

# RKS-G4028 Series

28G-port (with 802.3bt PoE option) full Gigabit modular managed Ethernet switches



## Features and Benefits

- Meets a wide range of demands from Fast Ethernet to full Gigabit industrial networks (up to 28 Gigabit ports)
- Modular interfaces for flexible connector type combinations
- Support for IEEE 802.3bt PoE for up to 90 W output per port
- High EMC immunity compliant with IEC 61850-3 and IEEE 1613
- Hardware-based IEEE 1588 PTP for high-precision time synchronization
- Turbo Ring and Turbo Chain (recovery time < 20 ms @ 250 switches)<sup>1</sup>, and STP/RSTP/MSTP for network redundancy
- -40 to 75°C operating temperature range
- Supports MXstudio for easy, visualized industrial network management
- Developed according to the IEC 62443-4-1 and compliant with the IEC 62443-4-2 industrial cybersecurity standards

## Certifications



## Introduction

The RKS-G4028 Series is designed to meet the rigorous demands of mission-critical applications for industry and business, such as power substation automation systems (IEC 61850-3, IEEE 1613), railway applications (EN 50121-4), and factory automation systems. The RKS-G4028 Series' Gigabit and Fast Ethernet backbone, redundant ring, and 24 VDC, 48 VDC, or 110/220 VDC/VAC dual isolated redundant power supplies increase the reliability of your communications and save on wiring costs.

The modular design of the RKS-G4028 Series also makes network planning easy, and allows greater flexibility by letting you install up to 28 Gigabit ports with various connector types.

## Additional Features and Benefits

- Layer 3 switching functionality to move data and information across networks (L3 models only)
- IEEE 1588v2 PTP (Precision Time Protocol) for network time synchronization
- Command line interface (CLI) for quickly configuring major managed functions
- IGMP snooping and GMRP for filtering multicast traffic
- Port-based VLAN, IEEE 802.1Q VLAN, and GVRP to ease network planning
- QoS (IEEE 802.1p/1Q and TOS/DiffServ) to increase determinism
- IEEE 802.3ad, LACP for optimum bandwidth utilization
- Line-swap fast recovery
- TACACS+, IEEE 802.1X, SNMPv3, HTTPS, and SSH to enhance network security
- SNMPv1/v2c/v3 for different levels of network management
- RMON for proactive and efficient network monitoring
- Bandwidth management prevents unpredictable network status with "Lock port" to restrict access to authorized MAC addresses
- Port mirroring for online debugging
- Automatic warning by exception through email and relay output
- Automatic recovery of connected device's IP addresses
- Configurable by web browser, Telnet/serial console, CLI, Windows utility, and ABC-02-USB automatic backup configurator

## Specifications

### Input/Output Interface

Alarm Contact Channels

1 relay output with current carrying capacity of 2 A @ 24 VDC

1. If the port link speed is 1 Gigabit or higher, the recovery time is < 50 ms.

## Ethernet Interface

10/100/1000BaseT(X) Ports (RJ45 connector)	RKS-G4028-4GT models: 4 RKS-G4028-L3-4GT models: 4
100/1000BaseSFP Slots	RKS-G4028-4GS models: 4 RKS-G4028-L3-4GS models: 4 RKS-G4028-PoE-4GS models: 4 RKS-G4028-L3-PoE-4GS models: 4
Module	<p>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.</p> <p>Refer to Expansion Modules in the Accessories section for a full list of supported interface modules.</p>
Standards	<p>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</p>

## Ethernet Software Features

Management	<p>IPv4/IPv6          Note: IPv6 is available for L2 models only.          Flow control          Back Pressure Flow Control          DHCP Server/Client          ARP          RARP          LLDP          Linkup Delay          SMTP          SNMP Trap          SNMP Inform          SNMPv1/v2c/v3          RMON          TFTP          SFTP          HTTP          HTTPS          Telnet          Syslog          Private MIB          Fiber check          DHCP Relay Agent (Option 82)          Port Mirroring (SPAN, RSPAN)</p>
Filter	<p>GMRP          GVRP          GARP          802.1Q          IGMP Snooping v1/v2/v3          IGMP Querier</p>
Redundancy Protocols	<p>STP          RSTP          Turbo Ring v2          Turbo Chain          Ring Coupling          Dual-Homing          MRP          Link Aggregation</p>

