

TN-4900 系列

EN 50155 Gigabit 安全路由器



特色與優點

- 8 個 Gigabit 連接埠以及最多 12 個 PoE 連接埠
- IEC 61375 ETBN 功能 (ETBN 型號)
- 雙繞道繼電器
- 支援常規與推拉式 M12 連接器
- 隔離式電源輸入範圍介於 24 至 110 VDC
- 符合所有 EN 50155 規範強制性測試項目¹
- IEC 62443-4-2 安全等級 2 認證
- -40°C 至 70°C 操作溫度範圍

認證



EN 50155



EN 50121-4



簡介

ToughNet TN-4900 系列專為軌道車輛乙太網路設計，是一組內含 8 個 Gigabit 連接埠及最多四個 繞道繼電器連接埠的高效能 M12 路由器。這些路由器提供 防火牆、ETBN 和路由功能，便於在網路上 部署應用程式。TN-4900 系列路由器採用 M12 和其他圓形連接器，可確保緊密、耐用的連線 能力，在環境干擾 (例如振動和衝擊) 下能夠 保證穩定性。

TN-4900 系列支援寬 電源輸入範圍 24 至 110 VDC，並可長時間在 -40 至 70°C 的溫度中操作。此外，這些路由器 也符合 EN 50155 的強制要求，使其 適合各種工業應用。

附加特色與優點

- 符合 IEC 61375-2-3、61375-2-5 標準的 ETBN
- 防火牆可保護網路及篩選不受信任的 網路流量
- 路由功能可將大型網路分成 階層式子網路，便於資料和資訊在網路間 進行傳輸
- NAT 使 IP 管理更輕鬆，因為不同 車廂中的終端裝置可以使用相同的 IP 位址
- 領先業界的 EN 50155 乙太網路路由器，適合軌道車輛應用
- Turbo Ring 與 RSTP/STP 支援網路備援
- 壁掛安裝
- 線路切換快速恢復
- 自動恢復連線設備的 IP 位址
- LLDP 在網路管理軟體中可用來進行 自動拓撲探索
- 可透過網頁瀏覽器、Telnet/序列主控台、CLI 和 Windows 公共程式進行設定

IEC 62443-4-2 安全等級 2 認證

內建防火牆 (硬體修正版 3.0) 的 TN-4900 系列型號通過 IEC 62443-4-2 安全等級 2 認證 (<https://certificates.iecee.org/#/deliverables/CERT/1672424/view>)，可提升工業網路中的網路安全。

MX-ROS 可解決 不斷增加的網路安全威脅

Moxa 的 MX-ROS (<https://www.moxa.com/en/spotlight/portfolio/mx-ros/index>) 是工業安全路由器與防火牆的軟體平台。該平台透過簡化的網頁與 CLI 介面，支援強固的安全性與易於操作的安全路由器。MX-ROS 裝置透過每次版本更新，提供豐富的跨產業 操作技術 (OT) 網路管理功能，全面防護您的 硬體與軟體資產。

1. 此產品適用於符合 EN 50155 標準所定義的所有軌道車輛應用。按此處取得更詳細內容：www.moxa.com/doc/specs/EN_50155_Compliance.pdf

規格

Ethernet Interface

10/100BaseT(X) Ports (M12 D-coded 4-pin female connector)	TN-4908-WV-CT-T: 8 TN-4908-ETBN-4TXBP-WV-CT-T: 4 TN-4908-ETBN-F-4TXBP-WV-CT-T: 4 TN-4908-4GTX-WV-CT-T: 4 TN-4908-ETBN-4GTX-4GTXBP-WV-CT-T: 4 TN-4908-ETBN-F-4GTX-4GTXBP-WV-CT-T: 4 TN-4916-4GTX-WV-CT-T: 12 TN-4916-ETBN-4GTXBP-WV-CT-T: 12 TN-4916-ETBN-F-4GTXBP-WV-CT-T: 12
10/100BaseT(X) Ports (M12 D-coded 4-pin female connector with bypass relay)	4TXBP Models: 4
PoE Ports (10/100BaseT(X), M12 D-coded 4-pin female connector)	8PoE Models: 8 12PoE Models: 12
PoE Ports (100/1000BaseT(X), M12 X-coded 8-pin female connector)	4GPoE Models: 4
10/100/1000BaseT(X) Ports (M12 X-coded 8-pin female connector)	4GTX Models: 4 8GTX Models: 8
10/100/1000BaseT(X) Ports (M12 X-coded 8-pin female connector with bypass relay)	4GTXBP Models: 4
Standards	IEEE 802.1Q for VLAN Tagging IEEE 802.1w for Rapid Spanning Tree Protocol IEEE 802.3af/at for PoE/PoE+ output IEEE 802.3ab for 1000BaseT(X) IEEE 802.1X for authentication IEEE 802.1D-2004 for Spanning Tree Protocol IEEE 802.3x for flow control IEEE 802.3u for 100BaseT(X) IEEE 802.1p for Class of Service IEEE 802.3 for 10BaseT

