MDS-G4000/
MDS-G4000-L3 Series
Quick Installation Guide

Version 1.9, March 2026

Technical Support Contact Information
www.moxa.com/support

P/N: 180204000000A

Package Checklist

Moxa's MDS-G4000/MDS-G4000-L3 Series industrial modular DIN-rail switch is shipped with the following items. If any of these items are missing or damaged, please contact your customer service representative for assistance.

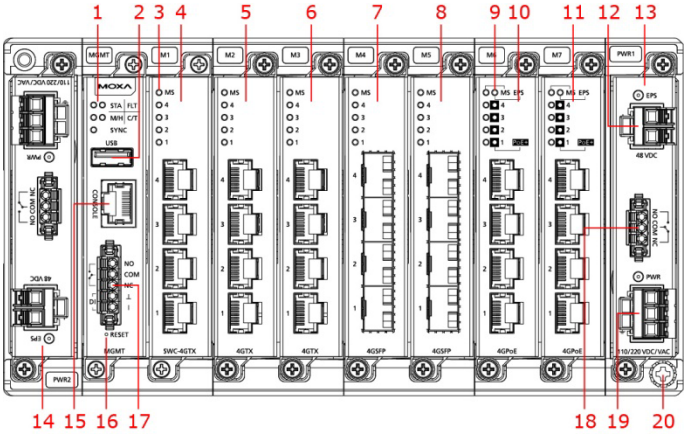
- 1 MDS-G4000 or MDS-G4000-L3 Series switch
- 2 protective caps for unused ports
- Pre-installed DIN-rail kit
  - MDS-G4012 and MDS-G4012-L3: x 1
  - MDS-G4020 and MDS-G4020-L3: x 2
  - MDS-G4028 and MDS-G4028-L3: x 2
- Quick installation guide (printed)
- Substance Disclosure Table
- Product Certificate of Quality Inspection (Simplified Chinese)
- Product Notices (Simplified Chinese)
- Warranty card

NOTE You can find information and software downloads on the relevant product pages located on Moxa's website: www.moxa.com

Default Settings

- IP address: 192.168.127.253
- Subnet Mask: 255.255.255.0
- Username: admin
- Password: moxa

Panel Layouts

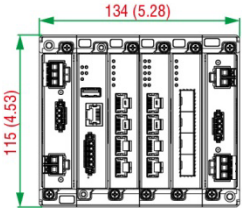


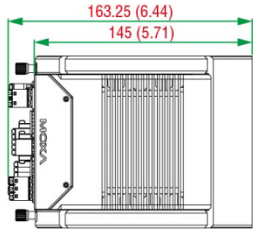
1. System status LEDs (from left to right, top to bottom) STATE, FAULT, MASTER/HEAD, COUPLER/TAIL, and SYNC LED indicators
2. USB port
3. Module status

4. Switch and Control module slot M1 (Embedded)
5. Ethernet module in slot M2
6. Ethernet module in slot M3
7. Ethernet module in slot M4 (For MDS-G4020/28, MDS-G4020/28-L3)
8. Ethernet module in slot M5 (For MDS-G4020/28, MDS-G4020/28-L3)
9. External power input status from EPS
10. Ethernet module in slot M6 (For MDS-G4028, MDS-G4028-L3)
11. Ethernet module in slot M7 (For MDS-G4028, MDS-G4028-L3)
12. External power supply input for PoE
13. Redundant power module in slot PWR1
14. Redundant power module in slot PWR2
15. RS-232 console port with RJ45 interface
16. Reset button (Pin hole 0.9 mm)
17. Relay output and Digital Input port
18. Relay output
19. Power input
20. Grounding screw

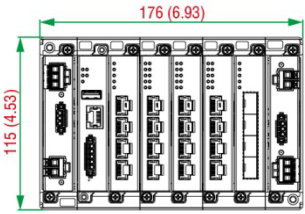
Dimensions

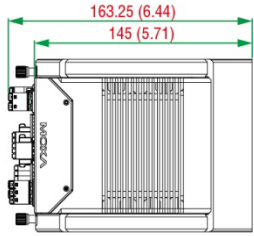
MDS-G4012 and MDS-G4012-L3 Series



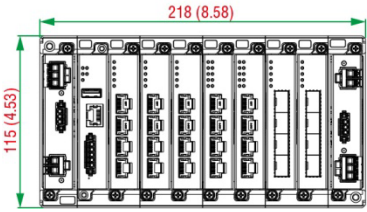


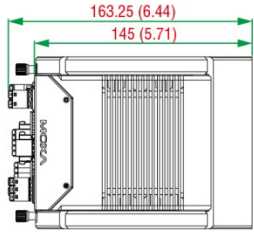
MDS-G4020 and MDS-G4020-L3 Series





MDS-G4028 and MDS-G4028-L3 Series



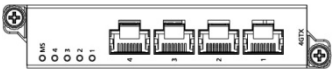


Unit: mm (inch)

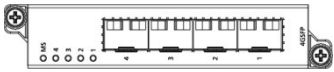
Ethernet Modules (Hardware Rev.2.0.0 and above)

NOTE Transceivers for the LM-7000H-4GSFP module are sold separately. Refer to Supported SFP Modules for list of supported transceivers.

