TN-5305 Series

EN 50155 5-port IP67 unmanaged Ethernet switches

Features and Benefits

- 10/100BaseT(X), 4-pin M12 (D-coded), F/H duplex mode, and auto MDI/MDI-X connection
- IP67-rated housing protection
- Power input: 12 to 45 VDC, 18 to 30 VAC
- Complies with all EN 50155 mandatory test items[1]
- -40 to 75°C operating temperature range (-T models)

Certifications

EN 50155 EN 50121-4 CE FC

Introduction

The TN-5305 Series Ethernet switches are IP67-rated for tough industrial applications. By using M12 connectors, you can rest assured that Ethernet cables will connect tightly to the switch, and will be robust enough to protect your applications from external disturbances, such as the vibration and shock encountered in the transportation industry.

The space-saving TN-5305 switches can be mounted virtually anywhere, and wide operating temperature (-40 to 75°C) models are also available for use in the most extreme weather conditions. TN-5305 Series Ethernet switches comply with a portion of EN 50155 specifications, covering operating temperature, power input voltage, surge, ESD, and vibration, making the switches suitable for a variety of industrial applications.

Specifications

Ethernet Interface	
10/100BaseT(X) Ports (M12 D-coded 4-pin female connector)	5
Standards	IEEE 802.3 for 10BaseT IEEE 802.3u for 100BaseT(X) IEEE 802.3x for flow control

Power Parameters	
Input Current	0.1 A @ 24 VDC, 0.08 A @ 36 VDC
Input Voltage	18 to 30 VAC (47 to 63 Hz), 24 to 36 VDC
Inrush Current (Max.)	0.28 A @ 24 VDC
No. of Power Inputs	1
Operating Voltage	18 to 30 VAC 12 to 45 VDC
Power Connector	M12 A-coded male connector

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

Physical Characteristics

Housing	Plastic top cover, metal bottom plate
IP Rating	IP67
Dimensions	60 x 125 x 29.6 mm (2.36 x 4.92 x 1.09 in)
Weight	Packaged: 270 g (0.56 lb)
Installation	DIN-rail mounting (with optional kit), Wall mounting

Environmental Limits

Operating Temperature	TN-5305: -25 to 60°C (-13 to 140°F) TN-5305-T: -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

Freefall	IEC 60068-2-32
EMC	EN 55032/24
EMI	CISPR 32, FCC Part 15B Class A
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
Environmental Testing	IEC 60068-2-1, EN 50155 IEC 60068-2-14, EN 50155 IEC 60068-2-2, EN 50155 IEC 60068-2-30, EN 50155
International Approval	RCM
Railway	EN 50121-4, EN 50155
Railway Fire Protection	EN 45545-2
Safety	EN 60950-1, UL 508
Salt Spray Test	IEC 60068-2-11, EN 50155
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	3,451,678 hrs
Standards	Telcordia SR332

Warranty

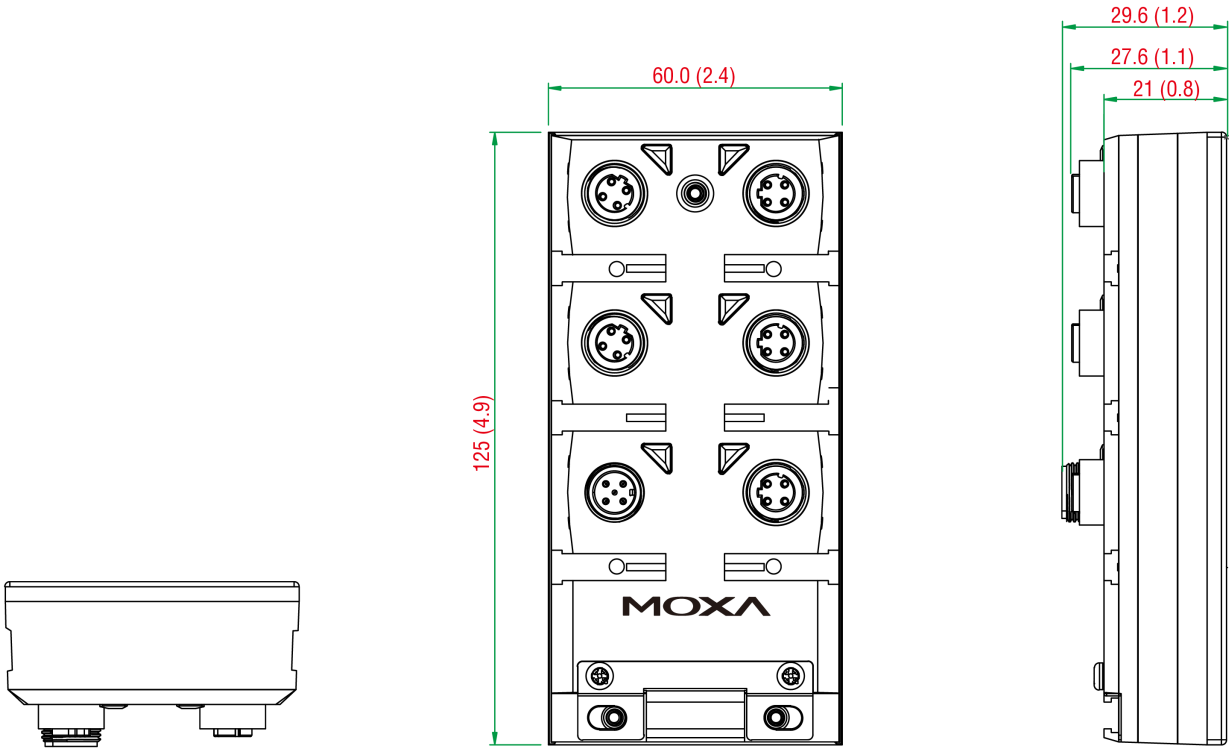
Warranty Period	5 years
Details	See www.moxa.com/warranty

Package Contents

Device	1 x TN-5305 Series switch
Installation Kit	1 x panel-mounting kit
Documentation	1 x quick installation guide 1 x warranty card

Dimensions

Unit: mm (inch)



Top View

Front View

Side View

Ordering Information

Model Name	PoE, 10/100BaseT(X) Ports, M12 D-Coded Female Connector	10/100BaseT(X) Ports, M12 D-Coded Female Connector	Power Input	Input Voltage	Operating Temp.
TN-5305	–	5	Single input	24/36 VDC, 18 to 30 VAC	-25 to 60°C
TN-5305-T	–	5	Single input	24/36 VDC, 18 to 30 VAC	-40 to 75°C

Accessories (sold separately)

Cables

CBL-M12(FF5P)/Open-100 IP67	A-coded M12-to-5-pin power cable, IP67-rated 5-pin female M12 connector, 1 m

CBL-M12D(MM4P)/RJ45-100 IP67	M12-to-RJ45 cable, IP67-rated, 1 m

M12 Connector Caps

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

Connectors

M12D-4PMM-IP67	M12 D-coded connector, QUICKON type, 4-pin male, IP67
M12D-4P-IP68	M12 D-coded screw-in sensor connector, male, IP68

DIN-Rail Mounting Kits

DK-M12-305	DIN-rail mounting kit for EDS-305-M12

TN-5308 Series

EN 50155 8-port unmanaged Ethernet switches

Features and Benefits

- M12 connectors and IP40 metal housing
- Up to 8 IEEE 802.3af compliant PoE and Ethernet combo ports
- Supports IEEE 802.3/802.3u/802.3x
- Complies with all EN 50155 mandatory test items[1]
- -40 to 75°C operating temperature range (-T models)

Certifications

EN 50155 EN 50121-4

Introduction

The ToughNet TN-5308 Series M12 unmanaged Ethernet switches are designed for industrial applications in harsh environments. TN-5308 Series switches use M12 connectors to ensure tight, robust connections, and guarantee reliable operation against environmental disturbances, such as vibration and shock. The TN-5308 Series Ethernet switches provide 8 Fast Ethernet M12 ports, support IEEE 802.3/802.3u/802/3x with 10/100M, full/half-duplex, MDI/MDI-X auto-sensing, and provide an economical solution for your industrial Ethernet network.

