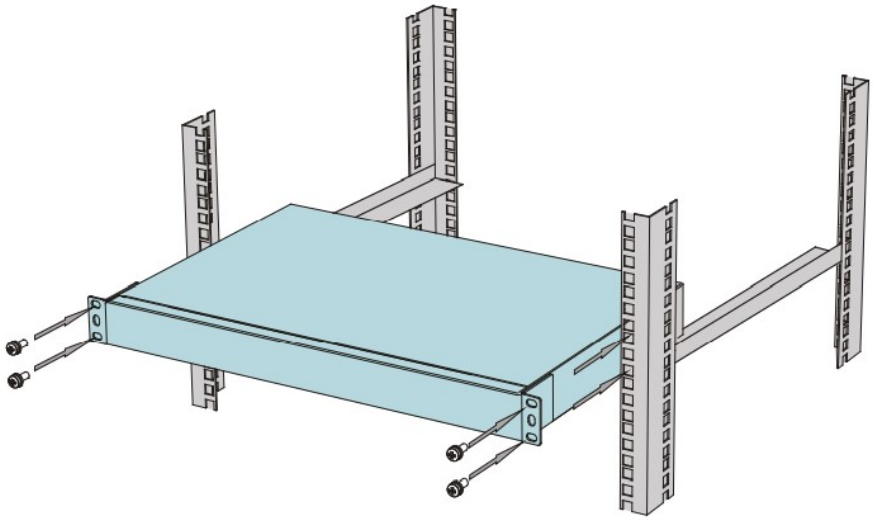


Figure 6: Installing the power module on a switch cabinet

2.6.1 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.**.

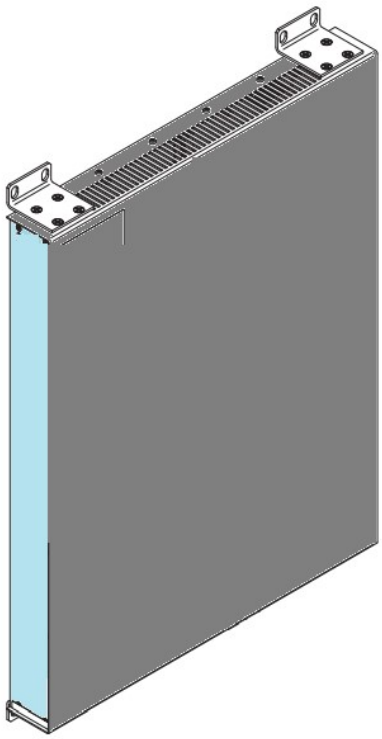


Figure 7: Installing the device on a vertical flat surface

2.6.2 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.**.

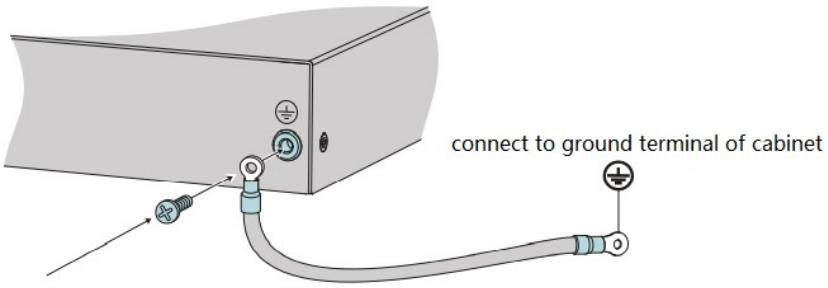


Figure 8: Grounding the device

2.7 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.

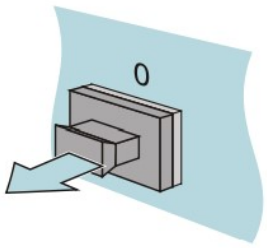


Figure 9: Take out the SFP transceiver

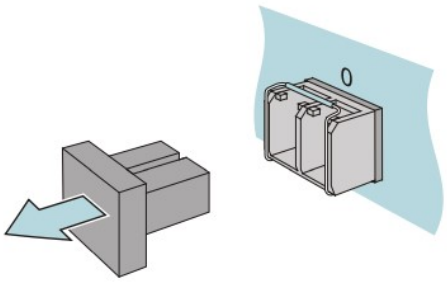


Figure 10: Remove the protective cap

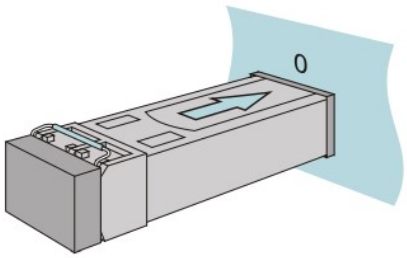


Figure 11: Install the SFP transceiver

2.8 Operating the device

Perform the following work step:

