

# TN-4500A Series

EN 50155 12+4G/24+4G-port Gigabit Ethernet switches with up to 20 PoE ports



## Features and Benefits

- 2 to 4 Gigabit ports with bypass relay function on the bypass models
- 2 Gigabit fiber ports with embedded multi-mode Q-ODC® interface on fiber models
- Up to 4 Gigabit ports with PoE function
- Up to 20 IEEE 802.3at/af compliant combo PoE and Ethernet ports
- Supports regular and push-pull M12 connectors
- Turbo Ring and Turbo Chain (recovery time < 20 ms @ 250 switches)<sup>1</sup>, and STP/RSTP/MSTP for network redundancy
- Complies with all EN 50155 mandatory test items<sup>2</sup>
- Isolated power with 24 to 110 VDC power supply range
- -40 to 70°C system operating temperature range

## Certifications



## Introduction

The ToughNet TN-4500A 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-4500A Series Ethernet switches provide 12 or 24 fast Ethernet M12 ports with or without IEEE 802.3at/af compliant PoE functionality, and the Gigabit models have 4 Gigabit Ethernet interfaces with PoE and optional bypass relay functionality. In addition, the fiber models provide 2 Gigabit fiber interface ports with an embedded 2 km multimode fiber transceiver. The PoE switches are classified as power source equipment (PSE).

The switches 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 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 range of the switches ensures they can withstand deployment in harsh environments. TN-4500A 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

- 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
- 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
- Wall mounting installation capability

1. If the port link speed is 1 Gigabit or higher, the recovery time is < 50 ms.

2. 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](http://www.moxa.com/doc/specs/EN_50155_Combpliance.pdf)

## 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 |
|------------------------|---------------------------------------------------------------------------------------------------------|

### Ethernet Interface

|                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 10/100/1000BaseT(X) Ports (M12 X-coded 8-pin female connector)                   | TN-4516A-4GTX-WV-T models: 4<br>TN-4516A-4GTX-WV-CT-T models: 4                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| 10/100BaseT(X) Ports (M12 D-coded 4-pin female connector)                        | TN-4512A models: 12<br>TN-4516A non-PoE models: 16<br>TN-4516A-4GTX models: 12<br>TN-4516A-4GTXBP models: 12<br>TN-4524A/4528A models: 8                                                                                                                                                                                                                                                                                                                                                                             |
| PoE Ports (10/100BaseT(X), M12 D-coded 4-pin female connector)                   | TN-4516A PoE models: 12<br>TN-4520A/4524A/4528A models: 16                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| PoE Ports (100/1000BaseT(X), M12 X-coded 8-pin female connector)                 | TN-4500A PoE models: 4<br>TN-4500A PoE fiber (ODC) and bypass (GTXBP) models: 2                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| 10/100/1000BaseT(X) Ports (M12 X-coded 8-pin female connector with bypass relay) | TN-4516A-4GTXBP models: 4<br>TN-4516A-12PoE-2GPoE-2GTXBP models: 2<br>TN-4528A-16PoE-2GPoE-2GTXBP models: 2                                                                                                                                                                                                                                                                                                                                                                                                          |
| 10/100/1000BaseT(X) Ports, Q-ODC Fiber Connector                                 | TN-4516A-12PoE-2GPoE-2GODC models: 2<br>TN-4528A-16PoE-2GPoE-2GODC models: 2                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Standards                                                                        | IEEE 802.1D-2004 for Spanning Tree Protocol<br>IEEE 802.1p for Class of Service<br>IEEE 802.1Q for VLAN Tagging<br>IEEE 802.1s for Multiple Spanning Tree Protocol<br>IEEE 802.1w for Rapid Spanning Tree Protocol<br>IEEE 802.1X for authentication<br>IEEE 802.3 for 10BaseT<br>IEEE 802.3ab for 1000BaseT(X)<br>IEEE 802.3ad for Port Trunk with LACP<br>IEEE 802.3af/at for PoE/PoE+ output<br>IEEE 802.3u for 100BaseT(X) and 100BaseFX<br>IEEE 802.3x for flow control<br>IEEE 802.3z for 1000BaseSX/LX/LHX/ZX |

### Ethernet Software Features

|                       |                                                                                                                                                    |
|-----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|
| Broadcast Forwarding  | Broadcast forwarding                                                                                                                               |
| Configuration Options | Command Line Interface (CLI) through Serial/Telnet/SSH<br>Web Console (HTTP/HTTPS)<br>Windows Utility                                              |
| Filter                | GMRP<br>GVRP<br>802.1Q VLAN<br>Port-based VLAN<br>Static Multicast<br>Multicast Filtering<br>IGMP Snooping v1/v2/v3<br>IGMP Querier<br>DHCP Filter |
| Management            | IPv4/IPv6<br>Flow control<br>LLDP<br>ICMP<br>Port Mirror<br>QoS/CoS/ToS<br>RMON<br>SMTP<br>SNMP Inform<br>SNMP Trap                                |

|                      |                                                                                                                                                                                                                                           |
|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                      | SNMPv1/v2c/v3<br>Syslog<br>Account Management<br>Loop Protection<br>DNS Server<br>DHCP option 82 (relay agent)<br>Port-based DHCP Server<br>DHCP Server (options 1/3/12/15/42/50/55)<br>DHCP Client (options 1/3/50/51/53/54/55/57/66/67) |
| MIB                  | Bridge MIB<br>Ethernet-like MIB<br>MIB-II<br>P-BRIDGE MIB<br>Q-BRIDGE MIB<br>RMON MIB Groups 1, 2, 3, 9<br>RSTP MIB                                                                                                                       |
| Redundancy Protocols | MSTP<br>RSTP<br>STP<br>Turbo Chain<br>Turbo Ring v1/v2<br>Turbo Ring with DRC<br>Static Port Trunk<br>LACP                                                                                                                                |
| Security             | Access control list<br>Trust access control<br>Broadcast storm protection<br>TACACS+<br>RADIUS<br>HTTPS/SSL<br>SSH<br>Rate Limit                                                                                                          |
| Time Management      | IEEE 1588 PTP v1/v2<br>NTP Server/Client<br>SNTP Server/Client                                                                                                                                                                            |

