

TN-4500B 系列

EN 50155 8 至 28 埠乙太網路網管型交換器



特色與優點

- 高達 28 個乙太網路連接埠，配備符合 IEC 61076-010 標準且帶內部鎖定裝置的 M12 推拉式連接器
- 高達 8 個 Gigabit 連接埠，可選配雙繼電器繞道功能
- 高達 24 個 PoE 連接埠，PoE 總功率預算為 150 W
- 隔離式電源，電源供應範圍為 24 至 110 VDC
- -40°C 至 70°C 系統操作溫度範圍
- 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
- 由 MX-NOS Rail 版本提供支援，這是一個專為滿足車載鐵路網路獨特需求所量身打造的綜合管理軟體

認證



EN 50155



EN 50121-4



簡介

ToughNet TN-4500B 系列 M12 網管型乙太網路交換器專為鐵路應用所設計，適用於軌道車輛應用。交換器使用 M12 圓形接頭，確保連接緊密牢固，確保在振動和衝擊常見的工業環境中可正常運作。TN-4500B 系列乙太網路交換器提供 8 至 28 個乙太網路連接埠，含或不含 IEEE 802.3at/af 標準的 PoE 功能。Gigabit 型號進一步配備高達 8 個 Gigabit 乙太網路連接埠。

交換器支援 24 至 110 VDC 的寬電源輸入範圍和隔離式雙電源輸入，不僅可讓您在世界各地使用相同類型的電源，還能提升通訊系統的可靠性。此外，交換器的工作溫度範圍為 -40 至 70°C，可確保它們部署在嚴苛環境中。TN-4500B 系列乙太網路交換器符合 EN 50155 標準中有關工作溫度、電源輸入電壓、突波、ESD 和振動的強制要求，而且採用保形塗層和電力絕緣技術，因此非常適合各種工業應用。

附加特色與優點

- 強大的 EN 50155 乙太網路交換器，適合軌道車輛應用
- Turbo Ring 以及透過 RSTP/MSTP/STP/MRP 協議支援網路備援
- 壁掛安裝
- 自動恢復連接裝置的 IP 位址
- 可透過網頁瀏覽器、Telnet/串列主控台或 Windows 公用程式進行設定

通過 IEC 62443-4-2 安全等級 2 認證

TN-4500B 系列型號 (韌體 v2.0) 通過 IEC 62443-4-2 安全等級 2 認證 (<https://certificates.iecee.org/#/deliverables/CERT/1995073/view>)，增強了工業網路中的網路安全。

規格

Ethernet Interface

10/100BaseT(X) Ports (M12 D-coded 4-pin female connector)	TN-4508B-CT-T: 8 TN-4512B-CT-T: 12 TN-4516B-CT-T: 16 TN-4516B-8G-CT-T: 8
PoE Ports (10/100BaseT(X), M12 D-coded 4-pin female connector)	TN-4512B PoE models: 8 TN-4516B PoE models: 8 TN-4520B models: 12 TN-4524B models: 16 TN-4528B models: 20

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

10/100/1000BaseT(X) Ports (M12 X-coded 8-pin female connector)	TN-4512B-8P-4G-CT-T: 4 TN-4516B-8G-CT-T: 8 TN-4516B-8P-4G-4GP-CT-T: 4 TN-4520B-12P-4G-4GP-CT-T: 4 TN-4524B-16P-4G-4GP-CT-T: 4 TN-4528B-20P-4G-4GP-CT-T: 4
PoE Ports (100/1000BaseT(X), M12 X-coded 8-pin female connector)	TN-4516B PoE models: 4 TN-4520B PoE models: 4 TN-4524B PoE models: 4 TN-4528B PoE models: 4
10/100/1000BaseT(X) Ports (M12 X-coded 8-pin female connector with bypass relay)	-4GBP models: 4
Standards	IEEE 802.3 for 10BaseT IEEE 802.3u for 100BaseT(X) IEEE 802.3ab for 1000BaseT(X) IEEE 802.3af/at for PoE/PoE+ output IEEE 802.1D-2004 for Spanning Tree Protocol IEEE 802.1p for Class of Service IEEE 802.1Q for VLAN Tagging IEEE 802.1w for Rapid Spanning Tree Protocol IEEE 802.1X for authentication IEEE 802.3x for flow control

Ethernet Software Features

Configuration Options	Command Line Interface (CLI) through Serial/Telnet/SSH Web Console (HTTP/HTTPS) MXview One MXconfig
Filter	GMRP GVRP GARP 802.1Q VLAN IGMP Snooping v1/v2/v3 IGMP Querier Static Multicast
Management	IPv4/IPv6 Flow control Back Pressure Flow Control DHCP Server DHCP Client DHCP Relay Agent (Option 82) QoS/CoS/ToS ARP RARP LLDP Port Mirroring Linkup Delay SMTP SNMP Trap SNMP Inform SNMPv1/v2c/v3 RMON TFTP SFTP HTTP HTTPS Telnet Syslog Private MIB Loop Protection
MIB	P-BRIDGE MIB Q-BRIDGE MIB Ethernet-like MIB IEEE8021-SPANNING-TREE-MIB IEEE8021-PAE-MIB IEEE8023-LAG-MIB

	LLDP-EXT-DOT1-MIB LLDP-EXT-DOT3-MIB SNMPv2-MIB RMON MIB Groups 1, 2, 3, 9
Redundancy Protocols	STP RSTP MSTP Turbo Ring v2 Link Aggregation Ring Coupling Static Port Trunk LACP MRP
Security	Rate Limit Access control list DHCP Snooping HTTPS/SSL Login and password policy MAC Security (MACsec) Port Lock RADIUS SSH Sticky MAC TACACS+ Trust access control
Time Management	SNTP Server/Client NTP Server/Client

