

User Manual

Installation

MAMMUTHUS CORE LAYER SWITCH – MTS2948X-6Q-A

MAMMUTHUS POWER MODULE – MTM2900-PSU250

MAMMUTHUS FAN MODULE – MTM2900-FAN



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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, switch 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 disconnecter (such as a switch or plug).
☐	The disconnecter shall be clearly marked, so that in an emergency, the operator knows at a glance the correspondence between the disconnecter 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 30 for details of “Equipment installation and grounding”](#).

- ☐ 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” switch 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 conformed 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.

Figure

The symbols used in this manual have the following meanings:

☐	☐	Item list
☐	☐	Work step
☐		Subtitle

1 Description

1.1 General equipment description

MTS2900 switch provides excellent port density and switching performance, with enhanced L2 / L3 feature set, which can support data center level network, and provides high flexibility configuration options and OpenFlow support. It can be used as a core switch, combined with MTS2600\MTS2700\MTS2800 to form a compact data network solution, or as a convergence switch, combined with MTS8003 to form a large network solution.

☐ Basic device



☐ Power module



You may choose 1 or 2 power modules with the same input voltage:
Power modules are provided as accessories. Please refer to “Order number” on Page 47.

☐ Fan module



The rear panel of the switch provides 4 fan slots, equipped with standard 4 fan modules.

Fan modules are provided as accessories. Please refer to “Order number” on Page 47.

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
942999824	MTS2948X-6Q-A	1U rack-mounted 10G core layer switch, 48 × 1/10G SFP + slot, 6 × 40G QSFP+ slot, 2 × modular PSU slot, 4 × fan slot, advanced software.

1.2.2 Power module

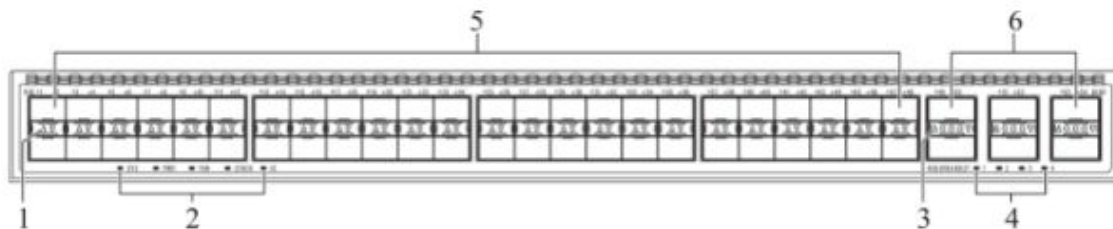
Order number	Product code	Description
942999822	MTM2900-PSU250	AC/DC 250W power module; AC input 100-240V; DC input 192~288V, 3.5A; output 12V/20.8A, 5VSB/2A; hot-pluggable.

1.2.3 Fan module

Order number	Product code	Description
942999823	MTM2900-FAN	It is a modular fan, hot-pluggable. MTS2948 is forcedly equipped with 4 fan units.

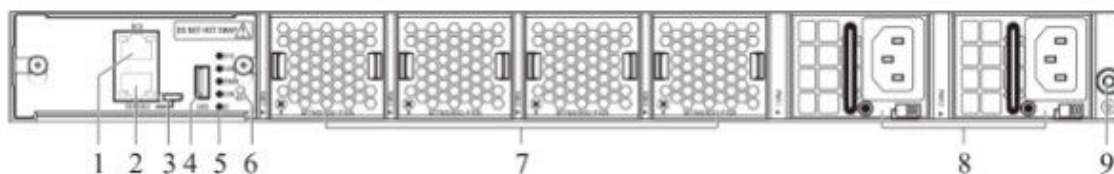
1.3 Equipment view

1.3.1 MTS2948X-6Q-A



Front view

1	Port Status LED (1 / 10G optical port)
2	The equipment Status LEDs from left to right are as follows: SYS: System indicator PWR: Power indicator FAN: Fan indicator STACK: Stack indicator ID: ID indicator
3	Port Status LED (40G optical port)
4	BREAK OUT indicator
5	10 Gbit optical port (configurable to 1000Base-X)
6	40G optical port (breakable out into 4 X 10G optical port)



