

# TN-4900 Series

## EN 50155 Gigabit Security Router



### Features and Benefits

- 8 Gigabit ports and up to 12 PoE ports
- IEC 61375 ETBN functionality (ETBN models)
- Dual bypass relay
- Supports regular and push-pull M12 connectors
- Isolated power input range from 24 to 110 VDC
- Complies with all EN 50155 mandatory test items<sup>1</sup>
- IEC 62443-4-2 Security Level 2 certified
- -40 to 70°C operating temperature range

### Certifications



EN 50155



EN 50121-4



## Introduction

The ToughNet TN-4900 Series, designed for rolling stock Ethernet networks, is a set of high-performance M12 routers with 8 Gigabit ports and up to four bypass relay ports. These routers feature firewall, ETBN, and routing functionality to facilitate the deployment of applications across networks. The TN-4900 Series routers use M12 and other circular connectors to ensure tight, robust connections that guarantee reliability against environmental disturbances, such as vibration and shock.

The TN-4900 Series supports a wide power input range of 24 to 110 VDC and can operate in temperatures of -40 to 70°C for extended periods of time. Furthermore, these routers are compliant with the mandatory requirements of EN 50155, making them suitable for a variety of industrial applications.

### Additional Features and Benefits

- IEC 61375-2-3, 61375-2-5-compliant ETBN
- Firewall to protect the network and filter untrusted network traffic
- Routing functionality to divide a large network into hierarchical subnets and allow data and information to communicate across networks
- NAT makes IP management easier as end devices in different carriages can use the same IP addresses
- Leading EN 50155 Ethernet router for rolling stock applications
- Turbo Ring and RSTP/STP for network redundancy
- Wall mounting installation
- Line-swap fast recovery
- Automatic recovery of connected device's IP addresses
- LLDP for automatic topology discovery in network management software
- Configurable by web browser, Telnet/serial console, and CLI Windows utility

### IEC 62443-4-2 Security Level 2 Certified

TN-4900 Series models with a firewall (HW Rev. 3.0) are IEC 62443-4-2 Security Level 2 certified (<https://certificates.iecee.org/#/deliverables/CERT/1672424/view>), enhancing cybersecurity in industrial networks.

### MX-ROS Addresses Growing Cybersecurity Threats

Moxa's MX-ROS (<https://www.moxa.com/en/spotlight/portfolio/mx-ros/index>) is a software platform for industrial security routers and firewalls. The platform supports the robust security and user-friendly operation of secure routers through simplified web and CLI interfaces. MX-ROS devices offer a wealth of the latest cross-industry Operational Technology (OT) network management features with each release to safeguard hardware and software.

1. This product is suitable for rolling stock railway applications, as defined by the EN 50155 standard. For a more detailed statement, click here: [www.moxa.com/doc/specs/EN\\_50155\\_Compliance.pdf](http://www.moxa.com/doc/specs/EN_50155_Compliance.pdf)

## Specifications

### 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-4GTXP-WV-CT-T: 4 TN-4908-ETBN-F-4GTX-4GTXP-WV-CT-T: 4 TN-4916-4GTX-WV-CT-T: 12 TN-4916-ETBN-4GTXP-WV-CT-T: 12 TN-4916-ETBN-F-4GTXP-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)	4GTXP 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
<b>Environmental Limits</b>	
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
<b>Standards and Certifications</b>	
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
<b>Declaration</b>	
Green Product	RoHS, CRoHS, WEEE

## 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 <a href="http://www.moxa.com/warranty">www.moxa.com/warranty</a>