Switch Properties

MAC Table Size	16 K
IGMP Groups	1024
Max. No. of VLANs	256
VLAN ID Range	VID 1 to 4094
Priority Queues	8

LED Interface

LED Indicators	PWR1, PWR2, FAULT, STATE, MSTR/HEAD, CPLR/TAIL, Ethernet ports, PoE ports
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Serial Interface

Console Port	M12 B-coded 5-pin female connector (RS-232)
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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-4508B models: 0.46 A @ 24 V TN-4512B non-PoE models: 0.56 A @ 24 V TN-4512B PoE models: 4.9 A @ 24 V TN-4516B non-PoE models: 0.83 A @ 24 V TN-4516/20/24/28B PoE models: 9.3 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

Overload Current Protection	Supported
Reverse Polarity Protection	Supported
Power Consumption (Max.)	Non-PoE models: TN-4508B-CT-T: 11.3 W @ 24 VDC, 10.9 W @ 110 VDC TN-4512B-CT-T: 13.3 W @ 24 VDC, 12.7 W @ 110 VDC TN-4516B-CT-T: 15.9 W @ 24 VDC, 15.3 W @ 110 VDC TN-4516B-8G-CT-T: 19.9 W @ 24 VDC, 18.9 W @ 110 VDC PoE models (with PoE disabled): TN-4512B-4G-8GP-CT-T: 16.0 W @ 24 VDC, 17.0 W @ 110 VDC TN-4512B-8P-4G-CT-T: 16.0 W @ 24 VDC, 17.0 W @ 110 VDC TN-4516B-4G-12GP-CT-T: 24.6 W @ 24 VDC, 24.8 W @ 110 VDC TN-4516B-8P-4G-4GP-CT-T: 24.6 W @ 24 VDC, 24.8 W @ 110 VDC TN-4516B-12GP-4GBP-CT-T: 24.6 W @ 24 VDC, 24.8 W @ 110 VDC TN-4516B-8P-4GP-4GBP-CT-T: 24.6 W @ 24 VDC, 24.8 W @ 110 VDC TN-4520B-12P-4G-4GP-CT-T: 25.6 W @ 24 VDC, 25.9 W @ 110 VDC TN-4520B-12P-4GP-4GBP-CT-T: 25.6 W @ 24 VDC, 25.9 W @ 110 VDC TN-4524B-16P-4G-4GP-CT-T: 26.5 W @ 24 VDC, 27.0 W @ 110 VDC TN-4524B-16P-4GP-4GBP-CT-T: 26.5 W @ 24 VDC, 27.0 W @ 110 VDC TN-4528B-20P-4G-4GP-CT-T: 28.5 W @ 24 VDC, 28.7 W @ 110 VDC TN-4528B-20P-4GP-4GBP-CT-T: 28.5 W @ 24 VDC, 28.7 W @ 110 VDC PoE models (with PoE enabled): TN-4512B-4G-8GP-CT-T: 23.7 W @ 24 VDC, 22.8 W @ 110 VDC TN-4512B-8P-4G-CT-T: 23.7 W @ 24 VDC, 22.8 W @ 110 VDC TN-4516B-4G-12GP-CT-T: 54.8 W @ 24 VDC, 36.8 W @ 110 VDC TN-4516B-8P-4G-4GP-CT-T: 54.8 W @ 24 VDC, 36.8 W @ 110 VDC TN-4516B-8P-4GP-4GBP-CT-T: 54.8 W @ 24 VDC, 36.8 W @ 110 VDC TN-4516B-12GP-4GBP-CT-T: 54.8 W @ 24 VDC, 36.8 W @ 110 VDC TN-4520B-12P-4G-4GP-CT-T: 56.3 W @ 24 VDC, 36.8 W @ 110 VDC TN-4520B-12P-4GP-4GBP-CT-T: 56.3 W @ 24 VDC, 36.8 W @ 110 VDC TN-4524B-16P-4G-4GP-CT-T: 50.1 W @ 24 VDC, 36.8 W @ 110 VDC TN-4524B-16P-4GP-4GBP-CT-T: 50.1 W @ 24 VDC, 36.8 W @ 110 VDC TN-4528B-20P-4G-4GP-CT-T: 60.1 W @ 24 VDC, 39.6 W @ 110 VDC TN-4528B-20P-4GP-4GBP-CT-T: 60.1 W @ 24 VDC, 39.6 W @ 110 VDC
Total PoE Power Budget	TN-4512B PoE models: 80 W TN-4516B PoE models: 150 W TN-4516B/20B/28B PoE models: 150 W TN-4520B PoE models: 150 W TN-4524B PoE models: 150 W TN-4528B PoE models: 150 W

