RKS-G4028/ RKS-4028-L3 Series Quick Installation Guide

Version 1.1, August 2022

Technical Support Contact Information
www.moxa.com/support

MOXA®

P/N:1802040000041

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Package Checklist

The Moxa RKS-G4028/RKS-G4028-L3 industrial rackmount switch is shipped with the following items. If any of these items are missing or damaged, please contact your customer service representative for assistance.

- RKS-G4028/RKS-G4028-L3 switch
- 4 protective caps for unused SFP ports (only for RKS-G4028-GS models)
- 2 rackmount ears
- 8 round stickers for module screws
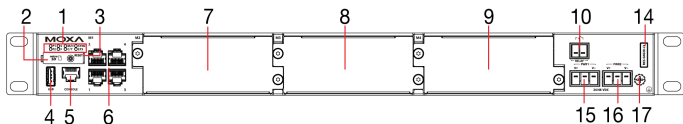- Quick installation guide (printed)
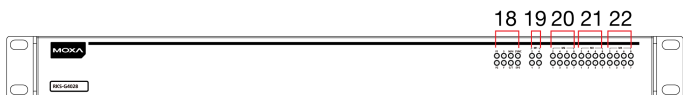- Warranty card

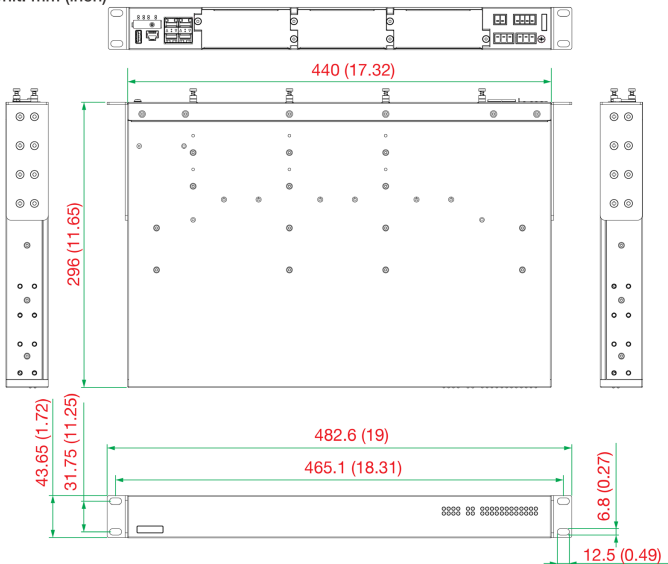## Panel Layouts

Front View

RKS-G4028-4GS Series
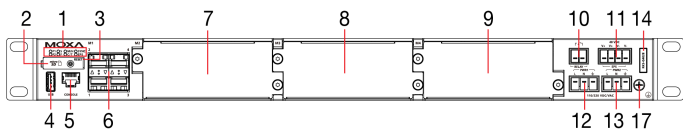
RKS-G4028-4GT Series

Rear View

1. System status LEDs
2. microSD card socket cover
3. Reset button
4. USB host (type A)
5. Console port (RS-232, RJ45)
6. Module 1
7. Module 2 socket
8. Module 3 socket
9. Module 4 socket
10. Relay output
11. EPS (external power supply) inputs
12. Power input 1 for 110/220 VDC/VAC
13. Power input 2 for 110/220 VDC/VAC
14. Model name
15. Power input 1 for 24/48 VDC
16. Power input 2 for 24/48 VDC
17. Grounding connector screw
18. System status LEDs
19. Module 1 status LEDs
20. Module 2 status LEDs
21. Module 3 status LEDs
22. Module 4 status LEDs

Dimensions

Unit: mm (inch)

440 (17.32)

296 (11.65)

43.65 (1.72)
31.75 (11.25)

482.6 (19)
465.1 (18.31)
6.8 (0.27)
12.5 (0.49)