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

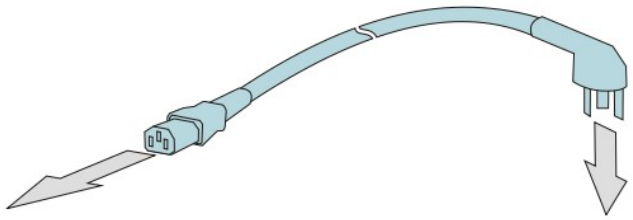


Figure 12: Connect the power supply

2.9 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..

2.10 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 Remove

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

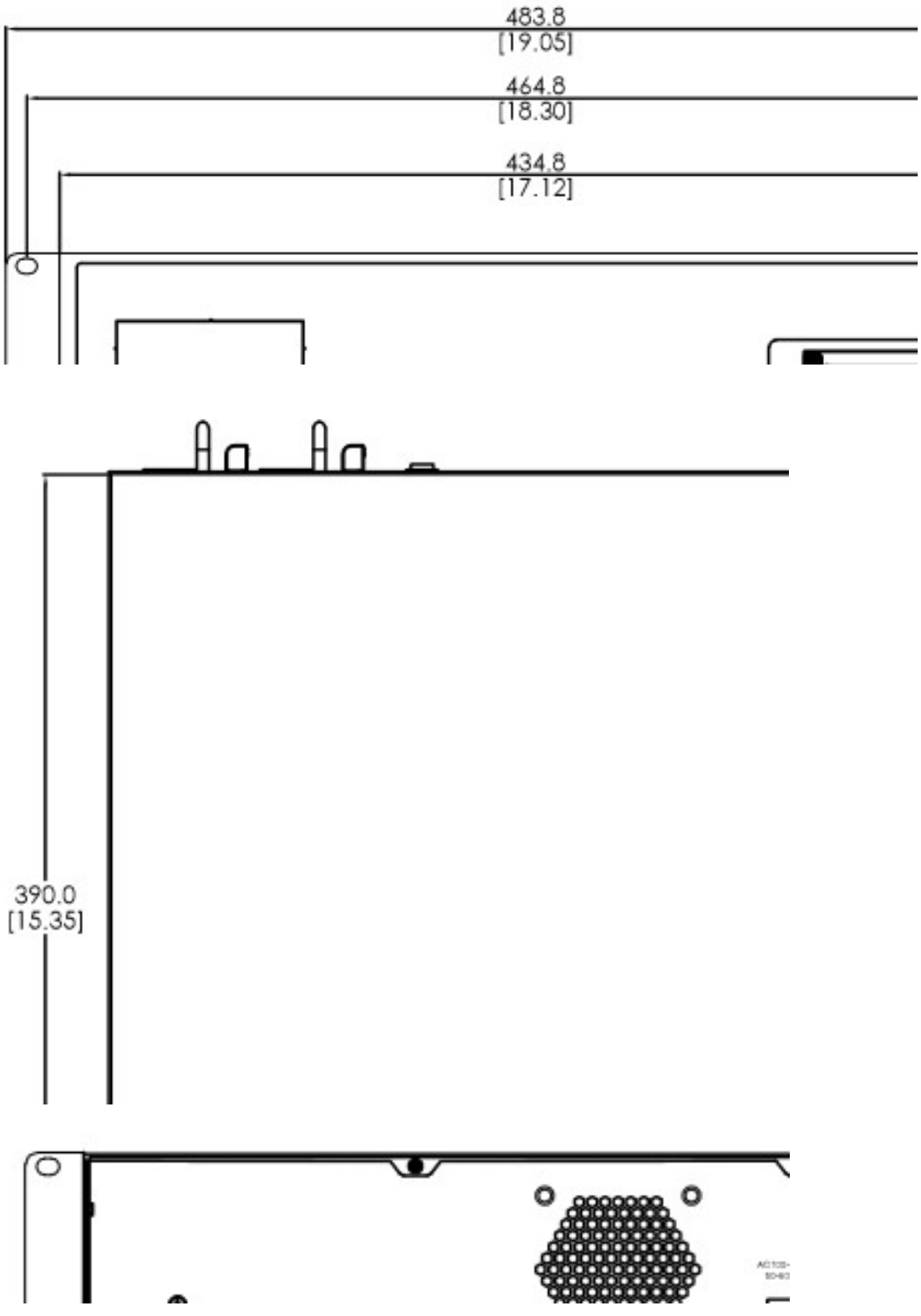
☐ Media module

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)