Physical Characteristics

Housing	Metal
Dimensions	TN-4508B models: 180 x 115 x 83.5 mm (7.09 x 4.53 x 3.29 in) TN-4512B non-PoE models: 200 x 115 x 83.5 mm (7.87 x 4.53 x 3.29 in) TN-4512B PoE models: 200 x 115 x 102 mm (8.46 x 4.53 x 4.02 in) TN-4512B-4G-8GP-CT-T model: 215 x 115 x 102 mm (7.87 x 4.53 x 3.29 in) TN-4516B non-PoE models: 230 x 115 x 98 mm (9.06 x 4.53 x 3.86 in) TN-4516B PoE models: 230 x 115 x 133 mm (9.06 x 4.53 x 5.24 in) TN-4516B-4G-12GP-CT-T model: 255 x 115 x 113 mm (10.04 x 4.53 x 4.45 in) TN-4516B-12GP-4GBP-CT-T model: 255 x 115 x 113 mm (10.04 x 4.53 x 4.45 in) TN-4520B models: 280 x 115 x 133 mm (11.02 x 4.53 x 5.24 in) TN-4524B models: 313 x 115 x 133 mm (12.32 x 4.53 x 5.24 in) TN-4528B models: 348 x 115 x 133 mm (13.70 x 4.53 x 5.24 in)
IP Rating	IP42
Weight	TN-4508B models: 1,002 g (2.21 lb) TN-4512B non-PoE models: 1,123 g (2.48 lb) TN-4512B PoE models: 1,459 g (3.22 lb) TN-4512B-4G-8GP-CT-T model: 1,579 g (3.48 lb) TN-4516B non-PoE models: 1,500 g (3.31 lb) TN-4516B PoE models: 2,310 g (5.10 lb) TN-4516B-4G-12GP-CT-T model: 2,087 g (4.60 lb) TN-4516B-12GP-4GBP-CT-T model: 2,138 g (4.71 lb) TN-4520B models: 2,419 g (5.33 lb) TN-4524B models: 2,651 g (5.84 lb)

	TN-4528B models: 2,802 g (6.18 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	3000 m

Standards and Certifications

EMC	EN 55032/35
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
Cybersecurity	IEC 62443-4-2 Security Level 2
Radio Frequency	FCC
Railway	IEC 60068-2-1, EN 50155 IEC 60068-2-2, EN 50155 IEC 60068-2-30, EN 50155 IEC 60068-2-78 EN 50121-4 EN 50155 IEC 60571
Railway Fire Protection	EN 45545-2
Safety	UL 62368-1 IEC 62368-1 EN 62368-1 BSMI
Salt Spray Test	EN 50155
Shock	IEC 60068-2-27, IEC 61373, EN 50155
Vibration	IEC 60068-2-64, IEC 61373, EN 50155
Package Vibration Test	ISTA 1A
Package Drop Test	ISTA 1A

Declaration

Green Product	RoHS, CRoHS, WEEE
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MTBF

Time	TN-4508B-CT-T: 1,964,461 hrs TN-4512B-CT-T: 1,447,268 hrs TN-4512B-4G-8GP-CT-T: 1,299,337 hrs TN-4512B-8P-4G-CT-T: 1,033,581 hrs TN-4516B-CT-T: 1,346,637 hrs TN-4516B-4G-12GP-CT-T: 1,097,547 hrs TN-4516B-8G-CT-T: 1,148,405 hrs TN-4516B-8P-4G-4GP-CT-T: 881,578 hrs TN-4516B-8P-4GP-4GBP-CT-T: 852,972 hrs TN-4516B-12GP-4GBP-CT-T: 1,042,142 hrs TN-4520B-12P-4G-4GP-CT-T: 851,025 hrs TN-4520B-12P-4GP-4GBP-CT-T: 824,348 hrs TN-4524B-16P-4GP-4G-CT-T: 772,151 hrs TN-4524B-16P-4GP-4GBP-CT-T: 747,294 hrs TN-4528B-20P-4G-4GP-CT-T: 693,572 hrs TN-4528B-20P-4GP-4GBP-CT-T: 581,667 hrs
Standards	Telcordia SR332 Issue 4

Warranty

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

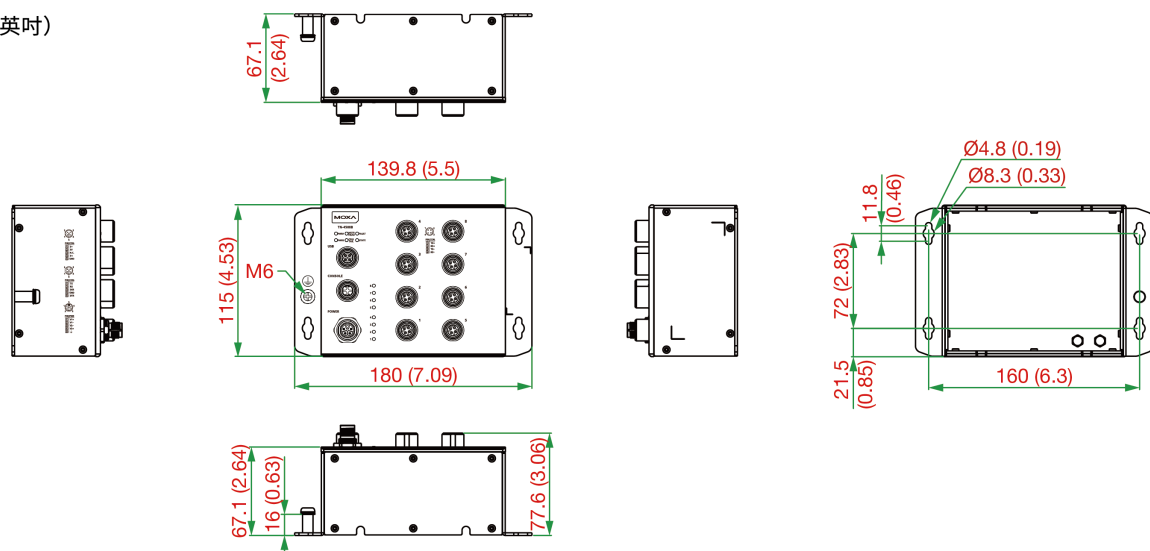
Package Contents

Device	1 x TN-4500B Series switch
Installation Kit	1 x wall-mounting kit 2 x cap, male, metal, for M12 ports (console and USB storage ports, pre-installed on the switch) 4/6/8/10/14 x cap, male, metal, for M12 ports (Ethernet ports, pre-installed on the switch)
Documentation	1 x quick installation guide 1 x warranty card