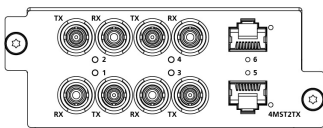## RM-G4000 Ethernet Interface Modules

4MSC2TX
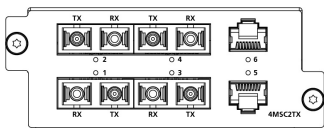
4MST2TX

4SSC2TX
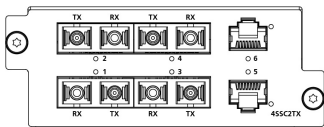
2MSC4TX
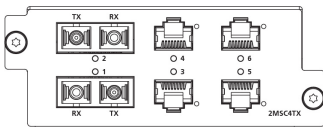
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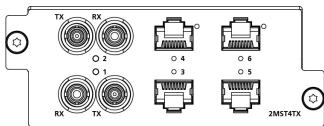
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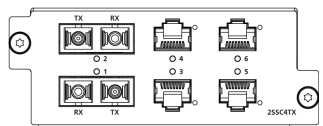
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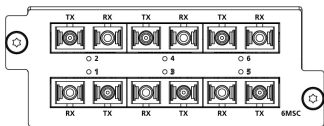
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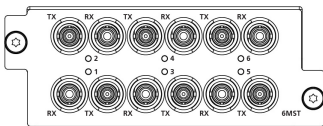
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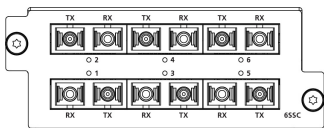
8PoE
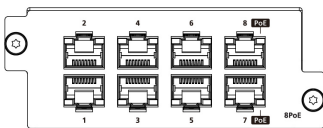
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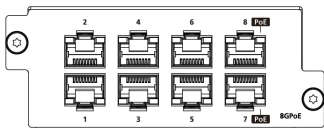
8SFP
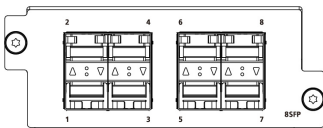
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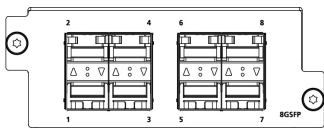
8TX
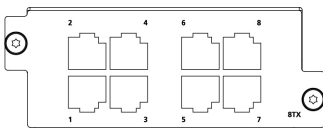
8GTX
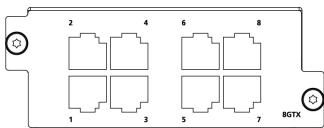
⚠️ **WARNING**

When end users are using Optical SFP Communications modules, these must be limited to Laser Class 1.

⚠️ **WARNING**

Use of the controls or adjustments or the performance of procedures other than those specified herein may result in hazardous radiation exposure.

CLASS 1 LASER PRODUCT

Grounding the Moxa Industrial Rackmount 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 compatibility.

Connecting the Power Inputs

The RKS-G4028 Series switches support various types of power supply.

- LV models provide one 24/48 VDC power input
- 2LV models provide two 24/28 VDC power inputs
- HV models provide one 110/220 VDC/VAC power input
- 2HV models provide two 110/220 VDC/VAC power inputs
- PoE models provide 1 EPS (external power supplies) with 48 VDC power inputs

Wiring Requirements

⚠️ **WARNING**

Do not disconnect modules or wires unless power has been switched off or the area is known to be non-hazardous. The device may only be connected to the supply voltage shown on the type plate. The device is designed for operation with a Safety Extra-Low Voltage (SELV) or an isolated power supply, which means that they may only be connected to the supply voltage connections and to the signal contact with a SELV or an isolated power supply in compliance with IEC 62368-1/EN 62368-1/UL 62368-1 or UL 61010.

Power Terminal Blocks

The connection for EPS (external power supply) / PWR1 (power supply 1) and PWR2 (power supply 2) are located on the front panel as shown below.

PoE Models

HV Models

LV Models

PoE Models Power Terminal Blocks

1. Insert the negative/positive (-/+) DC wires into the terminals.
2. Insert the terminal block connector prongs into the terminal block receptor.

HV Models Power Terminal Blocks

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

LV Models Power Terminal Blocks

1. Insert the negative/positive (-/+) DC wires into the terminals.
2. Insert the terminal block connector prongs into the terminal block receptor.

NOTE In order to have higher levels of protection against surge, it is suggested to 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 the cable type - AWG (American Wire Gauge) 16-20 (1.31-0.519 mm^2) and the corresponding pin type cable terminals. The rated temperature of wiring should be at least 105°C.