Rear view

1	DC0 interface
2	CONSOLE port
3	Micro USB (CONSOLE port) CONSOLE port
4	USB interface
5	The equipment Status LEDs from top to bottom are as follows: SYS: System indicator FAN: Fan indicator

STACK: Stack indicator

USB: USB indicator

ID: ID indicator

6	Reset button (press and hold for 5 seconds to restart the machine)
7	Fan module slot (FAN1---FAN4)
8	Modular power supply slot (PWR1, PWR2)
9	Earthing terminal

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1.3.3 Fan module



1.4 Power supply

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

See the “Power module” on page 16 for information about connecting supply voltage.

1.5 Ethernet port

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

1.5.1 10 Gbit/s F/O port

The port is an SFP + slot.

The port allows you to connect network components according to IEEE 802.3.

The port supports:

Full duplex

Delivery status

10 Gbit/s full duplex when 10 Gbit Ethernet SFP + transceiver is used

1.5.2 40 Gbit/s F/O port

The port is a QSFP + slot.

The port allows you to connect network components according to IEEE 802.3.

The port supports:

Full duplex

Delivery status

40 Gbit/s full duplex when 10 Gbit Ethernet QSFP + transceiver is used

1.5.3 Out-of-band management port

The port is an RJ45 socket.

The port allows you to connect network components according to IEEE 802.3 10BASE-T/100BASE-TX.

The port supports:

- ☐ Auto-negotiation
- ☐ 100 Mbit/s half-duplex, 100 Mbit/s full duplex, 10 Mbit/s half-duplex, 10 Mbit/s full duplex

The port allows you to manage the equipment and upload configuration through the following protocols:

- ☐ SNMP
- ☐ SSH
- ☐ Telnet
- ☐ FTP

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>

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 state

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 indicator	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
STACK indicator	STACK	Green	Flashing: indicating stacking function is enabled, and the equipment is the main unit of the stacking system ON: indicating stacking function is enabled, and the equipment is not the main unit of the stacking system OFF: indicating stacking function is not enabled
ID indicator	ID	Blue	Quick flashing (at frequency of 5Hz): used for site positioning, and for the operation and maintenance personnel to remotely control the ID light on and off OFF: indicating ID light is not enabled by default

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
USB indicator	USB	Green	ON: indicating U disk is in place Flashing: indicating data reading and writing OFF: indicating U disk is not in place
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

Indicator type	Indicator name	Indicator color	Status
STACK indicator	STACK	Green	Flashing: indicating stacking function is enabled, and the equipment is the main unit of the stacking system ON: indicating stacking function is enabled, and the equipment is not the main unit of the stacking system OFF: indicating stacking function is not enabled
ID indicator	ID	Blue	Quick flashing (at frequency of 5Hz): used for site positioning, and for the operation and maintenance personnel to remotely control the ID light on and off OFF: indicating ID light is not enabled by default

