TN-4900 系列

EN 50155 Gigabit 安全路由器

特色與優點

- 8 個 Gigabit 連接埠與最多 12 個 PoE 連接埠
- IEC 61375 ETBN 功能（ETBN 型號）
- 雙旁路繼電器
- 支援普通型和推拉型 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]
- 通過 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　　CE　　FC

簡介

ToughNet TN-4900 系列專為軌道車輛乙太網路所設計，是一組具有 8 個 Gigabit 連接埠和最多四個旁路繼電器連接埠的高效能 M12 路由器。這些路由器具有防火牆、ETBN 和路由功能，便於用戶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 24 至 110 VDC 的寬電源輸入範圍，並可在 -40 至 70°C 的溫度之下長時間運作。此外，這些路由器符合 EN 50155 的強制性要求，使其適用於各種工業應用。

附加特色與優點

- 符合 IEC 61375-2-3、61375-2-5 標準的 ETBN
- 防火牆可保護網路並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 可使 IP 管理更加便捷，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 以及透過 RSTP/STP 協議支援網路備援

- 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/串列主控台、CLI 和 Windows 公共程式進行設定
- 具備防火牆功能的型號支援 IPS/IDS威脅偵測和防護（需要授權）

通過 IEC 62443-4-2 安全等級 2 認證

配備防火牆（硬體版本 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)，增強了工業網路的網路安全。

MX-ROS 可應對日益增長的網路安全威脅

Moxa 的 MX-ROS 是一個用於工業安全路由器和防火牆的軟體平台。該平台透過簡化的 Web 和 CLI 介面，支援安全路由器的強大安全性和方便的操作。MX-ROS 裝置每次發布新版本時都會提供大量最新跨產業營運技術 (OT) 網路管理功能，可保護您的硬體和軟體。

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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。若需更詳細的說明，請參照：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

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

MOXA®

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

NAT

Features	1-to-1 Port forwarding N-to-1

Serial Interface

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

USB Interface

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

Power Parameters

Input Current	TN-4908/TN-4908-ETBN-4TXBP models: 0.5 A @ 24 V TN-4908-4GTX/TN-4908-ETBN-4GTXBP models: 0.6 A @ 24 V TN-4908-8GTX/TN-4908-4GTX-4GTXBP models: 0.7 A @ 24 V TN-4908-4GPOE-4GTX/TN-4908-ETBN-4GPOE-4GTXBP models: 3.6 A @ 24 V TN-4916-4GTX/TN-4916-ETBN-4GTXBP models: 1.0 A @ 24 V TN-4916-8PoE-4GPOE-4GTX/TN-4916-ETBN-8POE-4GPOE-4GTXBP/TN-4916-12POE-4GTX/TN-4916-ETBN-12PoE-4GTXBP models: 6.1 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
Power Consumption (Max.)	TN-4908/TN-4908-ETBN-4TXBP models: max. 11.2 W TN-4908-4GTX/TN-4908-ETBN-4GTXBP models: max. 13.2 W TN-4908-8GTX/TN-4908-4GTX-4GTXBP models: max. 16.4 W TN-4908-4GPOE-4GTX/TN-4908-ETBN-4GPOE-4GTXBP models: max. 30.8 W TN-4916-4GTX/TN-4916-ETBN-4GTXBP models: max. 24.3 W TN-4916-8PoE-4GPOE-4GTX/TN-4916-ETBN-8POE-4GPOE-4GTXBP/TN-4916-12POE-4GTX/TN-4916-ETBN-12PoE-4GTXBP models: max. 40.5 W Note: The system power consumption refers to the maximum power consumption of the PoE model without PoE load (excluding the power consumption of the PD).
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

MTBF

Time	TN-4908 models: 1,899,861 hrs TN-4908-ETBN-4TXBP models: 1,481,755 hrs TN-4908-4GTX models:1,828,376 TN-4908-ETBN-4GTXBP models: 1,208,027 hrs TN-4908-8GTX models:795,840 hrs TN-4908-ETBN-4GTX-4GTBXP models: 648,903 hrs TN-4908-4GPOE-4GTX models:1,395,992 hrs TN-4908-ETBN-4GPOE-4GTXBP models:1,318,027 hrs TN-4916-4GTX models: 1,337,525 hrs TN-4916-ETBN-4GTXBP models: 973,422 hrs TN-4916-12POE-4GTX models: 1,0127,024 hrs TN-4916-ETBN-12POE-4GTXBP models: 798,449 hrs TN-4916-8POE-4GPOE-4GTX models 550,148 hrs TN-4916-ETBN-8POE-4GPOE-4GTXBP: 472,578 hrs
Standards	Telcordia SR332 Issue 2