NOTE When wiring the PoE power input, we suggest using the cable type - AWG (American Wire Gauge) 16 (1.31 mm^2) and the corresponding pin type cable terminals. The rated temperature of wiring should be at least 105°C.

NOTE When wiring the grounding connector screw, we suggest using the cable type - AWG (American Wire Gauge) 16 (1.31 mm^2) and the corresponding pin type cable terminals. The rated temperature of wiring should be at least 105°C.

NOTE When HV models are connected with an AC power source, please make sure the Ground wire is well connected.

Ground
Connectors

NOTE When your purchase a device with two power modules, 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.

Wiring the Relay Contact

Each power module has one relay output that can be used to detect user-configured events. Two wires are attached to the relay pins with 'Normally Closed' and 'Normally Open' options.

1. Insert the wires into the terminals.
2. Insert the terminal block connector prongs into the terminal block receptor.

FAULT:
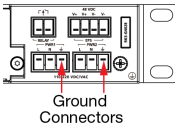The relay contact of the 2-pin terminal block connector is used to detect user-configured events. The two wires attached to the fault contacts form an open circuit when a user-configured event is triggered. If a user-configured event does not occur, the fault circuit remains closed.

USB Connection

Use Moxa's USB Automatic Backup Configurator ABC-02-USB to connect to the USB host port to backup and restore configuration files, auto-load configuration files, upgrade firmware, and backup system log files.

Type A

Console Port Connection

The RKS device has one RJ45 console port (RS-232), located on the front panel. Use an RJ45-based cable to connect the RKS's console port to your PC's COM port. You may then use a console terminal program, such as Moxa PComm Terminal Emulator, to access the RKS device that has a baud rate of 115200. Refer to the following table figure for the pin definition.

Pin	Description
1	–
2	–
3	–
4	TxD
5	RxD
6	GND
7	–
8	–
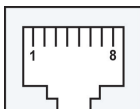
The Reset Button

Depress the Reset button for five continuous seconds to load the factory default settings. Use a pointed object, such as a straightened paper clip or toothpick, to depress the Reset button. When you do so, the STATE LED will start to blink about once 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

Placing the Round Stickers on Module Screws

Moxa offers eight round stickers in the shipment package. These stickers are to be placed on the screws of the modules to avoid unauthorized persons accessing the modules. If the stickers are broken, users will know the modules have been accessed by unauthorized persons. The figure below highlights the locations of the screws.

Follow these steps to place the stickers.

1. Use a cloth to clean the surface of the screws with 75% alcohol solution.
2. We suggest you use a tweezer to place the stickers.
3. Press the stickers down with 15PSI (pound per square inch) for at least 15 seconds.
4. Keep the device at room temperature for 24 hours before deploying the devices in harsh environments.

NOTE
1. Place the stickers carefully as they are thin and fragile.
2. The ideal environment for the stickers to be stored in is 22°C (72°F) and 50% relative humidity.
3. Keep the extra two stickers in a safe place so that no unauthorized persons can access them.

LED Indicators

The front/rear panels of the RKS-G4028 switch contains several LED indicators. The function of each LED is described in the table below.

LED	Color	State	Description
System LEDs			
P1 (PWR1)	Amber	On	Power is being supplied to the main module's power input PWR1.
		Off	Power is not being supplied to the main module's power input PWR1.
P2 (PWR2)	Amber	On	Power is being supplied to the main module's power input PWR2.
		Off	Power is not being supplied to the main module's power input PWR2.
S (STATE)	Green	On	The system passed the self-diagnosis test on boot up and is ready to run.
		Blinking (1Hz)	1. System service initialization. 2. When pressing the reset button for 5 seconds to reset to factory default setting.
		Blinking (4Hz)	1. After pressing the reset button for 5 seconds and the system is preparing to do a factory reset. 2. When the external storage ABC-02 automatic backup device is connected to the switch.
	Red	On	The system has initially failed in the boot-up process.
F (FAULT)	Red	On	1. Network loop is detected when loop protection is enabled. 2. The relay contact is triggered. 3. External storage Loading/Saving has failed. 4. The port is being disabled because it has exceeded the ingress rate limit of the shutdown mode. 5. Invalid Ring port connection.

