

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 items¹
- -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_Combpliance.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

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|-----------------------|---|
| 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

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

LED Interface

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|----------------|--|
| LED Indicators | STATE, PWR1, PWR2, FAULT, 10/100/1000M |
|----------------|--|

Serial Interface

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|--------------|----------------------------|
| Console Port | M12 A-coded male connector |
|--------------|----------------------------|

Power Parameters

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|-----------------------------|---|
| 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

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|--|----------------------------|
| 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 |

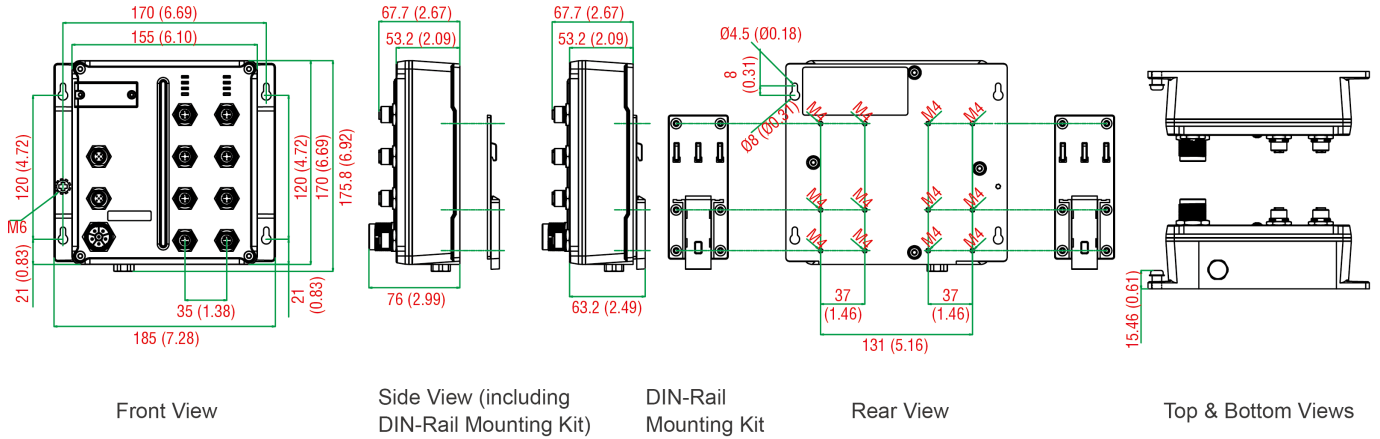
Package Contents

| | |
|------------------|---|
| 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