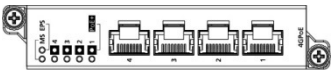
LM-7000H-4GTX



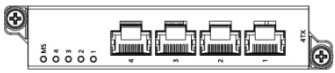
LM-7000H-4GSFP



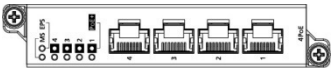
LM-7000H-4GPoE



LM-7000H-4TX



LM-7000H-4PoE



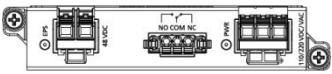
LM-7000H-2GPHR (L2 only)

NOTE
- The max. PoE output per LM-7000H-4(G)PoE is 120 W.
- LM-7000H-2GPHR modules require Hardware Rev v2.0.0 or above for both the L2 switch and the module.
- Maximum 1 2GPHR module installed per unit, using slot M3.
- 2GPHR modules may experience startup issues at low temperatures, including red fault LEDs and dropped packets. If this occurs, Moxa recommends startup at >–20°C, with operating temperatures of >–40°C. The device is capable of stable operation down to –40°C.

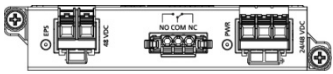
Power Modules (Hardware Rev.2.1.0 and above)

NOTE The PWR-LV-P48 power module is certified for Hazardous Location use.

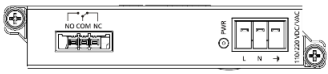
PWR-HV-P48



PWR-LV-P48



PWR-HV-NP



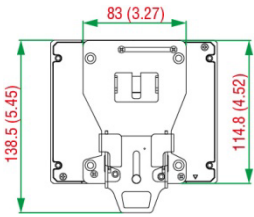
PWR-LV-NP

DIN-rail Dimensions and Instructions

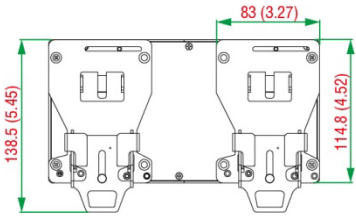
NOTE The DIN rail kit is certified for Hazardous Location usage.

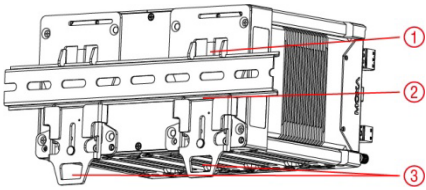
MDS-G4012 and MDS-G4012-L3 Series

Unit: mm (inch)



MDS-G4020/28 and MDS-G4020/28-L3 Series





1. Insert the upper lip of the DIN rail into the DIN-rail mounting kit.
2. Press the device towards the DIN rail until it snaps into place.
3. Pull down the two latches one by one to release the DIN-rail kit and lift up to remove the device from the DIN rail.

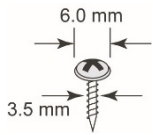
NOTE The DIN rail must use the TS35 (15 mm) specification.

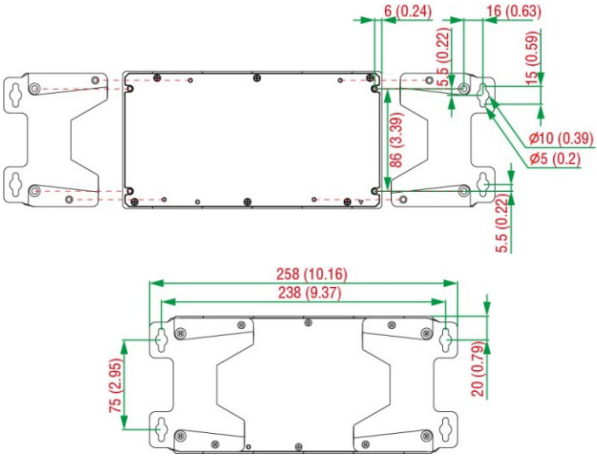
Wall-mounting Dimensions and Instructions

(Optional: WK-112-01)

NOTE The wall-mount kit is certified for Hazardous Location usage.

Mounting the switch to a wall requires four screws. The heads of the screws should be between 6.0 to 9.0 mm in diameter, and the diameter of screw thread should be between 3.5 to 4 mm, as shown in the figure on the right. Use the switch with the wall-mounting kit attached as a guide to mark the correct locations of the eight screws.





Rack-mounting Dimensions and Instructions (Optional: RK-3U-02)

Please refer to the RK-3U-02 Series QIG.

Matters That Require Attention

1. **Elevated Operating Temperature:** If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room temperature. Therefore, consideration should be given to installing the equipment in an environment compatible with the maximum ambient temperature (T_{max}) specified by the manufacturer.

NOTE To ensure reliable operation, make sure the operating temperature of the environment does not exceed the spec. When mounting a rack-mounted switch with other operating units in a cabinet without forced ventilation, it is recommended that 1U of space is reserved between each rack-mounted switch and/or device.

2. **Required Air Flow:** Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised.

NOTE The optimal keep-out zone is 50 mm for the top, bottom, left, and right side of the device.

3. **Mechanical Loading:** Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.
4. **Circuit Overloading:** Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.

5. **Reliable Grounding:** Reliable grounding of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (e.g. use of power strips).

ATTENTION

Safety First!

Be sure to disconnect the power cord before installing and/or wiring your Ethernet Switch. Calculate the maximum possible current in each power wire and common wire. Observe all electrical codes dictating the maximum current allowable for each wire size. If the current goes above the maximum ratings, the wiring could overheat, which can cause serious damage to your equipment.

WARNING

Optical SFP communications modules must be limited to Laser Class 1.

Connecting the Power Inputs

The MDS-G4000 and MDS-G4000-L3 Series support 4 types of power supply:

- PWR-HV-P48: one 110/220 VAC/VDC, one 48 VDC PoE power input for PoE+/PoE++ ports.
- PWR-LV-P48: one 24/48 VDC, one 48 VDC PoE power input for PoE+/PoE++ ports.

NOTE The required power module depends on the choice of LM-7000H module. Refer to the following power/module combination requirements.