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 in serial port OFF: indicating no data sending in serial port
	RXD	RJ45 build-in green LED	Flashing: indicating data receiving in serial port OFF: indicating no data receiving in serial port
DC0 interface indicator	1000M	RJ45 self-contained yellow LED	OFF: indicating DC0 works at 10 / 100M or is unlinked ON: indicating DC0 works at 1000M
	ACT	RJ45 build-in green LED	OFF: indicating DC0 interface is unlinked ON: indicating DC0 interface is linked with no data sending and receiving Flashing: indicating DC0 interface is linked with data sending and receiving
Port Status LED	LINK/ACT	Green	ON: indicating successful connection establishment in Ethernet port Flashing: indicating data sending and receiving in Ethernet port OFF: indicating no connection establishment in Ethernet port
40G port BREAK OUT indicator Light	40G BREAKOUT	Green	ON: indicating at least one 40GE interface works in 10GE mode and is broken out into 4 X 10GE interfaces. When any one or more 40GE interfaces are configured as four 10GE interfaces, BREAKOUT light is enabled and works with 40G interface indicator to distinguish the serial number of 10GE interface: When the Port LED 1 is on, each interface indicator indicates the status of the 1st 10GE interface in the interface. When the Port LED 2 is on, each interface indicator indicates the status of the 2nd 10GE interface in the interface. When the Port LED 3 is on, each interface indicator indicates the status of the 3rd 10GE interface in the interface. When the Port LED 4 is on, each interface indicator indicates the status of the 4th 10GE interface in the interface. OFF: indicating 40GE interface works in 40GE mode and is not broken out into 4 X 10GE interfaces.

1.7 Management interface

1.7.1 DC0 interface (external management)

The serial interface is provided on RJ45 socket (DC0 interface), which can realize the local connection of external management station (VT100 terminal or PC with corresponding terminal simulation), and thus you are allowed to establish the connection to the command line interface CLI and the system monitor.

1.7.2 USB interface

The switch provides two serial ports (EIA/TIA-232 and Micro USB 2.0), by which users can configure the switch using the PC (or laptop) equipped with RS-232 serial port (or USB interface).

2 Installation

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

Follow the following steps to install and configure the equipment:

- ☐ [Unpack the box for inspection](#)
- ☐ [Install cover plate and power module \(optional\)](#)
- ☐ [Install equipment and ground](#)
- ☐ [Operate equipment](#)
- ☐ [Install SFP transceiver \(optional\)](#)
- ☐ [Connect data cable](#)
- ☐ [Fill in the Device Label](#)

2.1 Unpack the box for inspection

- ☐ Check whether the box contains all the items specified in ["Delivery items" on page 47](#).
- ☐ Check the parts one by one for damages incurred in shipment.

2.2 Install power module (optional)

2.2.1 Install power module

Hirschmann IT provides ready-to-run power modules. You can choose to install the power module while the equipment is running.

Follow the steps below:

- ☐ Remove the cover plate (if installed) from the power module slot of the equipment.
- ☐ Plug the power module directly into the slot.
- ☐ Tighten 2 screws to secure the power unit to the equipment.
You can refer to the specified tightening torque in the "General technical data" on page 59.

2.3 Install equipment and ground

You can install the equipment by the following options:

- ☐ Install the equipment in the switch cabinet
- ☐ Install the equipment on a vertical flat surface



Warning

Electric shock

Such equipment can only be installed in switch cabinet or restricted operation place, and the equipment is accessible to maintenance personnel only.

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



Caution

Overheat

When installing equipment, make sure that the ventilating slots are not covered.

Failure to comply with these guidelines may result in minor injury or equipment damage.

☐ Install the equipment in the switch cabinet

NOTE: When the equipment is operated in an environment with continuous vibration load greater than 0.7g, it must be additionally fixed to the switch cabinet with 2 fixed mounting brackets on the front and back of the equipment.

Additional mounting brackets are provided as accessories. Please refer to “Accessories” on Page 47.

Preconditions:

- ☐ Install the equipment in 19" switch cabinet by means of slide or mounting rails.
It can improve the stability of the equipment in an environment affected by vibrations.
For more information about slide/mounting rails and how to install them, please contact the switch cabinet manufacturer.
- ☐ The equipment is designed to be installed in a 19" switch cabinet.
At the time of delivery, 2 preinstalled fixed mounting brackets come with the equipment on the side.
- ☐ Make sure it's well ventilated. If necessary, install a fan to prevent overheating.
- ☐ Measure the depth of the 19" cabinet so that all connections can be easily plugged in.

