

TN-4500B Series

EN 50155 8 to 28 ports Ethernet managed switches



Features and Benefits

- Developed according to the IEC 62443-4-1 and compliant with the IEC 62443-4-2 industrial cybersecurity standards
- Up to 28 Ethernet ports with M12 push-pull connectors
- Up to 8 Gigabit ports with optional dual relay bypass functionality
- Up to 24 PoE ports with a 150 W total PoE power budget
- Isolated power with 24 to 110 VDC power supply range
- -40 to 70°C system operating temperature range
- Complies with all EN 50155 mandatory test items¹
- Powered by MX-NOS Rail Version, a comprehensive management firmware tailored to the unique demands of onboard railway networks

Certifications



EN 50155



EN 50121-4



Introduction

The ToughNet TN-4500B Series M12 managed Ethernet switches are designed for railway applications, including rolling stock installations. The switches use M12 circular connectors to ensure tight, robust connections, and guarantee reliable operation in industrial environments where vibration and shock are commonplace. The TN-4500B Series Ethernet switches provide 8 to 28 Ethernet ports with or without IEEE 802.3at/af compliant PoE functionality. The Gigabit models further feature up to 8 Gigabit Ethernet ports.

The 24 to 110 VDC wide power input range and isolated dual power inputs not only allow you to use the same type of power source at different sites around the globe, but also increase the reliability of your communication systems. Furthermore, the -40 to 70°C operating temperature range of the switches ensures they can be deployed in harsh environments. TN-4500B Series Ethernet switches are compliant with the mandatory sections of EN 50155, covering operating temperature, power input voltage, surge, ESD, and vibration, as well as conformal coating and power insulation, making the switches suitable for a variety of industrial applications.

Additional Features and Benefits

- IEC 62443-4-2:2019 compliant cybersecurity features
- Robust EN 50155 Ethernet switches for rolling stock applications
- Turbo Ring and RSTP/MSTP/STP/MRP for network redundancy
- Wall mounting installation
- Automatic recovery of the IP address of connected devices
- Configurable by web browser, Telnet/serial console, or Windows utility

Specifications

Ethernet Interface

10/100BaseT(X) Ports (M12 D-coded 4-pin female connector)	TN-4516B-CT-T: 16 TN-4516B-8G-CT-T: 8
PoE Ports (10/100BaseT(X), M12 D-coded 4-pin female connector)	TN-4516B PoE models: 8 TN-4520B models: 12
10/100/1000BaseT(X) Ports (M12 X-coded 8-pin female connector)	TN-4516B-8G-CT-T: 8 TN-4516B-8P-4G-4GP-CT-T: 4 TN-4520B-12P-4G-4GP-CT-T: 4
PoE Ports (100/1000BaseT(X), M12 X-coded 8-pin female connector)	16/20-port PoE models: 4

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

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) Windows Utility
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 Mirror 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 Trust access control Port Lock Sticky MAC HTTPS/SSL SSH RADIUS TACACS+ Access control list Login and password policy DHCP Snooping
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
Serial Interface	
Console Port	M12 B-coded 5-pin female connector (RS-232)
USB Interface	
M12 Connector	M12 A-coded 5-pin female (for ABC-02 USB storage)
Power Parameters	
Input Current	TN-4516B non-PoE models: 0.83 A @ 24 VDC TN-4516B PoE models: 9.3 A @ 24 VDC TN-4520B PoE models: 9.3 A @ 24 VDC
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
Total PoE Power Budget	TN-4516B/TN-4520B PoE models: 150 W
Physical Characteristics	
Housing	Metal
Dimensions	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-4520B models: 280 x 115 x 133 mm (11.02 x 4.53 x 5.24 in)
IP Rating	IP42

Weight	TN-4516B non-PoE models: 1,500 g (2.48 lb) TN-4516B PoE models: 2,310 g (5.10 lb) TN-4520B models: 2,419 g (5.33 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
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
MTBF	
Time	TN-4516B-CT-T: 1,346,637 hrs TN-4516B-8G-CT-T: 1,148,405 hrs TN-4516B-8P-4G-4GP-CT-T: 881,578 hrs TN-4516B-8P-4GP-4GBPCT-T: 707,988 hrs TN-4520B-12P-4G-4GP-CT-T: 851,025 hrs TN-4520B-12P-4GP-4GBPCT-T: 688,231 hrs
Standards	Telcordia SR332 Issue 4