- LM-7000H non-PoE modules: Any power module.
- LM-7000H PoE modules: PWR-HV-P48, PWR-LV-P48 only.

NOTE The PWR-LV-P48 power module is certified for Hazardous Location use.

- PWR-HV-NP: one 110/220 VAC/VDC power input.
- PWR-LV-NP: one 24/48 VDC power input.

For the PWR-HV-P48, the 110/220 VAC/VDC power supplies provide power to the switch. Separate 48 VDC power supplies are required to provide power to all PoE+/PoE++ ports (50 to 57 VDC is recommended for IEEE 802.3at devices; 52 to 57 VDC is recommended for IEEE 802.3bt devices. The max. PoE output from an external power supply is 720 W when the operating temperature is under 60°C; 360 W when the operating temperature is under 75°C.).

For the PWR-LV-P48 models, the 24/48 VDC power supplies provide power to the switch. Separate 48 VDC power supplies are required to

provide power to all PoE+/PoE++ ports (50 to 57 VDC is recommended for IEEE 802.3at devices; 52 to 57 VDC is recommended for IEEE 802.3bt devices. The max. PoE output from an external power supply is 720 W when the operating temperature is under 60°C; 360 W when the operating temperature is under 75°C.).

ATTENTION

For Hazardous Location Use

The maximum certified PoE power budget for hazardous locations of the PWR-LV-P48 depends on the hardware revision of the installed LM-7000H-4(G)PoE module:

- Rev. 2.0.0: 369.6 W total, up to 15.4 W per port
- Rev. 3.0.0: Up to 720 W (120 W per module), up to 90 W per port

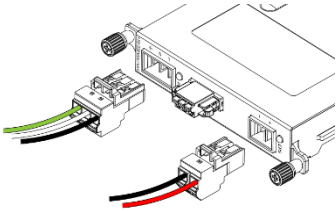
For the PWR-HV-NP, the 110/220 VAC/VDC power supplies provide power to the switch.

For the PWR-LV-NP, the 24/48 VDC power supplies provide power to the switch.

Power Terminal Blocks

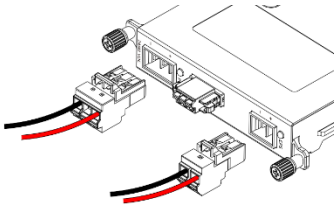
The connection for power input and PoE external power supply is on the power modules.

PWR-HV-P48/PWR-HV-NP (Not for Hazardous Locations)



1. Insert the neutral/line (L/N/Ground) AC wires into the terminals.
2. Insert the terminal block connector into the terminal block receptor.

PWR-LV-P48/PWR-LV-NP



1. Remove 8 to 9 mm of the DC wires' protective cover.
2. Use a tool to push the spring mechanism inwards to open it.

3. Insert the negative/positive (-/+) DC wires into the terminals.
4. Release the spring mechanism.
5. Insert the terminal block connector prongs into the terminal block receptor.

PoE Power Terminal Blocks

1. Remove 8 to 9 mm of the DC wires' protective cover.
2. Use a tool to push the spring mechanism inwards to open it.
3. Insert the negative/positive (-/+) DC wires into the terminals.
4. Release the spring mechanism.
5. Insert the terminal block connector prongs into the terminal block receptor.

NOTE For higher levels of surge protection, install a surge protector in front of the power input of the PoE-powered device so that it is suitable for use in IEC 61850 conditions.

NOTE When wiring the power input, we suggest using 20-16 AWG (1.31-0.519 mm²) wiring and corresponding pin cable terminals. Wiring temperature rating should be at least 105°C.

NOTE When wiring PoE power input, we suggest using 16 AWG (1.31 mm²) wiring and corresponding pin cable terminals. Wiring temperature rating should be at least 105°C.

NOTE When two power units are installed on the switch, both power units will be activated simultaneously, which will enable power redundancy.

NOTE The reverse power input connection will not activate the device or PoE input. In addition, the PoE will only activate when the external power supply is installed on the same power unit.

Wiring the Relay Contact

Each power module has one relay output that can provide two types of relay output. The relay contact is used to detect user-configured events. Two wires are attached to the relay pins with normally close and normally open options.

1. Remove 8 to 9 mm of the DC wires' protective cover.
2. Use a tool to push the spring mechanism inwards to open it.
3. Insert the wires into the terminals.
4. Release the spring mechanism.
5. Insert the terminal block connector prongs into the terminal block receptor.

FAULT:
The relay contact of the 3-pin terminal block connector is used to detect user-configured events. The module provides normally open and normally closed circuits depending on what the user chooses. For pin definitions refer to the table below.

Relay Connection	Power Off	Boot up Ready	Event Trigger
NO and COM	Closed Circuit	Open Circuit	Closed Circuit
NC and COM	Open Circuit	Closed Circuit	Open Circuit

NOTE When wiring the relay contact, we suggest using 16-20 AWG (1.31-0.519 mm²) wiring and corresponding pin cable terminals. Wiring temperature rating should be at least 105°C.

Digital Input/Output

Digital Output

1 relay output with current carrying capacity of 2 A @ 30 VDC.

NOTE For Hazardous Location certified models, the current carrying capacity is 1 A @ 30 VDC.

Digital Input

1 digital output with the same ground, but electrically isolated from the electronics.

- +13 to +30 V for state 1
- -30 to +1 V for state 0
- Max. input current: 8 mA

Wiring the Digital Input/Output

NOTE When wiring the digital input, we suggest using 16-24 AWG (1.31-0.205 mm²) wiring and corresponding pin cable terminals. Wiring temperature rating should be at least 105°C.