LED	Color	State	Description
		Off	When the system has successfully booted up and no events have been triggered.
M/H (MSTR/ HEAD)	Green	On	The switch is set as the Master of the Turbo Ring, or as the Head of the Turbo Chain, or as the Root of the RSTP.
		Blinking	1. The switch has become the Master of the Turbo Ring after the Turbo Ring has gone down. 2. The switch is set as the Head of the Turbo Chain and the Turbo Chain has gone down. 3. The switch is set as the Turbo Ring's Member and the corresponding Ring port is down. 4. The switch is set as the Turbo Chains' Member/Tail and the corresponding Head-end Chain port is down.
		Off	When the switch is not the Master/Head/Root of this Turbo Ring/Turbo Chain/RSTP Ring.
C/T (CPLR/ TAIL)	Green	On	1. The switch's ring coupling or dual homing function is enabled. 2. The switch is set as the Tail of the Turbo Chain.
		Blinking	1. The switch is set as the Tail of Turbo Chain and the Chain has gone down. 2. The switch is set as Turbo Chain's Member/Head and the corresponding Tail-end Chain port has gone down.
		Off	When the switch disables the coupling or the Tail of Turbo Chain.
SYNC	Amber	On	The PTP function is enabled.
		Blinking	The switch receives sync packets but the time has not converged yet.
	Green	On	The PTP function has successfully converged.
EPS (External Power Supply)	Amber	On	Normal operation.
		Off	No external power supply for PoE.
M1 Copper (10/100/ 1000 Mbps, 4GT model only)	Green	On	When the port is active and links at 1,000 Mbps.
		Blinking	When the port's data is being transmitted at 1,000 Mbps.
		Off	When the port is inactive or link down.
	Amber	On	When the port is active and links at 10/100 Mbps.
		Blinking	When the port's data is being transmitted at 10/100 Mbps.
		Off	When the port is inactive or link down.

LED	Color	State	Description
M1 SFP (100/1000 Mbps, 4GS model only)	Green	On	When the port is active and links at 1,000 Mbps.
		Blinking	When the port's data is being transmitted at 1,000 Mbps.
		Off	When the port is inactive or link down.
	Amber	On	When the port is active and links at 100 Mbps.
		Blinking	When the port's data is being transmitted at 100 Mbps.
		Off	When the port is inactive or link down.

LEDs for RM-G4000 Modules

RM-G4000-8GTX/8GSFP

LED	Color	State	Description
Copper (10/100/1000 Mbps)	Green	On	The corresponding port's 1000 Mbps link is active.
		Blinking	Data is being transmitted at 1000 Mbps.
		Off	The corresponding port's link is inactive.
	Amber	On	The corresponding port's 10/100 Mbps link is active.
		Blinking	Data is being transmitted at 10/100 Mbps.
		Off	The corresponding port's link is inactive.
SFP (100/1000 Mbps)	Green	On	The corresponding port's 1000 Mbps link is active.
		Blinking	Data is being transmitted at 1000 Mbps.
		Off	The corresponding port's link is inactive.
	Amber	On	The corresponding port's 100 Mbps link is active.
		Blinking	Data is being transmitted at 100 Mbps.
		Off	The corresponding port's link is inactive.

RM-G4000-8TX/8SFP/6MSC/6MST/6SSC/4MSC2TX/4MST2TX/4SSC2TX/2MSC4TX/2MST4TX/2SSC4TX

LED	Color	State	Description
Copper (10/100 Mbps)	Green	On	The corresponding port's 100 Mbps link is active.
		Blinking	Data is being transmitted at 100 Mbps.
		Off	The corresponding port's link is inactive.
	Amber	On	The corresponding port's 10 Mbps link is active.
		Blinking	Data is being transmitted at 10 Mbps.
		Off	The corresponding port's link is inactive.
Fiber (10/100 Mbps)	Green	On	The corresponding port's 100 Mbps link is active.
		Blinking	Data is being transmitted at 100 Mbps.
		Off	The corresponding port's link is inactive.
	Amber	On	The corresponding port's 10 Mbps link is active.
		Blinking	Data is being transmitted at 10 Mbps.
		Off	The corresponding port's link is inactive.