Models with an extended operating temperature range of -40 to 75°C are also available. TN-5308 Ethernet switches comply with those EN 50155 requirements that make products more suitable for rolling stock applications, including operating temperature, power input voltage, surge, ESD, and vibration, making the switches suitable for a variety of industrial applications. TN-5308 PoE Ethernet switches provide 4 or 8 IEEE 802.3af compliant PoE ports. These switches are classified as power source equipment (PSE) and provide up to 15.4 watts of power per port.

Specifications

Ethernet Interface

10/100BaseT(X) Ports (M12 D-coded 4-pin female connector)	TN-5308 Series non-PoE models: 8
PoE Ports (10/100BaseT(X), M12 D-coded 4-pin female connector)	TN-5308-4PoE Series: 4 TN-5308-8PoE Series: 8
Standards	IEEE 802.3 for 10BaseT IEEE 802.3u for 100BaseT(X) IEEE 802.3x for flow control TN-5308 Series PoE models: IEEE 802.3af for PoE

Power Parameters

Input Current	TN-5308-LV Series: 0.19 A @ 12 VDC, 0.10 A @ 24 VDC, 0.05 A @ 48 VDC TN-5308-MV Series: 0.033 A @ 72 VDC, 0.024 A @ 96 VDC, 0.021 A @ 110 VDC TN-5308-4PoE Series: 1.6 A @ 48 VDC TN-5308-8PoE Series: 2.9 A @ 48 VDC
Input Voltage	TN-5308-LV Series: 12 to 48 VDC TN-5308-MV Series: 72 to 110 VDC PoE models: 48 VDC
Max. PoE Power Output per Port	TN-5308 Series PoE models: 15.4 W
No. of Power Inputs	1

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

Operating Voltage	TN-5308-LV Series: 8.4 to 60 VDC TN-5308-MV Series: 50.4 to 137.5 VDC TN-5308 Series PoE models: 46 to 50 VDC
Power Connector	TN-5308-LV Series and TN-5308 Series PoE models: M12 A-coded male connector TN-5308-MV Series: M23 connector

Physical Characteristics

Housing	Metal
IP Rating	IP40
Dimensions	TN-5308-LV Series: 60 x 216.6 x 36.1 mm (2.36 x 8.53 x 1.42 in) TN-5308-MV Series: 60 x 216.6 x 53.8 mm (2.36 x 8.53 x 2.12 in) TN-5308-4PoE Series: 60 x 216.6 x 48.7 mm (2.36 x 8.53 x 1.91 in) TN-5308-8PoE Series: 60 x 216.6 x 52.9 mm (2.36 x 8.53 x 2.1 in)
Weight	TN-5308-LV Series: 485 g (1.07 lb) TN-5308-MV Series: 685 g (1.51 lb) TN-5308-4PoE Series: 675 g (1.49 lb) TN-5308-8PoE Series: 970 g (2.14 lb)
Installation	DIN-rail mounting (with optional kit), Wall mounting
Protection	TN-5308 Series -CT models: PCB conformal coating

Environmental Limits

Operating Temperature	Standard Models: -25 to 60°C (-13 to 140°F) Wide Temp. Models: -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

Freefall	IEC 60068-2-32
EMC	EN 55032/24
EMI	CISPR 32, FCC Part 15B Class A
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
Environmental Testing	IEC 60068-2-1, EN 50155 IEC 60068-2-14, EN 50155 IEC 60068-2-2, EN 50155 IEC 60068-2-30, EN 50155
International Approval	RCM
Railway	EN 50121-4, EN 50155
Railway Fire Protection	EN 45545-2
Safety	EN 60950-1, UL 508
Salt Spray Test	IEC 60068-2-11, EN 50155

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-5308-LV Series: 2,099,286 hrs TN-5308-MV Series: 2,590,858 hrs TN-5308-4PoE Series: 252,075 hrs TN-5308-8PoE Series: 308,392 hrs
Standards	Telcordia SR332

Warranty

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

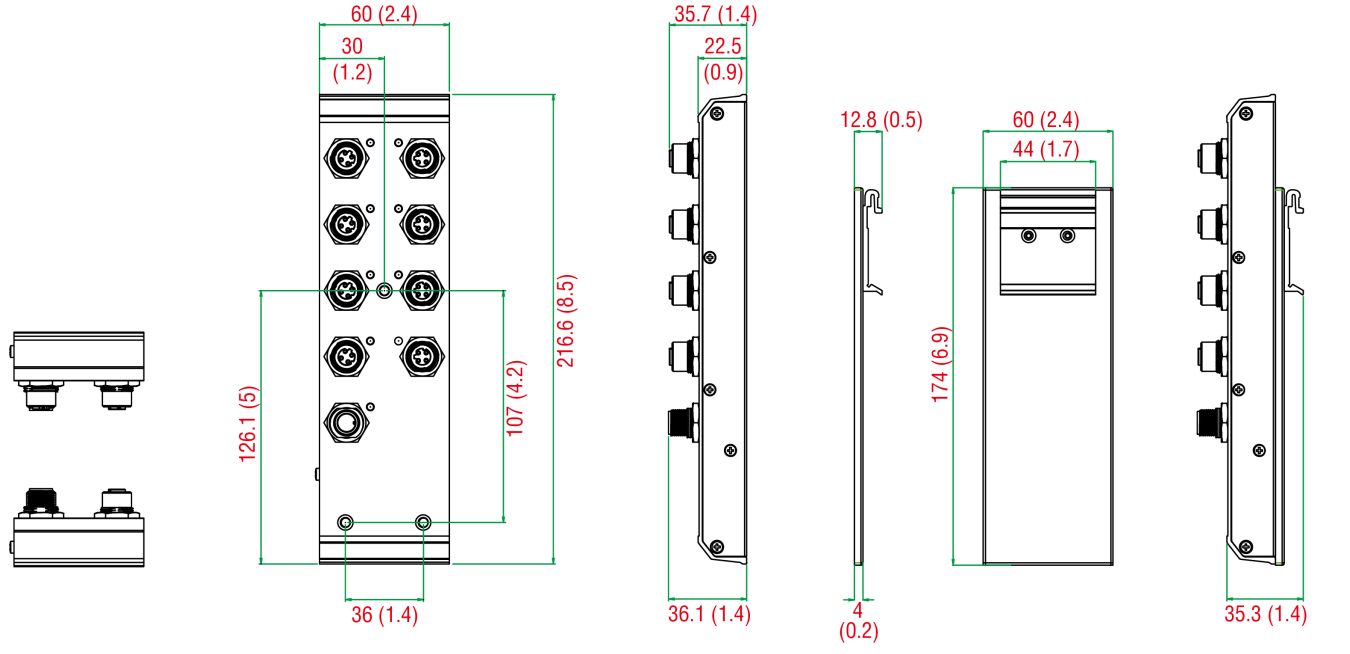
Package Contents

Device	1 x TN-5308 Series switch
Installation Kit	1 x panel-mounting kit
Documentation	1 x quick installation guide 1 x warranty card