1. Remove 8 to 9 mm of the DC wires' protective cover.
2. Use a tool to push the spring mechanism inwards to open it.
3. Insert the wires into the terminals.
4. Release the spring mechanism.
5. Insert the terminal block connector prongs into the terminal block receptor.

Installing and Removing the Ethernet Modules

The Ethernet modules are hot-swappable for the same module type. You have the option to mount or remove the Ethernet module while the device is operating.

NOTE When performing a cold start, you cannot remove and insert a module before booting up as it will cause the module to initially fail.

NOTE The default module is 4GTX, if it is the first time you are mounting a 4TX, PoE, SFP, or 2GPHR module, please reboot the switch after inserting it. The hot-swappable function, as defined above, will only work after the device is rebooted for the first time.

NOTE If a different model type module is changed on the same slot, it is recommended to reconfigure the settings or reset the device to default settings after rebooting the switch.

NOTE The MS light must turn green before the cable is plugged in for PTP to function properly.

To install an Ethernet module:

1. Insert the Ethernet module straight into the slot.
2. Fasten the module to the device by tightening the 2 screws. The tightening torque is 3.5 kgf-cm (0.35 Nm).

To remove an Ethernet module:

1. Loosen the 2 screws of the module.
2. Pull the module out of the slot.
3. Insert the dummy module into the slot in order to have better protection against dust and EMI.
4. Fasten the dummy module using 2 screws. The tightening torque is 4 kgf-cm (0.4 Nm).

Installing and Removing the Power Modules

The power supply units are hot-swappable when both power modules are installed. You have the option to mount or remove the power supply units while the device is operating.

To install a power module:

1. Insert the power unit straight into the slot.
2. Fasten the unit to the device by tightening the 2 screws. The tightening torque is 3.5 kgf-cm (0.35 Nm).

To remove a power module:

1. Loosen the 2 screws of the module.
2. Pull the module out of the slot.
3. Insert the dummy module in to the slot in order to have better protection against dust and EMI.
4. Fasten the dummy module using 2 screws. The tightening torque is 4 kgf-cm (0.4 Nm).

NOTE If one of the modules is removed from the device, it is advisable to insert a dummy module in order to provide better protection against dust and EMI.

Grounding the Moxa Industrial DIN-rail Switch

Grounding and wire routing help limit the effects of noise due to electromagnetic interference (EMI). Run the ground connection from the ground screw to the grounding surface prior to connecting devices.

NOTE Using a shielded cable achieves better electromagnetic resistance.

NOTE When grounding, we suggest using the cable type - AWG (American Wire Gauge) 16 (1.31 mm^2).

RS-232 with RJ45 Interface Console Connection

The switch has an RS-232 serial console with an RJ45 interface. Use a Moxa 9-pin female console cable to connect to your PC's COM port (or via USB-to-Serial converters or hubs). You can then use a console terminal program, such as Moxa's PComm Terminal Emulator, to access the console configuration utility of the switch. RS-232 Setup:

- Baud rate: 115,200
- Data Bits: 8
- Parity: None
- Stop Bits: 1
- Terminal Type: VT100

USB Connection

Use Moxa's ABC-02-USB automatic backup configurator to connect to the USB storage port (Type A connector; see the diagram below for pinout assignments) to back up and restore configuration files, auto-load configuration files, upgrade firmware, and back up system log files.

Pin	Description
1	VCC (+5V)
2	D- (Data-)
3	D+ (Data+)
4	GND (Ground)

The Reset Button (Diameter 0.9 mm)

The reset button can perform two functions. One is to reset the switch to factory default settings and the other is to reboot the switch if the button has been depressed and release immediately.

Reset to Factory Default Settings

Depress the Reset button for five seconds to load the factory default settings. Use a pointed object, such as a straightened paper clip or needle (the diameter must not exceed 0.9 mm), to depress the Reset button. When you do so, the STATE LED will start to blink about four times per second. Continue to depress the STATE LED until it begins blinking more rapidly; this indicates that the button has been depressed for five seconds and you can release the Reset button to load factory default settings.

NOTE DO NOT power off the switch when loading default settings.

Configuring PTP

To ensure that IEEE 1588—also known as Precision Time Protocol (PTP)—functions correctly:

- Ensure IEEE 1588 PTP uses slot M2 for cross-module sync.
  - M2 not required if cross-module sync not used.
- Ensure that MS LEDs are green before connecting cables.

NOTE Hot-swapping modules with PTP enabled may cause timing jitter. Hot-swapping the M2 module removes the master clock, resulting in timing fluctuations. PTP stays active but will resynchronize after the new module is inserted.

LED Indicators

The function of each LED is described in the table below.

LED	Color	State	Description
System LEDs			
STA (STATE)	Green	On	Normal operation.
		Blinking (1 Hz)	1. System service initialization. 2. When pressing the reset button for 5 seconds to reset to factory default settings.
		Blinking (4 Hz)	1. The reset button has been held for 5 seconds and the system is ready to perform a factory reset. 2. When the external storage ABC-02 automatic backup device is connected to the switch.
		Off	N/A
	Red	On	The system failed to initialize.
FLT (FAULT)	Red	On	1. Network loop detected with loop protection enabled. 2. Relay contact triggered. 3. External storage loading/saving failed. 4. Port disabled, shutdown mode ingress rate limit exceeded. 5. Invalid ring port connection. 6. Incorrect multiple network coupling connected.
		Blinking	When the switch boots up and the firmware loads to memory.
		Off	System successfully booted up and no events triggered.
M/H (MSTR/ HEAD)	Green	On	1. Master of Turbo Ring 1 or Turbo Ring 2. 2. Head of the Turbo Chain. 3. Manager of the MRP Ring.
		Blinking	1. Master of Turbo Ring 1 or Turbo Ring 2 and at least one ring is broken. 2. Member of a Turbo Ring and all the corresponding ring ports are down. 3. Head of Turbo Chain and chain is broken. 4. Manager of MRP Ring and the ring is open. 5. Member of Turbo Chain and corresponding Member Port 1 is down. 6. Tail of the Turbo Chain and the link of the corresponding Member Port is down.

