

# TN-5500A 系列

符合 EN 50155 標準、8 到 18 埠乙太網路交換器，具有最多 8 個 PoE 連接埠及 2 個 Gigabit 連接埠



## 特色與優點

- 最多 2 個 Gigabit 連接埠，具備可選式繞道功能
- 8 個符合 IEEE 802.3at/af 標準的 PoE 和乙太網路複合連接埠
- 隔離式電源，電源供應範圍為 24 至 110 VDC
- 符合所有 EN 50155 規範強制性測試項目<sup>1</sup>
- -40°C 至 75°C 操作溫度範圍
- Turbo Ring 和 Turbo Chain ( 250 台交換器，復原時間小於 20 毫秒 )，且支援 STP/RSTP/MSTP 網路備援

## 認證



## 簡介

ToughNet TN-5500A 系列 M12 網管型乙太網路交換器專為鐵路應用所設計，像是軌道車輛及軌旁等應用。TN-5500A 系列交換器採用 M12 和其他圓形連接器，可確保緊密、穩固的連線能力，且保證在環境干擾（例如：振動和衝擊）下能夠穩定運作。TN-5500A 系列乙太網路交換器提供 8 或 16 個快速乙太網路 M12 連接埠，8 個符合 IEEE 802.3at/af 標準的 PoE（乙太網路供電）連接埠，下方 2 個 Gigabit 乙太網路介面埠，具有可選式繞道功能。PoE 交換器屬於電源供應設備（PSE），每個連接埠可提供高達 30 瓦的電力，而且可用來為符合 IEEE 802.3at/af 標準的 IP 監控、無線存取點和 IP 電話等受電設備（PD）供電。

TN-5500A 系列提供 24/36/48/72/96/110 VDC 的電源輸入，可讓您在世界各地可以使用相同型號。24 到 110 VDC 的電源輸入和隔離式電源可增加通訊系統的可靠性。此外，因為有 -40 到 75°C 的操作溫度範圍和 IP54 等級防水機殼，適合應用在嚴苛環境中。TN-5500A 系列乙太網路交換器符合 EN 50155 規範中有關操作溫度、電源輸入電壓、突波、ESD 和振動的強制要求，並且採用敷形塗層和電力絕緣技術，讓這台交換器更適合用在各種工業應用。

## 附加特色與優點

- 每個 PoE 連接埠最高可提供 30 瓦，每個交換器的總功率上限為 120 瓦
- IPv6 Ready Logo 認證（獲得 IPv6 Logo 委員會認證）
- 領先業界的 EN 50155 PoE 交換器，適合軌道車輛應用
- DHCP Option 82 適用於以不同原則指派 IP 位址
- Turbo Ring 和 Turbo Chain（250 台交換器，復原時間小於 20 毫秒），以及 STP/RSTP/MSTP，以實現網路備援
- IGMP snooping 和 GMRP，用於過濾 multicast 流量
- 可基於連接埠實現 VLAN、IEEE 802.1Q VLAN 以及 GVRP，以簡化網路規劃
- QoS（IEEE 802.1p/1Q 和 ToS/DiffServ）可將即時流量進行分類及排序
- IEEE 802.3ad、LACP 提供最佳化頻寬使用率
- SNMPv1/v2c/v3，支援不同層級的網路管理
- 支援 TACACS+、SNMPv3、IEEE 802.1X、HTTPS 和 SSH，強化網路安全
- RMON 提供主動且有效率的網路監控
- 頻寬管理可防止無法預測的網路狀態
- 鎖定連接埠，僅允許授權的 MAC 位址進行存取
- Port mirroring 可用於除錯
- 發生例外狀況時透過電子郵件和繼電器輸出自動發出警告
- 線路切換快速恢復
- 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 程式進行設定
- 迴圈保護，防止網路迴圈
- 面板安裝或鋁軌安裝

## 規格

### Input/Output Interface

Alarm Contact Channels

2 x relay output in one M12 A-coded 5-pin male connector with current carrying capacity of 1 A @ 30 VDC

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](http://www.moxa.com/doc/specs/EN_50155_Compliance.pdf)

## Ethernet Interface

10/100/1000BaseT(X) Ports, Q-ODC Fiber Connector	TN-5510A-2GLSX Series: 2 TN-5510A-8PoE-2GLSX Series: 2
10/100/1000BaseT(X) Ports (M12 X-coded 8-pin female connector with bypass relay)	TN-5510A-2GTXPB Series: 2 TN-5510A-8PoE-2GTXPB Series: 2 TN-5518A-2GTXPB Series: 2 TN-5518A-8PoE-2GTXPB: 2
10/100BaseT(X) Ports (M12 D-coded 4-pin female connector)	TN-5508A/5510A Series non-PoE models: 8 TN-5516A/5518A Series non-PoE models: 16 TN-5516A/5518A Series PoE models: 8
PoE Ports (10/100BaseT(X), M12 D-coded 4-pin female connector)	TN-5508A/5510A/5516A/5518A Series PoE models: 8
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 802.3u for 100BaseT(X) and 100BaseFX IEEE 802.3x for flow control TN-5508A/5510A/5516A/5518A Series PoE models: IEEE 802.3af/at for PoE/PoE+ output TN-5510A Series 2GLSX models: IEEE 802.3z for 1000BaseSX/LX/LHX/ZX
10/100/1000BaseT(X) Ports (M12 X-coded 8-pin female connector)	TN-5510A-2GTX Series: 2 TN-5510A-8PoE-2GTX Series: 2 TN-5518A-2GTX Series: 2 TN-5518A-8PoE-2GTX Series: 2