Follow the steps below:

- ☐ Install sliding or mounting rails in a 19 "switch cabinet as specified by the manufacturer.
- ☐ Place the equipment on the rail in the switch cabinet.
- ☐ Screw the mounting bracket to the switch cabinet to secure the equipment.

☐ **Install the equipment on a vertical flat surface**



Warning

Fire risk

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

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

Follow the steps below:

- ☐ Use preinstalled mounting brackets, as shown below.
- ☐ And attach 2 mounting brackets to the back of the equipment.
- ☐ Additional mounting brackets are provided as accessories. Please refer to "Accessories" on Page 47.
- ☐ Screw the mounting brackets to the wall to secure the equipment.

☐ **Equipment grounding**

The equipment has the connection of protective grounding wire.

The equipment is grounded by grounding screw and power socket.

Follow the steps below:

- ☐ Ground the equipment with grounding screws
You can refer to the specified tightening torque in the ["General technical data" on page 50](#).

2.4 Install SFP transceiver (optional)

Preconditions:

Only Hirschmann IT SFP transceiver can be used. [Please refer to "Accessories" on Page 47](#).

Follow the steps below:

- ☐ Remove the protective cover from the SFP transceiver.

- ☐ Push the SFP transceiver into the slot until it is locked.

2.5 Operate equipment

Follow the steps below:

- ☐ Use screws to secure the connector to the equipment.
You can refer to the specified tightening torque in the [“General technical data” on page 38](#).
- ☐ Enable the supply voltage.

2.6 Connect data cable

In environments with high electrical interference, note the following general recommendations for data cable connections:

- ☐ Minimize the length of the data cable.
- ☐ Use fiber-optic data cables for data transmission between buildings.
- ☐ Try to separate the power cable from the data cable sufficiently if there are copper cables used. It is best to install it in a separate channel.
- ☐ Make sure the power cable and data cable are not laid out in parallel over a long distance, preferably in separate cable channels. To reduce inductive coupling, make sure the power and data cables intersect at 90°.
- ☐ Use SF/UTP cable conformed to ISO/IEC 11801:2002.
- ☐ Connect the data cable according to your requirements.

Note: Only shielded twisted pair cables are allowed in DNV GL EMC Class B area.

For more information:

[Refer to “Equipment name and product code” on page 16.](#)

2.7 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 38.](#)

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 switching frequency. Please check the resistance and switch function of the closed relay contacts according to the switching frequency.
- ❑ The internal fuse will be triggered only when the equipment detects an error. In case of any damage or failure to the equipment, switch 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 power module

Follow the steps below:

- ☐ Remove screws on the front panel of the power module.
 - ☐ Pull the power module out of the slot.
 - ☐ Seal the power 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 38.

6.2 Remove fan module

Follow the steps below:

- ☐ Remove screws on the front panel of the media module.
 - ☐ Press the locking lever outward to unlock the fan module (steps **1** and **2**).
 - ☐ Pull the fan module out of the slot (step **3**).
 - ☐ 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 38.

6.3 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.

6.4 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 switch 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.		
Weight		10.8kg	
Power supply	Rated voltage range	192 VAC ... 240 VAC	,50 Hz ... 60 Hz
		Maximum conductor diameter	AWG12 (2.5 mm ²)
Equipment grounding	Tighten torque Protective grounding	3.5~6.1 lb-in (0.4~0.7 Nm)	
Climatic conditions during operation	Ambient air temperature	0°C~45°C (2000m) Note: The altitude is 2000m ~ 4000m, and the maximum working temperature decreases by 1 °C every 200m above sea level.	
	Humidity	10%~90%/RH, no condensation	
Climatic conditions during storage	Altitude	<5000m	
Pollution level		2	
Protection Level	Laser protection	Class 1 conformed to IEC 60825-1	
	Degree of protection	IP20	