RM-G4000-8GPoE

LED	Color	State	Description
Copper (10/100/1000 Mbps)	Green	On	The corresponding port's 1000 Mbps link is active.
		Blinking	Data is being transmitted at 1000 Mbps.
		Off	The corresponding port's link is inactive.
	Amber	On	The corresponding port's 10/100 Mbps link is active.
		Blinking	Data is being transmitted at 10/100 Mbps.
		Off	The corresponding port's link is inactive.
PoE/ PoE+/ PoE++	Green	On	When the port is 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	When the port is connected to an IEEE 802.3af/at powered device (PD).
		Blinking	PoE power has been shut off because power budget is low.
		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).

RM-G4000-8PoE

LED	Color	State	Description
Copper (10/100/ 1000 Mbps)	Green	On	The corresponding port's 100 Mbps link is active.
		Blinking	Data is being transmitted at 100 Mbps.
		Off	The corresponding port's link is inactive.
	Amber	On	The corresponding port's 10 Mbps link is active.
		Blinking	Data is being transmitted at 10 Mbps.
		Off	The corresponding port's link is inactive.
PoE/ PoE+/ PoE++	Green	On	When the port is 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	When the port is connected to an IEEE 802.3af/at powered device (PD).
		Blinking	PoE power has been shut off because power budget is low.
		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).

Specifications

Input/Output Interface	
Alarm Contact Channels	1 relay output with current carrying capacity of 2 A @ 24 VDC
Ethernet Interface	
10/100/1000BaseT (X) Ports (RJ45 connector)	RKS-G4028-4GT Models: 4 RKS-G4028-L3-4GT Models: 4
100/1000BaseSFP	RKS-G4028-4GS Models: 4 RKS-G4028-L3-4GS Models: 4 RKS-G4028-PoE-4GS Models: 4 RKS-G4028-L3-PoE-4GS Models: 4
Modules	There are 3 module slots on the switch. Users can select different types of modules to insert into the switch. The modules that can be selected include 8-port/6-port modules with 10/100/1000BaseT(X), 10/100BaseT(X), 100/1000BaseSFP, or 100BaseFX (SC/ST connector) interfaces.

Standards	IEEE 802.1D-2004 for Spanning Tree Protocol
	IEEE 802.1p for Class of Service
	IEEE 802.1Q for VLAN Tagging
	IEEE 802.1s for Multiple Spanning Tree Protocol
	IEEE 802.1w for Rapid Spanning Tree Protocol
	IEEE 802.1X for Authentication
	IEEE 802.3 for 10BaseT
	IEEE 802.3ab for 1000BaseT(X)
	IEEE 802.3ad for Port Trunk with LACP
	IEEE 802.3u for 100BaseT(X) and 100BaseFX
	IEEE 802.3x for flow control
	IEEE 802.3z for 1000BaseSX/LX/LHX/ZX
	IEEE 802.3bt for Power over Ethernet

PoE Information

Total PoE Power Budget	300 W
PoE Output Power	For each PoE port: 15.4 W in IEEE 802.3af, 30 W in IEEE 802.3at*, 90 W in IEEE 802.3bt
	*The power consumption tested for UL certification.

Power Parameters

Input Voltage	RKS-G4028-LV Models: 24/48 VDC
	RKS-G4028-2LV Models: 24/48 VDC (redundant dual inputs)
	RKS-G4028-HV Models: 110/220 VAC, 110/220 VDC
	RKS-G4028-2HV Models: 110/220 VAC, 110/220 VDC (redundant dual inputs)
	PoE Models: 48 VDC (for PoE system)
Operating Voltage	RKS-G4028-LV Models: 18 to 72 VDC
	RKS-G4028-2LV Models: 18 to 72 VDC
	RKS-G4028-HV Models: 85 to 264 VAC, 88 to 300 VDC
	RKS-G4028-2HV Models: 85 to 264 VAC, 88 to 300 VDC
	PoE Models: 46 to 57 VDC (for PoE system)
Overload Current Protection	Supported
Reverse Polarity Protection	Supported
Input Current	RKS-G4028-LV/2LV models:
	• Max. 2.53 A @ 24 VDC
	• Max. 1.25 A @ 48 VDC
	RKS-G4028-HV/2HV models:
	• Max. 0.55 A @ 110 VDC
	• Max. 0.29 A @ 220 VDC
	• Max. 1.01 A @ 110 VAC
	• Max. 0.62 A @ 220 VAC
	EPS (only for PoE model):
	• Max. 7.50 A @ 48 VDC