LED	Color	State	Description
		Off	1. Not Master of Turbo Ring 1 or Turbo Ring 2. 2. Not Head of Turbo Chain. 3. Not Manager of MRP Ring.
C/T (CPRL/ TAIL)	Green	On	1. Ring coupling or dual homing function is enabled. 2. Turbo Chain Tail.
		Blinking	1. Turbo Chain Tail, Chain broken. 2. Turbo Chain Head, corresponding Member Port down. 3. Turbo Chain Member, corresponding Member Port 2 down.
		Off	1. Coupling disabled or switch is not Turbo Chain Tail. 2. Dual Homing disabled or Dual Homing session not configured
SYNC	Amber	On	The PTP function is enabled.
		Blinking	Receiving sync packets, convergence in progress.
		Off	PTP function disabled.
	Green	On	PTP function has successfully converged.
System LEDs (Except PWR)	Green/ Red/ Amber	Blinking (4 Hz)	The switch is being discovered/located by the locator function. Applies to the following LEDs: S, FLT, M/H, C/T, SYNC. Each LED will light up in its default color.
		Rotating (2 Hz)	Importing/exporting a file via the ABC-02. Applies to the following LEDs: FLT, M/H, C/T, SYNC. Each LED will light up in its default color.

SWC-4GTX

LED	Color	State	Description
MS (Module State)	Green	On	Normal operation.
		Blinking	Module booting.
		Off	Module is out of service.
	Red	On	1. The module failed to initialize. 2. A module designed for a different model was inserted.
Copper (10/100/ 1000Mbps)	Green	On	Port active and linking at 1 Gbps.
		Blinking	Data transmitting at 1 Gbps.
		Off	Port inactive or link down.
	Amber	On	Port active and linking at 10/100 Mbps.
		Blinking	Data transmitting at 10/100 Mbps.
		Off	Port inactive or link down.

LM-7000H-4GTX/LM-7000H-4GSFP/LM-7000H-4TX

LED	Color	State	Description
MS (Module State)	Green	On	Normal operation.
		Blinking	Module booting up.
		Off	Module out of service.

LED	Color	State	Description
	Red	On	1. The module failed to initialize. 2. A module designed for a different model was inserted. 3. On cold start, module removed and reinserted before initialization completed.
Copper (10/100 Mbps)	Green	On	Port active and linking at 100 Mbps.
		Blinking	Data transmitting at 100 Mbps.
		Off	Port is inactive or link down.
	Amber	On	Port active and linking at 10 Mbps.
		Blinking	Data transmitting at 10 Mbps.
		Off	Port is inactive or link down.
Copper (10/100/ 1000Mbps)	Green	On	Port active and linking at 1 Gbps.
		Blinking	Data transmitting at 1 Gbps.
		Off	Port inactive or link down.
	Amber	On	Port active and linking at 10/100 Mbps.
		Blinking	Data transmitting at 10/100 Mbps.
		Off	Port inactive or link down.
SFP (100/1000 Mbps)	Green	On	Port active and linking at 1 Gbps.
		Blinking	Data transmitting at 1 Gbps.
		Off	Port inactive or link down.
	Amber	On	Port active and linking at 100 Mbps.
		Blinking	Data transmitting at 100 Mbps.
		Off	Port inactive or link down.

LM-7000H-4GPoE/LM-7000H-4PoE

LED	Color	State	Description
MS (Module State)	Green	On	Normal operation.
		Blinking	Module booting up.
		Off	Module out of service.
	Red	On	1. The module failed to initialize. 2. A module designed for a different model was inserted. 3. On cold start, module removed and reinserted before initialization completed.
EPS (External Power Supply for PoE module)	Amber	On	Normal operation.
		Off	No external power supply for PoE.
Copper (10/100 Mbps)	Green	On	Port active and linking at 100 Mbps.
		Blinking	Data transmitting at 100 Mbps.
		Off	Port is inactive or link down.
	Amber	On	Port active and linking at 10 Mbps.
		Blinking	Data transmitting at 10 Mbps.
		Off	Port is inactive or link down.
Copper (10/100/ 1000Mbps)	Green	On	Port active and linking at 1 Gbps.
		Blinking	Data transmitting at 1 Gbps.
		Off	Port inactive or link down.

LED	Color	State	Description
	Amber	On	Port active and linking at 10/100 Mbps.
		Blinking	Data transmitting at 10/100 Mbps.
		Off	Port inactive or link down.

LED	Color	State	Description
PoE/PoE+/ PoE++	Green	On	Port connected to an IEEE 802.3bt powered device (PD).
		Off	1. Power is not being supplied to a powered device (PD). 2. The port is not connected to an IEEE 802.3bt/at/af standard powered device (PD).
	Amber	On	Port connected to IEEE 802.3af/at-powered device (PD).
		Blinking	PoE power shut off due to low power budget.
		Off	1. Power not being supplied to a powered device (PD). 2. The port not connected to an IEEE 802.3af/at standard PD.
	Red	On	Powered device (PD) detection failure.
		Blinking	Over-current or short circuit detected on powered Device (PD).
		Off	PoE operating normally.