Warranty

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

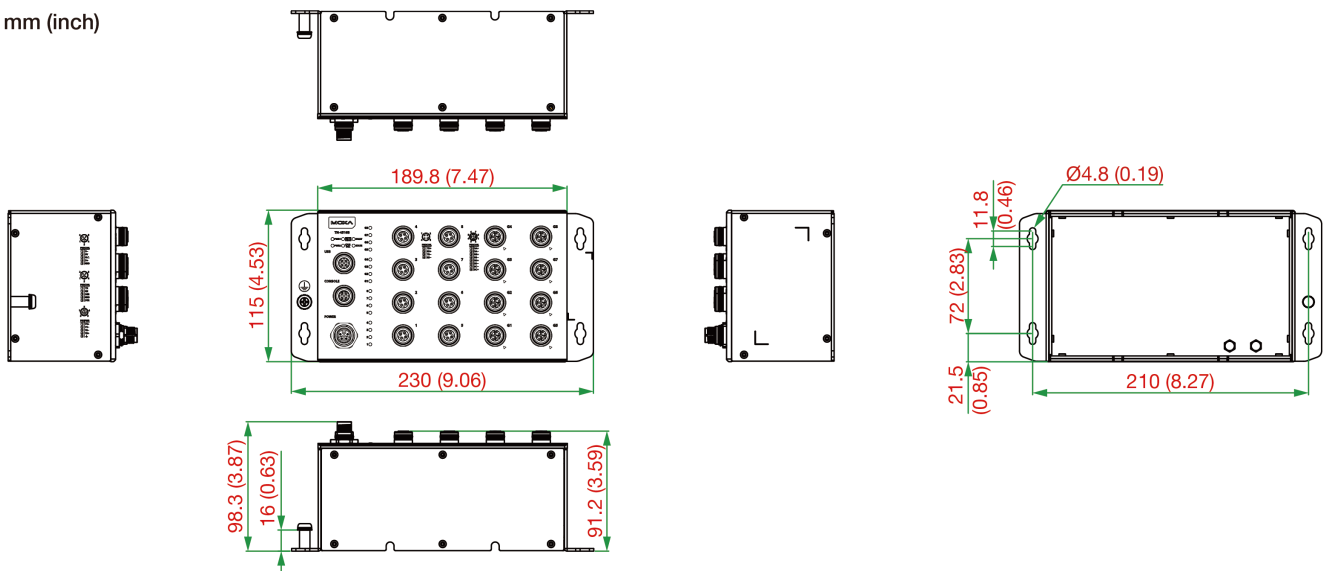
Package Contents

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

Dimensions

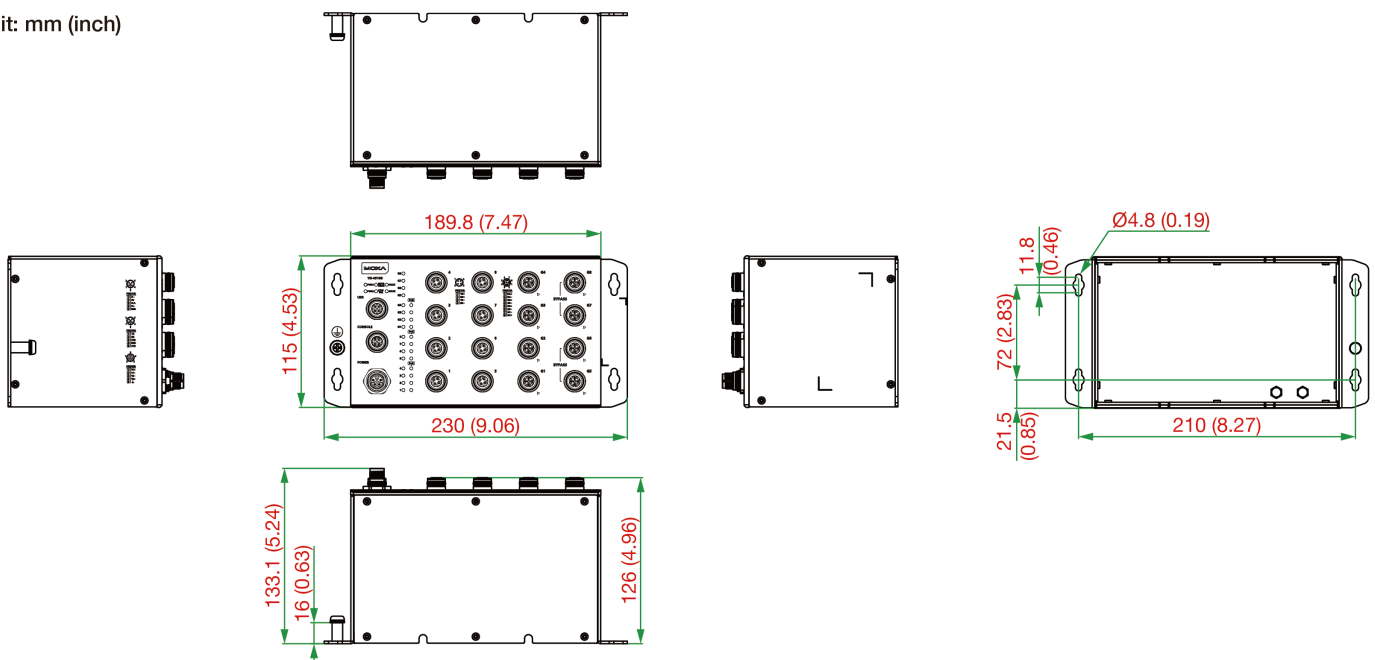
TN-4516B Non-PoE Models

Unit: mm (inch)



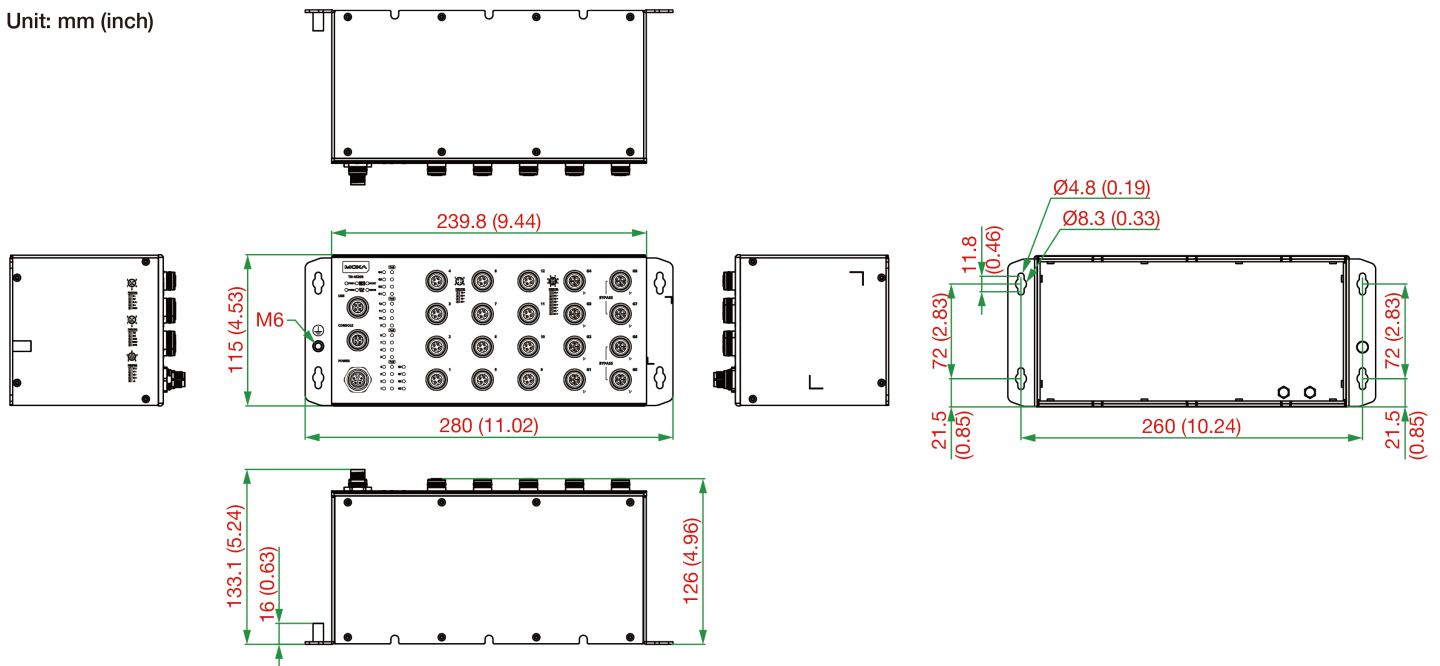
TN-4516B PoE Models

Unit: mm (inch)



TN-4520B PoE Models

Unit: mm (inch)



Ordering Information

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-CT-T	-	-	-	16	-	-
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-4520B-12P-4G-4GP-CT-T	4	4	-	-	12	150 W
TN-4520B-12P-4GP-4GBP-CT-T	-	4	4	-	12	150 W

Accessories (sold separately)

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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