TN-G4500 系列

EN 50155 Layer 2 多 Gigabit 交換器

特色與優點

- 4 個 10G 連接埠和 12 個 Gigabit 連接埠，M12 連接器
- 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[1]
- -40°C 至 70°C 操作溫度範圍
- Turbo Ring 與 Turbo Chain（復原時間 <50 毫秒 @ 250 台交換器），以及透過 RSTP/STP 協議支援網路備援
- 12 個符合 IEEE 802.3at/af 標準的 PoE 和乙太網路複合連接埠
- 每個 PoE 連接埠供電功率最高 30 瓦

認證

🚆 **EN 50155**   🛤 **EN 50121-4**   CE   FC

簡介

ToughNet TN-G4500 系列 M12 網管型乙太網路交換器專為鐵路應用所設計，適用於軌道車輛及軌道沿線等應用。此系列交換器配備 M12 接頭和類似的圓形連接頭，可確保緊密、穩固的連線能力，確保在振動和衝擊常見的工業環境中可正常運作。TN-G4500 系列乙太網路交換器提供 4 個具備 PoE 功能的 10G 乙太網路 M12 連接埠、16 個 Gigabit 乙太網路 M12 連接埠，以及 8 個具備 PoE 功能連接埠。這些 PoE 交換器被歸類為電源供應設備 (PSE)，每個連接埠可提供高達 30 瓦的電力，並且可供電給符合 IEEE 802.3at/af 標準的 IP 攝影機、無線存取點等受電設備 (PD)。

TN-G4500 系列結合了 24 至 110 VDC 的寬電源輸入範圍，讓您可以在全球各地使用相同類型的電源，並採用隔離式雙電源輸入設計，可提高通訊系統的可靠性。此外，-40 到 70°C 的寬廣操作溫度範圍，讓此設備適合在嚴峻環境中應用。TN-G4500 系列符合 EN 50155 標準的必要部分，涵蓋操作溫度、電源輸入電壓突波、ESD、振動、電源隔離，具有敷形塗層，以確保適用於各種工業應用。

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
- DHCP Option 82 以不同原則指派 IP 位址
- IGMP snooping 和 GMRP，用於過濾 multicast 流量
- 支援 EtherNet/IP 和 Modbus /TCP 工業級乙太網路通訊協定
- 以連接埠為基礎的 VLAN、IEEE 802.1Q VLAN 以及 GVRP，用來簡化網路規劃
- 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 提供有效率的網路監視與主動式功能
- 頻寬管理可預防無法預測的網路條件
- 連接埠鎖定僅允許存取授權的 MAC 位址
- Port mirroring 可用於除錯
- 透過電子郵件自動傳送警告通知
- 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/串列主控台、CLI 和 Windows 程式進行設定
- 迴圈保護，防止網路迴圈
- 壁掛安裝

規格

Ethernet Interface

10GBaseT(X) Ports (M12 X-coded 8-pin female connector with bypass relay)	TN-G4516 BP models: 2
10/100/1000BaseT(X) Ports (M12 X-coded 8-pin female connector)	4

---

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

MOXA®

PoE Ports (10GBaseT(X), M12 X-coded 8-pin female connector)	TN-G4516 non-BP models: 4 TN-G4516 BP models: 2
PoE Ports (100/1000BaseT(X), M12 X-coded 8-pin female connector)	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 802.3u for 100BaseT(X) IEEE 802.3bz for 5GBaseT and 2.5GBaseT IEEE 802.3an for 10GBaseT IEEE 802.3ad for Port Trunk with LACP IEEE 802.3af/at for PoE/PoE+ output IEEE 802.3x for flow control

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 DHCP Filter GMRP GVRP IGMP Snooping v1/v2/v3 IGMP Querier Port-based VLAN Static Multicast
Industrial Protocols	SNMPv1/v2c/v3
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) DNS Server Flow control HTTP ICMP IPv4/IPv6 Loop Protection LLDP Port-based DHCP Server Port Mirroring QoS/CoS/ToS RARP RMON SMTP SNMP Inform Syslog Telnet SNMP Trap
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

MOXA®

	RSTP STP Static Port Trunk Turbo Chain Turbo Ring v2 Turbo Ring with DRC
Security	Access control list TACACS+ Broadcast storm protection HTTPS/SSL Local Account Accessibility Port Lock RADIUS Rate Limit SSH Trust access control
Time Management	NTP Server/Client SNTP

Switch Properties

IGMP Groups	256
Max. No. of VLANs	256
Priority Queues	4
VLAN ID Range	VID 1 to 4094
Jumbo Frame Size	9.216 KB

LED Interface

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

Serial Interface

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

Power Parameters

No. of Power Inputs	2
Input Voltage	24/36/48/72/96/110 VDC
Operating Voltage	16.8 to 137.5 VDC
Input Current	7.5 A @ 24 VDC
Power Consumption (Max.)	With PoE disabled: 21.9 W @ 24 VDC 21.8 W @ 110 VDC With PoE enabled: 49.1 W @ 24 VDC 38.2 W @ 110 VDC
Total PoE Power Budget	120 W
Overload Current Protection	Supported
Reverse Polarity Protection	Supported
Power Connector	M12 K-coded 5-pin male connector