	<p>Network Loop Protection</p> <p>MSTP</p>
Routing Redundancy	L3 models: VRRP
Security	<p>Broadcast storm protection</p> <p>Rate Limit</p> <p>Access control list</p> <p>Static port lock</p> <p>Sticky MAC</p> <p>HTTPS/SSL</p> <p>SSH</p> <p>RADIUS</p> <p>TACACS+</p> <p>Login and password policy</p> <p>Secure boot</p> <p>MAC authentication bypass</p> <p>Trust access control</p> <p>Dynamic ARP Inspection</p> <p>DHCP Snooping</p> <p>IP Source Guard</p>
Time Management	<p>SNTP</p> <p>IEEE 1588v2 PTP (hardware-based)</p> <p>Supported power profiles: IEEE 1588 Default 2008, IEC 61850-9-3-2016, IEEE C37.238-2017</p> <p>NTP Server/Client</p> <p>NTP Authentication</p>
Protocols	<p>IPv4/IPv6</p> <p>Note: IPv6 is available for L2 models only.</p> <p>TCP/IP</p> <p>UDP</p> <p>ICMP</p> <p>ARP</p> <p>RARP</p> <p>TFTP</p> <p>DNS</p> <p>NTP Client</p> <p>DHCP Server</p> <p>DHCP Client</p> <p>802.1X</p> <p>QoS</p> <p>HTTPS</p> <p>HTTP</p> <p>EtherNet/IP</p> <p>Modbus TCP</p> <p>Telnet</p> <p>SMTP</p> <p>SNMPv1/v2c/v3</p> <p>RMON</p> <p>Syslog</p>
Unicast Routing	L3 models: OSPF, Static Route
MIB	<p>P-BRIDGE MIB</p> <p>Q-BRIDGE MIB</p> <p>IEEE8021-SPANNING-TREE-MIB</p> <p>IEEE8021-PAE-MIB</p> <p>IEEE8023-LAG-MIB</p> <p>LLDP-EXT-DOT1-MIB</p> <p>LLDP-EXT-DOT3-MIB</p> <p>SNMPv2-MIB</p> <p>RMON MIB Groups 1, 2, 3, 9</p>
Power Substation	<p>MMS</p> <p>1588 PTP Power Profile IEC 61850-9-3</p> <p>1588 PTP Power Profile C37.238-2017</p>

## Switch Properties

IGMP Groups	1024
Jumbo Frame Size	9.6 KB
MAC Table Size	16 K
Max. No. of VLANs	256
Packet Buffer Size	1.5 Mbits
Priority Queues	8
VLAN ID Range	VID 1 to 4094

## USB Interface

Storage Port	USB Type A
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## MicroSD Interface

Storage Port	MicroSD card
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## Serial Interface

Console Port	RS-232 (RJ45)
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## Power Parameters

Total PoE Power Budget	PoE models: 300 W
Max. PoE Power Output per Port	PoE models: IEEE 802.3af: 15.4 W IEEE 802.3at: 30 W IEEE 802.3bt: 90 W
Input Voltage	RKS-G4028-LV models: 24/48 VDC RKS-G4028-2LV models: 24/48 VDC (redundant power supplies) RKS-G4028-HV models: 110/220 VAC, 110/220 VDC RKS-G4028-2HV models: 110/220 VAC, 110/220 VDC (redundant power supplies) PoE models: 48 VDC (for the PoE system)
Operating Voltage	RKS-G4028-LV/2LV models: 18 to 72 VDC RKS-G4028-HV/2HV models: 88 to 300 VDC, 85 to 264 VAC PoE models: 46 to 57 VDC (for the PoE system)
Overload Current Protection	Supported
Reverse Polarity Protection	Supported

Input Current	<p>RKS-G4028-LV/2LV models: Max. 2.53 A @ 24 VDC Max. 1.25 A @ 48 VDC</p> <p>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</p> <p>EPS (PoE models only): Max. 7.50 A @ 48 VDC</p>
Power Consumption (Max.)	<p>RKS-G4028-LV/2LV models: Max. 60.72 W @ 24 VDC Max. 60 W @ 48 VDC</p> <p>RKS-G4028-HV/2HV models: Max. 60.5 W @ 110 VDC Max. 63.8 W @ 220 VDC Max. 62.2 W @ 110 VAC Max. 64.1 W @ 220 VAC</p> <p>Note: These are the maximum power consumption ratings for the device with the maximum number of modules installed.</p>