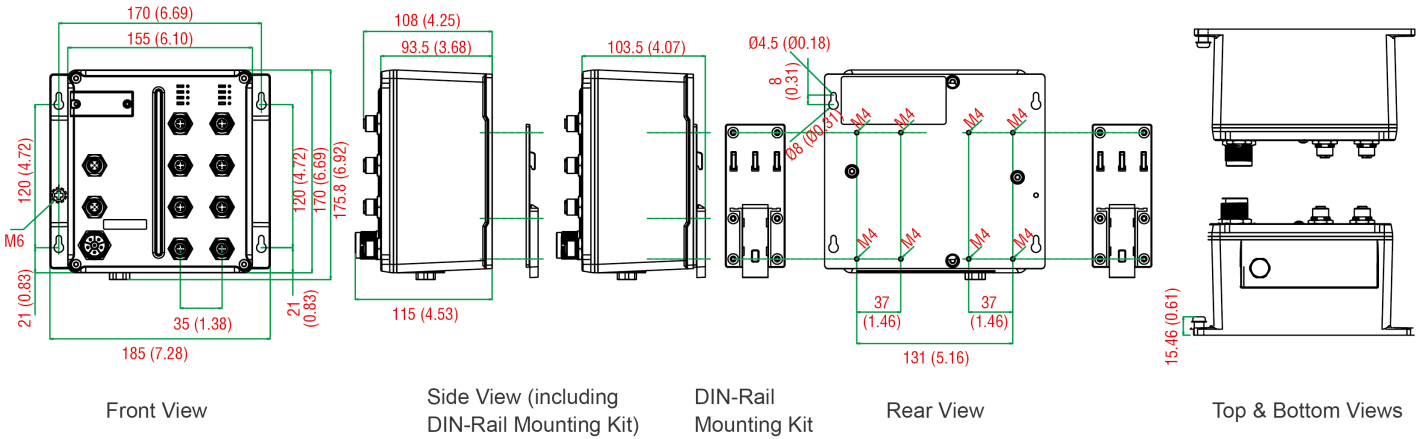
TN-5508A non-PoE Series

Unit: mm (inch)



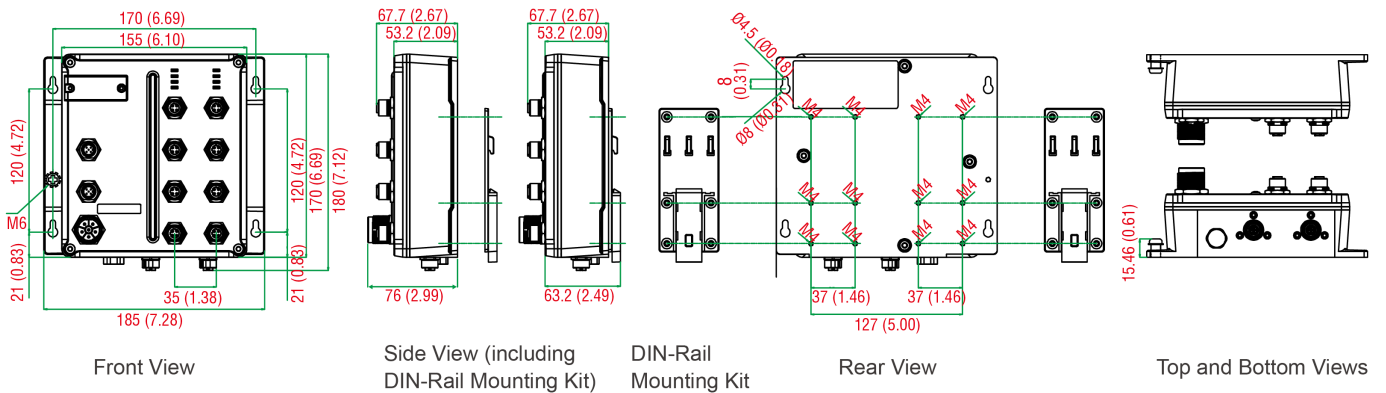
TN-5508A-8PoE Series

Unit: mm (inch)



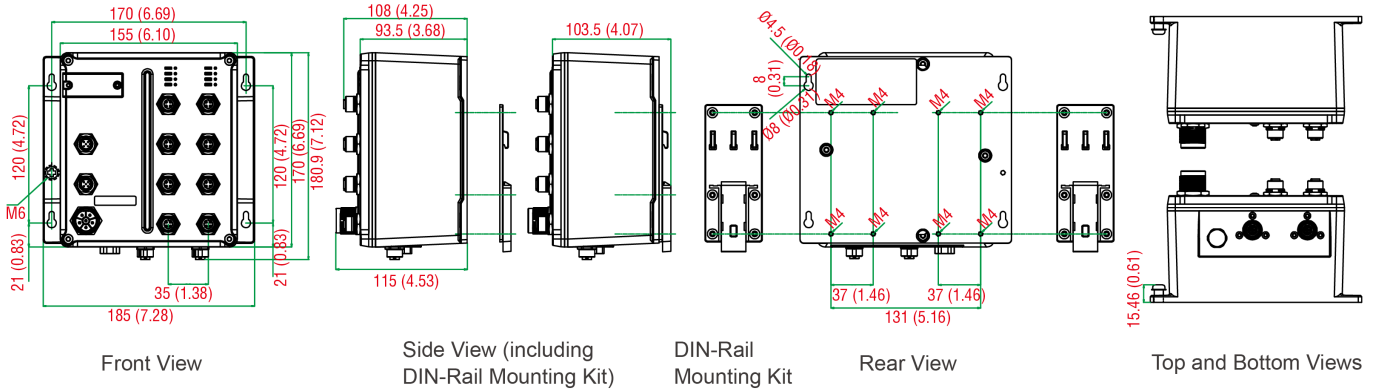
TN-5510A non-PoE Series

Unit: mm (inch)