Dimensions

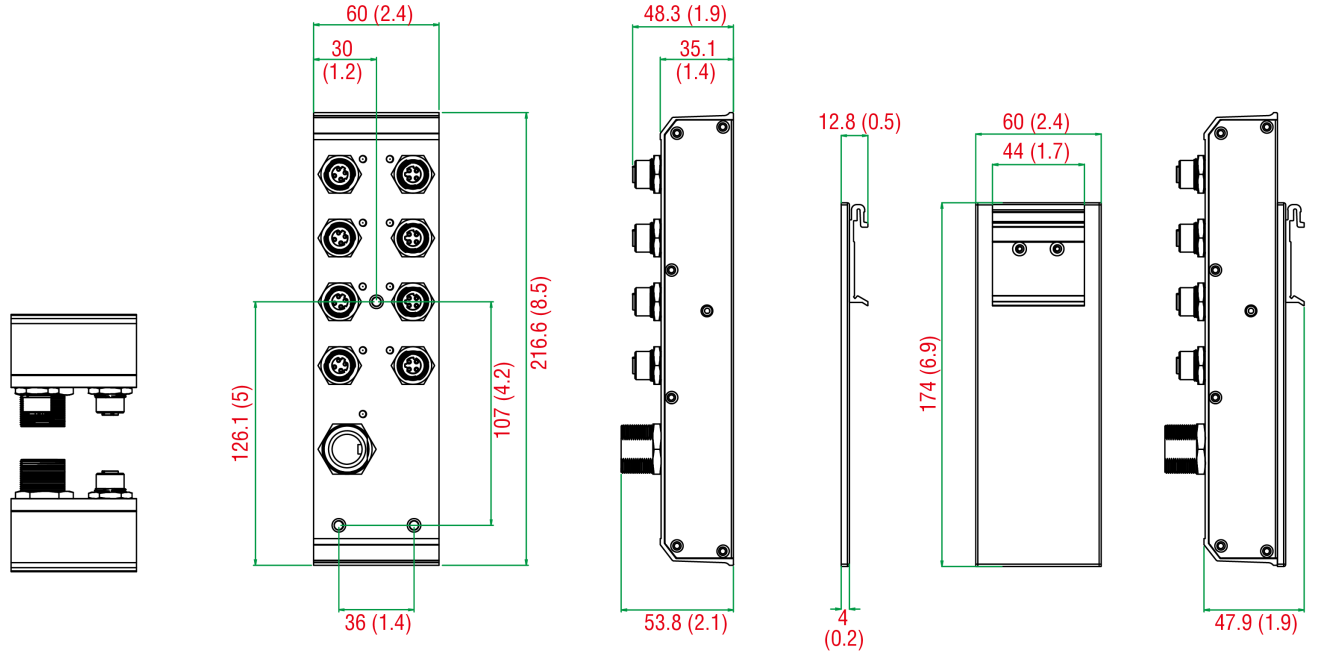
TN-5308-LV Series

Unit: mm (inch)



Top and Bottom Views | Front View | Side View | DIN-Rail Mounting Kit | Side View (including DIN-Rail)

Unit: mm (inch)



Top and Bottom Views | Front View | Side View | DIN-Rail Mounting Kit | Side View (including DIN-Rail)

Ordering Information

Model Name	PoE, 10/100BaseT(X) Ports, M12 D-Coded Female Connector	10/100BaseT(X) Ports, M12 D-Coded Female Connector	Power Input	Input Voltage	Operating Temp.	Conformal Coating
TN-5308-LV	–	8	Single input	12/24/36/48 VDC	-25 to 60°C	–
TN-5308-LV-CT	–	8	Single input	12/24/36/48 VDC	-25 to 60°C	✓
TN-5308-LV-T	–	8	Single input	12/24/36/48 VDC	-40 to 75°C	–
TN-5308-LV-CT-T	–	8	Single input	12/24/36/48 VDC	-40 to 75°C	✓
TN-5308-MV	–	8	Single input	72/96/110 VDC	-25 to 60°C	–
TN-5308-MV-CT	–	8	Single input	72/96/110 VDC	-25 to 60°C	✓
TN-5308-MV-T	–	8	Single input	72/96/110 VDC	-40 to 75°C	–
TN-5308-MV-CT-T	–	8	Single input	72/96/110 VDC	-40 to 75°C	✓
TN-5308-4PoE-48	4	4	Single input	48 VDC	-25 to 60°C	–
TN-5308-4PoE-48-CT	4	4	Single input	48 VDC	-25 to 60°C	✓
TN-5308-4PoE-48-T	4	4	Single input	48 VDC	-40 to 75°C	–
TN-5308-4PoE-48-CT-T	4	4	Single input	48 VDC	-40 to 75°C	✓
TN-5308-8PoE-48	8	–	Single input	48 VDC	-25 to 60°C	–
TN-5308-8PoE-48-CT	8	–	Single input	48 VDC	-25 to 60°C	✓
TN-5308-8PoE-48-T	8	–	Single input	48 VDC	-40 to 75°C	–
TN-5308-8PoE-48-CT-T	8	–	Single input	48 VDC	-40 to 75°C	✓

Accessories (sold separately)

Cables

CBL-M12(FF5P)/Open-100 IP67	A-coded M12-to-5-pin power cable, IP67-rated 5-pin female M12 connector, 1 m Applicable Models: TN-5308-LV TN-5308-LV-T TN-5308-LV-CT-T TN-5308-MV-CT-T TN-5308-4PoE-48 TN-5308-4PoE-48-T TN-5308-8PoE-48 TN-5308-8PoE-48-T
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 Applicable Models: TN-5308-MV TN-5308-MV-T
CBL-M12DMM4PM12DMM4P-BK-100-IP67	M12-to-M12 Cat-5E STP Ethernet cable, 4-pin D-coded M12 connector, IP67, 1 m

M12 Connector Caps

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

Connectors

M12D-4PMM-IP67	M12 D-coded connector, QUICKON type, 4-pin male, IP67
M12D-4P-IP68	M12 D-coded screw-in sensor connector, male, IP68
A-PLG-WPM23-01-IP67	M23 cable connector, female 6-pin, crimp type, IP67 Applicable Models: TN-5308-MV TN-5308-MV-T

DIN-Rail Mounting Kits

DK-TN-5308	DIN-rail mounting kit for the TN-5308 Series

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[1]
- -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

EN 50155 EN 50121-4

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

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)	TN-5510A-2GTX Series: 2 TN-5510A-8PoE-2GTX Series: 2 TN-5518A-2GTX Series: 2 TN-5518A-8PoE-2GTX 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
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-5500A 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-5500A Series PoE models: IEEE 802.3af/at for PoE/PoE+ output TN-5510A Series 2GLSX models: IEEE 802.3z for 1000BaseSX/LX/LHX/ZX

Ethernet Software Features

Broadcast Forwarding	IP directed broadcast, 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 v1/v2/v3, Port-based VLAN, Static Multicast
Industrial Protocols	EtherNet/IP Adapter (Slave), Modbus TCP Server (Slave)
Management	Back Pressure Flow Control, DHCP Option 66/67/82, DHCP Server/Client, Flow control, HTTP, IPv4/IPv6, IOxpress, LLDP, Port Mirror, QoS/CoS/ToS, RARP, RMON, SMTP, SNMP Inform, SNMP Trap, Syslog, Telnet, Account Management
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	Link Aggregation, MSTP, RSTP, STP, Turbo Chain, Turbo Ring v1/v2, Turbo Ring with DRC
Security	Broadcast storm protection, HTTPS/SSL, Local Account Accessibility, TACACS+, Port Lock, RADIUS, Rate Limit, SSH
Time Management	IEEE 1588 PTP v1/v2, 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	STATE, PWR1, PWR2, FAULT, 10/100/1000M