Ethernet Software Features

Configuration Options	Command Line Interface (CLI) through Serial/Telnet/SSH Web Console (HTTP/HTTPS) Windows Utility
Filter	IGMP v1/v2 Static Multicast 802.1Q
Management	Back Pressure Flow Control SNMP Inform LLDP Syslog HTTP HTTPS Flow control SMTP QoS/CoS/ToS Port Mirroring SNMP Trap SNMPv1/v2c/v3 IPv4 Telnet DHCP Server SFTP SCP TFTP RARP Account Management DHCP Client (Option 1/3/12/50/51/53/54/55/57/61/66/67/124/255) DHCP Server (Option 1/3/6/12/15/28/42/50/55) DHCP Relay Agent

Redundancy Protocols	RSTP Static Port Trunk Turbo Ring v2 STP
Routing Redundancy	VRRP
Security	Secure Boot IPsec L2TP (server) RADIUS Trust access control
Time Management	SNTP NTP Server/Client
Unicast Routing	RIPv1/V2 OSPF Static Route
Railway	TRDP
Multicast Routing	Static Route
Routing Throughput	450,000 FPS (pure routing)

DoS and DDoS Protection

Technology	NMAP-ID Scan ARP-Flood SYN/FIN Scan Null Scan ICMP-Death FIN Scan SYN-Flood TCP Sessions Without SYN Xmas Scan NMAP-Xmas Scan SYN/RST Scan
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Firewall

Filter	ICMP MAC address Ethernet protocols Ports IP address DDoS
Quick Automation Profiles	DNP DPI EtherCAT EtherNet/IP FOUNDATION Fieldbus FTP HTTP IEC 60870-104 IPsec L2TP LonWorks Modbus TCP PPTP PROFINET RADIUS SSH Telnet VPN
Stateful Inspection	Router firewall Transparent (bridge) firewall
Throughput	Max. 350,000 packets per second

IPsec VPN

Authentication	MD5 and SHA (SHA-256) RSA (key size: 1024-bit, 2048-bit) X.509 v3 certificate
Encryption	3DES DES AES-128 AES-192 AES-256
Concurrent VPN Tunnels	Max. 250 IPsec VPN tunnels

Switch Properties

IGMP Groups	1024
MAC Table Size	16 K
Max. No. of VLANs	32
VLAN ID Range	VID 1 to 4094

LED Interface

LED Indicators	STATE, PWR1, PWR2, FAULT, 10/100/1000M, PoE
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NAT

Features	1-to-1 Port forwarding N-to-1
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Serial Interface

Console Port	RS-232 (M12 B-coded 5-pin female connector)
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USB Interface

M12 Connector	M12 A-coded 5-pin female (for ABC-02 USB storage)
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Power Parameters

Input Current	TN-4908 Non-PoE Models: 0.65 A @ 24 V TN-4908 PoE Models: 3.6 A @ 24 V TN-4916 non-PoE Models: 1.1 A @ 24 V TN-4916 PoE Models: 5.9 A @ 24 V
Input Voltage	24/36/48/72/96/110 VDC Redundant dual inputs No. of power inputs: 2
Operating Voltage	16.8 to 137.5 VDC
Power Connector	M12 K-coded 5-pin male connector
Total PoE Power Budget	TN-4908 PoE Models: 50 W TN-4916 PoE Models: 95 W
Overload Current Protection	Supported
Reverse Polarity Protection	Supported

Physical Characteristics

Housing	Metal
Dimensions	TN-4908 Non-PoE Models: 160 x 115 x 70 mm (6.30 x 4.53 x 2.76 in) TN-4908 PoE Models: 160 x 115 x 100 mm (6.30 x 4.53 x 3.94 in) TN-4916 Models: 206 x 115 x 100 mm (8.10 x 4.53 x 3.94 in)

