RKS-G4028-PL-L3 Series

12 10GbE, 16 GbE-port (802.3bt PoE optional) Layer 3 modular managed Ethernet switches

Features and Benefits

- Scalable design supporting up to 28 ports, from Fast Ethernet to 10GbE industrial networks
- Modular interfaces with LAN modules and power modules for flexible expansion
- IEEE 802.3bt PoE with up to 90 W per port and 720 W total budget for high-power devices
- High EMC immunity compliant with IEC 61850-3 and IEEE 1613
- Hardware-based IEEE 1588 PTP for high-precision time synchronization
- Intelligent chassis monitoring with built-in temperature detection
- Turbo Ring and Turbo Chain (recovery time < 20 ms @ 250 switches)[1], and STP/RSTP/MSTP for network redundancy
- Supports MXView One series for easy, visualized industrial network management
- GOOSE Check for easy troubleshooting
- Built-in MMS server based on IEC 61850-90-4 switch data modeling for power SCADA
- IEC 62443-4-2 Security Level 2 certified
- -40 to 75°C operating temperature range

Certifications

EN 50121-4 IEC 61850-3 IEEE 1613 NEMA TS2

Introduction

The RKS-G4028-PL-L3 Series is purpose-built to deliver exceptional reliability and performance for mission-critical industrial and business applications, including power substation automation, railway operations, and intelligent transportation systems.

With its high-density 10GbE backbone (up to 12 fixed 10G SFP+ ports), modular LAN expansion (up to 16 additional Gigabit ports), and dual isolated redundant power supply options (12/24/48 VDC, 110/220 VAC/VDC, or 48V EPS), the RKS-G4028-PL-L3 Series ensures robust communication while reducing wiring and maintenance costs.

Even better, the dual-sided power installation design (front or rear) maximizes installation convenience for diverse cabinet layouts.

Additional Features and Benefits

- Layer 3 switching functionality to move data and information across networks
- 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 or ABC-03 automatic backup configurator
- Out-of-band management (OOBM) port to ensure the availability of network management when in-band services are inaccessible

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

Specifications

Ethernet Interface

1000/2500/10000BaseSFP Ports	RKS-G4028-PL-L3 models: 12
Out-of-band Management (OOBM)	1 x 8-pin RJ45 1GbE Ethernet port (MGMT)
Expansion Module Slots	There are 2 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 modules with 10/100/1000BaseT(X), 10/100/1000BaseT(X) PoE, and 100/1000BaseSFP interfaces. Refer to Expansion Modules in the Accessories section for a full list of supported interface modules. 8-port module slots: 2 (Up to 16 total ports) Module Options: 8-port 10/100/1000BaseT(X) 8-port 10/100/1000BaseT(X) PoE (PoE models only) 8-port 100/1000BaseSFP
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 802.3ae for 10 Gigabit Ethernet IEEE 802.3bz for 2.5GBaseX IEEE 802.3u for 100BaseT(X) and 100BaseFX IEEE 802.3x for flow control IEEE 802.3z for 1000BaseSX/LX/LHX/ZX
Note	All Ethernet ports on the RKS-G4028-PL series operate in full-duplex mode exclusively. Half-duplex transmission is not supported.

Ethernet Software Features

Management	ARP Back Pressure Flow Control DHCP Relay Agent (Option 82) Fiber check Flow control HTTP HTTPS IPv4 Linkup Delay LLDP Port Mirroring (SPAN, RSPAN) Private MIB RARP RMON SFTP SMTP SNMP Inform SNMP Trap SNMPv1/v2c/v3 Syslog Telnet TFTP
Filter	GMRP GVRP GARP 802.1Q IGMP Snooping v1/v2/v3 IGMP Querier
Redundancy Protocols	Link Aggregation MRP