#### Switch Properties

|                   |               |
|-------------------|---------------|
| IGMP Groups       | 256           |
| Max. No. of VLANs | 64            |
| VLAN ID Range     | VID 1 to 4094 |
| Jumbo Frame Size  | 9.712 KB      |

#### LED Interface

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

#### Serial Interface

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

#### Power Parameters

|                     |                                                                                                                                                                                                                                                                                                                         |
|---------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Input Current       | TN-4512A models: Max. 0.30 A @ 24 VDC<br>TN-4516A non-PoE models: Max. 0.33 A @ 24 VDC<br>TN-4516A non-PoE 4GTX/4GTXBP models: Max. 0.62 A @ 24 VDC<br>TN-4516A PoE models: Max. 7.0 A @ 24 VDC<br>TN-4520A models: Max. 7.0 A @ 24 VDC<br>TN-4524A models: Max. 6.5 A @ 24 VDC<br>TN-4528A models: Max. 7.0 A @ 24 VDC |
| Input Voltage       | 24/36/48/72/96/110 VDC                                                                                                                                                                                                                                                                                                  |
| No. of Power Inputs | 2                                                                                                                                                                                                                                                                                                                       |

|                             |                            |
|-----------------------------|----------------------------|
| Power Connector             | M23 connector              |
| Operating Voltage           | 16.8 to 137.5 VDC          |
| Overload Current Protection | Supported                  |
| Reverse Polarity Protection | Supported                  |
| Total PoE Power Budget      | TN-4500A PoE models: 120 W |

#### Physical Characteristics

|              |                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|--------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Dimensions   | TN-4512A models: 199.8 x 115 x 82.3 mm (7.87 x 4.53 x 3.24 in)<br>TN-4516A non-PoE models: 229.6 x 115 x 82.3 mm (9.04 x 4.53 x 3.24 in)<br>TN-4516A non-PoE 4GTX/4GTXBP models: 229.6 x 115 x 92.3 mm (9.04 x 4.53 x 3.63 in)<br>TN-4516A PoE models: 229.6 x 115 x 122.3 mm (9.04 x 4.53 x 4.82 in)<br>TN-4520A models: 279.6 x 115 x 122.3 mm (11.00 x 4.53 x 4.82 in)<br>TN-4524A/4528A models: 347.8 x 115 x 122.3 mm (13.70 x 4.53 x 4.81 in) |
| Housing      | Metal                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| IP Rating    | IP42                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Weight       | TN-4512A models: 1,032 g (2.28 lb)<br>TN-4516A non-PoE models: 1,248 g (2.75 lb)<br>TN-4516A PoE models: 2,090 g (4.61 lb)<br>TN-4516A fiber (ODC) models: 2,180 g (4.81 lb)<br>TN-4520A models: 2,292 g (5.05 lb)<br>TN-4524A models: 2,388 g (5.27 lb)<br>TN-4528A models: 2,559 g (5.64 lb)<br>TN-4528A fiber (ODC) models: 2,645 g (5.83 lb)                                                                                                    |
| Installation | Wall mounting                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Protection   | TN-4500A Series -CT models: 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

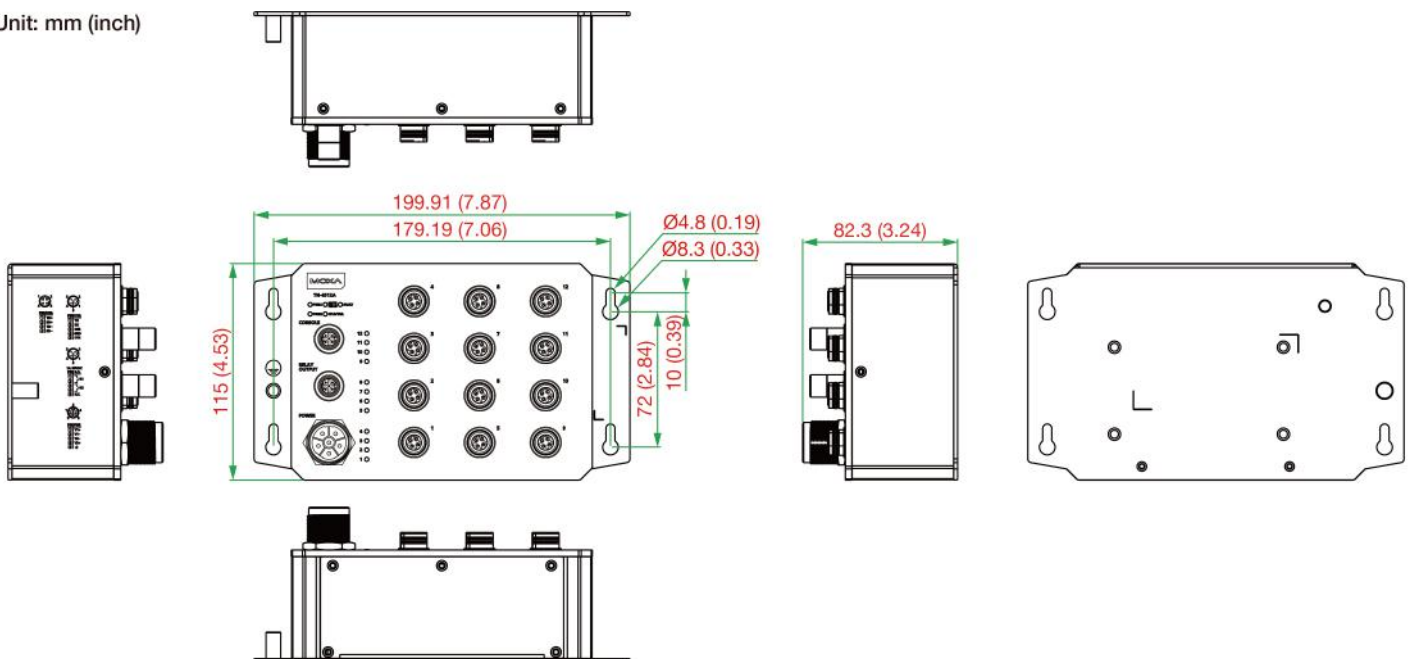
|                         |                                                                                                                                                                                                                                            |
|-------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EMC                     | EN 55032/35                                                                                                                                                                                                                                |
| EMS                     | IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV<br>IEC 61000-4-3 RS: 80 MHz to 1 GHz: 20 V/m<br>IEC 61000-4-4 EFT: Power: 2 kV; Signal: 2 kV<br>IEC 61000-4-5 Surge: Power: 2 kV; Signal: 2 kV<br>IEC 61000-4-6 CS: 10 V<br>IEC 61000-4-8 PFMF |
| Freefall                | IEC 60068-2-31                                                                                                                                                                                                                             |
| Radio Frequency         | FCC                                                                                                                                                                                                                                        |
| Railway                 | EN 50121-4<br>EN 50155<br>IEC 60571                                                                                                                                                                                                        |
| Railway Fire Protection | EN 45545-2                                                                                                                                                                                                                                 |
| Safety                  | UL 62368-1<br>IEC 62368-1<br>EN 62368-1                                                                                                                                                                                                    |