Serial Interface

Console Port	M12 A-coded male connector

Power Parameters

Input Current	TN-5508A-WV Series: 0.28 A @ 24 VDC, 0.07 A @ 110 VDC TN-5508A-8PoE Series: 7.6 A @ 24 VDC, 1.55 A @ 110 VDC TN-5510A-2GTXBP Series: 0.56 A @ 24 VDC, 0.13 A @ 110 VDC TN-5510A-2GLSX Series: 0.45 A @ 24 VDC, 0.1 A @ 110 VDC TN-5510A-8PoE-2GTX Series: 7.90 A @ 24 VDC, 1.61 A @ 110 VDC TN-5510A-8PoE-2GLSX Series: 7.80 A @ 24 VDC, 1.58 A @ 110 VDC TN-5516A-WV Series: 0.39 A @ 24 VDC, 0.09 A @ 110 VDC TN-5516A-8PoE Series: 8.37 A @ 24 VDC, 1.65 A @ 110 VDC TN-5518A-2GTX Series 0.68 A @ 24 VDC, 0.16 A @ 110 VDC TN-5518A-8PoE-2GTX Series: 8.66 A @ 24 VDC, 1.69 A @ 110 VDC
Input Voltage	24/36/48/72/96/110 VDC, Redundant dual inputs
No. of Power Inputs	TN-5500A Series non-PoE models: 2 TN-5500A Series PoE models: 1
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 175.8 x 76 mm (7.28 x 6.92 x 2.99 in) TN-5508A Series PoE models: 185 x 175.8 x 115 mm (7.28 x 6.92 x 4.53 in) TN-5510A Series non-PoE models: 185 x 180.9 x 76 mm (7.28 x 7.12 x 2.99 in) TN-5510A Series PoE models: 185 x 180.9 x 115 mm (7.28 x 7.12 x 4.53 in) TN-5510A-2GLSX-ODC Series: 185 x 204.3 x 76.0 mm (7.28 x 8.04 x 2.99 in) TN-5510A-8PoE-2GLSX-ODC series: 185 x 219.3 x 115 mm (7.28 x 8.63 x 4.53 in) TN-5516A Series non-PoE models: 250 x 175.8 x 76 mm (9.84 x 6.92 x 2.99 in) TN-5516A Series PoE models: 250 x 175.8 x 115 mm (9.84 x 6.92 x 4.53 in) TN-5518A Series non-PoE models: 250 x 180.9 x 76 mm (9.84 x 7.12 x 2.99 in) TN-5518A Series PoE models: 250 x 180.9 x 115 mm (9.84 x 7.12 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

EMC	EN 55032/24
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, IEC 60571
Railway Fire Protection	EN 45545-2
Safety	IEC 60950-1, UL 61010-2-201
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-5508A-WV Series: 814,964 hrs TN-5508A-8PoE Series: 526,372 hrs TN-5510A-2GTX Series: 758,855 hrs TN-5510A-2GTXBP Series: 742,880 hrs TN-5510A-2GLSX Series: 722,049 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: 722,721 hrs TN-5516A-2GTX Series: 647,128 hrs TN-5516A-2GTXBP Series: 628,808 hrs TN-5516A-8PoE-2GTX Series: 448,300 hrs TN-5516A-8PoE-2GTXBP Series: 439,442 hrs
Standards	Telcordia SR332

Warranty

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

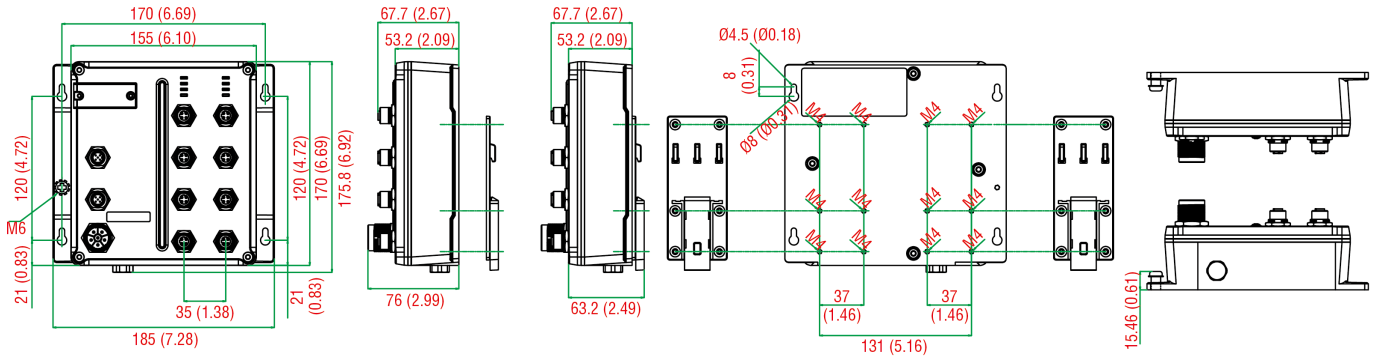
Package Contents

Device	1 x TN-5500A Series switch
Installation Kit	2 x cap, female, metal, for M12 port 1 x wall-mounting kit
Cable	1 x M12-to-DB9 console port
Documentation	1 x document and software CD 1 x quick installation guide 1 x warranty card

Dimensions

TN-5508A non-PoE Series

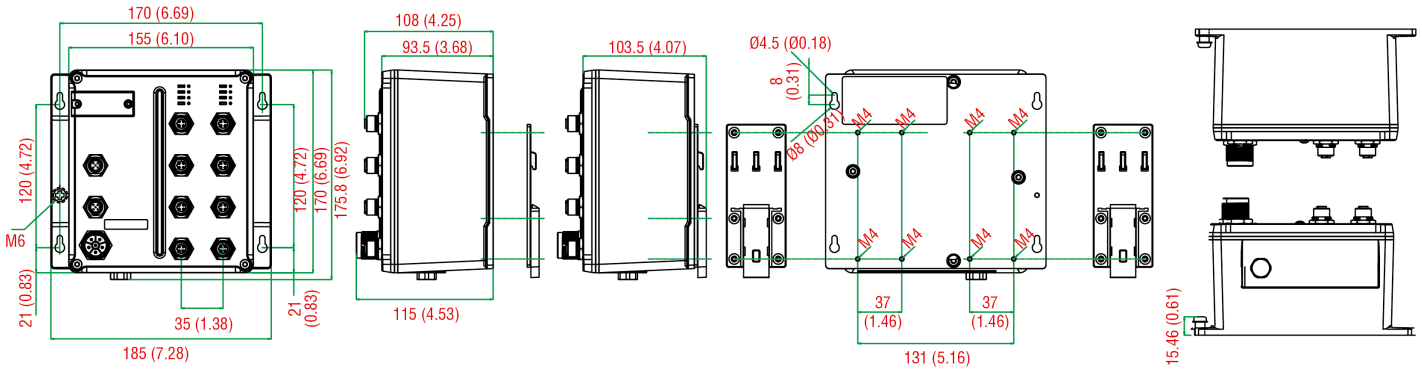
Unit: mm (inch)



Front View | Side View (including DIN-Rail Mounting Kit) | DIN-Rail Mounting Kit | Rear View | Top & Bottom Views