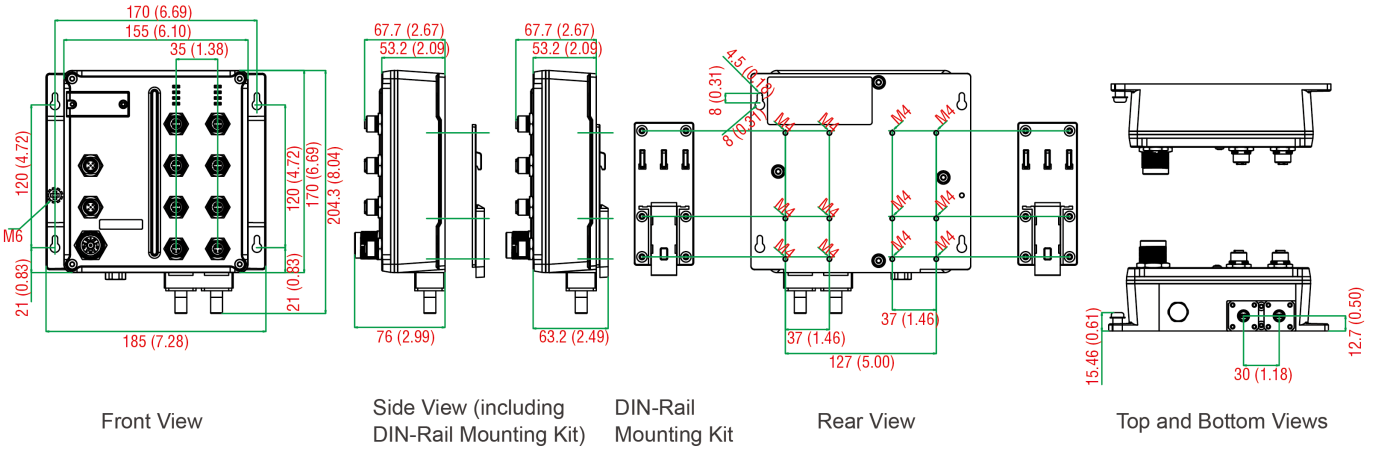
TN-5510A-8PoE Series

Unit: mm (inch)



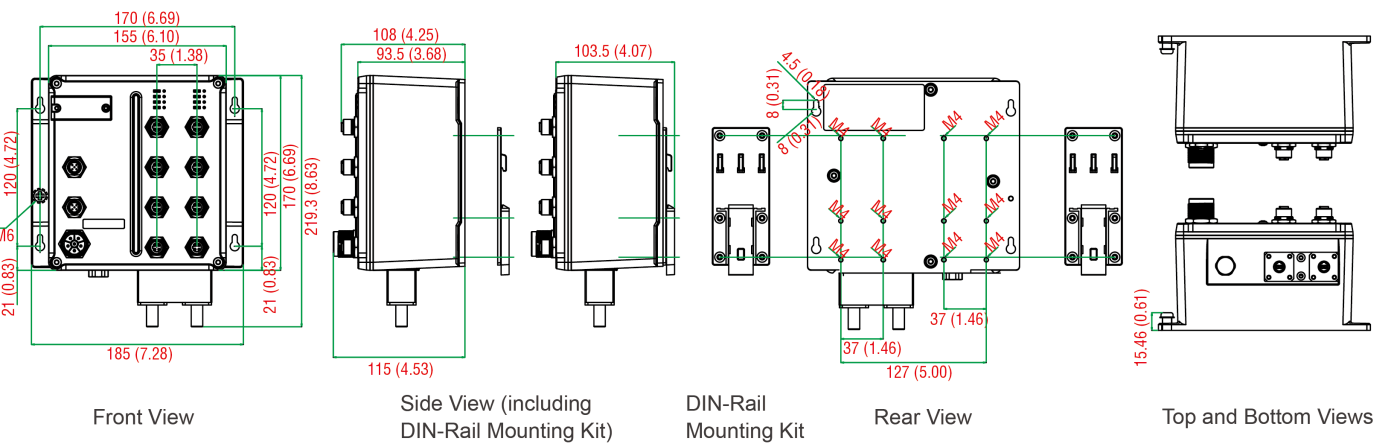
TN-5510A-2GLSX-ODC Series

Unit: mm (inch)