IP Rating	IP40
Weight	TN-4908 Non-PoE Models: 1120 g (2.47 lb) TN-4908 PoE Models: 1640 g (3.62 lb) TN-4916 Models: 1990 g (4.39 lb)
Installation	Wall mounting
Protection	PCB conformal coating

Environmental Limits

Operating Temperature	-40 to 70°C (-40 to 158°F)
Storage Temperature (package included)	-40 to 85°C (-40 to 185°F)
Ambient Relative Humidity	5 to 95% (non-condensing)
Altitude	3,000 m

Standards and Certifications

EMC	EN 55032, EN 55035
EMI	CISPR 32, FCC Part 15B Class A
EMS	IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 20 V/m IEC 61000-4-4 EFT: Power: 2 kV; Signal: 2 kV IEC 61000-4-5 Surge: Power: 2 kV; Signal: 2 kV IEC 61000-4-6 CS: 10 V IEC 61000-4-8 PFMF
Industrial Cybersecurity	IEC 62443-4-2 Security Level 2
Radio Frequency	FCC
Railway	EN 50121-4 EN 50155 IEC 60068-2-1, EN 50155 IEC 60068-2-14, EN 50155 IEC 60068-2-2, EN 50155 IEC 60068-2-30, EN 50155 IEC 60068-2-78 IEC 60571
Railway Fire Protection	EN 45545-2
Safety	IEC 62368, UL 62368
Salt Spray Test	EN 50155
Shock	IEC 60068-2-27, IEC 61373, EN 50155
Vibration	IEC 60068-2-64, IEC 61373, EN 50155
Package Drop Test	ISTA 1A
Package Vibration Test	ISTA 1A

Declaration

Green Product	RoHS, CRoHS, WEEE
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MTBF

Time	TN-4908 Non-PoE Models: 795,840 hrs TN-4908 Non-PoE ETBN Models: 648,903 hrs TN-4908 PoE Models: 644,898 hrs TN-4908 PoE ETBN Models: 545,021 hrs TN-4916 PoE Models: 550,148 hrs TN-4916 PoE ETBN Models: 472,578 hrs
Standards	Telcordia SR332 Issue 2