	MRP Interconnection MSTP Multiple Dual Homing Multiple Network Coupling Network Loop Protection Ring Coupling RSTP STP Tracking Turbo Chain Turbo Ring v2
Routing Redundancy	VRRP
Security	Access control list Broadcast storm protection DHCP Snooping Dynamic ARP Inspection HTTPS/SSL IEEE 802.1AE MAC security IP Source Guard Login and password policy MAC authentication bypass RADIUS Rate Limit Secure boot SSH Static port lock Sticky MAC TACACS+ Trust access control
Time Management	IEEE 1588v2 PTP (hardware-based) NTP Authentication NTP Server/Client SNTP Supported power profiles: IEEE 1588 Default 2008, IEC 61850-9-3-2016, IEEE C37.238-2017
Protocols	802.1X ARP DNS HTTP HTTPS ICMP IPv4 NTP Client QoS RARP RMON SMTP SNMPv1/v2c/v3 Syslog TCP/IP Telnet TFTP UDP VLAN Assignment
Industrial Protocols	EtherNet/IP Modbus TCP PROFINET
Unicast Routing	OSPF Static Route
Multicast Routing	PIM-DM PIM-SM Multicast Local Route

MIB	IEEE8021-PAE-MIB IEEE8021-SPANNING-TREE-MIB IEEE8023-LAG-MIB LLDP-EXT-DOT1-MIB LLDP-EXT-DOT3-MIB P-BRIDGE MIB Q-BRIDGE-MIB RMON MIB Groups 1, 2, 3, 9 SNMPv2-MIB
Power Substation	1588 PTP Power Profile IEC 61850-9-3 1588 PTP Power Profile C37.238-2017 GOOSE Check MMS

Switch Properties

IGMP Groups	2048
Jumbo Frame Size	9.216 KB
MAC Table Size	32 K
Max. No. of VLANs	512
Packet Buffer Size	8 MB
Priority Queues	8
VLAN ID Range	VID 1 to 4094

USB Interface

Storage Port	USB Type A

MicroSD Interface

Storage Port	microSD card

LED Interface

LED Indicators	PWR1, PWR2, STATE, FAULT, MSTR/HEAD, CPLR/TAIL, SYNC, EPS1, EPS2

Serial Interface

Console Port	RS-232 (RJ45)

Input/Output Interface

Alarm Contact Channels	1 relay output with current carrying capacity of 2 A @ 30 VDC, 0.5A @ 125VAC
Buttons	Reset button

Power Parameters

Total PoE Power Budget	720 W[2]
Max. PoE Power Output per Port	IEEE 802.3af: 15.4 W IEEE 802.3at: 30 W IEEE 802.3bt: 90 W
Input Voltage	Isolated Power Module PWR-310-HV: 110/220 VDC, 110/220 VAC PWR-310-HVA: 110/220 VAC PWR-310-LV: 12/24/48 VDC Isolated Power Module with PoE EPS PWR-310-HV-P: 110/220 VAC, 110/220 VDC, EPS Input: 48–57 VDC PWR-310-LV-P: 12/24/48 VDC, EPS Input: 48–57 VDC

2. with dual power module installation

	(For PoE+ applications, a minimum of 53 VDC is recommended)
Operating Voltage	PWR-310-LV / PWR-310-LV-P models: 10.8 to 72 VDC PWR-310-HV: 88 to 300 VDC, 85 to 264 VAC PWR-310-HVA: 85 to 264 VAC PoE models: 46 to 57 VDC (for the PoE system)
Overload Current Protection	Supported
Reverse Polarity Protection	Supported
Input Current	PWR-310-LV / PWR-310-LV-P models: Max. 8 A @ 12 VDC Max. 3.08 A @ 24 VDC Max. 1.52 A @ 48 VDC PWR-310-HV / PWR-310-HV-P models: Max. 0.67 A @ 110 VDC Max. 0.33 A @ 220 VDC Max. 0.79 A @ 110 VAC Max. 0.35 A @ 220 VAC PWR-310-HVA models: Max. 0.79 A @ 110 VAC Max. 0.35 A @ 220 VAC EPS (PoE models only): Max. 12 A @ 48 to 57 VDC
Power Consumption (Max.)	RKS-G4028-PL-L3 with PWR-310 LV and LV-P Modules: Max. 96.06 W @ 12 VDC Max. 81.4 W @ 24 VDC Max. 80.3 W @ 48 VDC RKS-G4028-PL-L3 with PWR-310 HV and HV-P Modules: Max. 80.96 W @ 110 VDC Max. 80.3 W @ 220 VDC Max. 79.86 W @ 110 VAC Max. 78.76 W @ 220 VAC RKS-G4028-PL-L3 with PWR-310 HVA Modules: Max.79.86 W @ 110 VAC Max.78.76 W @ 220 VAC