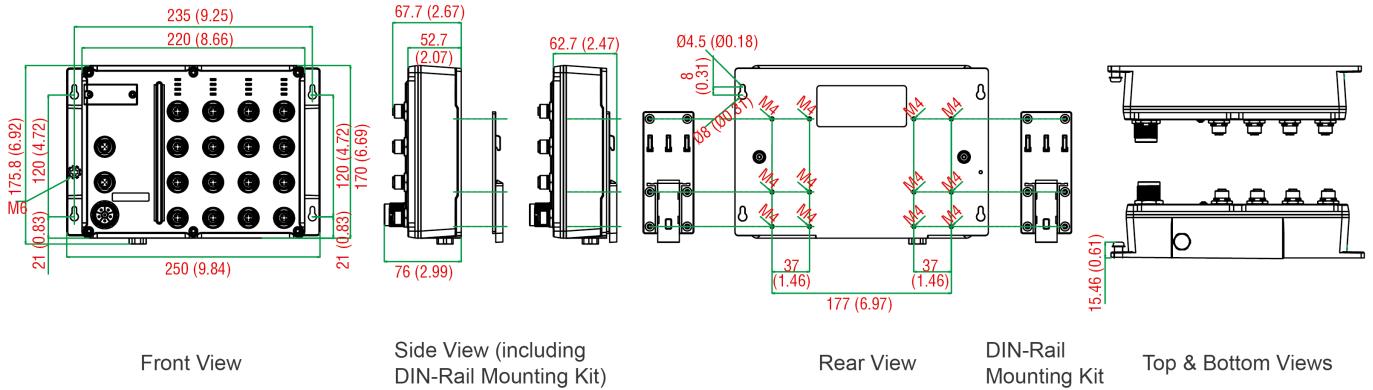
TN-5510A-8PoE-2GLSX-ODC Series

Unit: mm (inch)



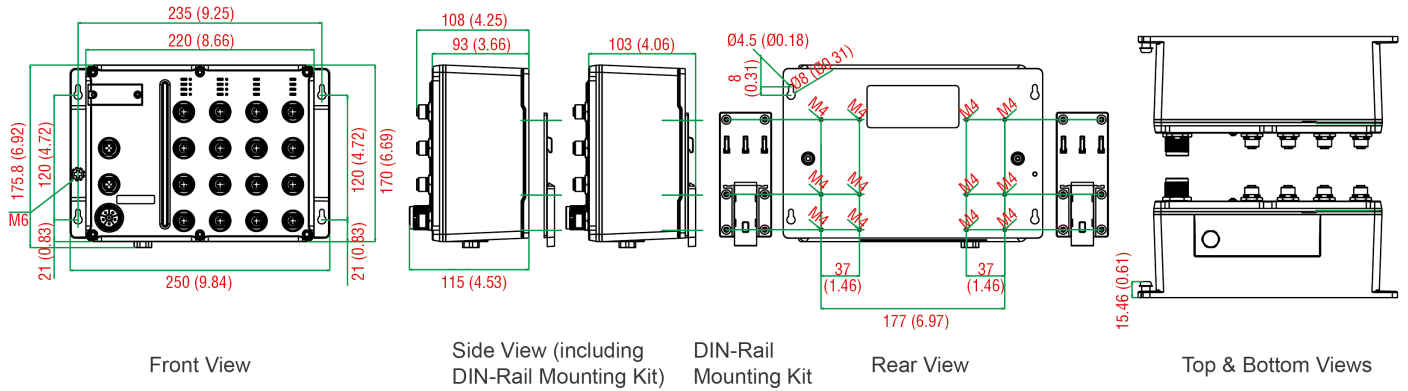
TN-5516A non-PoE Series

Unit: mm (inch)