TN-5508A-8PoE Series

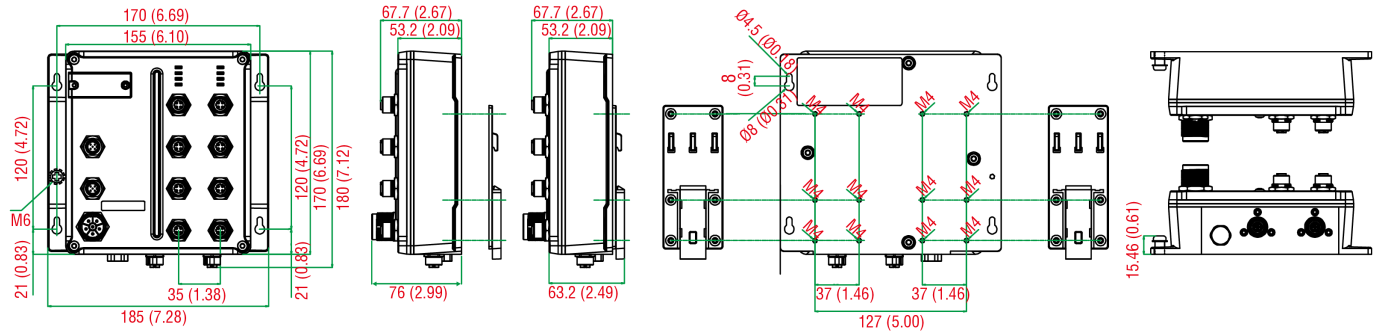
Unit: mm (inch)



Front View | Side View (including DIN-Rail Mounting Kit) | DIN-Rail Mounting Kit | Rear View | Top & Bottom Views

TN-5510A non-PoE Series

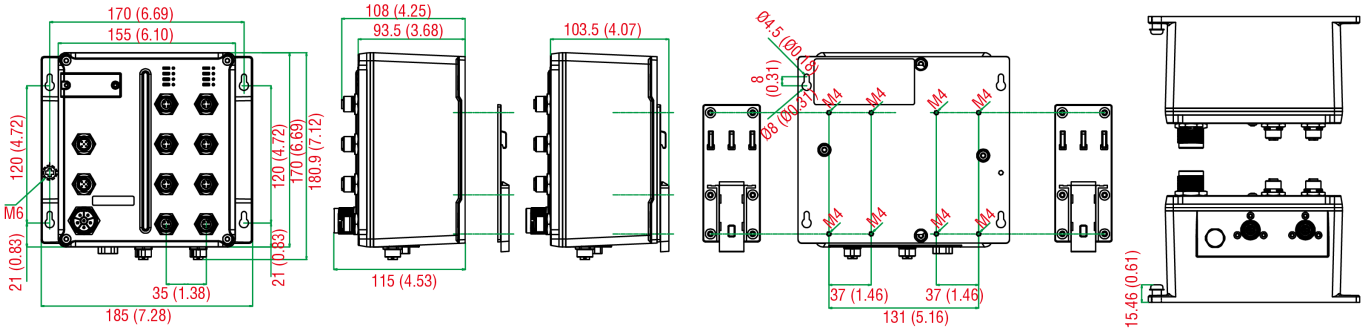
Unit: mm (inch)



Front View | Side View (including DIN-Rail Mounting Kit) | DIN-Rail Mounting Kit | Rear View | Top and Bottom Views

TN-5510A-8PoE Series

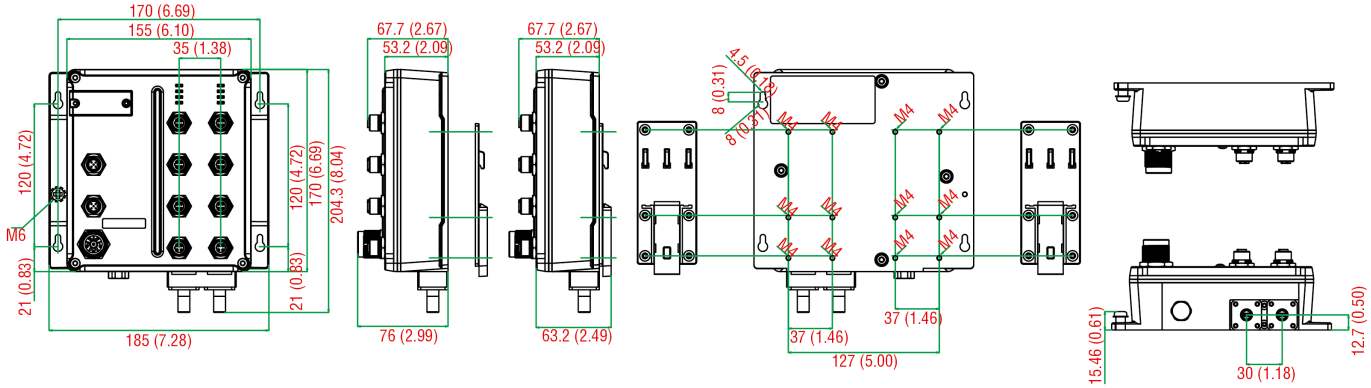
Unit: mm (inch)



Front View | Side View (including DIN-Rail Mounting Kit) | DIN-Rail Mounting Kit | Rear View | Top and Bottom Views

TN-5510A-2GLSX-ODC Series

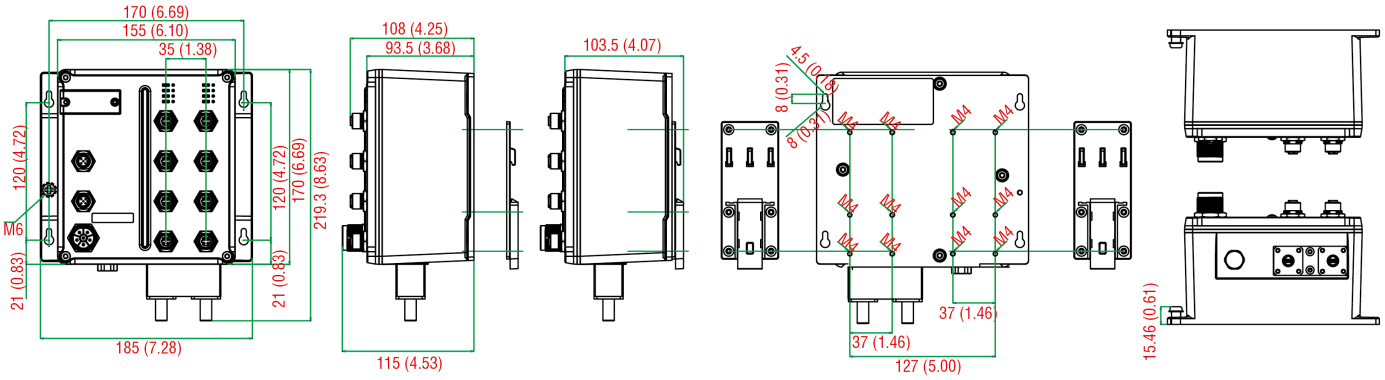
Unit: mm (inch)



Front View | Side View (including DIN-Rail Mounting Kit) | DIN-Rail Mounting Kit | Rear View | Top and Bottom Views