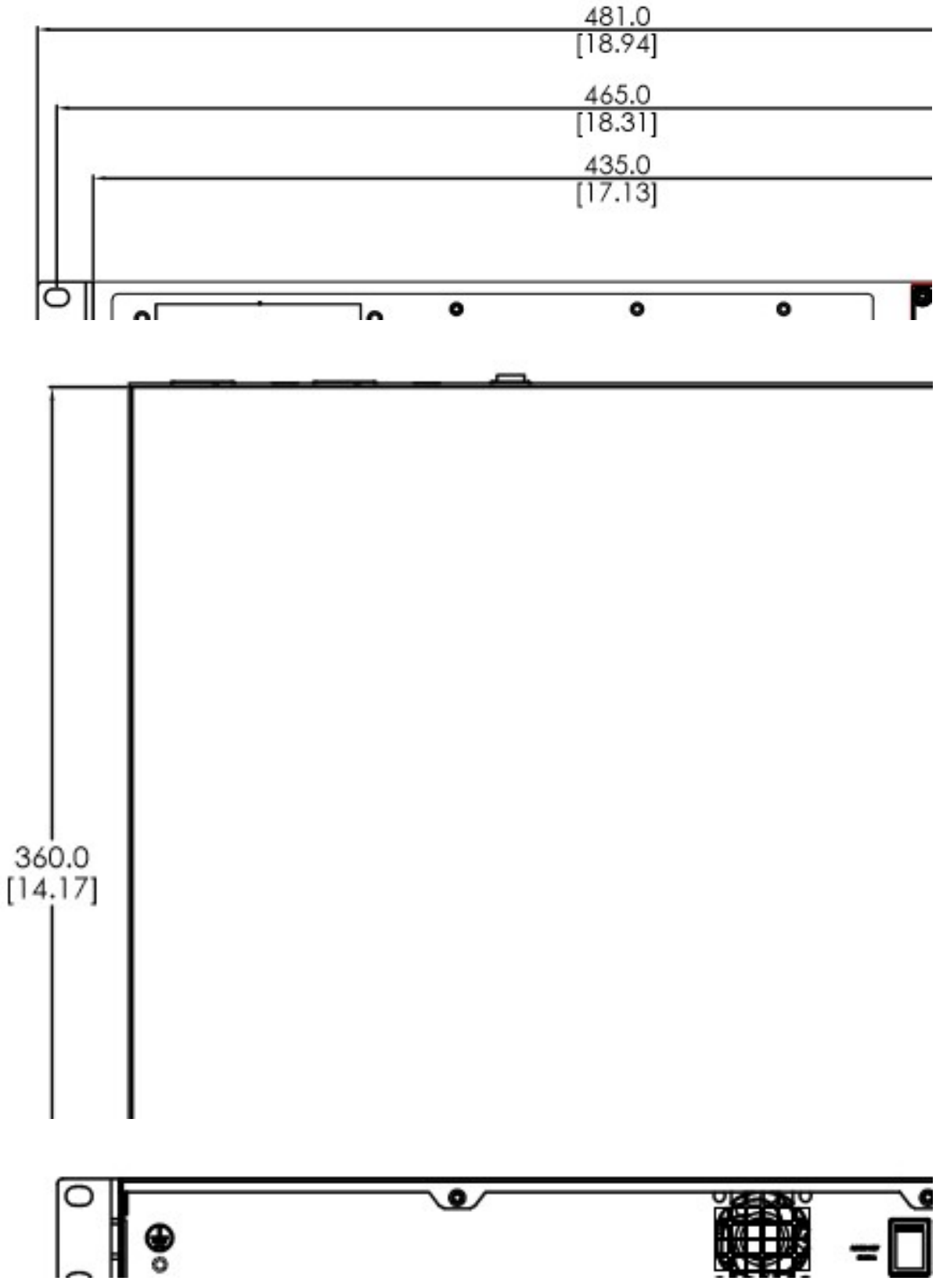
7.2 Dimension drawing

☐ Basic device

RAVEN 4500



RAVEN 4300



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/RJ 45	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

7.5 Power consumption / power output

Name	Maximum power consumption	Power output
Basic device		
RAVEN 4500	80W	280 Btu (IT)/h
RAVEN 4300	60 W	210 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 4500
RAVEN 4300
RAVEN 4500M-8T
RAVEN 4500M-8F
RAVEN 4500M-4T4F
RAVEN 4300M-8T

☐ 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

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.