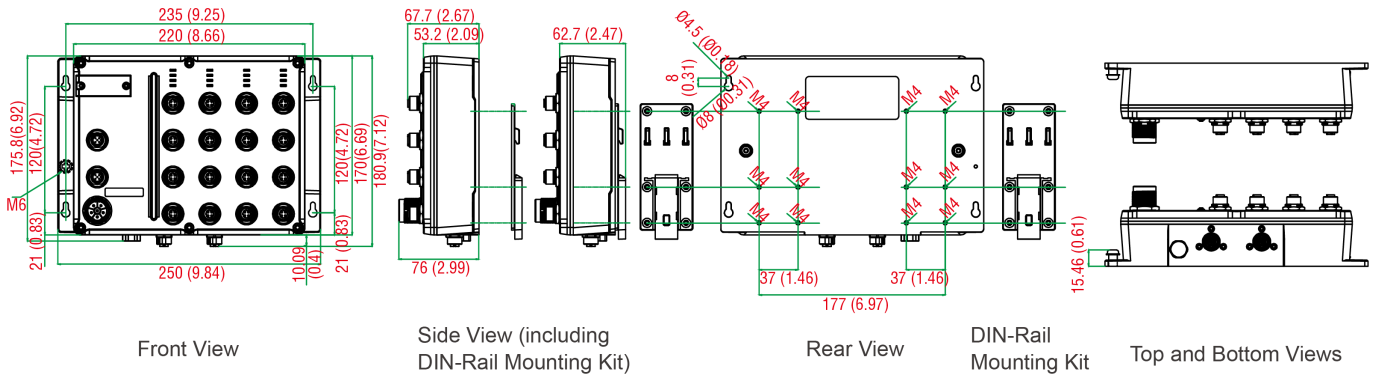
TN-5516A-8PoE Series

Unit: mm (inch)



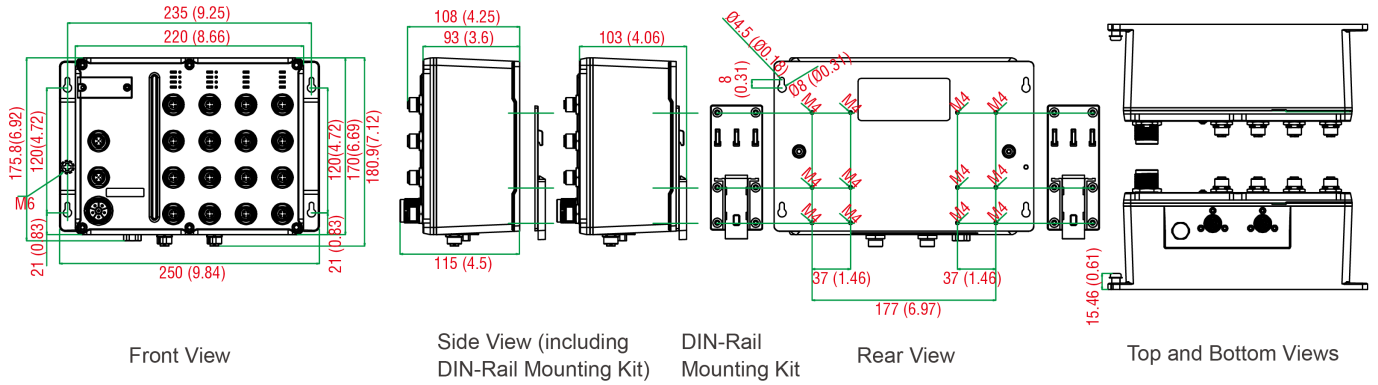
TN-5518A non-PoE Series

Unit: mm (inch)



TN-5518A-8PoE Series

Unit: mm (inch)



Ordering Information

| Model Name | 10/100/1000BaseT(X) 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 |

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