## Ethernet Software Features

Broadcast Forwarding	Broadcast forwarding
Configuration Options	Command Line Interface (CLI), Command Line Interface (CLI) through Serial/Telnet/SSH, Web Console (HTTP/HTTPS), Windows Utility
Filter	802.1Q GMRP GVRP IGMP Snooping v1/v2/v3 IGMP Querier Port-based VLAN Static Multicast
Management	Account Management Back Pressure Flow Control DHCP Client (options 1/3/50/51/53/54/55/57/66/67) DHCP option 82 (relay agent) DHCP Server (options 1/3/12/15/42/50/55) Flow control HTTP ICMP IPv4/IPv6 LLDP Loop Protection Port-based DHCP Server Port Mirror QoS/CoS/ToS RARP RMON SMTP SNMP Inform SNMP Trap SNMPv1/v2c/v3 Syslog Telnet

MIB	Bridge MIB Ethernet-like MIB MIB-II P-BRIDGE MIB Q-BRIDGE MIB RMON MIB Groups 1, 2, 3, 9 RSTP MIB
Redundancy Protocols	LACP MSTP RSTP Static Port Trunk STP Turbo Chain Turbo Ring v2 Turbo Ring with DRC
Security	Broadcast storm protection HTTPS/SSL Local Account Accessibility TACACS+ Port Lock RADIUS Rate Limit SSH
Time Management	NTP Server/Client SNTP

### Switch Properties

IGMP Groups	256
Max. No. of VLANs	64
VLAN ID Range	VID 1 to 4094

### LED Interface

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

Console Port	M12 A-coded male connector
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### Power Parameters

Input Current	TN-5508A-WV Series: 24-110 VDC, 0.5A max. TN-5510A-2GTX Series: 24-110 VDC, 0.5A max. TN-5510A-2GTXBP Series: 24-110 VDC, 0.5A max. TN-5510A-2GLSX Series: 24-110 VDC, 0.5A max. TN-5508A-8PoE Series: 24-110 VDC, 6.8A max. TN-5510A-8PoE-2GTX Series: 24-110 VDC, 6.8A max. TN-5510A-8PoE-2GTXBP Series: 24-110 VDC, 6.8A max. TN-5510A-8PoE-2GLSX Series: 24-110 VDC, 6.8A max. TN-5516A-WV Series: 24-110 VDC, 0.75A max. TN-5518A-2GTX Series: 24-110 VDC, 0.75A max. TN-5518A-2GTXBP Series: 24-110 VDC, 0.75A max. TN-5516A-8PoE Series: 24-110 VDC, 7.1A max. TN-5518A-8PoE-2GTX Series: 24-110 VDC, 7.1A max. TN-5518A-8PoE-2GTXBP Series: 24-110 VDC, 7.1A max.
Input Voltage	Redundant dual inputs 24/36/48/72/96/110 VDC
No. of Power Inputs	2
Operating Voltage	16.8 to 137.5 VDC
Overload Current Protection	Supported
Power Connector	M23 connector

Reverse Polarity Protection	Supported
Total PoE Power Budget	TN-5500A Series PoE models: 120 W
<b>Physical Characteristics</b>	
Housing	Metal
IP Rating	IP54
Dimensions	TN-5508A Series non-PoE models: 185 x 176.2 x 76 mm (7.28 x 6.9 x 2.99 in) TN-5508A Series PoE models: 185 x 176.2 x 117.2 mm (7.28 x 6.9 x 4.61 in) TN-5510A Series non-PoE models: 185 x 178.1 x 76 mm (7.28 x 7.01 x 2.99 in) TN-5510A Series PoE models: 185 x 178.1 x 117.2 mm (7.28 x 7.01 x 4.61 in) TN-5510A-2GLSX-ODC Series: 185 x 219.4 x 76 mm (7.28 x 8.63 x 2.99 in) TN-5510A-8PoE-2GLSX-ODC series: 185 x 219.4 x 117.2 mm (7.28 x 8.63 x 4.61 in) TN-5516A Series non-PoE models: 250 x 176.2 x 75 mm (9.84 x 6.9 x 2.95 in) TN-5516A Series PoE models: 250 x 176.2 x 115 mm (9.84 x 6.9 x 4.53 in) TN-5518A Series non-PoE models: 250 x 178.6 x 75 mm (9.84 x 7.03 x 2.95 in) TN-5518A Series PoE models: 250 x 178.6 x 115 mm (9.84 x 7.03 x 4.53 in)
Weight	TN-5508A Series non-PoE models: 1,610 g (3.54 lb) TN-5508A Series PoE models: 2,383 g (5.25 lb) TN-5510A Series non-PoE models: 1,805 g (3.97 lb) TN-5510A Series PoE models: 2,690 g (5.93 lb) TN-5516A Series non-PoE models: 2,138 g (4.71 lb) TN-5516A Series PoE models: 3,286 g (7.24 lb) TN-5518A Series non-PoE models: 2,250 g (4.96 lb) TN-5518A Series PoE models: 3,439 g (7.58 lb)
Installation	DIN-rail mounting (optional) Wall mounting
Protection	TN-5500A Series -CT models: PCB conformal coating
<b>Environmental Limits</b>	
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)
Altitude	2000 m
<b>Standards and Certifications</b>	
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
Freefall	IEC 60068-2-31
Radio Frequency	FCC
Railway	EN 50121-4 EN 50155
Railway Fire Protection	EN 45545-2
Safety	EN 62368-1
Shock	IEC 60068-2-27, IEC 61373, EN 50155
Vibration	IEC 60068-2-64, IEC 61373, EN 50155
EMC	EN 55032/35

