

# TN-5500A Series

EN 50155 8- to 18-port Ethernet switches with up to 8 PoE ports and up to 2 Gigabit ports



## Features and Benefits

- Up to 2 Gigabit ports with optional bypass relay function
- 8 IEEE 802.3at/af compliant PoE and Ethernet combo ports
- Isolated power with 24 to 110 VDC power supply range
- Complies with all EN 50155 mandatory test items<sup>1</sup>
- -40 to 75°C operating temperature range
- Turbo Ring and Turbo Chain (recovery time < 20 ms @ 250 switches), and STP/RSTP/MSTP for network redundancy

## Certifications



## Introduction

The ToughNet TN-5500A Series M12 managed Ethernet switches are designed for railway applications, such as rolling stock, and wayside installations. The TN-5500A Series switches use M12 and other circular connectors to ensure tight, robust connections, and guarantee reliable operation against environmental disturbances, such as vibration and shock. The TN-5500A Series Ethernet switches provide 8 or 16 Fast Ethernet M12 ports with or without 8 IEEE 802.3at/af compliant PoE (Power-over-Ethernet) ports, and 2 ports on the down side to provide the Gigabit Ethernet interface with an optional bypass relay function. The PoE switches are classified as power source equipment (PSE) and provide up to 30 watts of power per port, and can be used to power IEEE 802.3at/af compliant powered devices (PDs), such as IP surveillance, wireless access points, and IP phones.

The TN-5500A Series provides a wide power input range of 24/36/48/72/96/110 VDC that allows you to use the same type of power source at different sites around the globe. In addition, the 24 to 110 VDC wide power input range and isolated power increases the reliability of your communications system. In addition, the -40 to 75°C operating temperature and IP54 rated waterproof enclosure allow deployment in harsh environments. TN-5500A Series Ethernet switches are compliant with 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

- Provides up to 30 watts per PoE port with a total power budget of 120 watts per switch
- IPv6 Ready logo awarded (IPv6 Logo Committee certified)
- Leading EN 50155 PoE switches for rolling stock applications
- DHCP Option 82 for IP address assignment with different policies
- Turbo Ring and Turbo Chain (recovery time < 20 ms @ 250 switches), and STP/RSTP/MSTP for network redundancy
- IGMP snooping and GMRP for filtering multicast traffic
- EtherNet/IP and Modbus TCP industrial Ethernet protocols supported
- Port-based VLAN, IEEE 802.1Q VLAN, and GVRP to ease network planning
- QoS (IEEE 802.1p/1Q and ToS/DiffServ) allows real-time traffic classification and prioritization
- IEEE 802.3ad, LACP for optimum bandwidth utilization
- SNMPv1/v2c/v3 for different levels of network management
- TACACS+, SNMPv3, IEEE 802.1X, HTTPS, and SSH to enhance network security
- RMON for proactive and efficient network monitoring
- Bandwidth management to prevent unpredictable network status
- Lock port allows access by only authorized MAC addresses
- Port mirroring for online debugging
- Automatic warning by exception through email and relay output
- Line-swap fast recovery
- LLDP for automatic topology discovery in network management software
- Configurable by web browser, Telnet/serial console, CLI, and Windows utility
- Loop protection to prevent network loops
- Panel mounting or DIN-rail mounting installation capability

## Specifications

### 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. 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](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-2GTXBP Series: 2 TN-5510A-8PoE-2GTXBP Series: 2 TN-5518A-2GTXBP Series: 2 TN-5518A-8PoE-2GTXBP: 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