尺寸

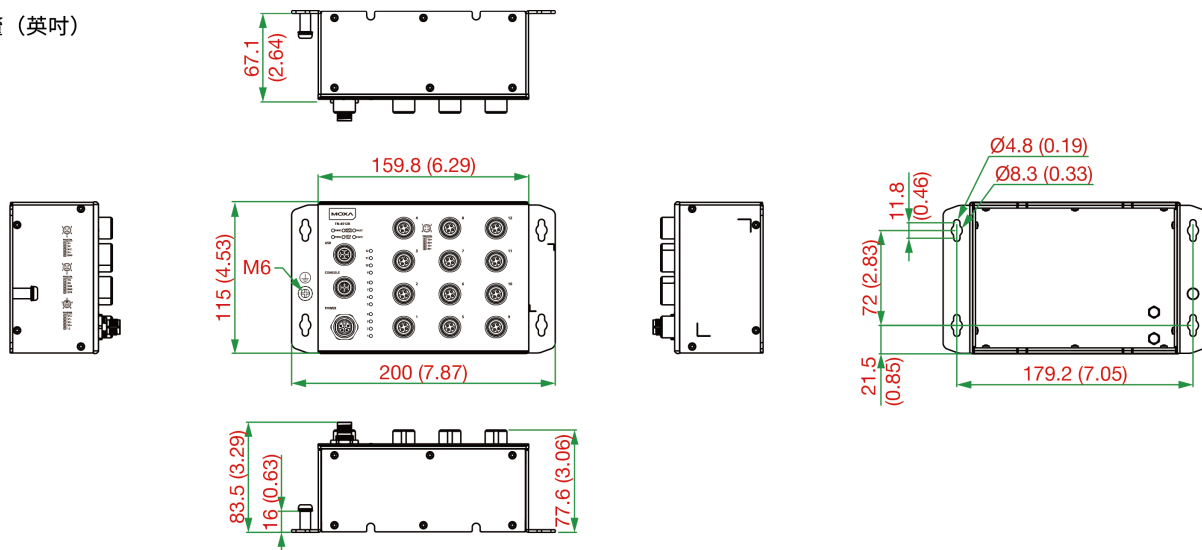
TN-4508B 型號

單位：公釐（英吋）



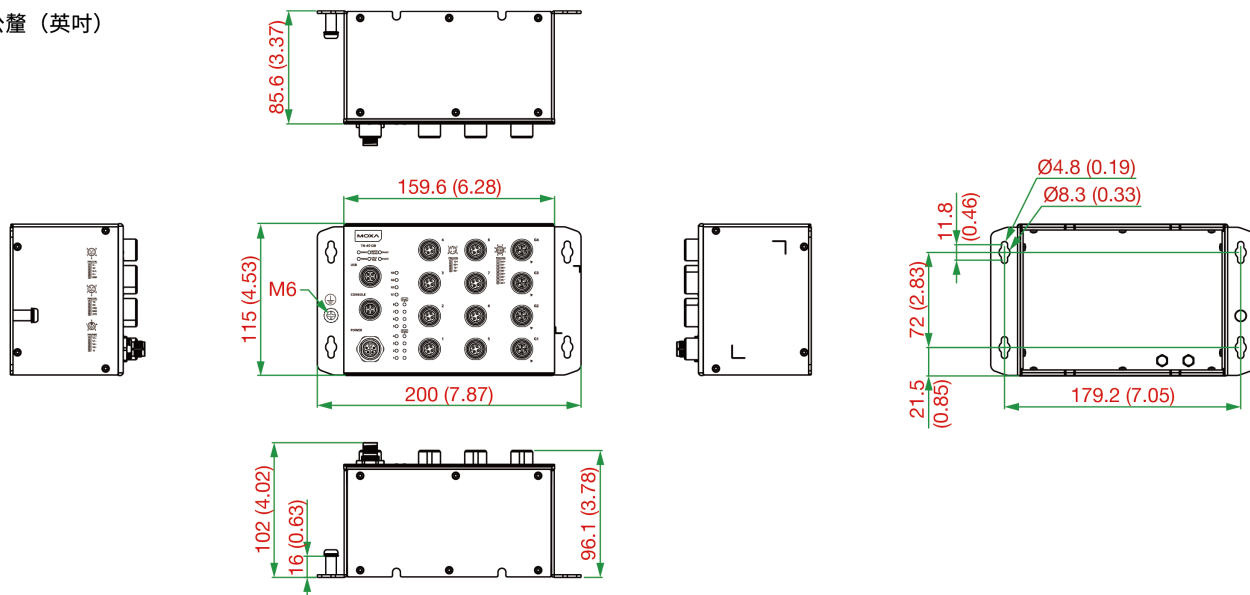
TN-4512B 非 PoE 型號

單位：公釐（英吋）



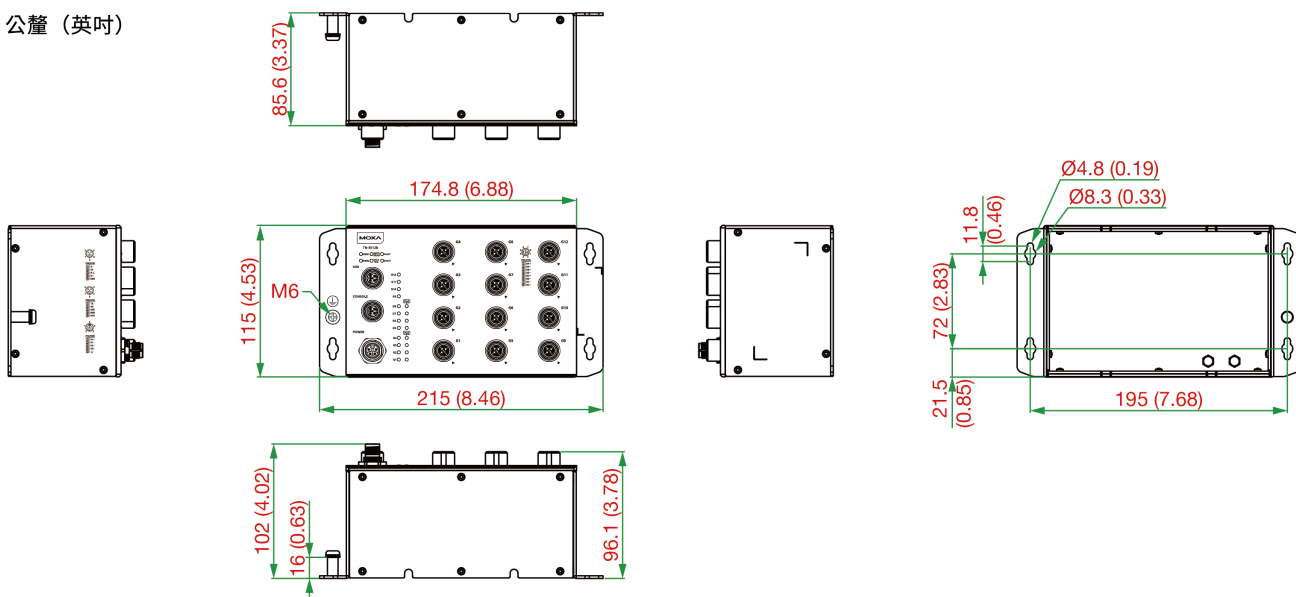