Warranty

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

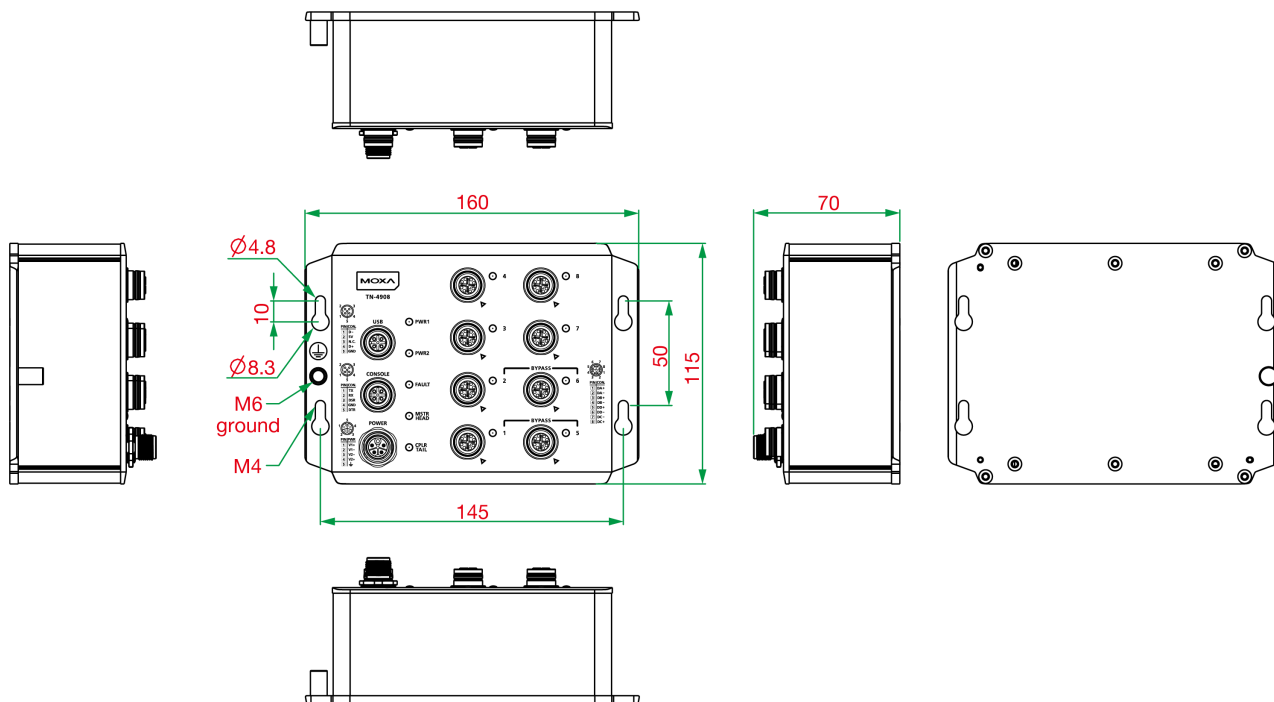
Package Contents

Device	1 x TN-4900 Series router
Installation Kit	1 x wall-mounting kit 2 x cap, male, metal, for M12 port (Console and USB storage ports, pre-installed on switch) 4/8 x cap, male, metal, for M12 port (Ethernet ports,pre-installed on switch)
Documentation	1 x quick installation guide 1 x warranty card