Physical Characteristics

IP Rating	IP30
Dimensions	440 x 44 x 300 mm (17.32 x 1.73 x 11.81 in)

Weight	RKS-G4028-LV/HV Models: 4,900 g
	RKS-G4028-2LV/2HV Models: 5,200 g
	RKS-G4028-PoE-LV/HV Models: 5,000 g
	RKS-G4028-PoE-2LV/2HV Models: 5,300 g
	RM-G4000-8TX: 300 g
	RM-G4000-8SFP: 400 g
	RM-G4000-8GTX: 300 g
	RM-G4000-8GSFP: 400 g
	RM-G4000-6MSC: 400 g
	RM-G4000-6MST: 400 g
	RM-G4000-6SSC: 400 g
	RM-G4000-4MSC2TX: 400 g
	RM-G4000-4MST2TX: 400 g
	RM-G4000-4SSC2TX: 400 g
	RM-G4000-2MSC4TX: 400 g
	RM-G4000-2MST4TX: 400 g
	RM-G4000-2SSC4TX: 400 g
	RM-G4000-8PoE: 500 g
	RM-G4000-8GPoE: 500 g
Installation	Rack mounting
Environmental Limits	
Operating Temperature	-40 to 75°C (-40 to 167°F)
Storage Temperature (package included)	-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, UL 61010
EMC	EN 55032/35
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: 35 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 DIPs
Power Substation	IEC 61850-3, IEEE 1613
Railway	EN 50121-4
Freefall	IEC 60068-2-32
Shock	IEC 60068-2-27
Vibration	IEC 60068-2-6
Warranty	
Warranty Period	5 years
Details	See www.moxa.com/warranty

Rack Mounting Instructions

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

NOTE In order to ensure reliable operations, please make sure the operating temp. of the environment does not exceed the spec. When mounting an RKS-G4028 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. **Reduced 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.
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). Make sure the grounding screw of the device has been connected by a 16 AWG (min.) green-and-yellow wire to the rack, and the protective terminal of the rack has connected to the earth ground.
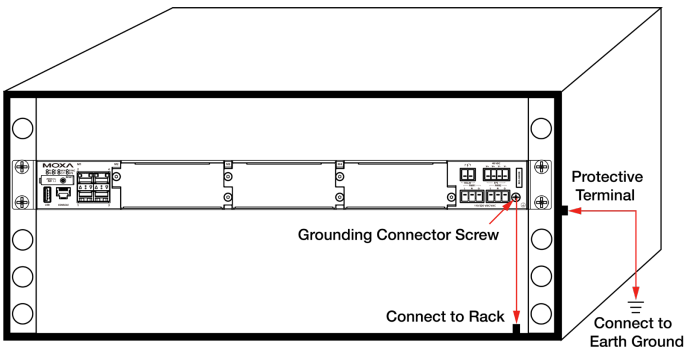
> ⚠️ **ATTENTION**
>
> When installing the device onto a rack, make sure that the input terminal block and protective terminal do not connect, or it may cause an electric shock.

NOTE The rackmount ears can be equipped on the front or rear of Moxa RKS-G4028/RKS-G4028-L3 switch.

Restricted Access Locations

- This equipment is intended to be used in Restricted Access Locations, such as a computer room, with access limited to SERVICE PERSONAL or USERS who have been instructed on how to handle the metal chassis of equipment that is so hot that special protection may be needed before touching it. The location should only be accessible with a key or through a security identity 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.

Patent
https://www.moxa.com/doc/operations/Moxa_Patent_Marking.pdf

> ⚠️ **ATTENTION**
>
> 1. To protect against the risk of fire, only replace the fuse with one that has the same type and rating.
> 2. It is recommended to incorporate a readily accessible disconnect device into the building installation wiring. Importantly, ensure the power supply is disconnected before performing any maintenance.
> 3. This equipment is designed to connect the earthed conductor of the D.C supply circuit to the equipment's' earthing conductor.
> 4. It is recommended to keep the PoE network indoors when using Information Technology Equipment.