Physical Characteristics

Housing	Metal
IP Rating	IP40
Dimensions	291.6 x 117.7 x 132.2 mm (11.48 x 4.63 x 5.20 in)
Weight	TN-G4516 without bypass: 2,780g(6.13lb) TN-G4516 with bypass: 2,790g(6.15lb)
Installation	Wall mounting
Protection	-CT model with 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	2000 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 6 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 IEC 60571
Railway Fire Protection	EN 45545-2
Safety	IEC 62368-1 UL 62368-1
Shock	IEC 60068-2-27, IEC 61373, EN 50155
Vibration	IEC 60068-2-64, IEC 61373, EN 50155

Declaration

Green Product	RoHS, CRoHS, WEEE

MTBF

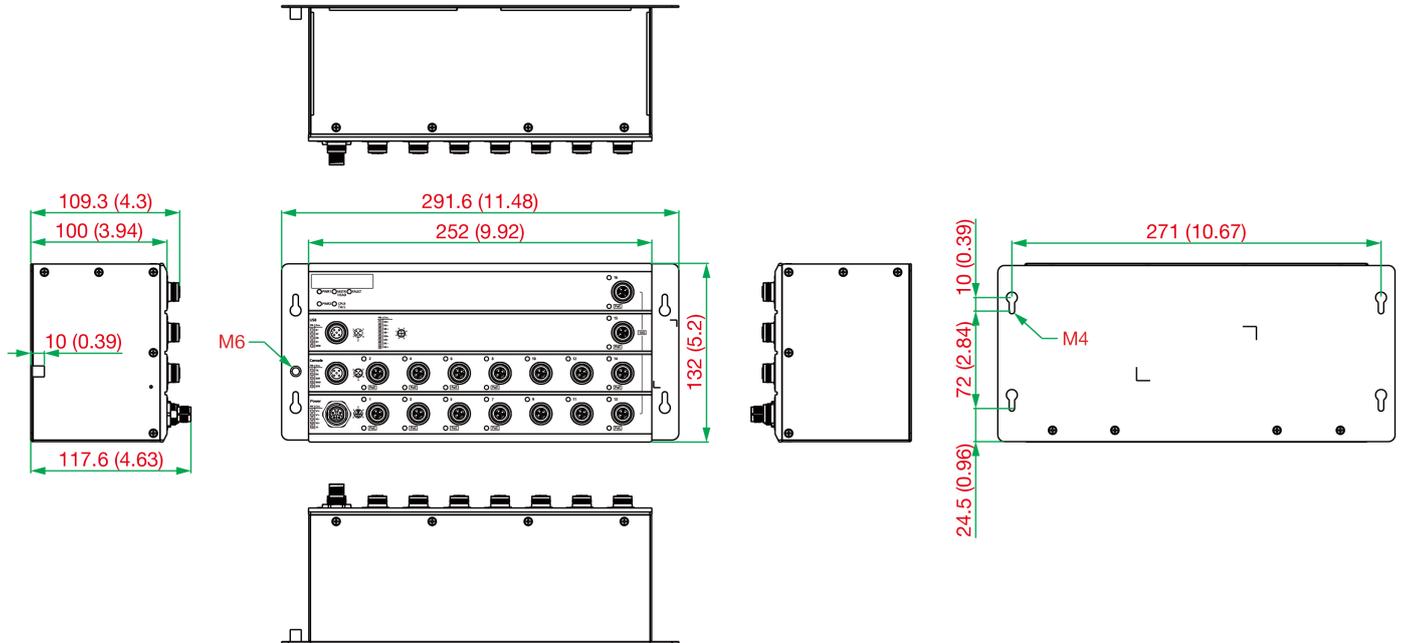|	
Time	TN-G4516 without bypass: 436,136 hrs TN-G4516 with bypass: 435,764 hrs
Standards	Telcordia Standard SR-332

Warranty

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

Package Contents

Device	1 x TN-G4500 Series switch
Installation Kit	1 x wall-mounting kit
Documentation	1 x quick installation guide 1 x warranty card

尺寸

單位：公釐（英吋）

訂購資訊

Model Name	10/100/1000BaseT(X) Ports, M12 X-coded 8-pin Female Connector	10G BaseT(X) Ports, M12 X-coded 8-pin Female Connector With Bypass Relay	100/1000BaseT(X) PoE Ports, M12 X-coded 8-pin Female Connector	10G BaseT(X) PoE Ports, M12 X-coded 8-pin Female Connector	Conformal Coating
TN-G4516-8GPoE-4XGPoE-WV-T	4	-	8	4	No
TN-G4516-8GPoE-4XGPoE-WV-CT-T	4	-	8	4	Yes
TN-G4516-8GPoE-2XGPoE-2XGTXBP-WV-T	4	2	8	2	No
TN-G4516-8GPoE-2XGPoE-2XGTXBP-WV-CT-T	4	2	8	2	Yes

配件（選購）

M12 Connector Caps

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

Connectors

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-M12KFF5POPEN-O-150-IP67	K-coded female M12-to-5-pin open wire power cable, orange, IP67-rated, 1.5 m
CBL-M12BMM5PF9-BK-150-IP68	B-coded male M12-to-5-pin DB9 console cable, black, IP68-rated, 1.5 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