LM-7000H-2GPHR

LED	Color	State	Description
MS (Module State)	Green	On	Normal operation.
		Blinking	Module booting up.
		Off	Module out of service.
	Red	On	1. The module failed to initialize. 2. A module designed for a different model was inserted. 3. On cold start, module removed and reinserted before initialization completed. 4. LM-7000H-2GPHR in a slot other than slot M3.
PRP	Green	On	PRP working.
		Off	PRP not enabled.
HSR	Green	On	HSR working.
		Off	HSR not enabled.
COUP	Green	On	PRP/HSR Coupling working.
		Off	PRP/HSR Coupling not enabled.
A	Green	On	Port active and linking at 1 Gbps.
		Blinking	Data transmitting at 1 Gbps.
		Off	Port is inactive or link down.
	Amber	On	Port active and linking at 10/100 Mbps.
		Blinking	Data transmitting at 10/100 Mbps.
		Off	Port is inactive or link down.
B	Green	On	Port active and linking at 1 Gbps.

LED	Color	State	Description
		Blinking	Data transmitting at 1 Gbps.
		Off	Port inactive or link down.
	Amber	On	Port active and linking at 10/100 Mbps.
		Blinking	Data transmitting at 10/100 Mbps.
		Off	Port inactive or link down.

PWR-HV-P48/PWR-LV-P48

LED	Color	State	Description
EPS (External Power Supply)	Amber	On	External power is being supplied to the module's EPS input.
		Off	No external power supply for PoE.
PWR	Amber	On	Power is being supplied to the module's power input.
		Off	Power is not being supplied to the module's power input.

PWR-HV-NP/PWR-LV-NP

LED	Color	State	Description
PWR	Amber	On	Power is being supplied to the module's power input.
		Off	Power is not being supplied to the module's power input.

Specifications

Interface	
Gigabit Ethernet	4 10/100/1000BaseT(X) ports
Modules	2/4/6 slots for optional FE/GbE modules
Slot Combination	See the LM-7000H Series modules datasheet for more information. **NOTE**: The required power module depends on the choice of LM-7000H module. Refer to the following power/module combination requirements: • LM-7000H non-PoE modules: Any power module • LM-7000H PoE modules: PWR-HV-P48, PWR-LV-P48 only
Console Port	RS-232 (RJ45 connector)
Buttons	Reset button
Storage Port	USB (Type A connector)
LED Indicators	PWR, EPS, STATE, SYNC, FAULT, MSTR/HEAD, CPLR/TAIL
Alarm Contact Channels	3 (on the MGMT, PWR1, and PWR2 modules) Relay output with current carrying capacity of 2 A @ 30 VDC. (1 A @ 30 VDC for Hazardous Location certified models)
Digital Input Channels	1 (on the MGMT module)
Digital Inputs	• +13 to +30 V for state 1 • -30 to +3 V for state 0 • Max. input current: 8 mA

Power Requirements	
Input Voltage	**With PWR-HV-P48 installed:** 110/220 VDC, 110 VAC, 60 Hz, 220 VAC, 50 Hz, PoE: 48 VDC **With PWR-LV-P48 installed (certified for Hazardous Location use):** 24/48 VDC PoE: 48 VDC **With PWR-HV-NP installed:** 110/220 VDC, 110 VAC, 60 Hz, 220 VAC, 50 Hz **With PWR-LV-NP installed:** 24/48 VDC
Operating Voltage	**With PWR-HV-P48 installed:** 88 to 300 VDC, 90 to 264 VAC, 47 to 63 Hz, PoE: 46 to 57 VDC **With PWR-LV-P48 installed:** 18 to 72 VDC (24 to 48 VDC for Hazardous Location), PoE: 46 to 57 VDC (48 VDC for Hazardous Location) **With PWR-HV-NP installed:** 88 to 300 VDC, 90 to 264 VAC, 47 to 63 Hz **With PWR-LV-NP installed:** 18 to 72 VDC
Rated Input Current	**With PWR-HV-P48-A/PWR-HV-NP installed:** 0.75 A @ 110-220 VDC 1.2 A @ 110-220 VAC **With PWR-LV-P48-A/PWR-LV-NP installed:** 3.3 A @ 24/48 VDC
Input Current (Full modules installed)	**With PWR-HV-P48/PWR-HV-NP installed:** Max. 0.42 A @ 110 VDC Max. 0.21 A @ 220 VDC Max. 0.62 A @ 110 VAC Max. 0.43 A @ 220 VAC **With PWR-LV-P48/PWR-LV-NP installed:** Max. 1.87 A @ 24 VDC Max. 0.94 A @ 48 VDC **EPS (PoE models only):** Max. 8.2 A @ 48 VDC
Power Consumption (Max.) (Full modules installed)	**With PWR-HV-P48/PWR-HV-NP installed:** Max. 45.8 W @ 110 VDC Max. 46.2 W @ 220 VDC Max. 45.7 W @ 110 VAC Max. 47.9 W @ 220 VAC **With PWR-LV-P48/PWR-LV-NP installed:** Max. 44.9 W @ 24 VDC Max. 44.9 W @ 48 VDC
Peak Inrush Current	**PWR-HV-P48/PWR-HV-NP:** 110 VAC: < 10 A (t > 0.1 ms) 220 VAC: < 20 A (t > 0.1 ms) **PWR-LV-P48/PWR-LV-NP:** 24 VDC: < 5 A (t > 0.1 ms) 48 VDC: < 10 A (t > 0.1 ms)