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

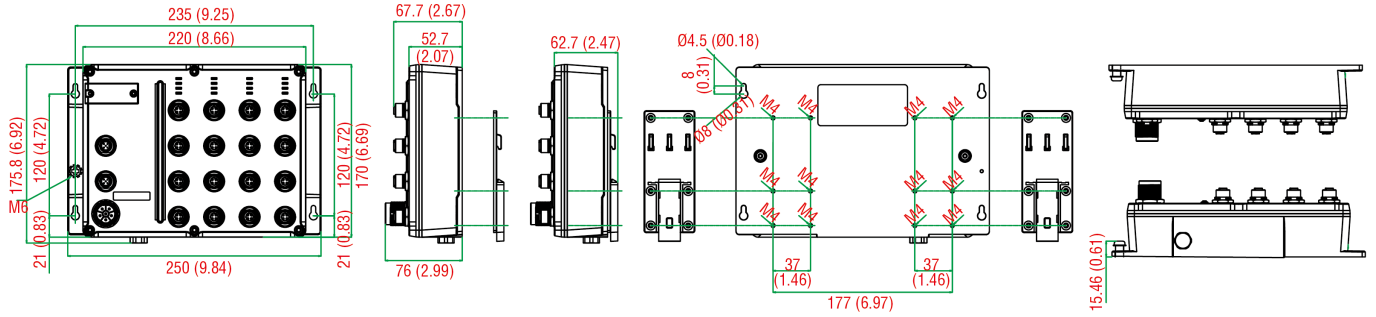
Unit: mm (inch)



Front View | Side View (including DIN-Rail Mounting Kit) | DIN-Rail Mounting Kit | Rear View | Top and Bottom Views

TN-5516A non-PoE Series

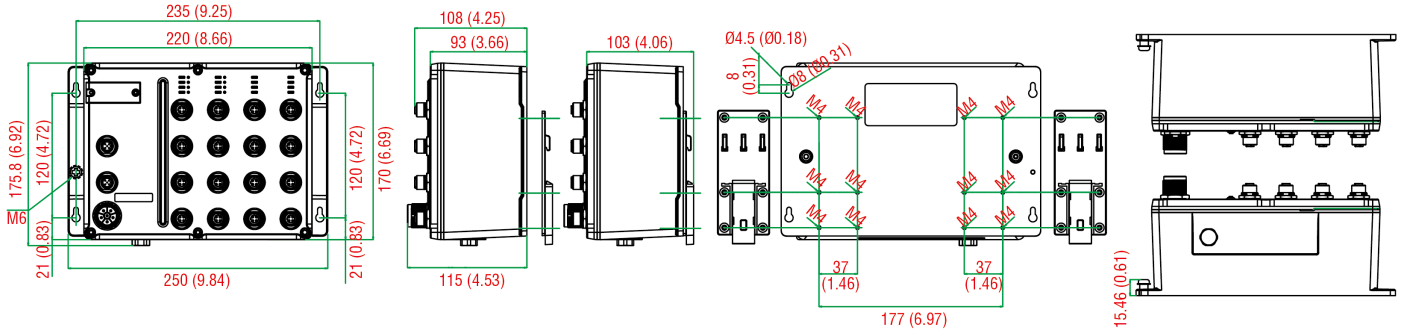
Unit: mm (inch)



Front View | Side View (including DIN-Rail Mounting Kit) | Rear View | DIN-Rail Mounting Kit | Top & Bottom Views

TN-5516A-8PoE Series

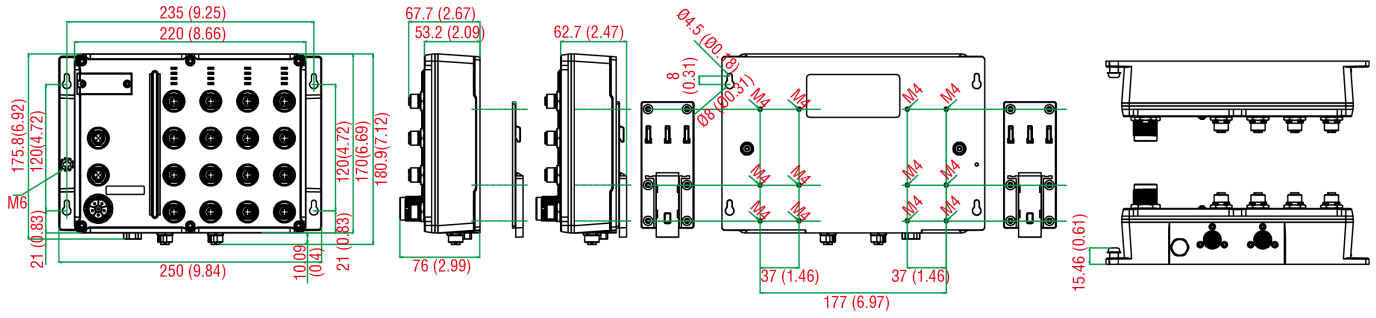
Unit: mm (inch)



Front View | Side View (including DIN-Rail Mounting Kit) | DIN-Rail Mounting Kit | Rear View | Top & Bottom Views

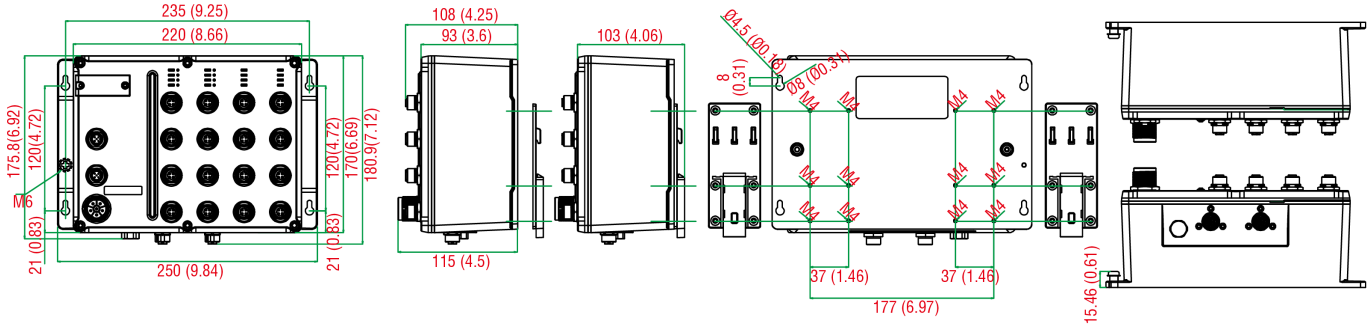
TN-5518A non-PoE Series

Unit: mm (inch)



Front View | Side View (including DIN-Rail Mounting Kit) | Rear View | DIN-Rail Mounting Kit | Top and Bottom Views

Unit: mm (inch)



Front View

Side View (including DIN-Rail Mounting Kit)

DIN-Rail Mounting Kit

Rear View

Top and Bottom Views

Ordering Information

Model Name	10/100/1000BaseT(X) Ports Q-ODC Fiber Connector	10/100/1000BaseT(X) 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	PoE Ports 10/100BaseT(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	–	–
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	–

Model Name	10/100/1000BaseT(X) Ports Q-ODC Fiber Connector	10/100/1000BaseT(X) 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	PoE Ports 10/100BaseT(X), M12 D-Coded 4-Pin Female Connector	Conformal Coating
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	M12 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-DC50131-01	DIN-rail mounting kit, 6 screws

M12 Connector Caps

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

TN-G4500 Series

EN 50155 layer 2 multi-Gigabit switches

Features and Benefits

- 4 10G ports and 12 Gigabit ports with push-pull M12 connectors
- Isolated power with 24 to 110 VDC power supply range
- Complies with all EN 50155 mandatory test items[1]
- -40 to 70°C operating temperature range
- Turbo Ring and Turbo Chain (recovery time < 50 ms @ 250 switches), and RSTP/STP for network redundancy
- 12 IEEE 802.3at/af compliant PoE and Ethernet combo ports
- Provides up to 30 W per PoE port

Certifications

EN 50155 EN 50121-4

Introduction

The ToughNet TN-G4500 Series M12 managed Ethernet switches are designed for railway applications, including rolling stock and wayside installations. These switches are equipped with M12 and similar circular connectors to ensure tight, robust connections, and guarantee reliable operation in industrial environments where vibrations and shock are commonplace. The TN-G4500 Series Ethernet switches provide 4 10G Ethernet M12 ports with PoE functionality, 16 Gigabit Ethernet M12 ports, and 8 ports with PoE functionality. These PoE switches are classified as power source equipment (PSE), capable of providing up to 30 watts of power per port to IEEE 802.3at/af-compliant powered devices (PDs), such as IP cameras and wireless access points.