### Physical Characteristics

IP Rating	IP30
Dimensions	440 x 44 x 300 mm (17.32 x 1.37 x 11.81 in)
Weight	<p>RKS-G4028-LV/HV models: 4900 g (10.80 lb) RKS-G4028-2LV/2HV models: 5200 g (11.46 lb) RKS-G4028-PoE-LV/HV models: 5000 g (11.02 lb) RKS-G4028-PoE-2LV/2HV models: 5300 g (11.68 lb)</p>
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	<p>EN 62368-1 UL 62368-1 UL 61010</p>
EMC	EN 55032/35
EMI	CISPR 32, FCC Part 15B Class A
Traffic Control	NEMA TS2
EMS	<p>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</p>
Power Substation	<p>IEC 61850-3 IEEE 1613</p>
Railway	EN 50121-4

Freefall	IEC 60068-2-32
Shock	IEC 60068-2-27
Vibration	IEC 60068-2-6

#### MTBF

Time	<p>RKS-G4028-4GT-HV models: 572,888 hours  RKS-G4028-4GT-2HV models: 518,894 hours  RKS-G4028-4GS-HV models: 529,925 hours  RKS-G4028-4GS-2HV models: 483,436 hours  RKS-G4028-4GT-LV models: 548,589 hours  RKS-G4028-4GT-2LV models: 479,574 hours  RKS-G4028-4GS-LV models: 508,639 hours  RKS-G4028-4GS-2LV models: 449,160 hours  RKS-G4028-PoE-4GS-HV models: 508,190 hours  RKS-G4028-PoE-4GS-2HV models: 465,282 hours  RKS-G4028-PoE-4GS-LV models: 488,598 hours  RKS-G4028-PoE-4GS-2LV models: 433,472 hours</p>
Standards	Telcordia (Bellcore), GB

#### Warranty

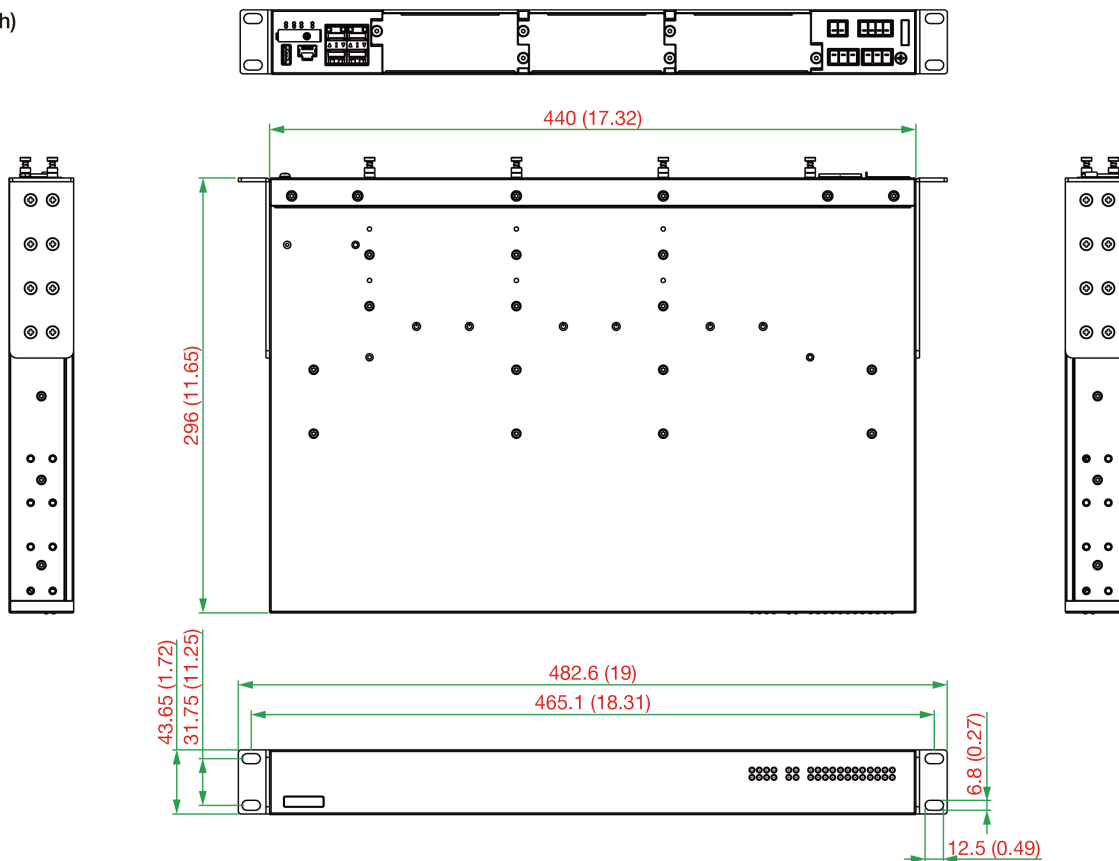
Warranty Period	5 years
Details	See <a href="http://www.moxa.com/warranty">www.moxa.com/warranty</a>