Maximum PoE Power Output per Port	IEEE 802.3at: Up to 30W, high power mode up to 36W (LM-7000H-4(G)PoE rev. 2.0.0) IEEE 802.3bt: Up to 90W (LM-7000H-4(G)PoE rev. 3.0.0 and later)
Total PoE Power Budget	Max. 360 W (with one power supply) for total PD consumption at 48 VDC input for PoE systems Max. 360 W (with one power supply) for total PD consumption at 53-57 VDC input for PoE+/PoE++ systems Max. 720 W (with two power supplies) for total PD consumption at 48 VDC input for PoE systems Max. 720 W (with two power supplies) for total PD consumption at 53-57 VDC input for PoE+/PoE++ systems
Overload Current Protection	Present
Reverse Polarity Protection	Present
Physical Characteristics	
Ingress Protection Rating	IP40 (This rating will only be achieved when the relay output terminal block and all modules are installed.)
Dimensions	MDS-G4012/MDS-G4012-L3 Series: 134 x 115 x 163.25 mm MDS-G4020/ MDS-G4020-L3 Series: 176 x 115 x 163.25 mm MDS-G4028/MDS-G4028-L3 Series: 218 x 115 x 163.25 mm
Weight	MDS-G4012/MDS-G4012-L3 Series: 2.00 kg (4.41 lb) MDS-G4020/MDS-G4020-L3 Series: 2.50 kg (5.51 lb) MDS-G4028/MDS-G4028-L3 Series: 2.84 kg (6.26 lb) LM-7000H-4GSFP: 0.3 kg (0.66 lb) LM-7000H-4GTX: 0.24 kg (0.53 lb) LM-7000H-4GPoE: 0.31 kg (0.69 lb) LM-7000H-4TX: 0.24 kg (0.53 lb) LM-7000H-4PoE: 0.31 kg (0.69 lb) LM-7000H-2GPHR: 0.31 kg (0.69 lb) PWR-HV-P48/PWR-LV-P48: 0.36 kg (0.69 lb) PWR-HV-NP/PWR-LV-NP: 0.34 kg (0.75 lb)
Installation	DIN-rail mounting (certified for Hazardous Location use): Pre-installed by default Wall mounting (certified for Hazardous Location use): WK-112-01 (with optional kit) Rack mounting: RK-3U-02 (with optional kit)
Environmental Limits	
Operating Temperature	Standard Temperature Models: -10 to 60°C (14 to 140°F) • MDS-G4012, MDS-G4012-L3 • MDS-G4020, MDS-G4020-L3 • MDS-G4028, MDS-G4028-L3 Wide Temperature Models: -40 to 75°C (-40 to 167°F) • MDS-G4012-T, MDS-G4012-L3-T • MDS-G4020-T, MDS-G4020-L3-T • MDS-G4028-T, MDS-G4028-L3-T

Storage Temperature	-40 to 85°C (-40 to 185°F)
Ambient Relative Humidity	5 to 95% (non-condensing)
Standards and Certifications	
Safety	EN 62368-1, UL 62368-1, IEC 62368-1, IEC 60950-1
EMC	EN 55035/55032 EN 61000-6-2/-6-4
EMI	CISPR 32, FCC Part 15B Class A
EMS	IEC 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 20 V/m IEC 61000-4-4 EFT: Power: 4 kV; Signal: 4 kV IEC 61000-4-5 Surge: Power 4 kV; Signal: 4 kV IEC 61000-4-6 CS: 10 V IEC 61000-4-8 PFMF IEC 61000-4-11 Voltage Dips & Interruptions
NOTE: For better conductive radiation immunity, it is recommended to use a STP cable and install a surge protector at the PoE power input: EPS.	
Rail Traffic	EN 50121-4
Traffic Control	NEMA TS2
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-31
Vibration	IEC 60068-2-6
Hazardous Location	Class I Division 2, ATEX
Power Substation	IEC 61850-3, IEEE 1613
Warranty	
Warranty Period	5 years
Details	See www.moxa.com/warranty

Supported SFP Modules

Module	Description
SFP-1FEMLC-T	SFP module with 1 100Base multi-mode, LC connector for 2/4 km transmission, -40 to 85°C operating temperature.
SFP-1FESLC-T	SFP module with 1 100Base single-mode with LC connector for 40 km transmission, -40 to 85°C operating temperature.
SFP-1FELLC-T	SFP module with 1 100Base single-mode with LC connector for 80 km transmission, -40 to 85°C operating temperature.
SFP-1G10ALC	WDM-type (BiDi) SFP module with 1 1000BaseSFP port with LC connector for 10 km transmission; TX 1310 nm, RX 1550 nm, 0 to 60°C operating temperature.
SFP-1G10ALC-T	WDM-type (BiDi) SFP module with 1 1000BaseSFP port with LC connector for 10 km transmission; TX 1310 nm, RX 1550 nm, -40 to 85°C operating temperature.