The TN-G4500 Series has M12 connectors that are tailor-made for push-pull cables to facilitate quick installation and allow M12 rotary cables to be utilized. 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 communications system. Furthermore, the -40 to 70°C wide operating temperature range allows deployment in harsh environments. The TN-G4500 Series complies with the essential sections of the EN 50155 standard, covering operating temperature, power input voltage, surge, ESD, vibration, power isolation, and features models with conformal coating to ensure suitability 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
- DHCP Option 82 for IP address assignment with different policies
- IGMP snooping and GMRP for filtering multicast traffic
- Supports the EtherNet/IP and Modbus/TCP industrial Ethernet protocols
- 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 optimal 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 efficient network monitoring and proactive capability
- Bandwidth management prevents unpredictable network conditions
- Port locking to only allow access to authorized MAC addresses
- Port mirroring for online debugging
- Automatic warning notifications 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
- Wall mounting installation

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

Specifications

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
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	IP directed broadcast, 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 v1/v2, Port-based VLAN, Static Multicast
Industrial Protocols	SNMPv1/v2c/v3
Management	Account Management, Back Pressure Flow Control, DHCP Option 66/67/82, DHCP Server/Client, Flow control, HTTP, IPv4/IPv6, LLDP, Port Mirror, 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	Link Aggregation, MSTP, RSTP, STP, Turbo Chain, Turbo Ring v1/v2, Turbo Ring with DRC
Security	TACACS+, Broadcast storm protection, HTTPS/SSL, Local Account Accessibility, Port Lock, RADIUS, Rate Limit, SSH
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

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

Input Voltage	24/36/48/72/96/110 VDC
No. of Power Inputs	2
Operating Voltage	16.8 to 137.5 VDC
Overload Current Protection	Supported
Reverse Polarity Protection	Supported
Total PoE Power Budget	120 W
Input Current	7.5 A @ 24 VDC
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: 2,730g(6.02lb) TN-G4516 with bypass: 2,740g(6.04lb)
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 55032/24
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 SR332

Warranty

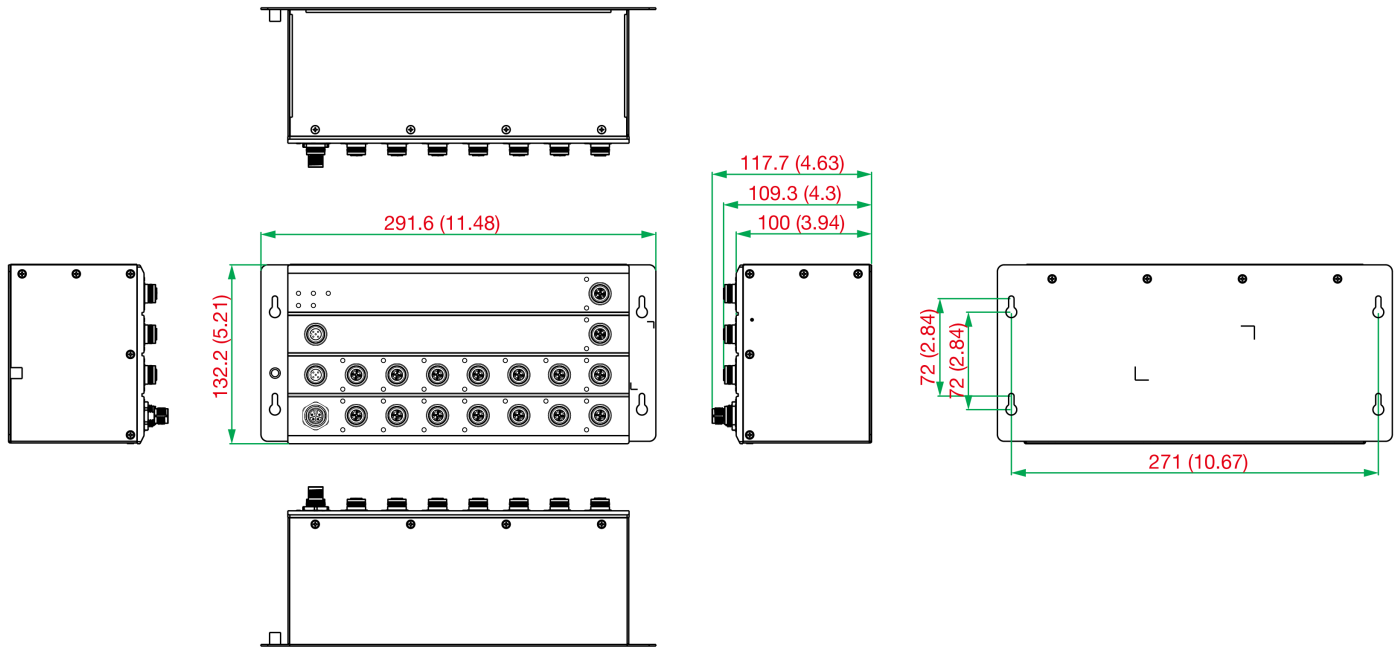
Warranty Period	5 years
Details	See www.moxa.com/warranty

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

Dimensions

Unit: mm (inch)



Ordering Information

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

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-2XGPoE-2XGTXBP-WV-T	4	2	8	2	No
TN-G4516-8GPoE-2XGPoE-2XGTXBP-WV-CT-T	4	2	8	2	Yes

Accessories (sold separately)

Storage Kits

ABC-02-P-USB-M12	Configuration backup and restoration tool with M12 connector for Moxa's ToughNet series of managed Ethernet switches and wireless AP/bridge/client, -40 to 75°C operating temperature, conformal coating

M12 Connector Caps

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

Connectors

M12X-8PMM-IP67-HTG	X-coded screw-in Gigabit Ethernet connector, 8-pin male M12 connector, IP67

Cables

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
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
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

TN-G6500 Series

EN 50155 Full Gigabit Ethernet switches with up to 8 PoE ports

Features and Benefits

Preliminary

- 12 Gigabit ports with push-pull M12 connectors
- Isolated power with 24 to 110 VDC power supply range
- Complies with all EN 50155 mandatory test items[1]
- -40 to 70°C operating temperature range
- IP67-rated housing protection
- Turbo Ring and Turbo Chain (recovery time < 50 ms @ 250 switches), and RSTP/STP for network redundancy
- 8 IEEE 802.3at/af compliant PoE and Ethernet combo ports
- Provides up to 30 W per PoE port

Certifications

EN 50155 EN 50121-4

Introduction

The ToughNet TN-G6500 Series M12 managed Ethernet switches are designed for railway applications, including rolling stock and wayside installations. The switches use M12 and other circular connectors to ensure tight, robust connections, and guarantee reliable operation in industrial environments where vibration and shock are commonplace. The TN-G6500 Series Ethernet switches provide 12 Gigabit Ethernet M12 ports; 8 ports support IEEE 802.3at/af compliant PoE functionality. These PoE switches are classified as power source equipment (PSE); they 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 cameras, wireless access points, and IP phones.