□ Power module

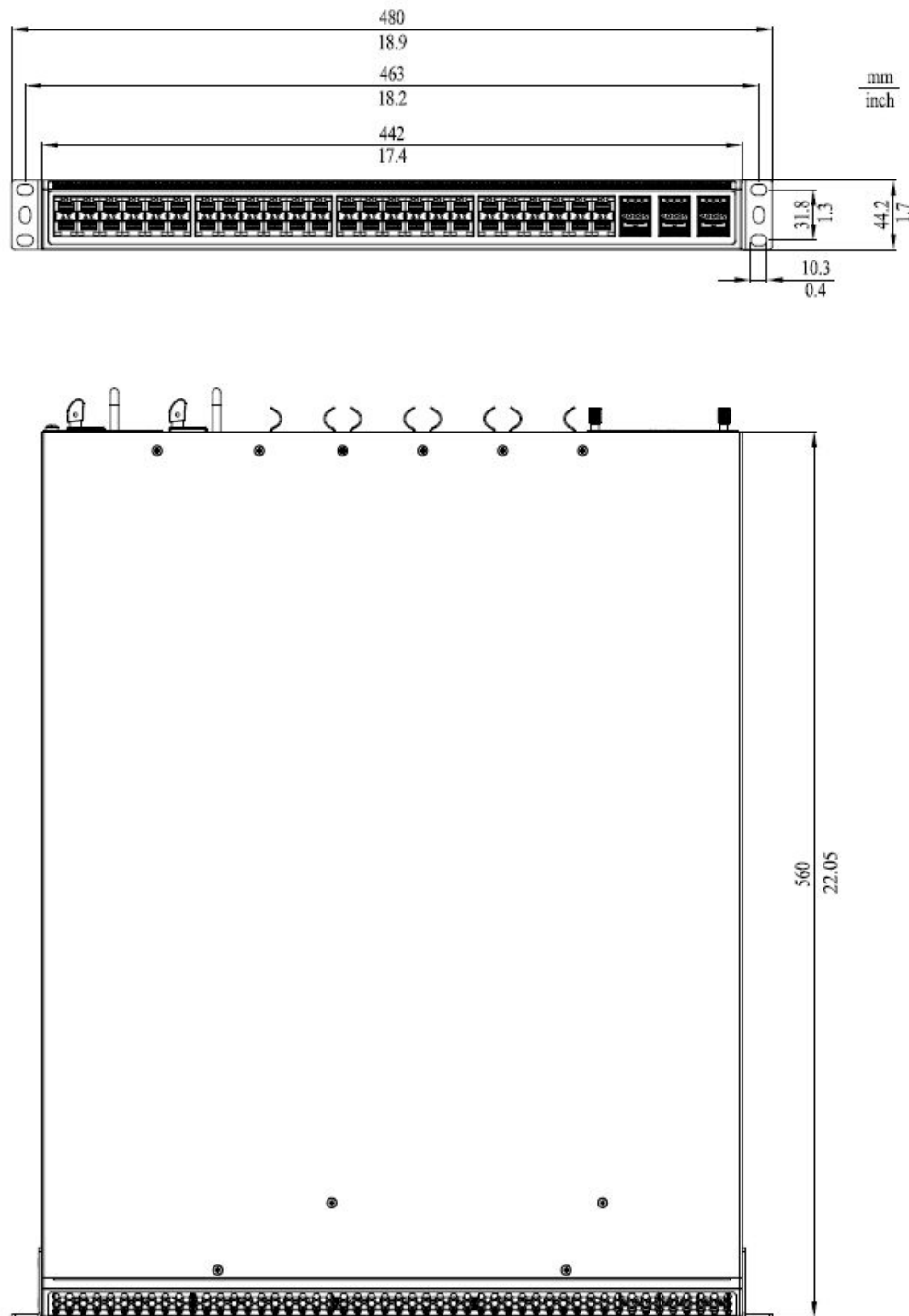
Size	Please refer to “Size diagram” on Page 40.		
Weight	MTM2900-PSU250	0.8Kg	
Installation of power module	Tighten torque	3.5~5.2 lb-in (0.4~0.6 Nm)	
Installation of cover plate	Tighten torque	3.5~5.2 lb-in (0.4~0.6 Nm)	
Power module	Rated voltage range	192 VAC ... 240 VAC	,50 Hz ... 60 Hz