## Declaration

Green Product

RoHS, CRoHS, WEEE

## MTBF

Time

TN-5508A Series: 814,964 hrs  
 TN-5510A-2GTX Series: 758,855 hrs  
 TN-5510A-2GTXBP Series: 742,880 hrs  
 TN-5510A-2GLSX Series: 722,049 hrs  
 TN-5508A-8PoE Series: 526,372 hrs  
 TN-5510A-8PoE-2GTX Series: 502,756 hrs  
 TN-5510A-8PoE-2GTXBP Series: 495,703 hrs  
 TN-5510A-8PoE-2GLSX Series: 486,560 hrs  
 TN-5516A-WV Series: 722,721 hrs  
 TN-5516A-8PoE Series: 483,246 hrs  
 TN-5518A-2GTX Series: 647,128 hrs  
 TN-5518A-2GTXBP Series: 628,808 hrs  
 TN-5518A-8PoE-2GTX Series: 448,300 hrs  
 TN-5518A-8PoE-2GTXBP Series: 439,442 hrs

Standards

Telcordia SR332

## Warranty

Warranty Period

5 years

Details

See [www.moxa.com/tw/warranty](http://www.moxa.com/tw/warranty)

## Package Contents

Device

1 x TN-5500A Series switch

Installation Kit

1 x wall-mounting kit

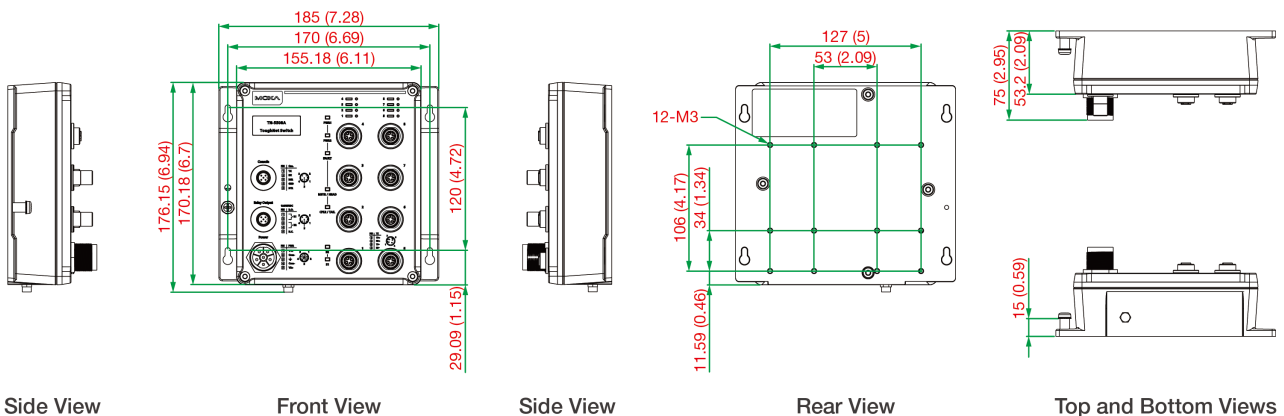
Documentation

1 x quick installation guide  
 1 x warranty card

## 尺寸

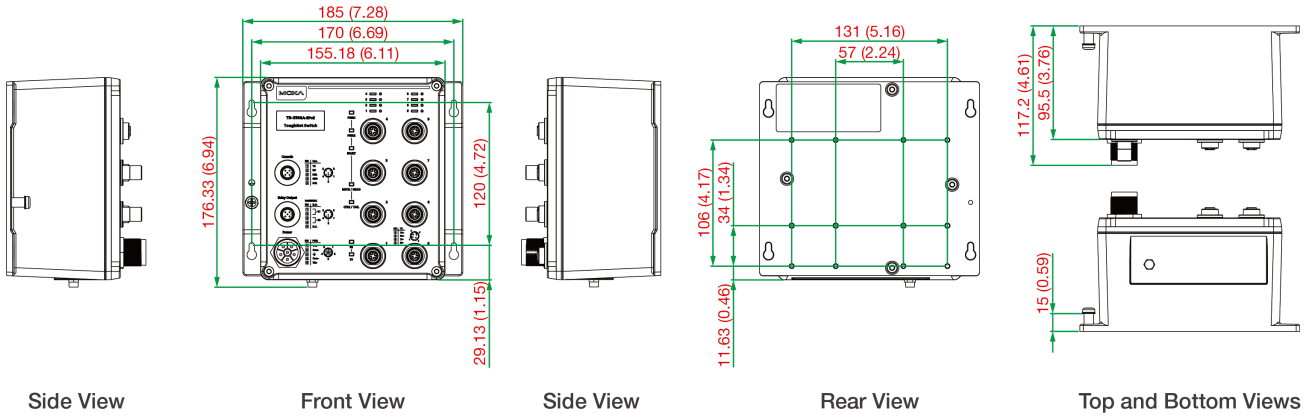
### TN-5508A 非 PoE 系列

單位：公釐 (英吋)



## TN-5508A-8PoE 系列

單位：公釐 (英吋)



Side View

Front View

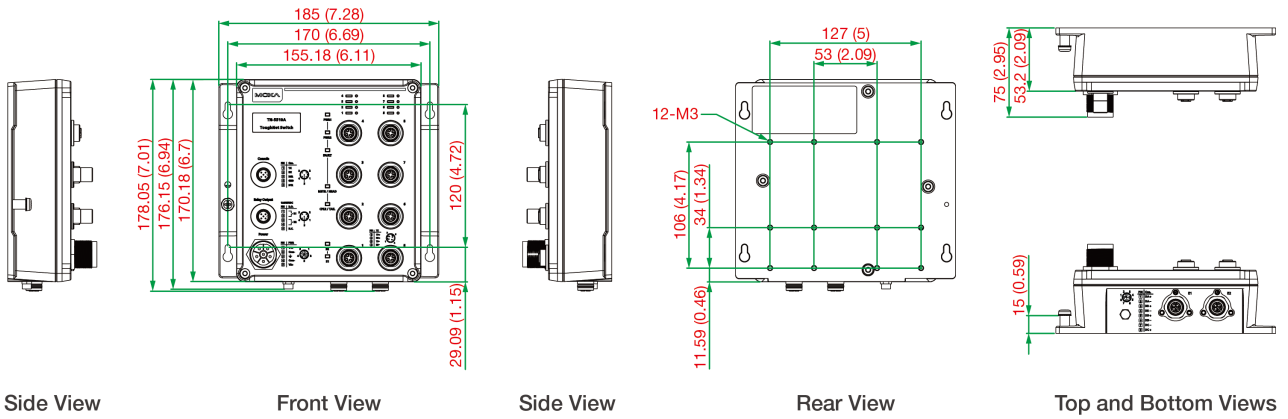
Side View

Rear View

Top and Bottom Views

## TN-5510A 非 PoE 系列

單位：公釐 (英吋)



Side View

Front View

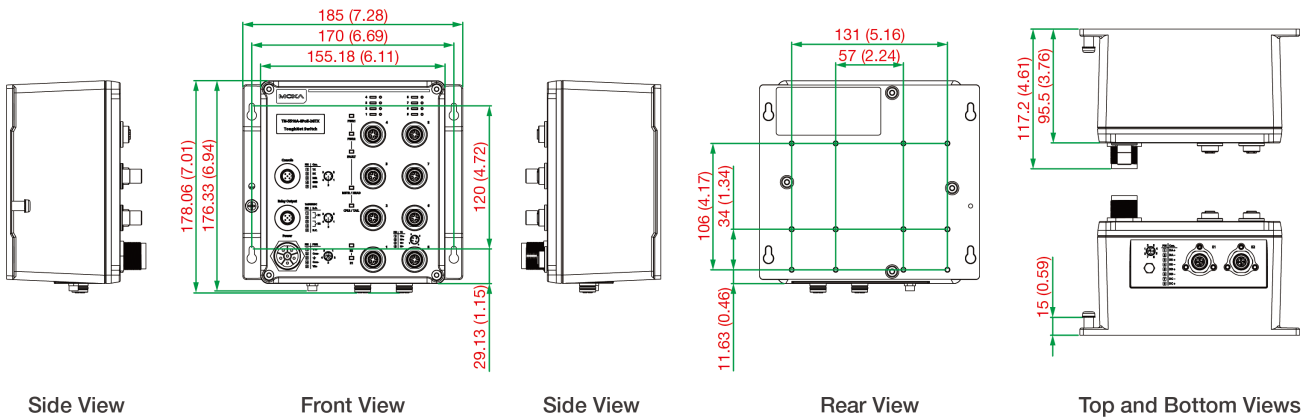
Side View

Rear View

Top and Bottom Views

## TN-5510A-8PoE 系列

單位：公釐 (英吋)