The TN-G6500 Series has push-pull M12 connectors that are tailor-made for push-pull cables in order to facilitate quick installation, and also allow M12 rotary cables to be utilized. 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 communications system. Furthermore, the -40 to 70°C operating temperature and IP67-rated enclosure allow deployment in harsh environments. The TN-G6512 Series Ethernet switches are compliant with the essential sections of the EN 50155 standard, covering operating temperature, power input voltage, surge, ESD, vibration, power isolation, and includes a model with conformal coating to ensure suitability for a variety of industrial applications.

Additional Features and Benefits

- Provides up to 30 watts per PoE port with a total power budget of 96 watts per switch
- IPv6 Ready logo awarded (IPv6 Logo Committee certified)
- DHCP Option 82 for IP address assignment with different policies
- 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 efficient network monitoring and proactive capability
- Bandwidth management prevents 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 prevents network loops
- Panel mounting installation capability

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

Specifications

Ethernet Interface

10/100/1000BaseT(X) Ports (M12 X-coded 8-pin female connector)	4
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 802.3ad for Port Trunk with LACP IEEE 802.3af/at for PoE/PoE+ output IEEE 802.3x for flow control IEEE 802.3u for 100BaseT(X)

Ethernet Software Features

Broadcast Forwarding	IP directed broadcast, 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 v1/v2, Port-based VLAN, Static Multicast
Industrial Protocols	SNMPv1/v2c/v3
Management	Account Management, Back Pressure Flow Control, DHCP Option 66/67/82, DHCP Server/Client, Flow control, HTTP, IPv4/IPv6, LLDP, Port Mirror, 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	Link Aggregation, MSTP, RSTP, STP, Turbo Chain, Turbo Ring v1/v2, Turbo Ring with DRC
Security	TACACS+, Broadcast storm protection, HTTPS/SSL, Local Account Accessibility, Port Lock, RADIUS, Rate Limit, SSH
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

LED Interface

LED Indicators	PWR1, PWR2, FAULT, MSTR/HEAD, CPLR/TAIL, 10/100/1000M, PoE

Serial Interface

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

Power Parameters

Input Voltage	24/36/48/72/96/110 VDC
No. of Power Inputs	2

Operating Voltage	16.8 to 137.5 VDC
Overload Current Protection	Supported
Reverse Polarity Protection	Supported
Total PoE Power Budget	96 W
Input Current	5.8 A @ 24 VDC
Power Connector	M12 K-coded 5-pin male connector

Physical Characteristics

Housing	Metal
IP Rating	IP67
Dimensions	159 x 97 x 100 mm (6.26 x 3.82 x 3.94 in)
Weight	1,750 g (3.86 lb)
Installation	Wall mounting
Protection	TN-G6512-8GPoE-WV-CT-T: 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 55032/24
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	UL 61010-2-201, IEC 60950-1
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	471,356 hrs
Standards	Telcordia SR332

Warranty

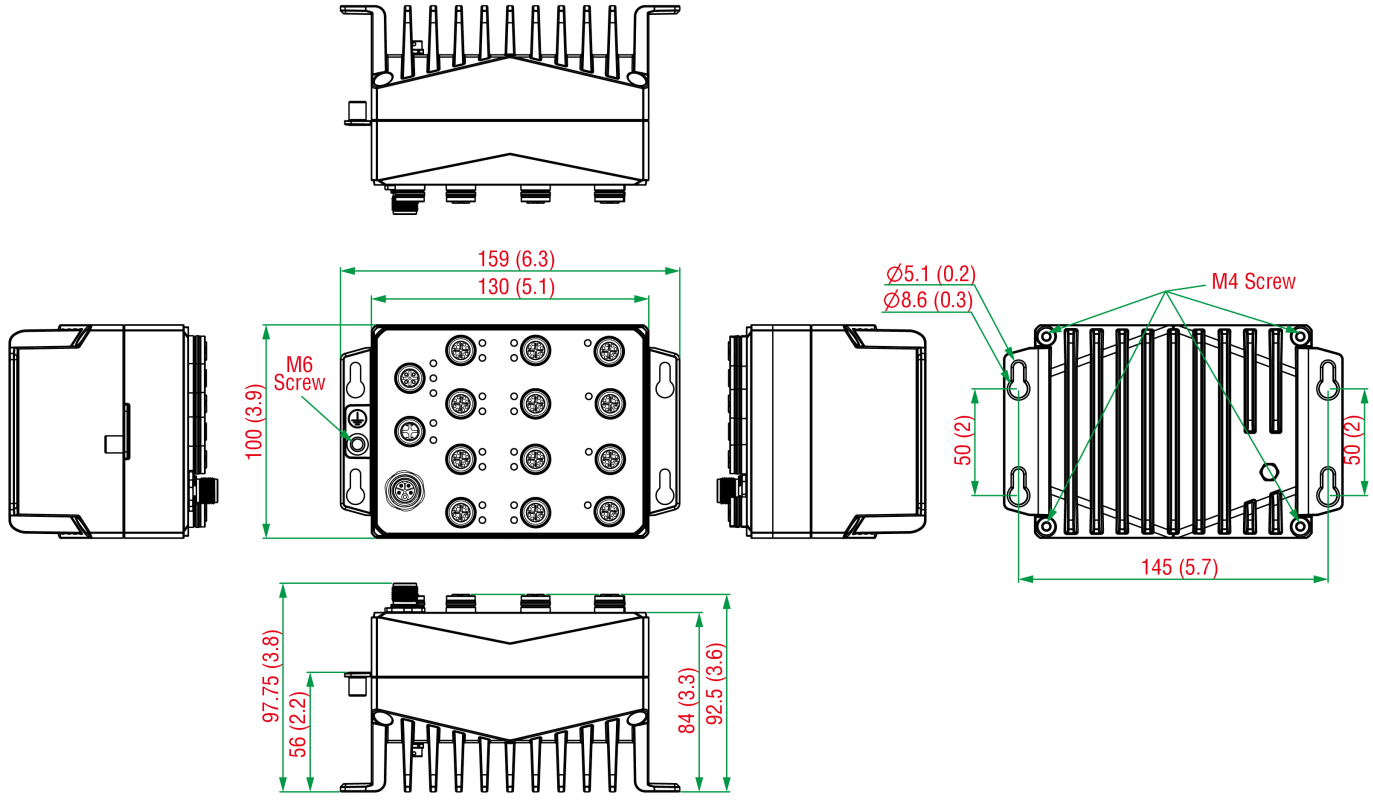
Warranty Period	5 years
Details	See www.moxa.com/warranty

Package Contents

Device	1 x TN-G6500 Series switch
Installation Kit	1 x wall-mounting kit 1 x cap, male, metal, for M12 port 14 x cap, female, metal, for M12 port
Cable	1 x M12-to-DB9 console port
Documentation	1 x quick installation guide 1 x warranty card

Dimensions

Unit: mm (inch)



Ordering Information

Model Name	10/100/1000BaseT(X) Ports, M12 X-Coded 8-Pin Female Connector	PoE Ports 100/1000BaseT(X), M12 X-Coded 8-Pin Female Connector	Conformal Coating
TN-G6512-8GPoE-WV-T	4	8	–
TN-G6512-8GPoE-WV-CT-T	4	8	✓

Accessories (sold separately)

Storage Kits

ABC-02-P-USB-M12	Configuration backup and restoration tool with M12 connector for Moxa's ToughNet series of managed Ethernet switches and wireless AP/bridge/client, -40 to 75°C operating temperature, conformal coating

M12 Connector Caps

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

Connectors

M12X-8PMM-IP67-HTG	X-coded screw-in Gigabit Ethernet connector, 8-pin male M12 connector, IP67

Cables

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
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
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