#### Package Contents

Device	1 x RKS-G4028 Series switch
Installation Kit	<p>2 x rack-mounting ear  4 x protective caps for unused SFP ports (for RKS-G4028-GS models only)  8 x round stickers for module screws</p>
Documentation	<p>1 x quick installation guide  1 x warranty card</p>
Note	<p>1. Only the RKS-G4028-PoE Series and RKS-G4028-L3-PoE models support PoE functionality with RM-G4000-8GPoE and/or RM-G4000-8PoE modules.  2. Power over Ethernet requires the 48 VDC external power supply (46 to 57 VDC).  3. The 48 VDC external power supply, SFP modules, and modules from the RM-G4000 Module Series need to be purchased separately for use with this product.</p>

## Dimensions

Unit: mm (inch)



## Ordering Information

Model Name	Max. No. of Ports	PoE Support	L3 Functionality	Input Voltage	Redundant Power Supplies	External Power Supply	Operating Temp.
RKS-G4028-4GT-HV-T	28	-	-	110/220 VAC/ VDC	-	-	-40 to 75°C
RKS-G4028-4GT-2HV-T	28	-	-	110/220 VAC/ VDC	✓	-	-40 to 75°C
RKS-G4028-4GS-HV-T	28	-	-	110/220 VAC/ VDC	-	-	-40 to 75°C
RKS-G4028-4GS-2HV-T	28	-	-	110/220 VAC/ VDC	✓	-	-40 to 75°C
RKS-G4028-4GT-LV-T	28	-	-	24/48 VDC	-	-	-40 to 75°C
RKS-G4028-4GT-2LV-T	28	-	-	24/48 VDC	✓	-	-40 to 75°C
RKS-G4028-4GS-LV-T	28	-	-	24/48 VDC	-	-	-40 to 75°C
RKS-G4028-4GS-2LV-T	28	-	-	24/48 VDC	✓	-	-40 to 75°C
RKS-G4028-L3-4GT-HV-T	28	-	✓	110/220 VAC/ VDC	-	-	-40 to 75°C
RKS-G4028-L3-4GT-2HV-T	28	-	✓	110/220 VAC/ VDC	✓	-	-40 to 75°C
RKS-G4028-L3-4GS-HV-T	28	-	✓	110/220 VAC/ VDC	-	-	-40 to 75°C
RKS-G4028-L3-4GS-2HV-T	28	-	✓	110/220 VAC/ VDC	✓	-	-40 to 75°C
RKS-G4028-L3-4GT-LV-T	28	-	✓	24/48 VDC	-	-	-40 to 75°C