Warranty

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

Package Contents

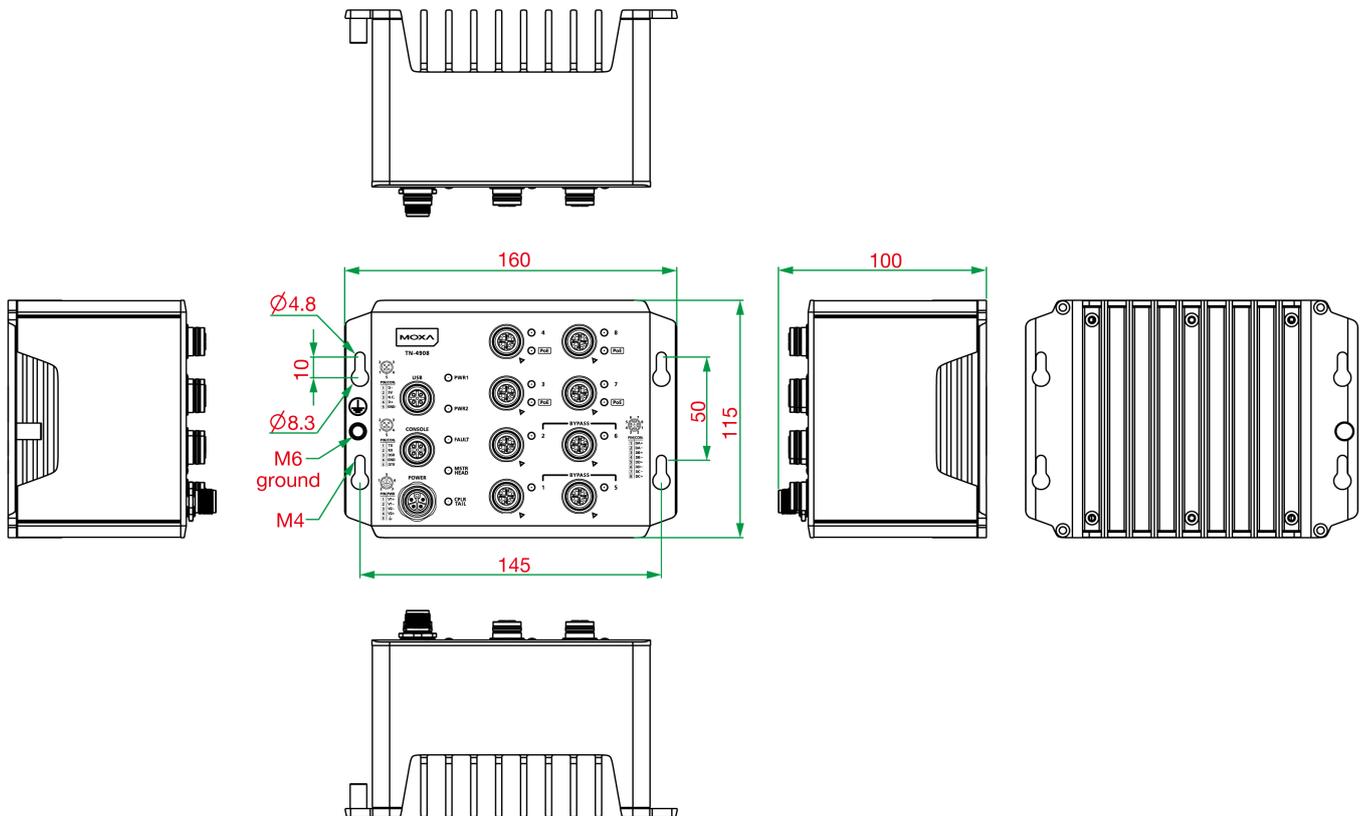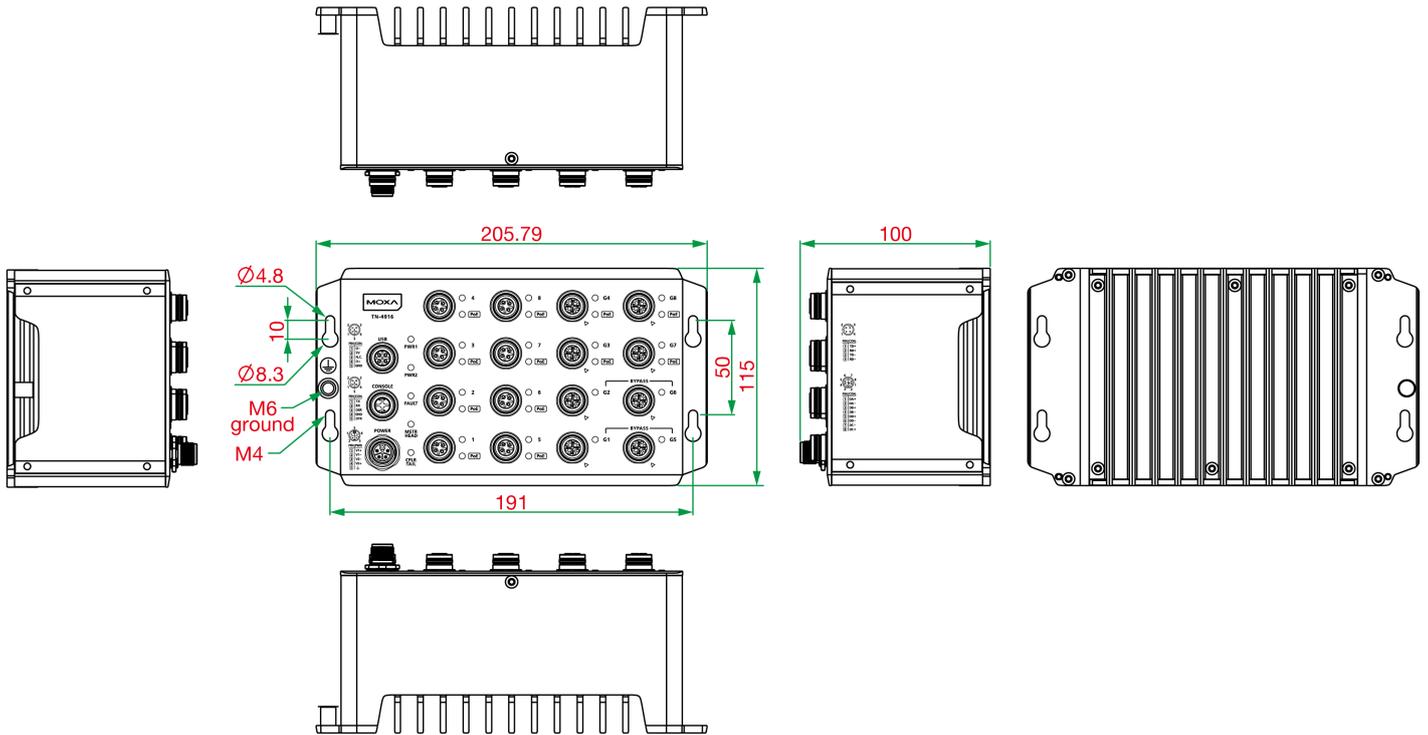| Device	1 x TN-4900 Series router
Installation Kit	1 x wall-mounting kit 2 x cap, male, metal, for M12 port (Console and USB storage ports, pre-installed on switch) 4/8 x cap, male, metal, for M12 port (Ethernet ports,pre-installed on switch)
Documentation	1 x quick installation guide 1 x warranty card