□ Fan module

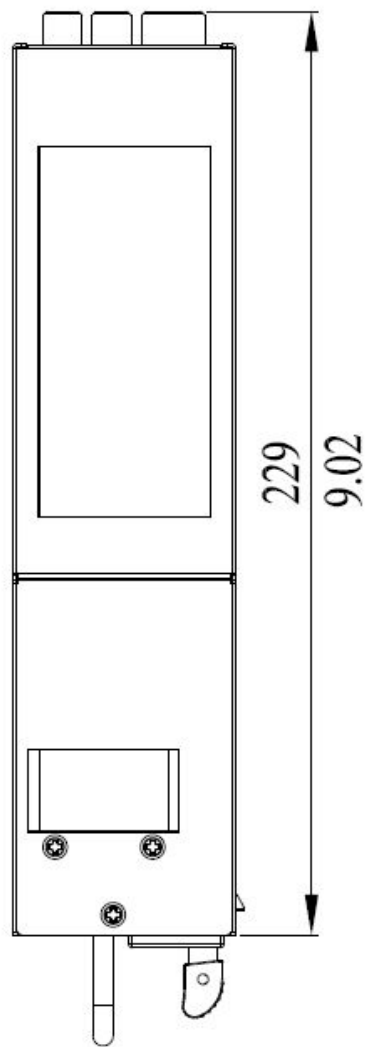
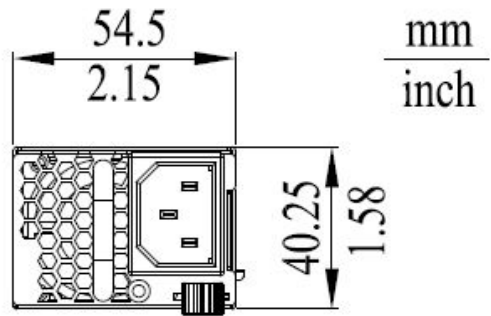
Size	Please refer to “Size diagram” on Page 40.		
Weight	MTM2900-FAN	0.2Kg	
Install fan module	Tighten torque	2.0~3.1 lb-in (0.2~0.3 Nm)	
Mount cover plate	Tighten torque	2.0~3.1 lb-in (0.2~0.3 Nm)	