Physical Characteristics

IP Rating	IP40[3]
Dimensions	440 x 44 x 387 mm (17.32 x 1.72 x 15.24 in)
Weight	RKS-G4028-PL-L3-PoE-12XGS-T: 5410 g (11.93 lb) RKS-G4028-PL-12XGS-T: 5450 g (12.02 lb) RM-G4000-PL LAN Port Module: RM-G4000-PL-8GSFP: 505 g (1.11 lb) RM-G4000-PL-8GTX: 438 g (0.97 lb) RM-G4000-PL-8GPoE: 596 g (1.31 lb) PWR-310 Power Module: PWR-310-LV: 854 g (1.88 lb) PWR-310-HV: 854 g (1.88 lb) PWR-310-HVA: 861g (1.90 lb) PWR-310-LV-P: 830 g (1.83 lb) PWR-310-HV-P: 845 g (1.86 lb) 5410 g (11.93 lb) 5450 g (12.02 lb)
Installation	Rack mounting

3. with all ports/interfaces populated

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

EMC	EN 55032/35 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 AC Voltage Dips and Interruptions IEC 61000-4-29 DC Voltage Dips and Interruptions
Cybersecurity	IEC 62443-4-2 Security Level 2
Safety	EN IEC 62368-1 IEC 62368-1 UL 61010-1 UL 61010-2-201 UL 62368-1
Power Substation	IEC 61850-3 Edition 2.0 IEC 61850-90-4 IEEE 1613 Class 2 (EMC)
Railway	EN 50121-4
Traffic Control	NEMA TS2
Shock	IEC 60068-2-27
Vibration	IEC 60068-2-6

MTBF

Time	RKS-G4028-PL-L3-12XGS-T: 1,532,844 hours RKS-G4028-PL-L3-PoE-12XGS-T: 1,326,867 hours
Standards	Telcordia (Bellcore), GB