Side View

Front View

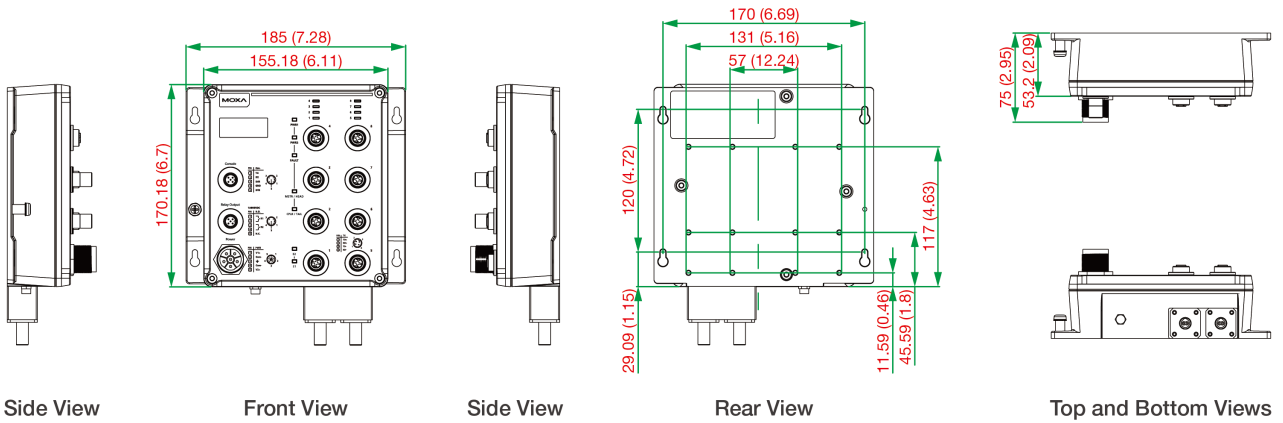
Side View

Rear View

Top and Bottom Views

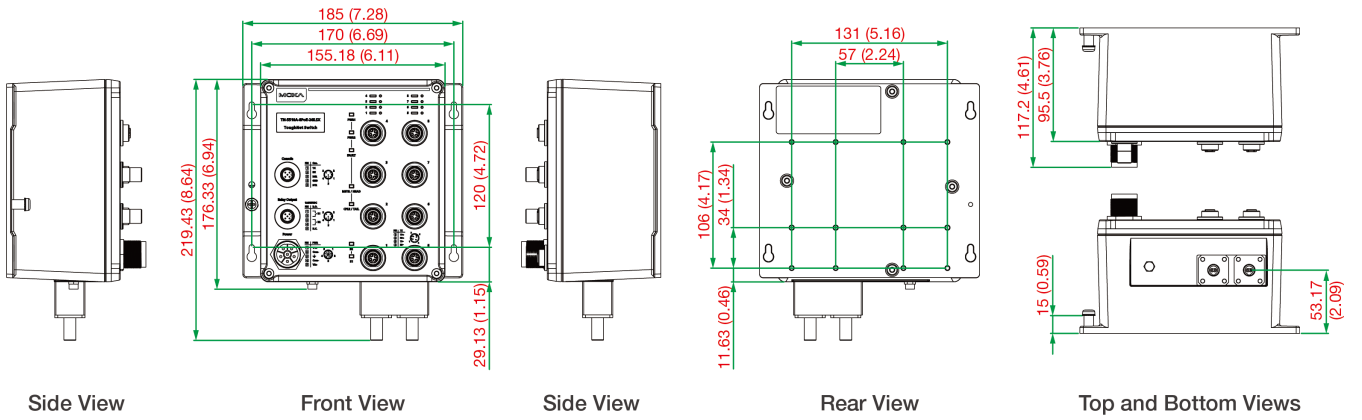
## TN-5510A-2GLSX-ODC 系列

單位：公釐 (英吋)



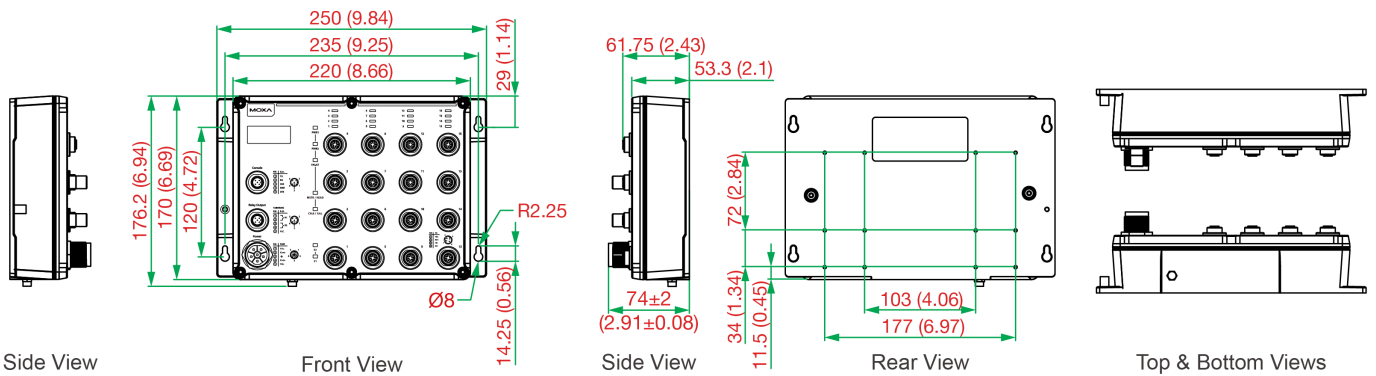
## TN-5510A-8PoE-2GLSX-ODC 系列

單位：公釐 (英吋)