|                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Shock                   | IEC 60068-2-27, IEC 61373, EN 50155                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Vibration               | IEC 60068-2-64, IEC 61373, EN 50155                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Declaration</b>      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Green Product           | RoHS, CRoHS, WEEE                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>MTBF</b>             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Standards               | Telcordia SR332                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Time                    | TN-4512A models: 816,541 hrs<br>TN-4516A non-PoE models: 815,913 hrs<br>TN-4516A non-PoE 4GTX models: 755,975 hrs<br>TN-4516A non-PoE 4GTXBP models: 624,458 hrs<br>TN-4516A PoE models: 459,971 hrs<br>TN-4516A PoE 2GTXBP models: 434,683 hrs<br>TN-4516A PoE fiber (ODC) models: 413,810 hrs<br>TN-4520A models: 437,198 hrs<br>TN-4524A models: 453,479 hrs<br>TN-4528A models: 421,101 hrs<br>TN-4528A 2GTXBP models: 398,146 hrs<br>TN-4528A fiber (ODC) models: 380,761 hrs |
| <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-4500A Series switch                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Installation Kit        | 2 x cap, female, metal, for M12 port (console and relay ports, fixed on switch)<br>6/8/10/12/14 x cap, male, metal, for M12 port (Ethernet ports, fixed on switch)<br>1 x wall-mounting kit                                                                                                                                                                                                                                                                                        |
| Documentation           | 1 x quick installation guide<br>1 x warranty card                                                                                                                                                                                                                                                                                                                                                                                                                                  |

## Dimensions

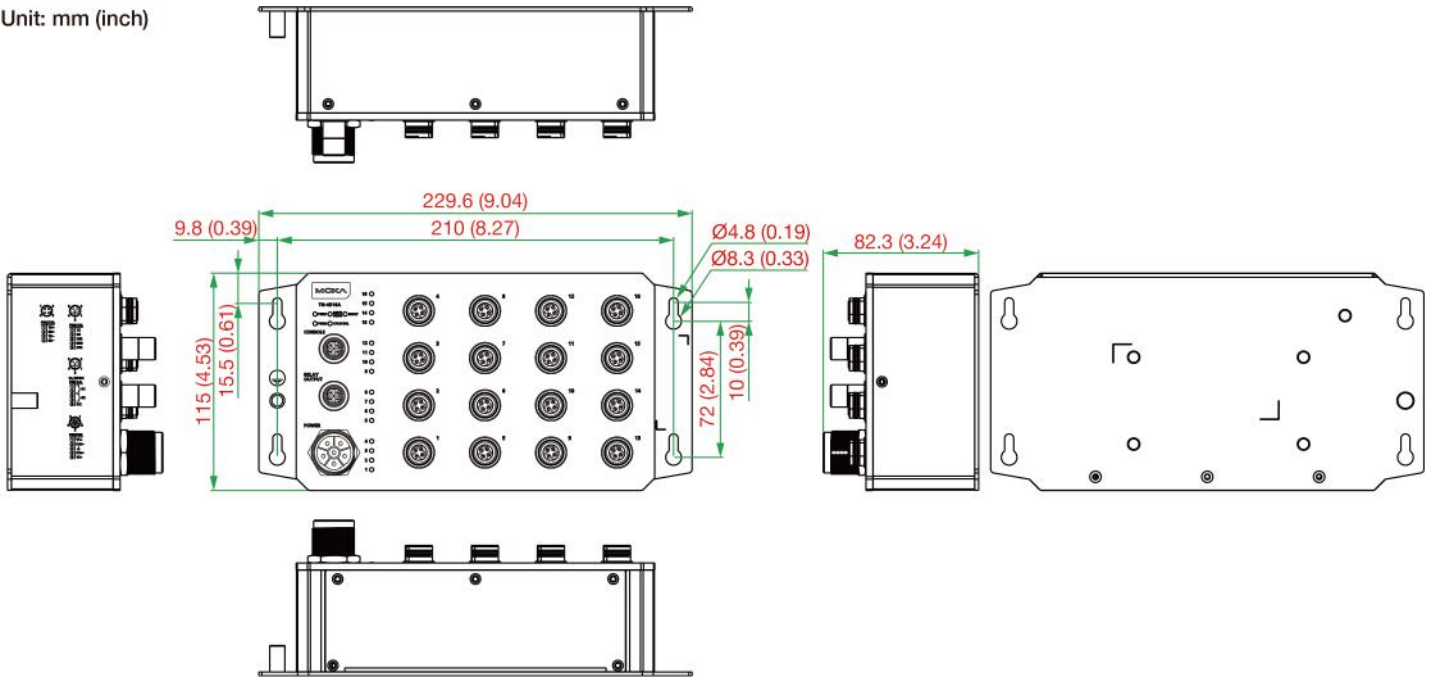
### TN-4512A Models

Unit: mm (inch)