Warranty

Warranty Period	5 years
Details	See www.moxa.com/warranty

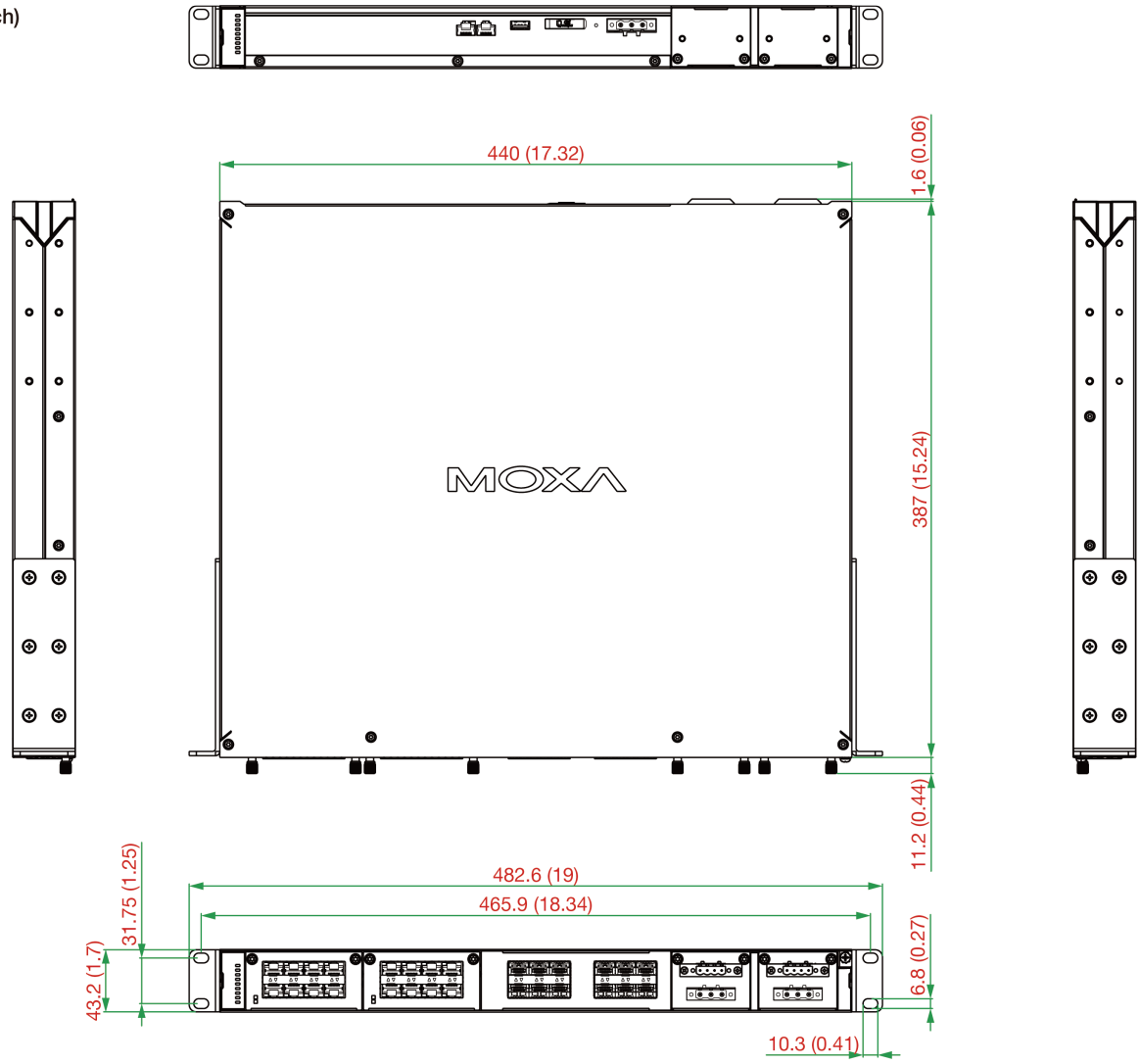
Package Contents

Device	1 x RKS-G4028-PL-L3 Series switch
Installation Kit	2 x rack-mounting ear 12 x protective caps for unused SFP ports

Documentation	1 x quick installation guide 1 x warranty card
Note	1. Only the RKS-G4028-PL-PoE Series and RKS-G4030-PL-L3-PoE models support PoE functionality with RM-G4000-PL-8GPoE modules. 2. Only the PWR-310-LV-P, PWR-310-HV-P support RKS-G4028-PL-PoE Series and RKS-G4030-PL-L3-PoE models PoE function 3. Power over Ethernet requires the 48 VDC external power supply. (53 to 57 VDC is recommended for PoE+ devices) The 48 VDC external power supply, SFP modules, isolated system power supply from PWR-310 series and modules from the RM-G4000-PL Module Series need to be purchased separately for use with this product.