#### Physical Characteristics

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

#### Environmental Limits

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

#### Standards and Certifications

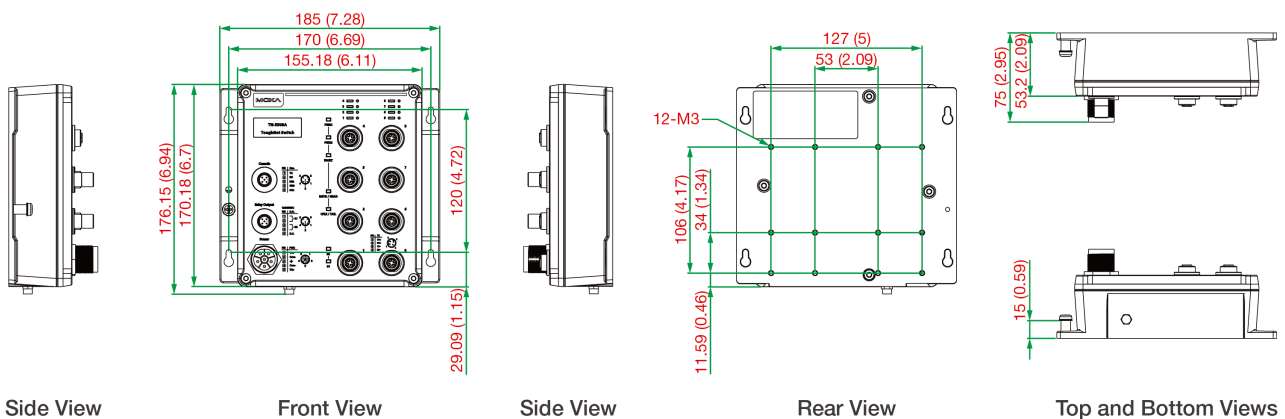
EMS	IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 20 V/m IEC 61000-4-4 EFT: Power: 2 kV; Signal: 2 kV IEC 61000-4-5 Surge: Power: 2 kV; Signal: 2 kV IEC 61000-4-6 CS: 10 V IEC 61000-4-8 PFMF
Freefall	IEC 60068-2-31
Radio Frequency	FCC
Railway	EN 50121-4 EN 50155
Railway 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
<b>Declaration</b>	
Green Product	RoHS, CRoHS, WEEE
<b>MTBF</b>	
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
<b>Warranty</b>	
Warranty Period	5 years
Details	See <a href="http://www.moxa.com/warranty">www.moxa.com/warranty</a>
<b>Package Contents</b>	
Device	1 x TN-5500A Series switch
Installation Kit	1 x wall-mounting kit
Documentation	1 x quick installation guide 1 x warranty card

## Dimensions

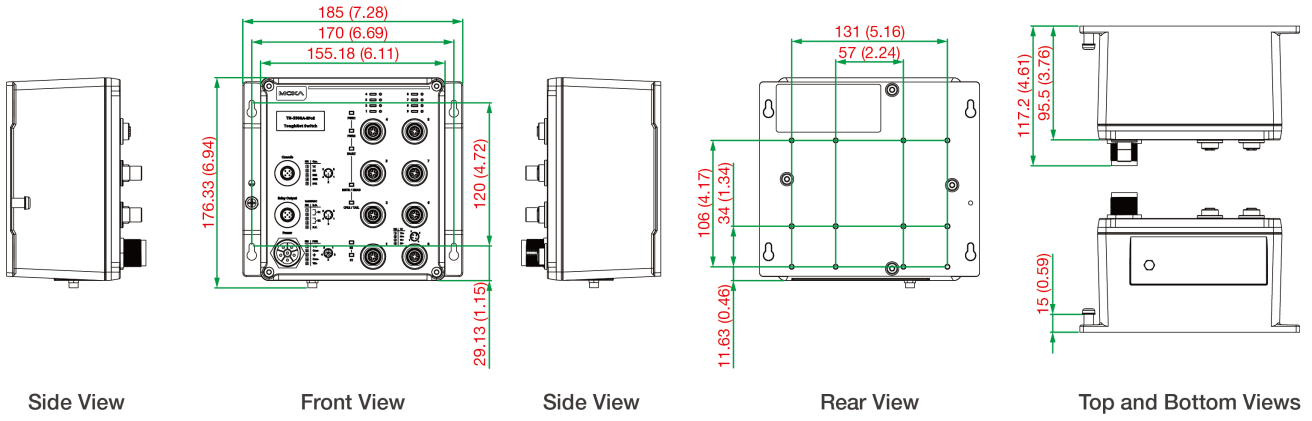
### TN-5508A non-PoE Series

Unit: mm (inch)