TN-4512B PoE 型號

單位：公釐（英吋）



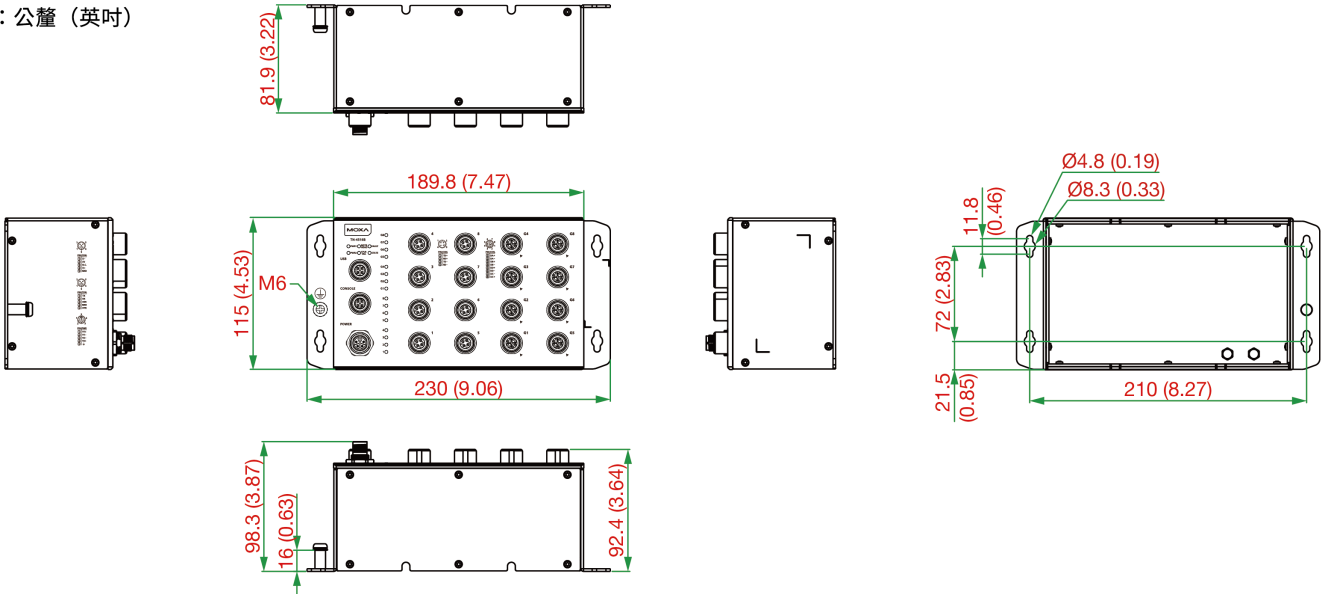
TN-4512B-4G-8GP-CT-T 型號

單位：公釐（英吋）



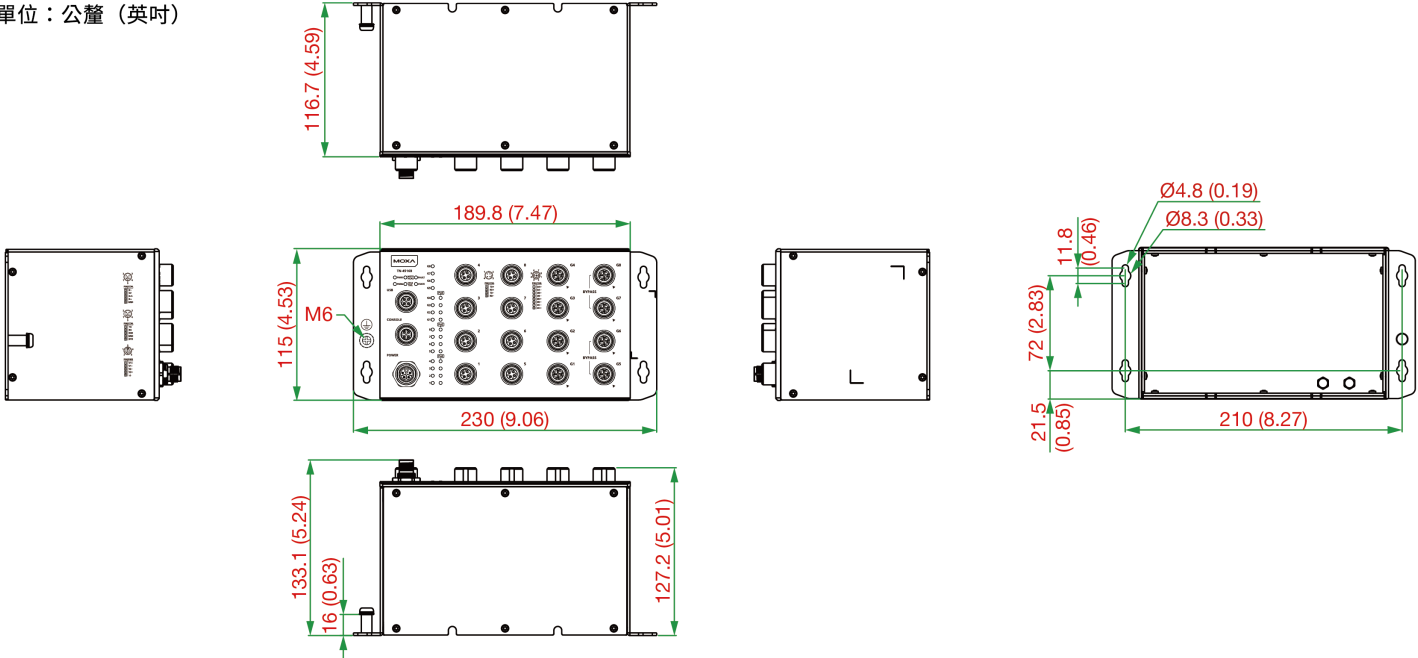
TN-4516B 非 PoE 型號