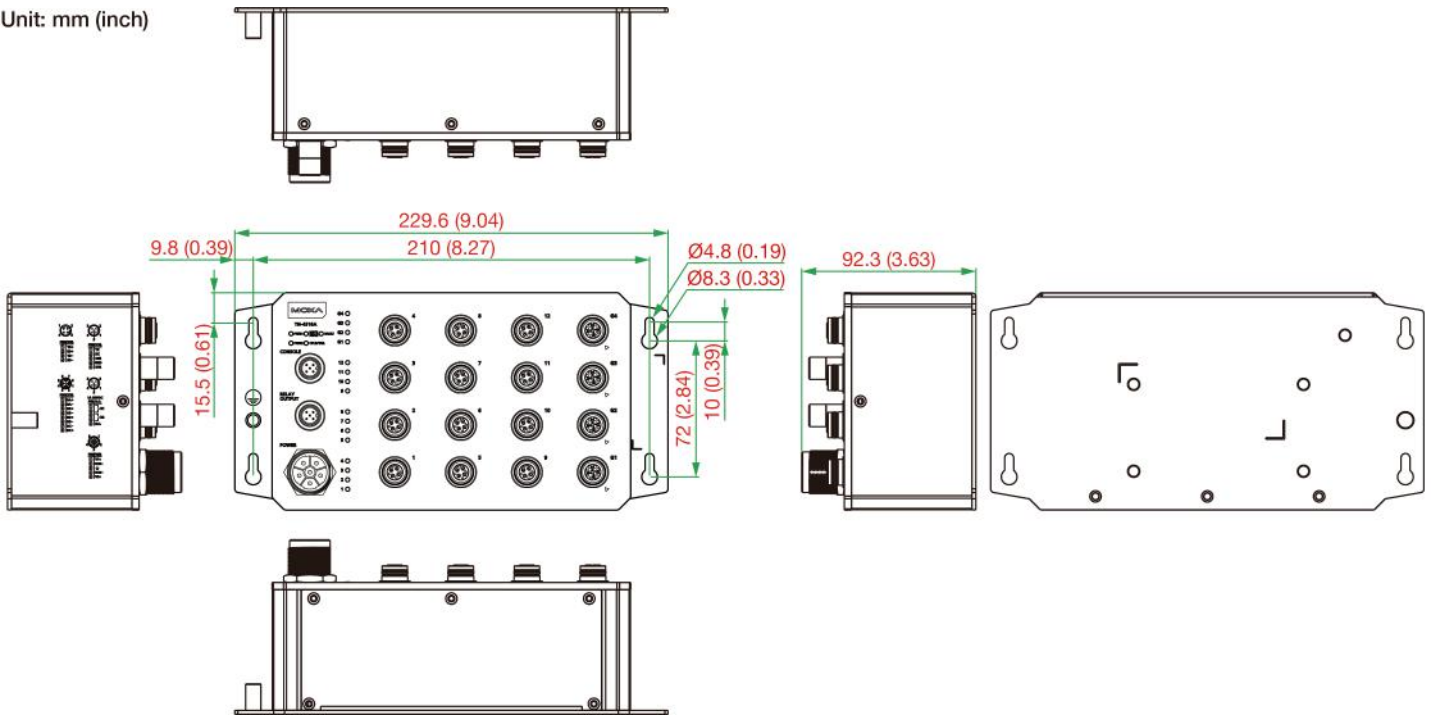
## TN-4516A Non-PoE Models

Unit: mm (inch)