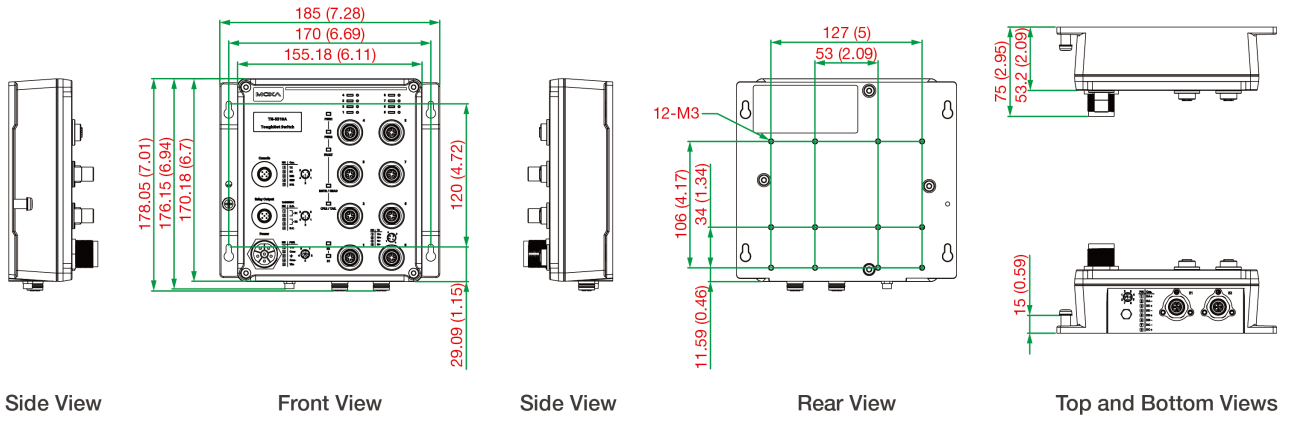
### TN-5508A-8PoE Series

Unit: mm (inch)



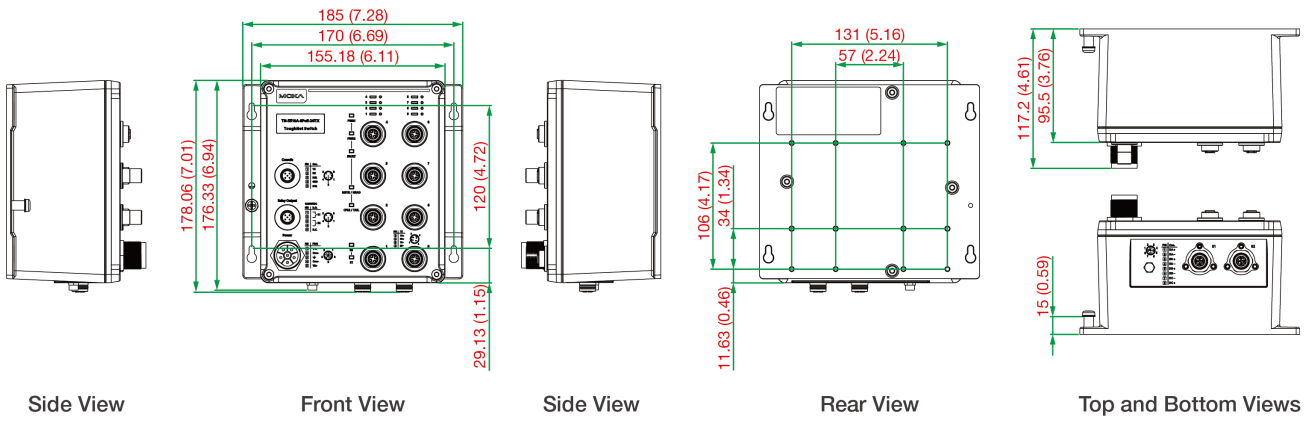
### TN-5510A non-PoE Series

Unit: mm (inch)