單位：公釐（英吋）



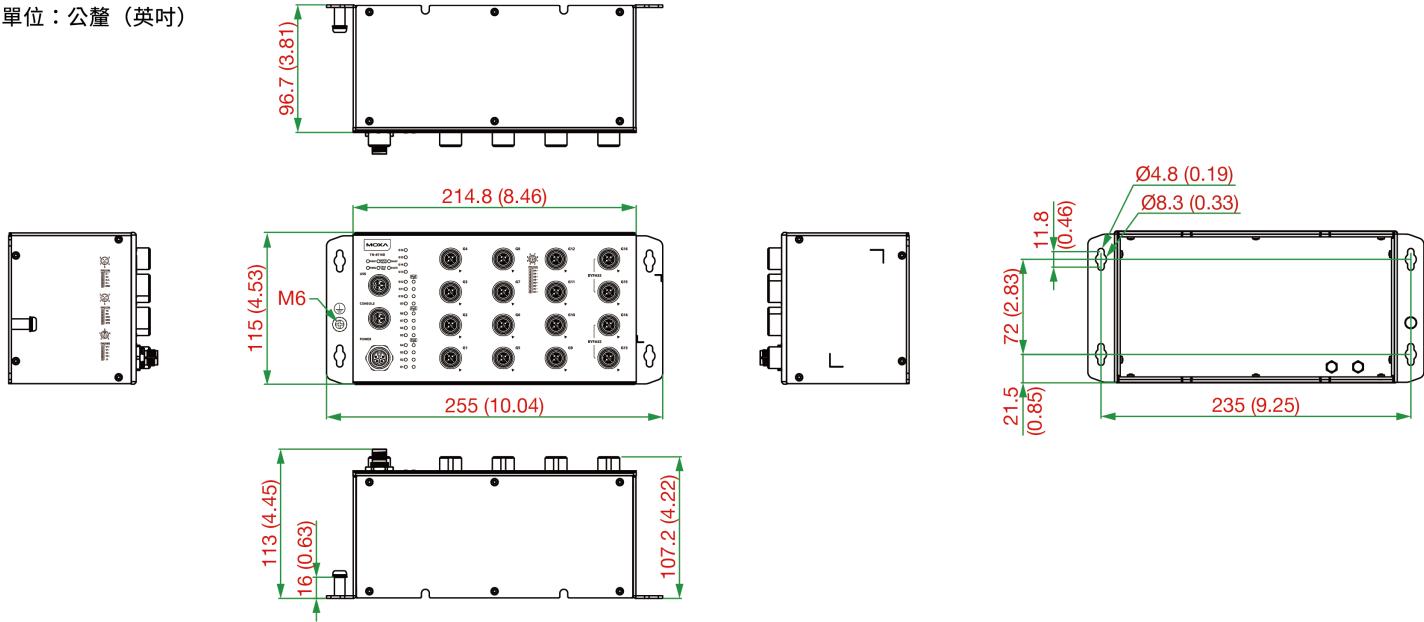
TN-4516B PoE 型號

單位：公釐（英吋）



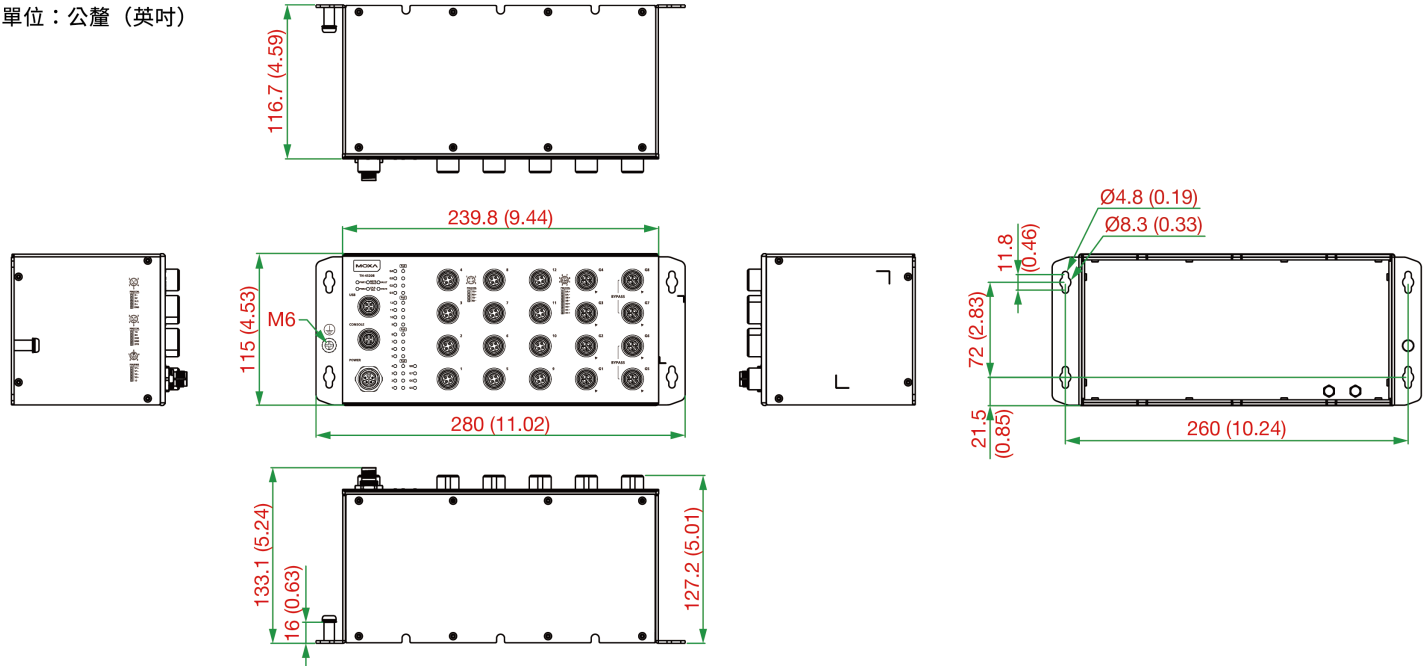
TN-4516B-4G-12GP-CT-T 和 TN-4516B-12GP-4GBP-CT-T 型號