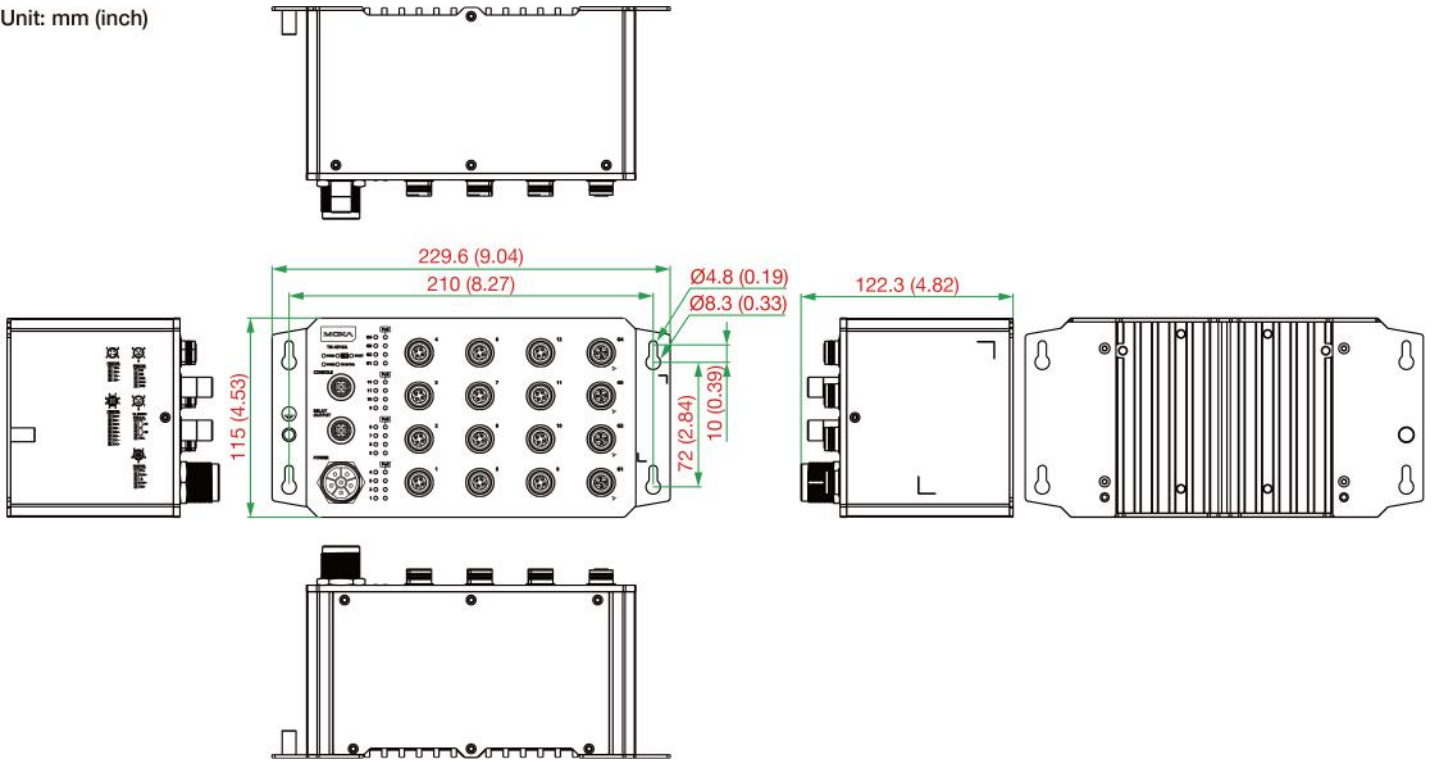
## TN-4516A Non-PoE 4GTX/4GTXBP Models

Unit: mm (inch)



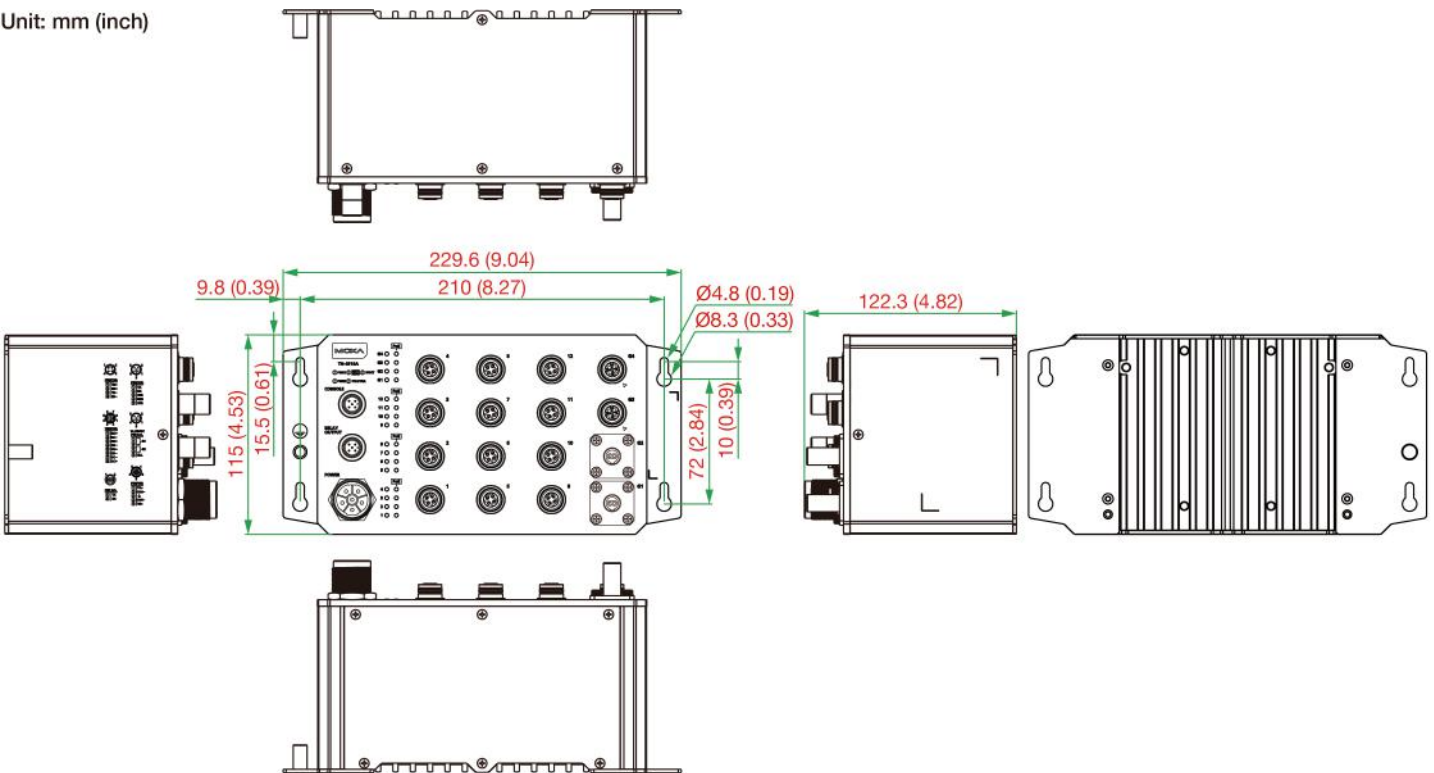
## TN-4516A PoE Models

Unit: mm (inch)