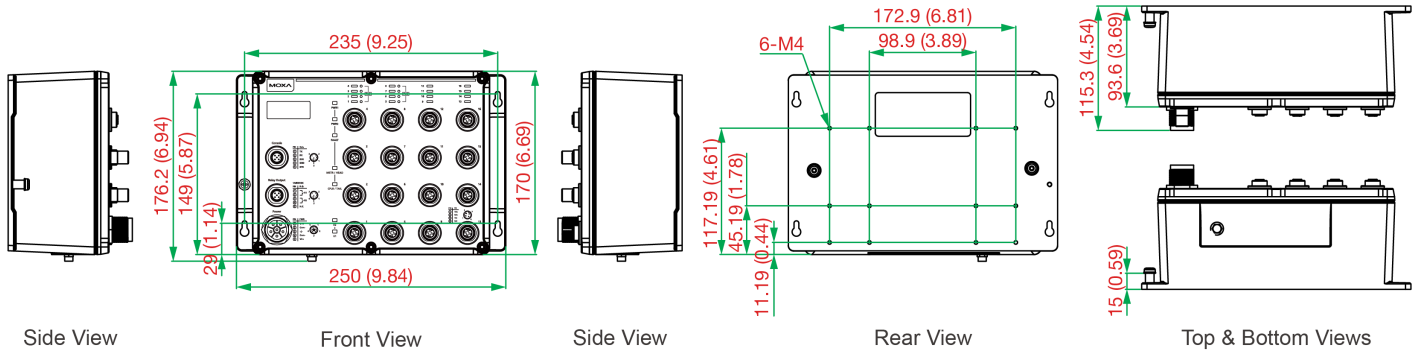
## TN-5516A 非 PoE 系列

單位：公釐 (英吋)



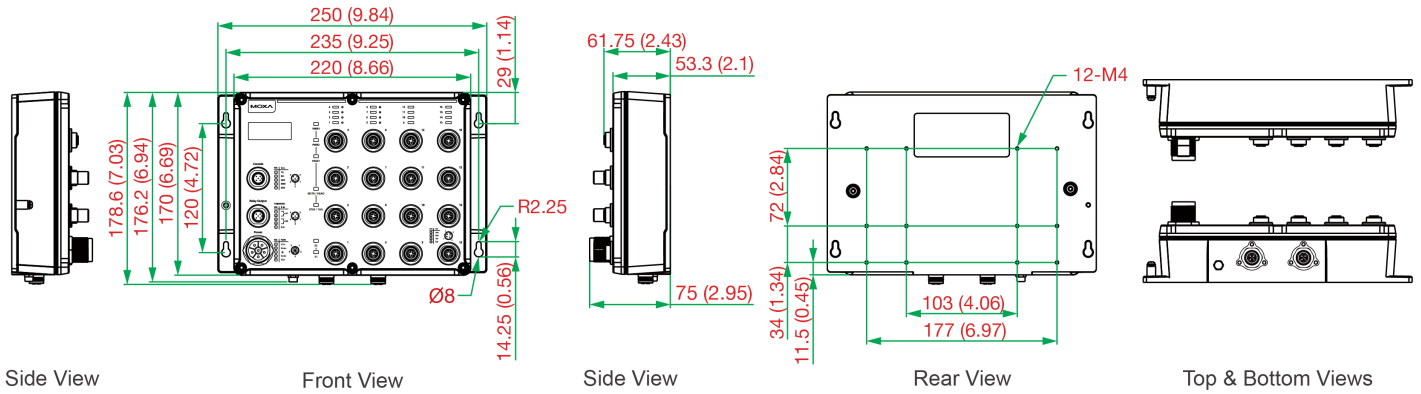
## TN-5516A-8PoE 系列

單位：公釐 (英吋)