單位：公釐（英吋）



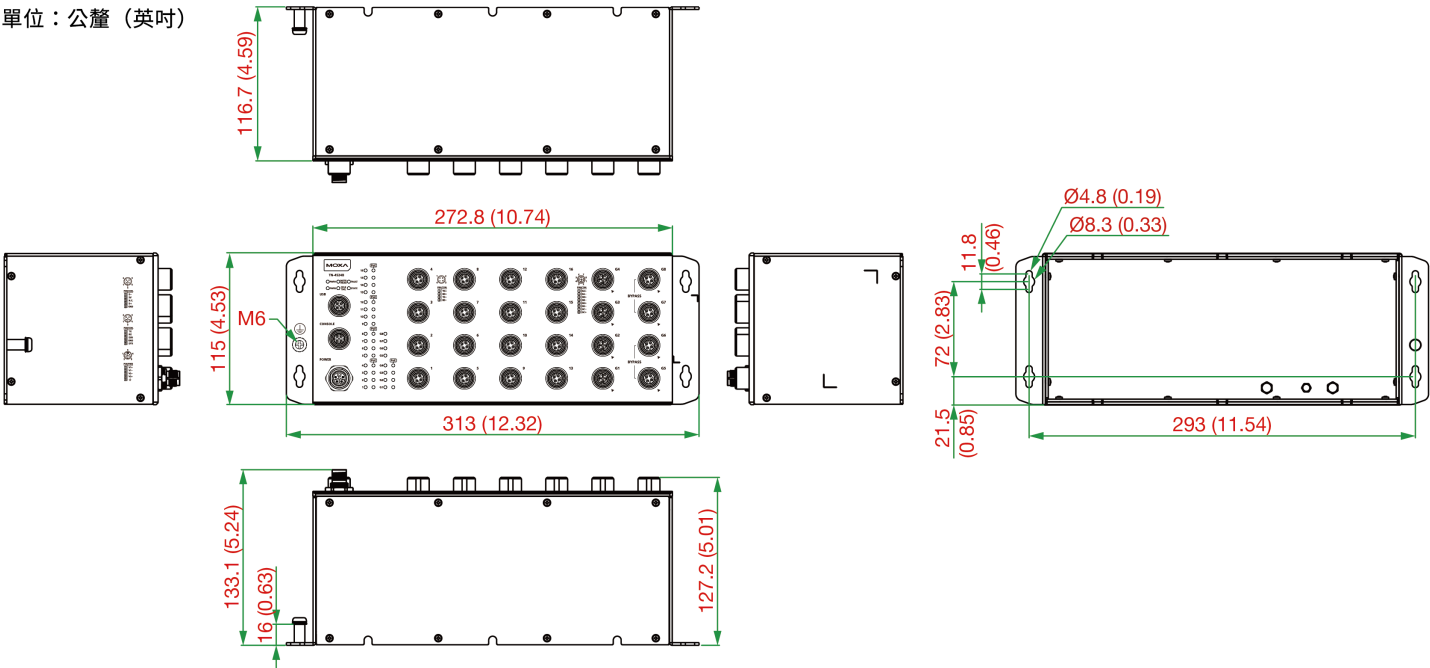
TN-4520B 型號

單位：公釐（英吋）



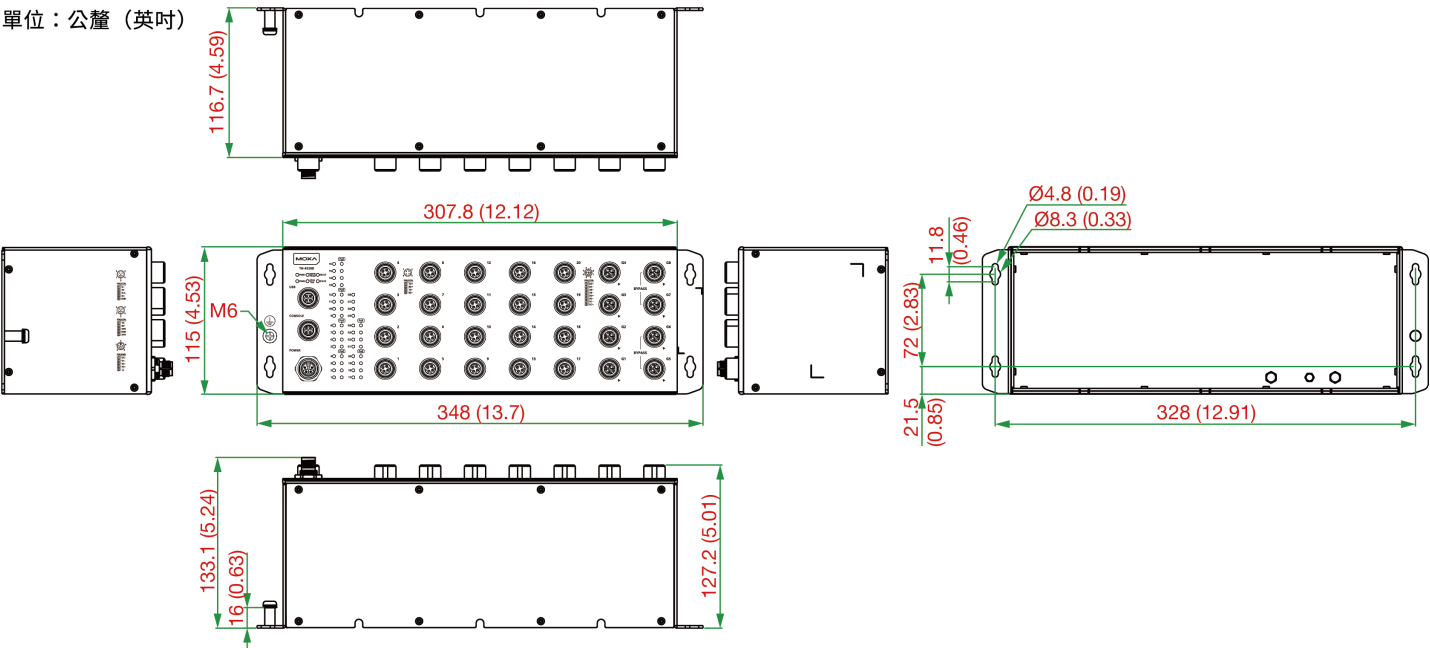
TN-4524B 型號

單位：公釐（英吋）



TN-4528B 型號

單位：公釐（英吋）



訂購資訊

Model Name	10/100/1000BaseT(X) Ports, M12 X-coded 8-pin Female Connector	10/100/1000BaseT(X) PoE Ports, M12 X-coded 8-pin Female Connector	10/100/1000BaseT(X) Ports, M12 X-coded 8-pin Female Connector With Bypass Relay	10/100BaseT(X) Ports, M12 D-coded 4-pin Female Connector	10/100BaseT(X) PoE PoE Ports, M12 D-coded 4-pin Female Connector	PoE Power Budget
TN-4508B-CT-T	-	-	-	8	-	-
TN-4512B-CT-T	-	-	-	12	-	-
TN-4512B-4G-8GP-CT-T	4	8	-	-	-	80 W
TN-4512B-8P-4G-CT-T	4	-	-	-	8	80 W
TN-4516B-CT-T	-	-	-	16	-	-