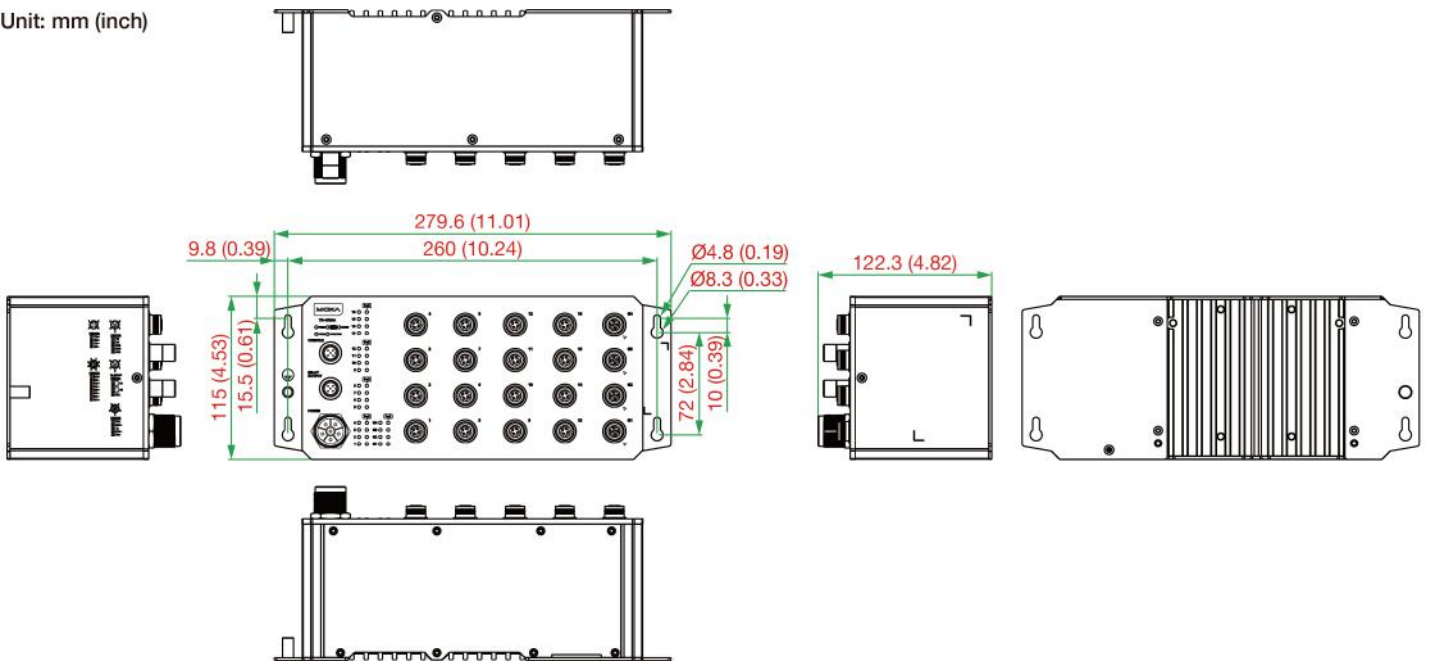
## TN-4516A PoE Fiber (ODC) Models

Unit: mm (inch)



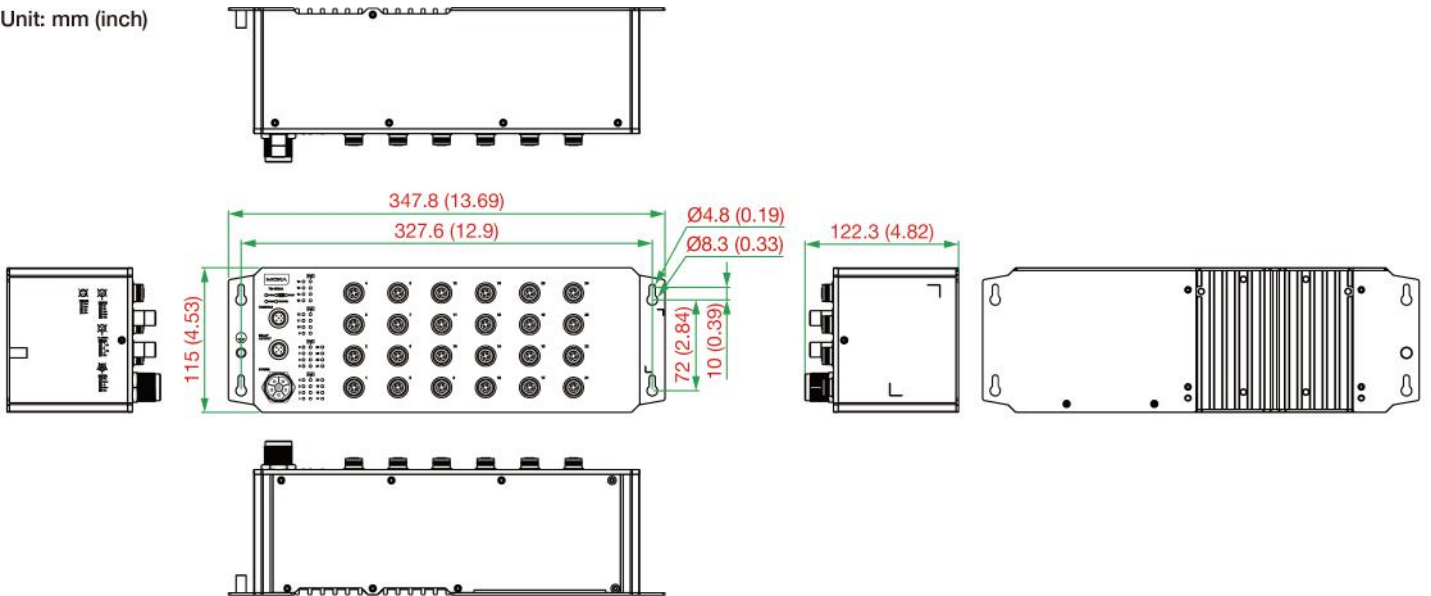
## TN-4520A Models

Unit: mm (inch)