Model Name	Max. No. of Ports	PoE Support	L3 Functionality	Input Voltage	Redundant Power Supplies	External Power Supply	Operating Temp.
RKS-G4028-L3-4GT-2LV-T	28	-	✓	24/48 VDC	✓	-	-40 to 75°C
RKS-G4028-L3-4GS-LV-T	28	-	✓	24/48 VDC	-	-	-40 to 75°C
RKS-G4028-L3-4GS-2LV-T	28	-	✓	24/48 VDC	✓	-	-40 to 75°C
RKS-G4028-PoE-4GS-HV-T	28	✓	-	110/220 VAC/VDC	-	✓	-40 to 75°C
RKS-G4028-PoE-4GS-2HV-T	28	✓	-	110/220 VAC/VDC	✓	✓	-40 to 75°C
RKS-G4028-PoE-4GS-LV-T	28	✓	-	24/48 VDC	-	✓	-40 to 75°C
RKS-G4028-PoE-4GS-2LV-T	28	✓	-	24/48 VDC	✓	✓	-40 to 75°C
RKS-G4028-L3-PoE-4GS-HV-T	28	✓	✓	110/220 VAC/VDC	-	✓	-40 to 75°C
RKS-G4028-L3-PoE-4GS-2HV-T	28	✓	✓	110/220 VAC/VDC	✓	✓	-40 to 75°C
RKS-G4028-L3-PoE-4GS-LV-T	28	✓	✓	24/48 VDC	-	✓	-40 to 75°C
RKS-G4028-L3-PoE-4GS-2LV-T	28	✓	✓	24/48 VDC	✓	✓	-40 to 75°C

## Accessories (sold separately)

### Expansion Modules

RM-G4000-8TX	Fast Ethernet module with 8 10/100BaseT(X) ports
RM-G4000-8SFP	Fast Ethernet module with 8 100BaseSFP slots
RM-G4000-8PoE	Fast Ethernet module with 8 10/100BaseT(X) IEEE 802.3bt PoE ports
RM-G4000-8GTX	Gigabit Ethernet module with 8 10/100/1000BaseT(X) ports
RM-G4000-8GSFP	Gigabit Ethernet module with 8 100/1000BaseSFP slots
RM-G4000-8GPoE	Gigabit Ethernet module with 8 10/100/1000BaseT(X) IEEE 802.3bt PoE ports
RM-G4000-6MSC	Fast Ethernet module with 6 multi-mode 100BaseFX ports with SC connectors
RM-G4000-6MST	Fast Ethernet module with 6 multi-mode 100BaseFX ports with ST connectors
RM-G4000-6SSC	Fast Ethernet module with 6 single-mode 100BaseFX ports with SC connectors
RM-G4000-4MSC2TX	Fast Ethernet module with 4 multi-mode 100BaseFX ports with SC connectors, 2 10/100BaseT(X) ports
RM-G4000-4MST2TX	Fast Ethernet module with 4 multi-mode 100BaseFX ports with ST connectors, 2 10/100BaseT(X) ports
RM-G4000-4SSC2TX	Fast Ethernet module with 4 single-mode 100BaseFX ports with SC connectors, 2 10/100BaseT(X) ports
RM-G4000-2MSC4TX	Fast Ethernet module with 2 multi-mode 100BaseFX ports with SC connectors, 4 10/100BaseT(X) ports
RM-G4000-2MST4TX	Fast Ethernet module with 2 multi-mode 100BaseFX ports with ST connectors, 4 10/100BaseT(X) ports
RM-G4000-2SSC4TX	Fast Ethernet module with 2 single-mode 100BaseFX ports with SC connectors, 4 10/100BaseT(X) ports

### Storage Kits

ABC-02-USB	Configuration backup and restoration tool, firmware upgrade, and log file storage tool for managed Ethernet switches and routers, 0 to 60°C operating temperature
ABC-02-USB-T	Configuration backup and restoration tool, firmware upgrade, and log file storage tool for managed Ethernet switches and routers, -40 to 75°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-1GSXLC-T	SFP module with 1 1000BaseSX port with LC connector for 300m/550m transmission, -40 to 85°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-1GTXRJ45-T	SFP module with 1 1000BaseT port with RJ45 connector for 100 m transmission, -40 to 75°C operating temperature

#### Software

MXview-100	MXview license for 100 nodes
MXview-50	MXview license for 50 nodes
MXview-250	MXview license for 250 nodes
MXview-500	MXview license for 500 nodes
MXview-1000	MXview license for 1000 nodes
MXview-2000	MXview license for 2000 nodes
MXview Upgrade-50	MXview license expansion for 50 nodes

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