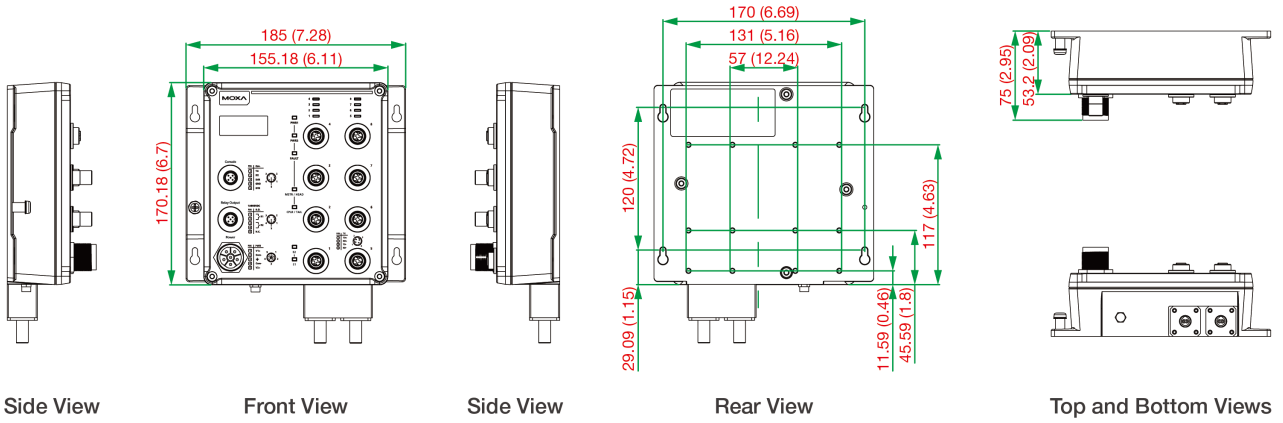
### TN-5510A-8PoE Series

Unit: mm (inch)



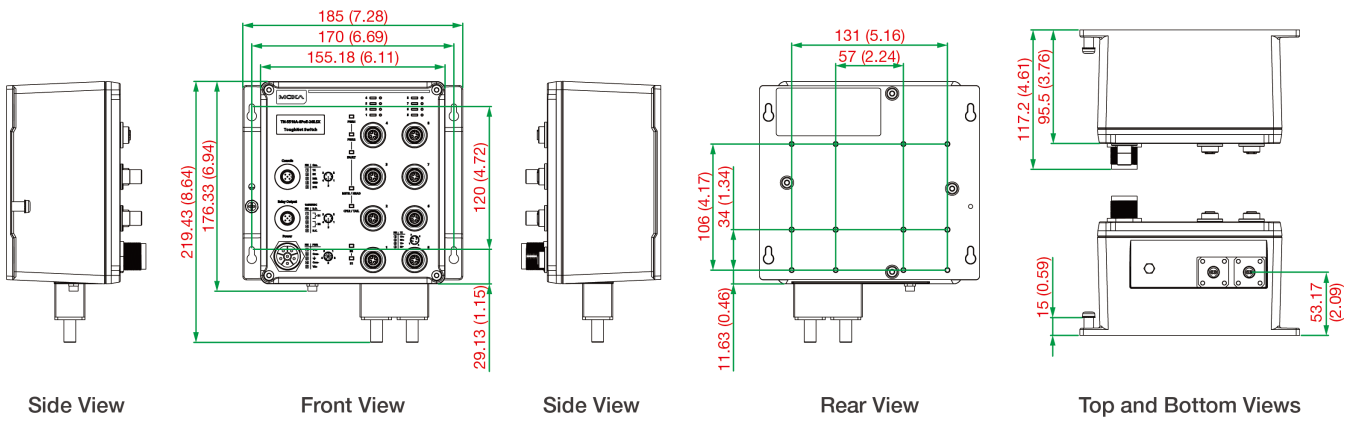
### TN-5510A-2GLSX-ODC Series

Unit: mm (inch)