Model Name	10/100/ 1000BaseT(X) Ports, M12 X- coded 8-pin Female Connector	10/100/ 1000BaseT(X) PoE Ports, M12 X- coded 8-pin Female Connector	10/100/ 1000BaseT(X) Ports, M12 X- coded 8-pin Female Connector With Bypass Relay	10/100BaseT(X) Ports, M12 D- coded 4-pin Female Connector	10/100BaseT(X) PoE PoE Ports, M12 D-coded 4- pin Female Connector	PoE Power Budget
TN-4516B-8G-CT-T	8	–	–	8	–	–
TN-4516B-8P-4G-4GP-CT-T	4	4	–	–	8	150 W
TN-4516B-8P-4GP-4GBP-CT-T	–	4	4	–	8	150 W
TN-4516B-4G-12GP-CT-T	4	12	–	–	–	150 W
TN-4516B-12GP-4GBP-CT-T	–	12	4	–	–	150 W
TN-4520B-12P-4G-4GP-CT-T	4	4	–	–	12	150 W
TN-4520B-12P-4GP-4GBP-CT-T	–	4	4	–	12	150 W
TN-4524B-16P-4G-4GP-CT-T	4	4	–	–	16	150 W
TN-4524B-16P-4GP-4GBP-CT-T	–	4	4	–	16	150 W
TN-4528B-20P-4G-4GP-CT-T	4	4	–	–	20	150 W
TN-4528B-20P-4GP-4GBP-CT-T	–	4	4	–	20	150 W

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

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