## TN-4524A Models

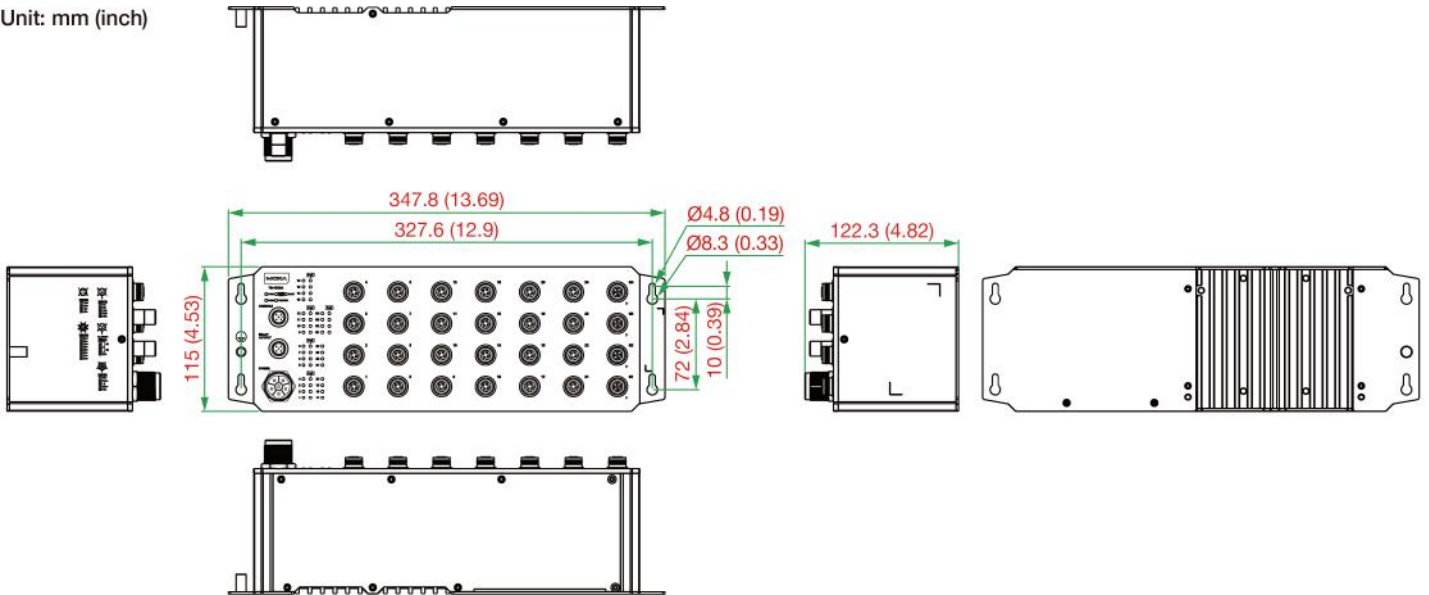
Unit: mm (inch)





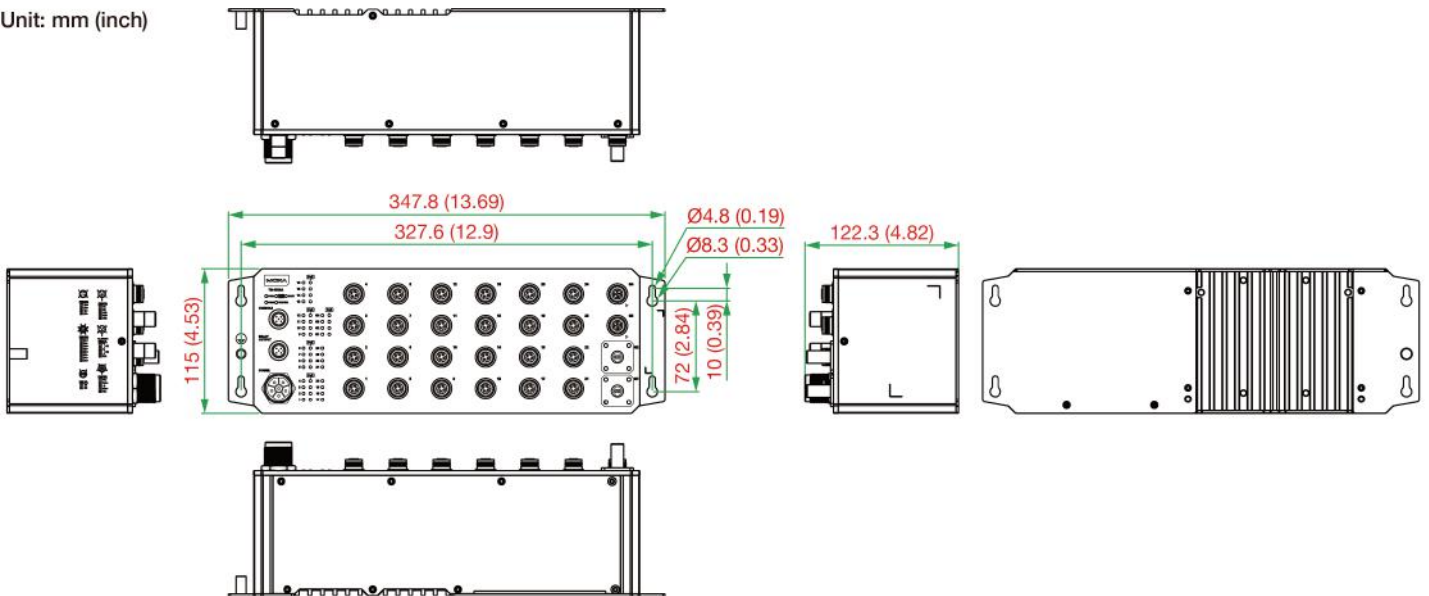
## TN-4528A Models

Unit: mm (inch)



## TN-4528A Fiber (ODC) Models

Unit: mm (inch)