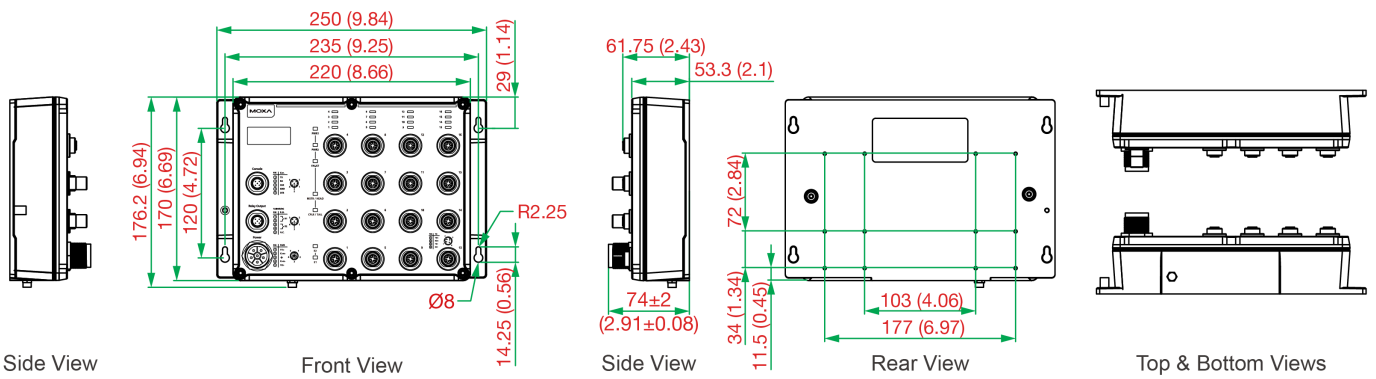
### TN-5510A-8PoE-2GLSX-ODC Series

Unit: mm (inch)



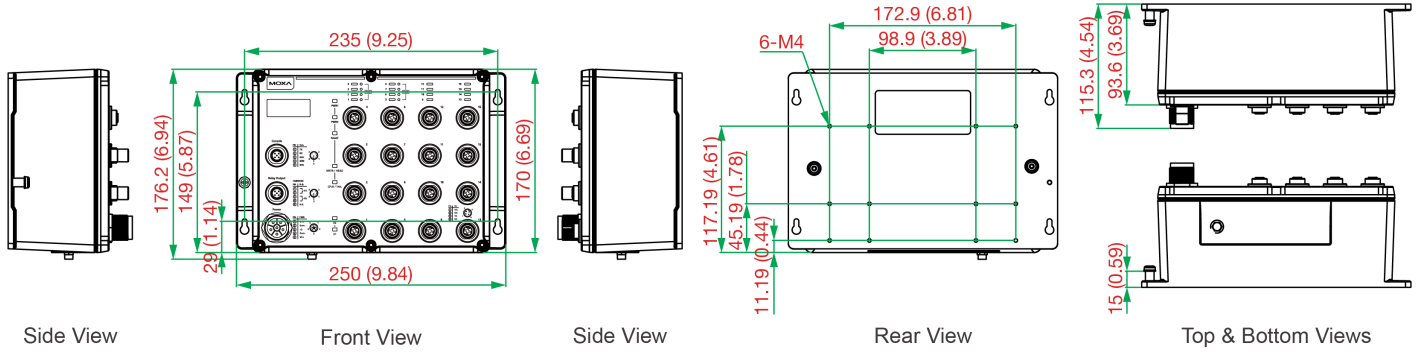
### TN-5516A non-PoE Series

Unit: mm (inch)