Module	Description
SFP-1G10BLC	WDM-type (BiDi) SFP module with 1 1000BaseSFP port with LC connector for 10 km transmission; TX 1550 nm, RX 1310 nm, 0 to 60°C operating temperature.
SFP-1G10BLC-T	WDM-type (BiDi) SFP module with 1 1000BaseSFP port with LC connector for 10 km transmission; TX 1550 nm, RX 1310 nm, -40 to 85°C operating temperature.
SFP-1G20ALC	WDM-type (BiDi) SFP module with 1 1000BaseSFP port with LC connector for 20 km transmission; TX 1310 nm, RX 1550 nm, 0 to 60°C operating temperature
SFP-1G20ALC-T	WDM-type (BiDi) SFP module with 1 1000BaseSFP port with LC connector for 20 km transmission; TX 1310 nm, RX 1550 nm, -40 to 85°C operating temperature.
SFP-1G20BLC	WDM-type (BiDi) SFP module with 1 1000BaseSFP port with LC connector for 20 km transmission; TX 1550 nm, RX 1310 nm, 0 to 60°C operating temperature.
SFP-1G20BLC-T	WDM-type (BiDi) SFP module with 1 1000BaseSFP port with LC connector for 20 km transmission; TX 1550 nm, RX 1310 nm, -40 to 85°C operating temperature.
SFP-1G40ALC	WDM-type (BiDi) SFP module with 1 1000BaseSFP port with LC connector for 40 km transmission; TX 1310 nm, RX 1550 nm, 0 to 60°C operating temperature.
SFP-1G40ALC-T	WDM-type (BiDi) SFP module with 1 1000BaseSFP port with LC connector for 40 km transmission; TX 1310 nm, RX 1550 nm, -40 to 85°C operating temperature.
SFP-1G40BLC	WDM-type (BiDi) SFP module with 1 1000BaseSFP port with LC connector for 40 km transmission; TX 1550 nm, RX 1310 nm, 0 to 60°C operating temperature.
SFP-1G40BLC-T	WDM-type (BiDi) SFP module with 1 1000BaseSFP port with LC connector for 40 km transmission; TX 1550 nm, RX 1310 nm, -40 to 85°C operating temperature.
SFP-1GSXLC	SFP module with 1 1000BaseSX port with LC connector for 300 m/550 m transmission, 0 to 60°C operating temperature.
SFP-1GSXLC-T	SFP module with 1 1000BaseSX port with LC connector for 300 m/550 m transmission, -40 to 85°C operating temperature.
SFP-1GLSXLC	SFP module with 1 1000BaseLSX port with LC connector for 1 km/2 km transmission, 0 to 60°C operating temperature.
SFP-1GLSXLC-T	SFP module with 1 1000BaseLSX port with LC connector for 1 km/2 km transmission, -40 to 85°C operating temperature.

Module	Description
SFP-1GLXLC	SFP module with 1 1000BaseLX port with LC connector for 10 km transmission, 0 to 60°C operating temperature.
SFP-1GLXLC-T	SFP module with 1 1000BaseLX port with LC connector for 10 km transmission, -40 to 85°C operating temperature.
SFP-1GLHLC	SFP module with 1 1000BaseLH port with LC connector for 30 km transmission, 0 to 60°C operating temperature.
SFP-1GLHLC-T	SFP module with 1 1000BaseLH port with LC connector for 30 km transmission, -40 to 85°C operating temperature.
SFP-1GLHXLC	SFP module with 1 1000BaseLHX port with LC connector for 40 km transmission, 0 to 60°C operating temperature.
SFP-1GLHXLC-T	SFP module with 1 1000BaseLHX port with LC connector for 40 km transmission, -40 to 85°C operating temperature.
SFP-1GZXLC	SFP module with 1 1000BaseZX port with LC connector for 80 km transmission, 0 to 60°C operating temperature.
SFP-1GZXLC-T	SFP module with 1 1000BaseZX port with LC connector for 80 km transmission, -40 to 85°C operating temperature.
SFP-1GEZXLC	SFP module with 1 1000BaseEZX port with LC connector for 110 km transmission, 0 to 60°C operating temperature.
SFP-1GEZXLC-120	SFP module with 1 1000BaseEZX port with LC connector for 120 km transmission, 0 to 60°C operating temperature.
SFP-1GTXRJ45-T	SFP module with 1 1000BaseT port with RJ45 connector for 100 m transmission, -40 to 75°C operating temperature. **NOTE**: This module is not certified for Hazardous Location.

Restricted Access Locations

- This equipment is intended to be used in Restricted Access Locations, such as a computer room, with access limited to service personnel or users who have been instructed on how to handle the metal chassis of equipment that is very hot. The location should only be accessible with a key or through a security system.
- External metal parts of this equipment are extremely hot. Before touching the equipment, you must take special precautions to protect your hands and body from serious injury.

Special Conditions of Use

- The equipment shall only be used in an area of at least pollution degree 2, as defined in EN 60664-1.
- The equipment shall be installed in an enclosure that provides a degree of protection not less than IP 54 in accordance with EN 60079-0 and accessible only by the use of a tool.

- Transient protection device with capability of voltage clamping rating less than 119Vdc shall be provided externally of the PWR voltage supply terminal.

ATTENTION

These devices are open-type devices that are to be installed in an enclosure with tool-removable cover or door, suitable for the environment.

This equipment is suitable for use in Class I, Division 2, Groups A, B, C, and D or non-hazardous locations only.

WARNING—EXPLOSION HAZARD

Do not disconnect equipment unless power has been removed or the area is known to be non-hazardous.

Substitution of any components may impair suitability for Class I, Division 2.

Hazardous Location Usage Terms

Usage Terms			
Models	MDS-G4012, MDS-G4012-T MDS-G4020, MDS-G4020-T MDS-G4028, MDS-G4028-T		
Rating	Input: 24 to 48 VDC, 3.3 A (for PWR input) and 48 VDC, 8.2 A (for EPS input) Relay Output: 30 VDC/1 A Digital Input: 30 VDC/8 mA PoE Output: 48 VDC, 1.875A max.		
Conductors suitable for rated cable temperature	≥105°C		
Hazardous Location	EN IEC 60079-0:2018 EN IEC 60079-7:2015+A1:2018 EN IEC 60079-15: 2019		
	Class I, Division 2, Groups A, B, C, and D		
Address of manufacturer	No. 1111, Heping Rd., Bade Dist., Taoyuan City 334004, Taiwan		
CID2			
c UL us LISTED I.T.E. for Use in Hazardous Locations 86CY Class I, Division 2 Groups A, B, C and D		Temp. Code	T3B
ATEX			
Ex II 3G	Temp. Code	165°C (T3)	
	Certification Number	UL 20 ATEX 2415X	
	Protection type code	Ex ec nC IIC 165°C (T3) Gc	

	Warning	Do not open or disassemble the device while it is in operation