7.2 Size diagram

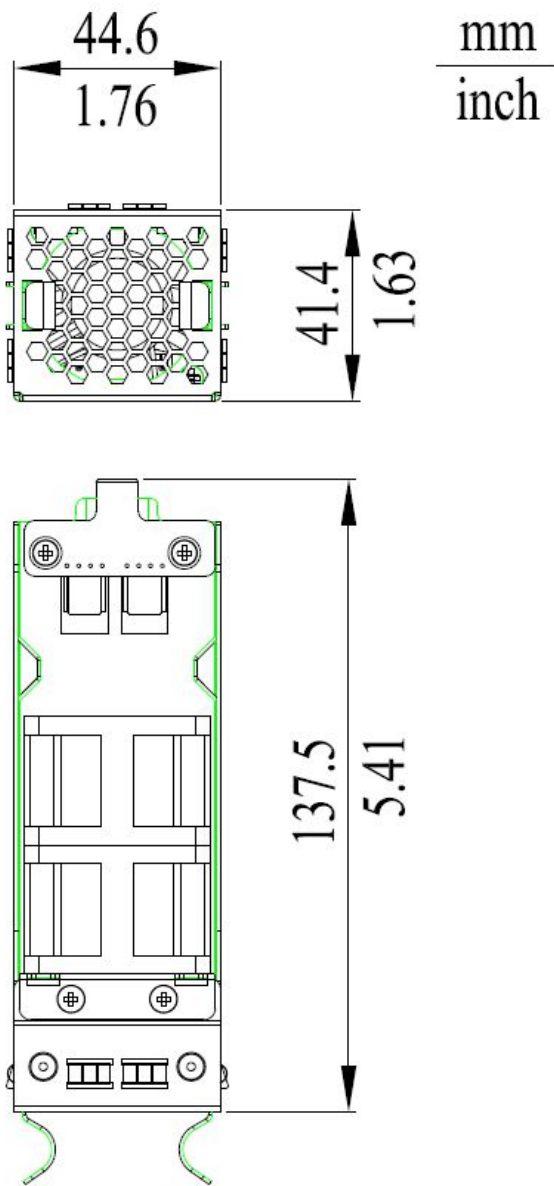
□ Basic device



□ Power module



□ Fan module



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		Conformed
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	Conformed
EN 55032	Signal Line	Class A
EN 61000-6-4	Signal Line	Conformed
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	10 V/m
	1000 MHz ... 6000 MHz	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 200ms 500ms 5s	ΔU 100 % ΔU 60 % ΔU 30 % ΔU 100 %

Stability		Standard application	
IEC 60068-2-6, Test Fc	Vibration	5 Hz ... 8.4 Hz, amplitude 8.4 Hz ... 150 Hz / 1g	0.14 in. (3.5 mm)
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-10G-...	Mode ^a	Wave length	F/O cable length example ^b	Optical 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 Negotiation	30 m	-	-

Table 3: Fiber port 10G SFP module

a. MM =multi-module, SM =simple module

b. When optical fiber data is observed, it includes 3dB system reserve

Product code MTS-SFP-40G-...	Mode ^a	Wave length	F/O cable length example ^b	Optical attenuation	BLP/dispersion
-SR/LC...	MM	850 nm	100m(OM3), 150m(OM4) > 3.5 dB link budget at 850 nm	3.0 dB/km	-
-LR/LC...	SM	1310 nm	10 km < 7.5 dB link budget at 1310 nm	0.32 dB/km	-

Table 4: Fiber port 10G SFP module

a. MM =multi-module, SM =simple module

b. When optical fiber data is observed, it includes 3dB system reserve

7.5 Power consumption / power output

Name	Max power consumption
Basic device + 2 power modules + 4 fan modules	
MTS2948X-6Q-A	200 W

8 Delivery item, order number and accessories

☐ Delivery item

Quantity	Articles
1	Equipment
1	General safety guidelines
2	Bracket

☐ Order number

MAMMUTHUS SWITCH	942 999 824
MAMMUTHUS POWER MODULE	942 999 822
MAMMUTHUS FAN MODULE	942 999 823

☐ Accessories

Note that the fact that the products used as accessories may have different characteristics from the equipment itself limits the influence sphere of the whole system. For example, if you apply IP20 accessory to IP 65 equipment, the entire system will be reduced to IP20.

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

40G SFP module	Order number
MTS-SFP-40G-SR/LC	942999863
MTS-SFP-40G-LR/LC	942999864

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	Safety of Laser Products
IEC/EN 61850-3	Communication networks and systems for power utility automation - Part 3: General requirements
IEEE 1613	IEEE Environmental and Testing Requirements for Communications Networking Devices Installed in Electrical Power Substations
IEEE 802.3	Ethernet
EN 55032	Electromagnetic compatibility of multimedia equipment. Emission Requirements
EN 55032	Electromagnetic compatibility of multimedia equipment. Emission Requirements
EN 60950-1	Information technology equipment - Safety - Part 1: General requirements
EN 61000-3-2	Electromagnetic compatibility (EMC) - Part 3-2: Threshold - Threshold for harmonic current (equipment input current ≤ 16 A per phase)
EN 61000-3-3	Electromagnetic compatibility (EMC) - Part 3-3: Threshold - Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current ≤ 16 A per phase and not subject to conditional connection
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 - 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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