尺寸

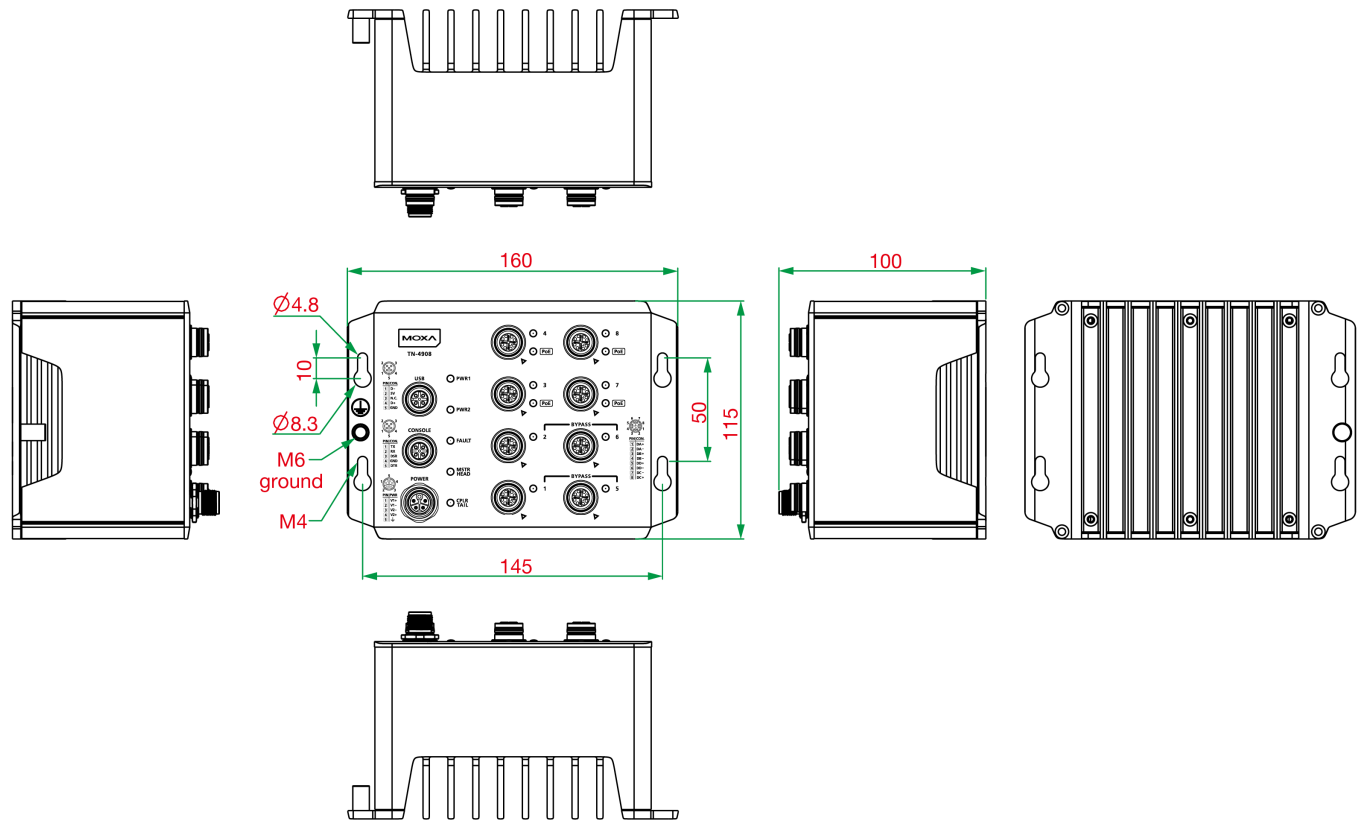
TN-4908 非 PoE 型號

單位：公釐



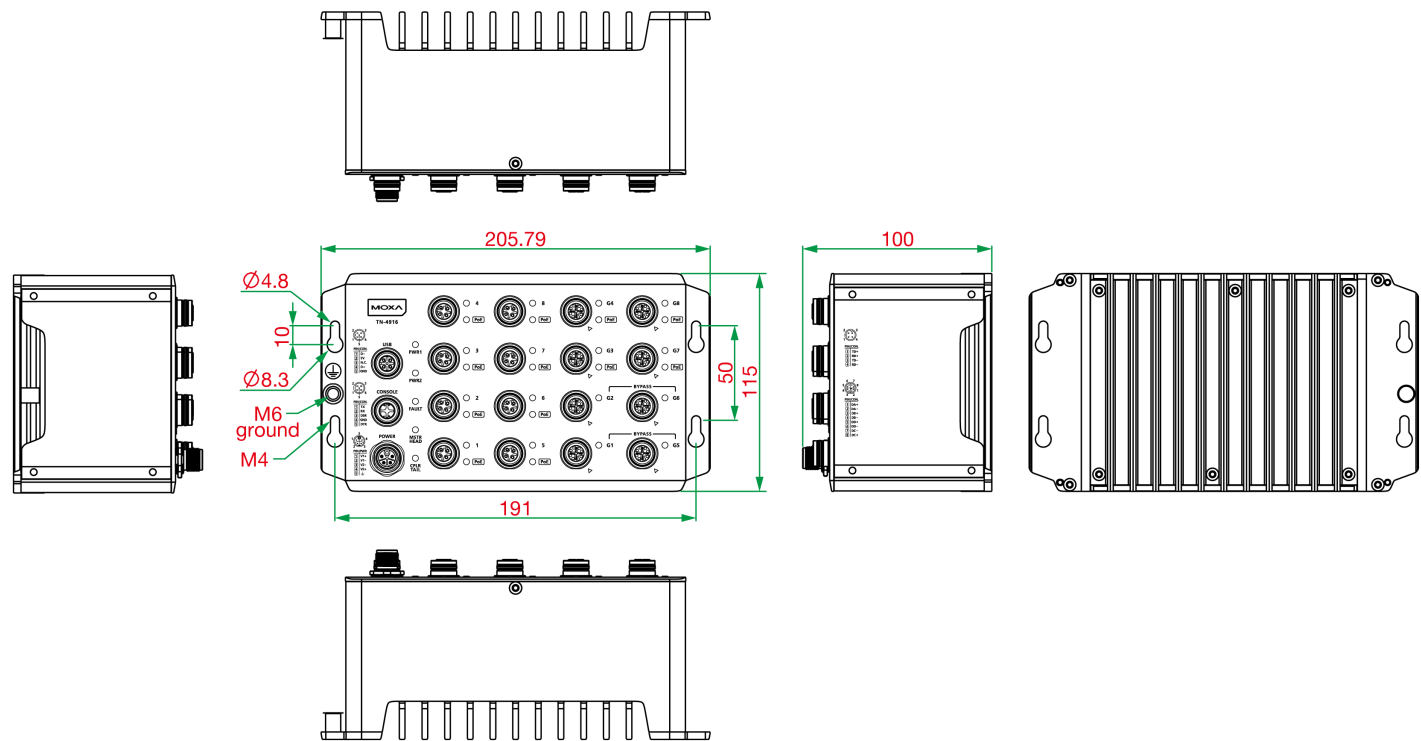
TN-4908 PoE 型號

單位：公釐



TN-4916 型號

單位：公釐



Model Name	Firewall	ETBN	10/ 100BaseT(X), M12 D-coded 4-pin Female Connector	10/ 100BaseT(X), M12 D-coded 4-pin Female Connector With Bypass Relay	10/ 100BaseT(X) PoE Ports, M12 D-coded 4-pin Female Connector	10/100/ 1000BaseT(X) Ports, M12 X- coded Female Connector	100/ 1000BaseT(X) Ports, M12 X- coded 8-pin Female Connector With Bypass Relay	10/100/ 1000BaseT(X) PoE Ports, M12 X-coded 8-pin Female Connector
TN-4908-WV-CT-T	√	–	8	–	–	–	–	–
TN-4908-ETBN-4TXBP-WV-CT-T	–	√	4	4	–	–	–	–
TN-4908-ETBN-F-4TXBP-WV-CT-T	√	√	4	4	–	–	–	–
TN-4908-4GTX-WV-CT-T	√	–	4	–	–	4	–	–
TN-4908-ETBN-4GTXBP-WV-CT-T	–	√	4	–	–	–	4	–
TN-4908-ETBN-F-4GTXBP-WV-CT-T	√	√	4	–	–	–	4	–
TN-4908-8GTX-WV-CT-T	√	–	–	–	–	8	–	–
TN-4908-ETBN-4GTX-4GTXBP-WV-CT-T	–	√	–	–	–	4	4	–
TN-4908-ETBN-F-4GTX-4GTXBP-WV-CT-T	√	√	–	–	–	4	4	–
TN-4908-4GPoE-4GTX-WV-CT-T	√	–	–	–	–	4	–	4
TN-4908-ETBN-4GPoE-4GTXBP-WV-CT-T	–	√	–	–	–	–	4	4
TN-4908-ETBN-F-4GPoE-4GTXBP-WV-CT-T	√	√	–	–	–	–	4	4
TN-4916-4GTX-WV-CT-T	√	–	12	–	–	4	–	–
TN-4916-ETBN-4GTXBP-WV-CT-T	–	√	12	–	–	–	4	–
TN-4916-ETBN-F-4GTXBP-WV-CT-T	√	√	12	–	–	–	4	–
TN-4916-12PoE-4GTX-WV-CT-T	√	–	–	–	12	4	–	–
TN-4916-ETBN-12PoE-4GTXBP-WV-CT-T	–	√	–	–	12	–	4	–
TN-4916-ETBN-F-12PoE-4GTXBP-WV-CT-T	√	√	–	–	12	–	4	–
TN-4916-8PoE-4GPoE-4GTX-WV-CT-T	√	–	–	–	8	4	–	4
TN-4916-ETBN-8PoE-4GPoE-4GTXBP-WV-CT-T	–	√	–	–	8	–	4	4