尺寸

TN-4908 非 PoE 型號

單位：公釐
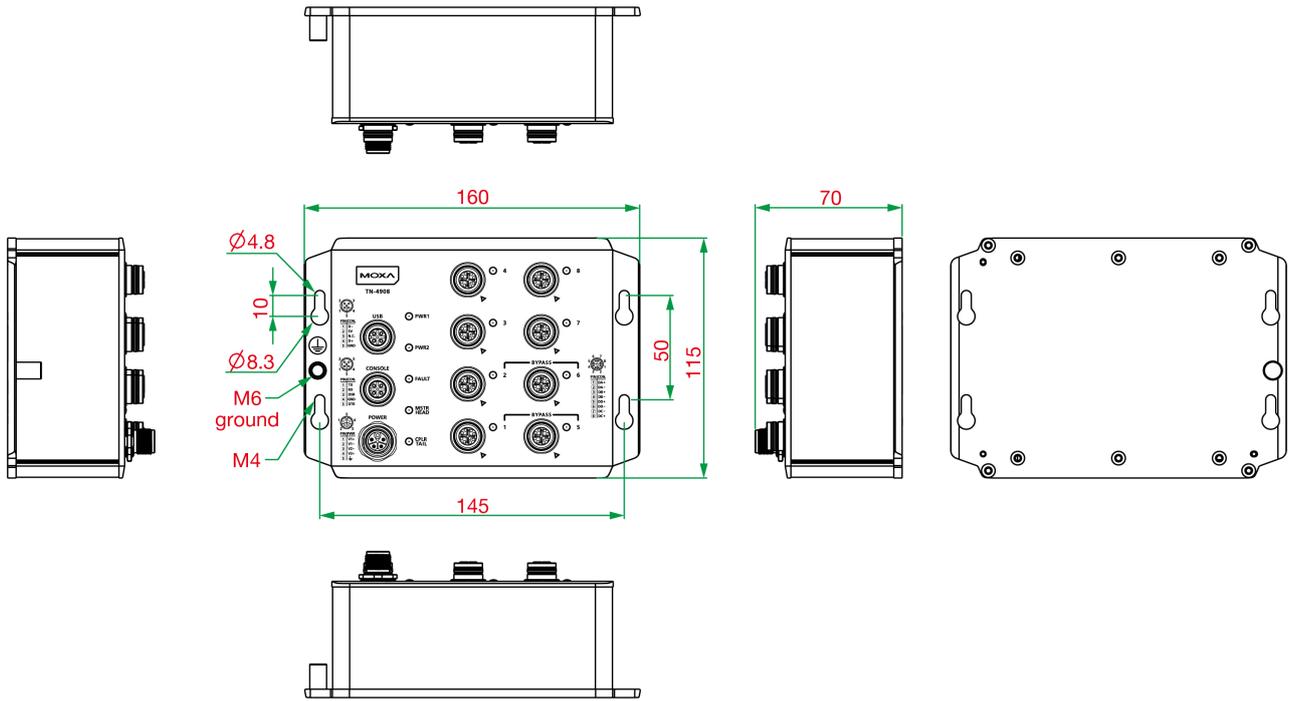
TN-4908 PoE 型號

單位：公釐

TN-4916 型號

單位：公釐

訂購資訊

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	P	–	8	–	–	–	–	–
TN-4908-ETBN-4TXBP-WV-CT-T	–	P	4	4	–	–	–	–
TN-4908-ETBN-F-4TXBP-WV-CT-T	P	P	4	4	–	–	–	–
TN-4908-4GTX-WV-CT-T	P	–	4	–	–	4	–	–
TN-4908-ETBN-4GTXBP-WV-CT-T	–	P	4	–	–	–	4	–
TN-4908-ETBN-F-4GTXBP-WV-CT-T	P	P	4	–	–	–	4	–
TN-4908-8GTX-WV-CT-T	P	–	–	–	–	8	–	–
TN-4908-ETBN-4GTX-4GTXBP-WV-CT-T	–	P	–	–	–	4	4	–
TN-4908-ETBN-F-4GTX-4GTXBP-WV-CT-T	P	P	–	–	–	4	4	–
TN-4908-4GPoE-4GTX-WV-CT-T	P	–	–	–	–	4	–	4
TN-4908-ETBN-4GPoE-4GTXBP-WV-CT-T	–	P	–	–	–	–	4	4

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-ETBN-F-4GPoE-4GTXBP-WV-CT-T	P	P	–	–	–	–	4	4
TN-4916-4GTX-WV-CT-T	P	–	12	–	–	4	–	–
TN-4916-ETBN-4GTXBP-WV-CT-T	–	P	12	–	–	–	4	–
TN-4916-ETBN-F-4GTXBP-WV-CT-T	P	P	12	–	–	–	4	–
TN-4916-12PoE-4GTX-WV-CT-T	P	–	–	–	12	4	–	–
TN-4916-ETBN-12PoE-4GTXBP-WV-CT-T	–	P	–	–	12	–	4	–
TN-4916-ETBN-F-12PoE-4GTXBP-WV-CT-T	P	P	–	–	12	–	4	–
TN-4916-8PoE-4GPoE-4GTX-WV-CT-T	P	–	–	–	8	4	–	4
TN-4916-ETBN-8PoE-4GPoE-4GTXBP-WV-CT-T	–	P	–	–	8	–	4	4
TN-4916-ETBN-F-8PoE-4GPoE-4GTXBP-WV-CT-T	P	P	–	–	8	–	4	4

配件（選購）

M12 Connector Caps

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

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

Software

LIC-IPS-MGMT-[X]Point-SR	IPS license for MXsecurity or MXview Security add-on management software with customizable point balance (minimum 365 points).
LIC-IPS-DEVICE-365Point(1Y)-MR	1-year (365 points) device-based IPS license for a single device without management software.
LIC-IPS-DEVICE-730Point(2Y)-MR	2-year (730 points) device-based IPS license for a single device without management software.
LIC-IPS-DEVICE-1095Point(3Y)-MR	3-year (1095 points) device-based IPS license for a single device without management software.
LIC-IPS-DEVICE-1460Point(4Y)-MR	4-year (1460 points) device-based IPS license for a single device without management software.
LIC-IPS-DEVICE-1825Point(5Y)-MR	5-year (1825 points) device-based IPS license for a single device without management software.

www.moxa.com/tw