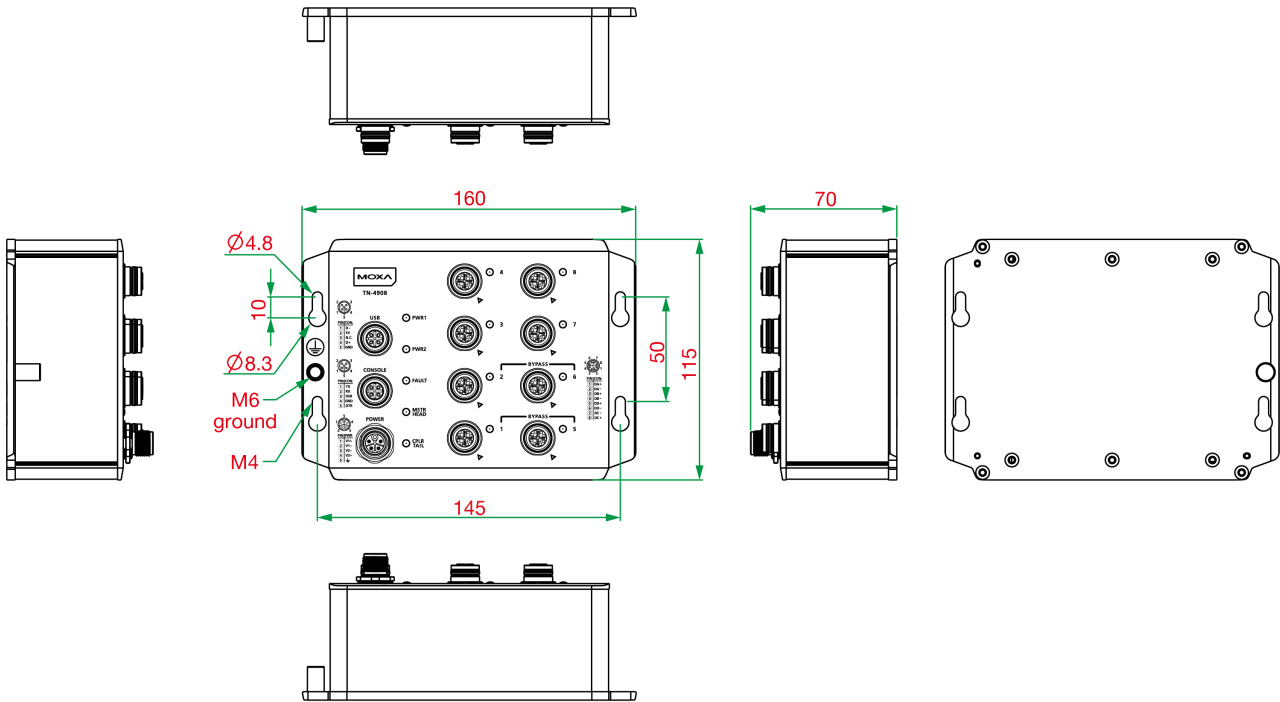
## Package Contents

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

## Dimensions

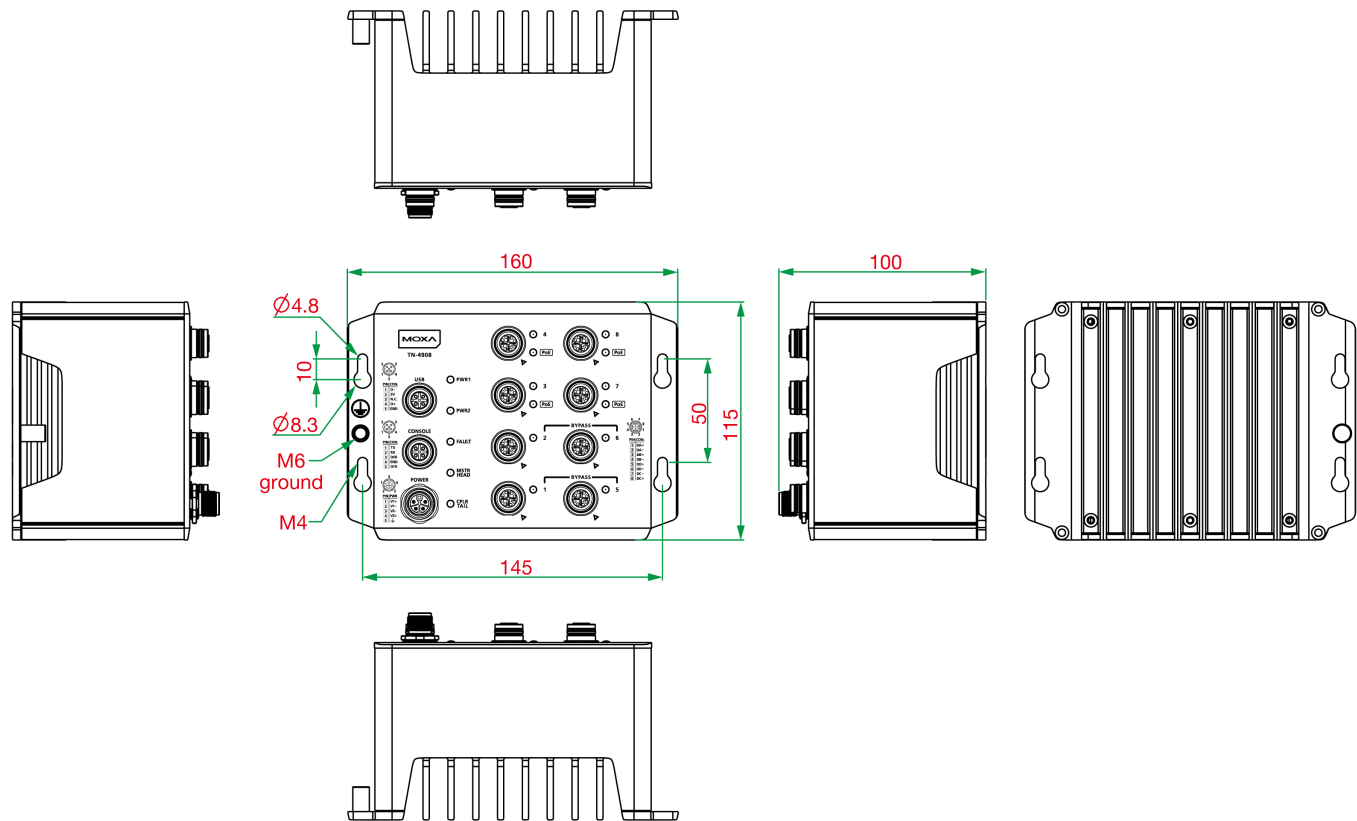
### TN-4908 Non-PoE Models

Unit: mm



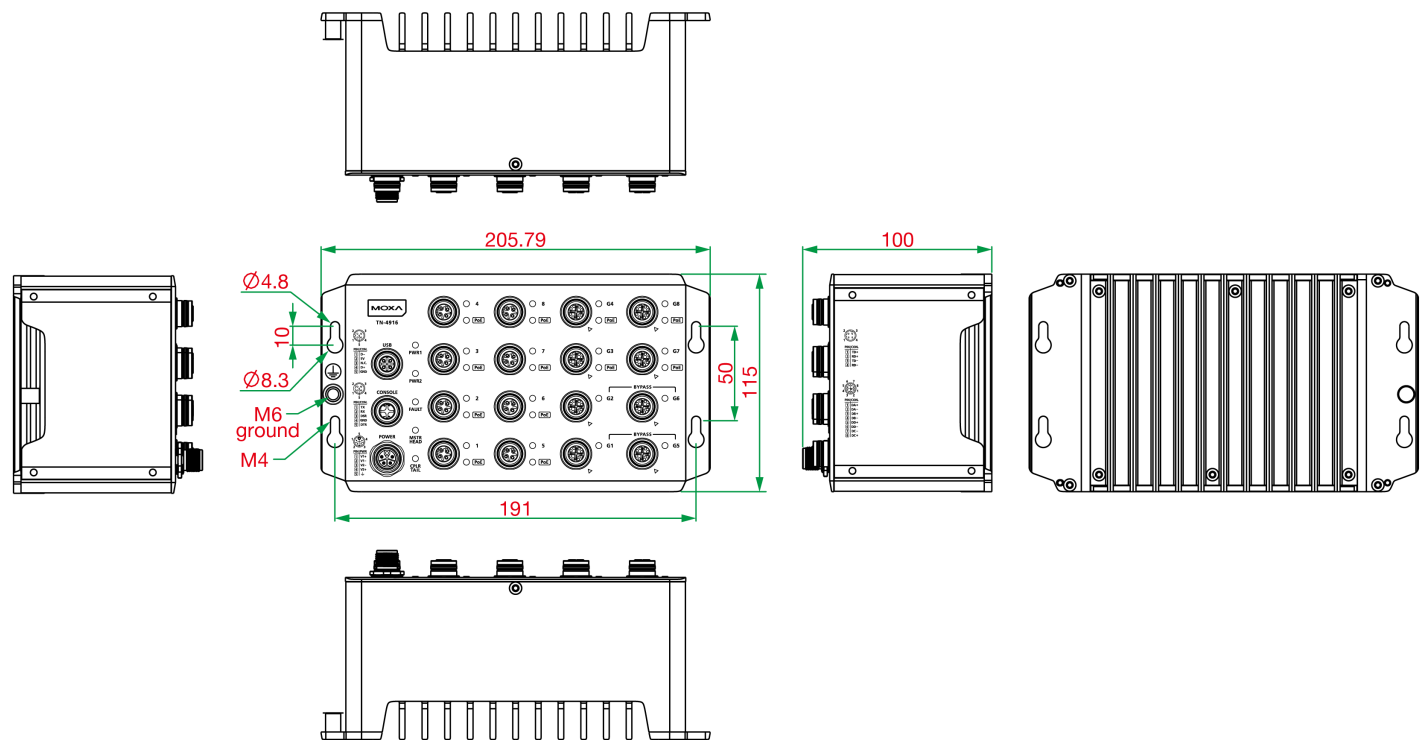
**TN-4908 PoE Models**

Unit: mm



**TN-4916 Models**

Unit: mm



## Ordering Information

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



## Accessories (sold separately)

### 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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