TN-4916-ETBN-F-8PoE-4GPoE-4GTXBP-WV-CT-T	√	√	–	–	8	–	4	4

配件 (選購)

M12 Connector Caps

A-CAP-M12F-M-PP	Metal cap for M12 female push-pull connector
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Connectors

M12D-4P-IP68	Solder type M12 connector, male 4-pin, D-coded, IP68-rated
M12D-4PMM-IP67	IDC type M12 connector, male 4-pin, D-coded, IP67-rated
M12K-5PFF-IP65-PxC	Crimp type M12 connector, female 5-pin, K-coded, IP65-rated
M12X-8PMM-IP67-HTG	Crimp type M12 connector, male 8-pin, X-coded, IP67-rated

Cables

CBL-M12XMM8P-Y-300-IP67	X-coded male M12-to-8-pin open wire cable, yellow, IP67-rated, 3 m
CBL-M12XMM8PRJ45-Y-200-IP67	X-coded male M12-to-RJ45 Ethernet cable, yellow, IP67-rated, 2 m
CBL-M12XMM8P-Y-100-IP67	X-coded male M12-to-8-pin open wire cable, yellow, IP67-rated, 1 m
CBL-M12BMM5PF9-BK-150-IP68	B-coded male M12-to-5-pin DB9 console cable, black, IP68-rated, 1.5 m
CBL-M12DMM4PM12DMM4P-BK-100-IP67	D-coded male M12-to-D-coded female M12 Ethernet cable, black, IP67-rated, 1 m
CBL-M12KFF5POpen-O-150-IP67	K-coded female M12-to-5-pin open wire power cable, orange, IP67-rated, 1.5 m
CBL-M12D(MM4P)/RJ45-100 IP67	D-coded male M12-to-RJ45 Ethernet cable, black, IP67-rated, 1 m

Storage Kits

ABC-02-P-USB-M12-CT-T	USB-based configuration backup and restoration tool with M12 connector for Moxa's ToughNet series of managed Ethernet switches and wireless APs/bridges/clients, -40 to 75°C operating temperature, conformal coating
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