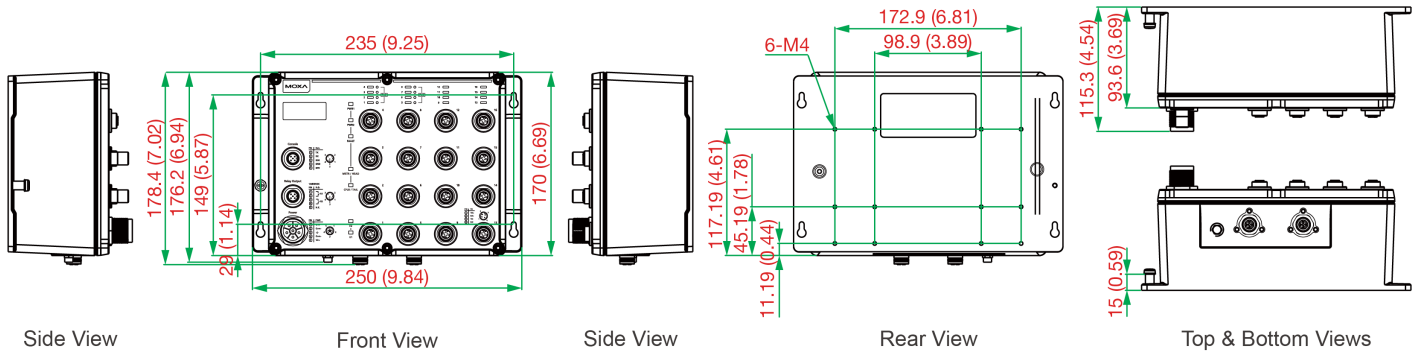
## TN-5518A 非 PoE 系列

單位：公釐 (英吋)



## TN-5518A-8PoE 系列

單位：公釐 (英吋)



## 訂購資訊

Model Name	10/100/1000BaseT(X) Ports10Q-ODC Fiber Connector	10/100/1000BaseT(X) Ports10M12 X-Coded 8-Pin Female Connector	10/100/1000BaseT(X) Ports10M12 X-Coded 8-Pin Female Connector with Bypass Relay	10/100BaseT(X) Ports10M12 D-Coded 4-Pin Female Connector	PoE Ports1010/100BaseT(X), M12 D-Coded 4-Pin Female Connector	Conformal Coating
TN-5508A-WV-T	-	-	-	8	-	-
TN-5508A-WV-CT-T	-	-	-	8	-	✓
TN-5508A-8PoE-WV-T	-	-	-	-	8	-
TN-5508A-8PoE-WV-CT-T	-	-	-	-	8	✓
TN-5510A-2GTX-WV-T	-	2	-	8	-	-



Model Name	10/100/ 1000BaseT(X) Ports10Q-ODC Fiber Connector	10/100/ 1000BaseT(X) Ports10M12 X- Coded 8-Pin Female Connector	10/100/ 1000BaseT(X) Ports10M12 X- Coded 8-Pin Female Connector with Bypass Relay	10/100BaseT(X) Ports10M12 D- Coded 4-Pin Female Connector	PoE Ports1010/ 100BaseT(X), M12 D-Coded 4-Pin Female Connector	Conformal Coating
TN-5510A-2GTX-WV-CT-T	-	2	-	8	-	✓
TN-5510A-2GTXBP-WV-T	-	-	2	8	-	-
TN-5510A-2GTXBP-WV-CT-T	-	-	2	8	-	✓
TN-5510A-2GLSX-ODC-WV-T	2	-	-	8	-	-
TN-5510A-2GLSX-ODC-WV-CT-T	2	-	-	8	-	✓
TN-5510A-8PoE-2GTX-WV-T	-	2	-	-	8	-
TN-5510A-8PoE-2GTX-WV-CT-T	-	2	-	-	8	✓
TN-5510A-8PoE-2GTXBP-WV-T	-	-	2	-	8	-
TN-5510A-8PoE-2GTXBP-WV-CT-T	-	-	2	-	8	✓
TN-5510A-8PoE-2GLSX-ODC-WV-T	2	-	-	-	8	-
TN-5510A-8PoE-2GLSX-ODC-WV-CT-T	2	-	-	-	8	✓
TN-5516A-WV-T	-	-	-	16	-	-
TN-5516A-WV-CT-T	-	-	-	16	-	✓
TN-5516A-8PoE-WV-T	-	-	-	8	8	-
TN-5516A-8PoE-WV-CT-T	-	-	-	8	8	✓
TN-5518A-2GTX-WV-T	-	2	-	16	-	-
TN-5518A-2GTX-WV-CT-T	-	2	-	16	-	✓
TN-5518A-2GTXBP-WV-T	-	-	2	16	-	-
TN-5518A-2GTXBP-WV-CT-T	-	-	2	16	-	✓
TN-5518A-8PoE-2GTX-WV-T	-	2	-	8	8	-
TN-5518A-8PoE-2GTX-WV-CT-T	-	2	-	8	8	✓
TN-5518A-8PoE-2GTXBP-WV-T	-	-	2	8	8	-
TN-5518A-8PoE-2GTXBP-WV-CT-T	-	-	2	8	8	✓

## 配件 (選購)

### Storage Kits

ABC-01-M12

Configuration backup and restoration tool with M12 connector for managed Ethernet switches and wireless APs/Bridges/Clients, 0 to 60°C operating temperature