Dimensions

Unit: mm (inch)



Ordering Information

Model Name	Max. No. of Ports	10GbE SFP+ Ports	100/1000 BaseSFP Ports (Expansion Module)	10/100/ 1000BaseT(X) Ports RJ45 Ports (Expansion Module)	PoE Support	L3 Functionality	Operating Temp.
RKS-G4028-PL-L3-PoE-12XGS-T	28	12	Up to 16 (8 ports per module)	Up to 16 (8 ports per module)	✓	✓	-40 to 75°C (-40 to 167°F)
RKS-G4028-PL-L3-12XGS-T	28	12	Up to 16 (8 ports per module)	Up to 16 (8 ports per module)	–	✓	-40 to 75°C (-40 to 167°F)

Accessories (sold separately)

Expansion Modules

RM-G4000-PL-8GTX	Gigabit Ethernet module with 8 100/1000BaseT(X) ports
RM-G4000-PL-8GSFP	Gigabit Ethernet module with 8 100/1000BaseSFP ports
RM-G4000-PL-8GPoE	Gigabit Ethernet module with 8 100/1000BaseT(X) IEEE 802.3bt PoE ports

Power Modules

PWR-310-LV	12/24/48 VDC power supply module with system power input
PWR-310-HV	110/220 VAC/VDC power supply module with system power input
PWR-310-HVA	110/220 VAC power supply module with system power input, AC power inlet
PWR-310-LV-P	12/24/48 VDC power supply module with system power input, PoE power input
PWR-310-HV-P	110/220 VAC/VDC power supply module with system power input, PoE power input

SFP Modules

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-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-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-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-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-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-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
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-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-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-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-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 300m/550m transmission, 0 to 60°C operating temperature

SFP-1GLSXLC	SFP module with 1 1000BaseLSX port with LC connector for 1km/2km transmission, 0 to 60°C operating temperature
SFP-1GLXLC	SFP module with 1 1000BaseLX port with LC connector for 10 km transmission, 0 to 60°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-1GLHXLC	SFP module with 1 1000BaseLHX port with LC connector for 40 km transmission, 0 to 60°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-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-1GSXLC-T	SFP module with 1 1000BaseSX port with LC connector for 300m/550m transmission, -40 to 85°C operating temperature
SFP-1GLSXLC-T	SFP module with 1 1000BaseLSX port with LC connector for 1km/2km transmission, -40 to 85°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-T	SFP module with 1 1000BaseLH port with LC connector for 30 km transmission, -40 to 85°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-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
SFP-2.5GMLC-T	SFP module with 1 2.5GBaseFX port with LC connector, multi-mode, for 170, 200, 550, 600 m transmission, -40 to 85 °C operating temperature
SFP-2.5GSLC-T	SFP module with 1 2.5GBaseFX port with LC connector, single-mode, for 5 km transmission, -40 to 85 °C operating temperature
SFP-2.5GLSLC-T	SFP module with 1 2.5GBaseFX port with LC connector, single-mode, for 20 km transmission, -40 to 85 °C operating temperature
SFP-2.5GSLHLC-T	SFP module with 1 2.5GBaseFX port with LC connector, single-mode, for 45 km transmission, -40 to 85 °C operating temperature
SFP-10GSRLC-T	SFP+ module with 1 10GBase-SR port, LC connector for 33m/82m/300m/400m transmission, -40 to 85°C operating temperature
SFP-10GLRLC-T	SFP+ module with 1 10GBase-LR port, LC connector for 10 km transmission, -40 to 85°C operating temperature
SFP-10GERLC-T	SFP+ module with 1 10GBase-ER port, LC connector for 40 km transmission, -40 to 85°C operating temperature
SFP-10GZRLC-T	SFP+ module with 1 10GBase-ZR port, LC connector for 80 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-1FEMLC-T	SFP module with 1 100Base multi-mode, LC connector for 2/4 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

Cables

CN20070	10-pin RJ50 to DB9 female serial cable
PWC-C15US-3B-183	Power cord with US plug, 1.83 m, -40 to 75°C operating temperature
PWC-C15EU-3B-183	Power cord with EU plug, 1.83 m, -40 to 75°C operating temperature

Software

LIC-MXviewOne-NEW-XN-SR	MXview One node license with customizable node quantity (minimum 1 node)

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
ABC-03-microSD-T	MicroSD-based configuration backup and restoration tool, firmware upgrades, and log file storage tool for managed Ethernet switches and WLAN products, -40 to 85°C operating temperature

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