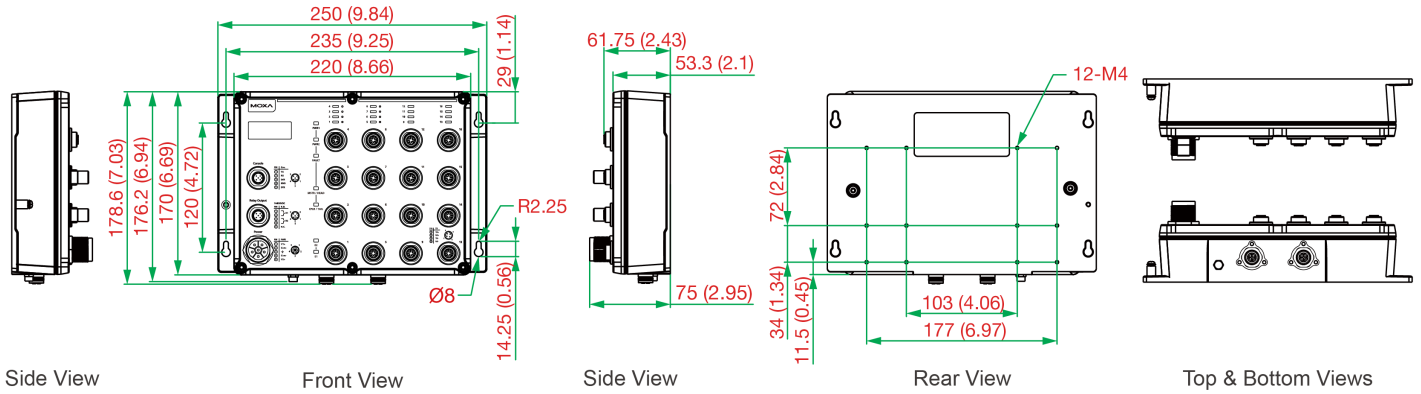
## TN-5516A-8PoE Series

Unit: mm (inch)



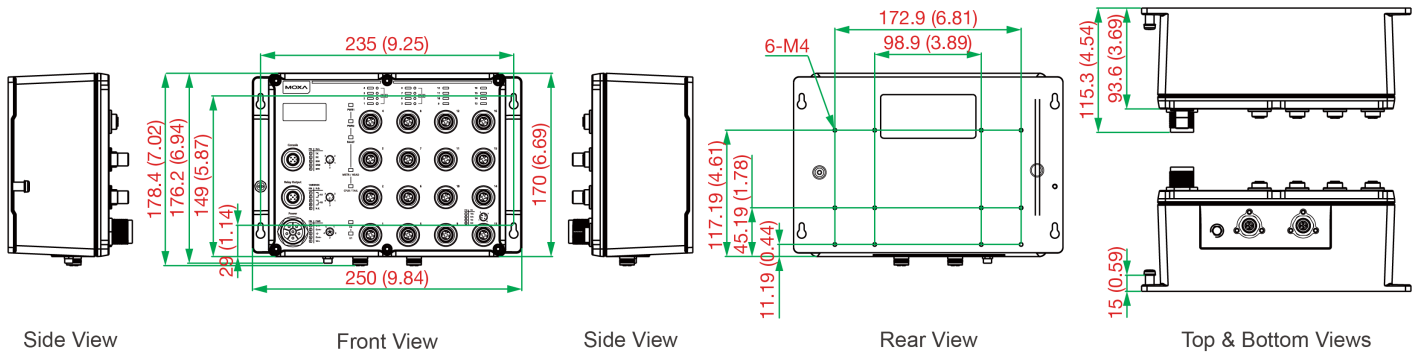
## TN-5518A non-PoE Series

Unit: mm (inch)



## TN-5518A-8PoE Series

Unit: mm (inch)



## Ordering Information

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	✓

## Accessories (sold separately)

### 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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