## Cables

CBL-M12D(MM4P)/RJ45-100 IP67	M12-to-RJ45 cable, IP67-rated, 1 m
CBL-M23(FF6P)/OPEN-BK-100 IP67	M23 to 6-pin power cable, IP67-rated female 6-pin M23 connector, IP67, 1 m
CBL-M12DMM4PM12DMM4P-BK-100-IP67	M12-to-M12 Cat-5E STP Ethernet cable, 4-pin D-coded M12 connector, IP67, 1 m
CBL-M12XMM8P-Y-100-IP67	M12-to-M12 Cat-5 UTP Ethernet cable, 8-pin male X-coded crimp type M12 connector, IP67, 1 m  Applicable Models: TN-5510A-2GTX-WV-T TN-5510A-2GTX-WV-CT-T TN-5510A-2GTXBP-WV-T TN-5510A-2GTXBP-WV-CT-T TN-5510A-8PoE-2GTX-WV-T TN-5510A-8PoE-2GTX-WV-CT-T TN-5510A-8PoE-2GTXBP-WV-T TN-5510A-8PoE-2GTXBP-WV-CT-T TN-5518A-2GTX-WV-T TN-5518A-2GTX-WV-CT-T TN-5518A-2GTXBP-WV-T TN-5518A-2GTXBP-WV-CT-T TN-5518A-8PoE-2GTX-WV-T TN-5518A-8PoE-2GTX-WV-CT-T TN-5518A-8PoE-2GTXBP-WV-T TN-5518A-8PoE-2GTXBP-WV-CT-T
CBL-M12XMM8P-Y-300-IP67	M12-to-M12 Cat-5 UTP Ethernet cable, 8-pin male X-coded crimp type M12 connector, IP67, 3 m  Applicable Models: TN-5510A-2GTX-WV-T TN-5510A-2GTX-WV-CT-T TN-5510A-2GTXBP-WV-T TN-5510A-2GTXBP-WV-CT-T TN-5510A-8PoE-2GTX-WV-T TN-5510A-8PoE-2GTX-WV-CT-T TN-5510A-8PoE-2GTXBP-WV-T TN-5510A-8PoE-2GTXBP-WV-CT-T TN-5518A-2GTX-WV-T TN-5518A-2GTX-WV-CT-T TN-5518A-2GTXBP-WV-T TN-5518A-2GTXBP-WV-CT-T TN-5518A-8PoE-2GTX-WV-T TN-5518A-8PoE-2GTX-WV-CT-T TN-5518A-8PoE-2GTXBP-WV-T TN-5518A-8PoE-2GTXBP-WV-CT-T
CBL-M12XMM8PRJ45-Y-200-IP67	M12-to-RJ45 Cat-5 UTP Ethernet cable, 8-pin male X-coded crimp type M12 connector, IP67, 2 m  Applicable Models: TN-5510A-2GTX-WV-T TN-5510A-2GTX-WV-CT-T TN-5510A-2GTXBP-WV-T TN-5510A-2GTXBP-WV-CT-T TN-5510A-8PoE-2GTX-WV-T TN-5510A-8PoE-2GTX-WV-CT-T TN-5510A-8PoE-2GTXBP-WV-T TN-5510A-8PoE-2GTXBP-WV-CT-T TN-5518A-2GTX-WV-T TN-5518A-2GTX-WV-CT-T TN-5518A-2GTXBP-WV-T TN-5518A-2GTXBP-WV-CT-T TN-5518A-8PoE-2GTX-WV-T TN-5518A-8PoE-2GTX-WV-CT-T TN-5518A-8PoE-2GTXBP-WV-T TN-5518A-8PoE-2GTXBP-WV-CT-T

## Connectors

M12A-5P-IP68	A-coded screw-in sensor connector, female, IP68, 4.05 cm
M12D-4PMM-IP67	M12 D-coded connector, QUICKON type, 4-pin male, IP67
M12D-4P-IP68	D-coded screw-in sensor connector, male, IP68

A-PLG-WPM23-01-IP67	M23 cable connector, female 6-pin, crimp type, IP67
M12X-8PMM-IP67-HTG	X-coded screw-in Gigabit Ethernet connector, 8-pin male M12 connector, IP67  Applicable Models: TN-5510A-2GTX-WV-T TN-5510A-2GTX-WV-CT-T TN-5510A-2GTXBP-WV-T TN-5510A-2GTXBP-WV-CT-T TN-5510A-8PoE-2GTX-WV-T TN-5510A-8PoE-2GTX-WV-CT-T TN-5510A-8PoE-2GTXBP-WV-T TN-5510A-8PoE-2GTXBP-WV-CT-T TN-5518A-2GTX-WV-T TN-5518A-2GTX-WV-CT-T TN-5518A-2GTXBP-WV-T TN-5518A-2GTXBP-WV-CT-T TN-5518A-8PoE-2GTX-WV-T TN-5518A-8PoE-2GTX-WV-CT-T TN-5518A-8PoE-2GTXBP-WV-T TN-5518A-8PoE-2GTXBP-WV-CT-T

### DIN-Rail Mounting Kits

DK-DC50131	DIN-rail mounting kit
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### M12 Connector Caps

A-CAP-M12F-M	Metal cap for M12 female connector
A-CAP-M12M-M	Metal cap for M12 male connector

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