## Ordering Information

| Model Name            | 10/100/<br>1000BaseT(X)<br>Ports<br>Q-ODC Fiber<br>Connector | 10/100/<br>1000BaseT(X)<br>Ports<br>M12 X-Coded 8-<br>Pin Female<br>Connector | 10/100/<br>1000BaseT(X)<br>Ports<br>M12 X-Coded 8-<br>Pin Female<br>Connector with<br>Bypass Relay | 10/100BaseT(X)<br>Ports<br>M12 D-Coded 4-<br>Pin Female<br>Connector | PoE Ports<br>10/100BaseT(X),<br>M12 D-Coded 4-<br>Pin Female<br>Connector | PoE Ports<br>100/<br>1000BaseT(X),<br>M12 X-Coded 8-<br>Pin Female<br>Connector | Conformal<br>Coating |
|-----------------------|--------------------------------------------------------------|-------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|----------------------------------------------------------------------|---------------------------------------------------------------------------|---------------------------------------------------------------------------------|----------------------|
| TN-4512A-WV-T         | -                                                            | -                                                                             | -                                                                                                  | 12                                                                   | -                                                                         | -                                                                               | -                    |
| TN-4512A-WV-CT-T      | -                                                            | -                                                                             | -                                                                                                  | 12                                                                   | -                                                                         | -                                                                               | ✓                    |
| TN-4516A-WV-T         | -                                                            | -                                                                             | -                                                                                                  | 16                                                                   | -                                                                         | -                                                                               | -                    |
| TN-4516A-WV-CT-T      | -                                                            | -                                                                             | -                                                                                                  | 16                                                                   | -                                                                         | -                                                                               | ✓                    |
| TN-4516A-4GTX-WV-T    | -                                                            | 4                                                                             | -                                                                                                  | 12                                                                   | -                                                                         | -                                                                               | -                    |
| TN-4516A-4GTXBP-WV-T  | -                                                            | -                                                                             | 4                                                                                                  | 12                                                                   | -                                                                         | -                                                                               | -                    |
| TN-4516A-4GTX-WV-CT-T | -                                                            | 4                                                                             | -                                                                                                  | 12                                                                   | -                                                                         | -                                                                               | ✓                    |

| Model Name                          | 10/100/<br>1000BaseT(X)<br>Ports<br>Q-ODC Fiber<br>Connector | 10/100/<br>1000BaseT(X)<br>Ports<br>M12 X-Coded 8-<br>Pin Female<br>Connector | 10/100/<br>1000BaseT(X)<br>Ports<br>M12 X-Coded 8-<br>Pin Female<br>Connector with<br>Bypass Relay | 10/100BaseT(X)<br>Ports<br>M12 D-Coded 4-<br>Pin Female<br>Connector | PoE Ports<br>10/100BaseT(X),<br>M12 D-Coded 4-<br>Pin Female<br>Connector | PoE Ports<br>100/<br>1000BaseT(X),<br>M12 X-Coded 8-<br>Pin Female<br>Connector | Conformal<br>Coating |
|-------------------------------------|--------------------------------------------------------------|-------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|----------------------------------------------------------------------|---------------------------------------------------------------------------|---------------------------------------------------------------------------------|----------------------|
| TN-4516A-4GTXPB-WV-CT-T             | -                                                            | -                                                                             | 4                                                                                                  | 12                                                                   | -                                                                         | -                                                                               | ✓                    |
| TN-4516A-12PoE-4GPoE-WV-T           | -                                                            | -                                                                             | -                                                                                                  | -                                                                    | 12                                                                        | 4                                                                               | -                    |
| TN-4516A-12PoE-4GPoE-WV-CT-T        | -                                                            | -                                                                             | -                                                                                                  | -                                                                    | 12                                                                        | 4                                                                               | ✓                    |
| TN-4516A-12PoE-2GPoE-2GTXPB-WV-T    | -                                                            | -                                                                             | 2                                                                                                  | -                                                                    | 12                                                                        | 2                                                                               | -                    |
| TN-4516A-12PoE-2GPoE-2GTXPB-WV-CT-T | -                                                            | -                                                                             | 2                                                                                                  | -                                                                    | 12                                                                        | 2                                                                               | ✓                    |
| TN-4516A-12PoE-2GPoE-2GODC-WV-T     | 2                                                            | -                                                                             | -                                                                                                  | -                                                                    | 12                                                                        | 2                                                                               | -                    |
| TN-4516A-12PoE-2GPoE-2GODC-WV-CT-T  | 2                                                            | -                                                                             | -                                                                                                  | -                                                                    | 12                                                                        | 2                                                                               | ✓                    |
| TN-4520A-16PoE-4GPoE-WV-T           | -                                                            | -                                                                             | -                                                                                                  | -                                                                    | 16                                                                        | 4                                                                               | -                    |
| TN-4520A-16PoE-4GPoE-WV-CT-T        | -                                                            | -                                                                             | -                                                                                                  | -                                                                    | 16                                                                        | 4                                                                               | ✓                    |
| TN-4524A-16PoE-WV-T                 | -                                                            | -                                                                             | -                                                                                                  | 8                                                                    | 16                                                                        | -                                                                               | -                    |
| TN-4524A-16PoE-WV-CT-T              | -                                                            | -                                                                             | -                                                                                                  | 8                                                                    | 16                                                                        | -                                                                               | ✓                    |
| TN-4528A-16PoE-4GPoE-WV-T           | -                                                            | -                                                                             | -                                                                                                  | 8                                                                    | 16                                                                        | 4                                                                               | -                    |
| TN-4528A-16PoE-4GPoE-WV-CT-T        | -                                                            | -                                                                             | -                                                                                                  | 8                                                                    | 16                                                                        | 4                                                                               | ✓                    |
| TN-4528A-16PoE-2GPoE-2GTXPB-WV-T    | -                                                            | -                                                                             | 2                                                                                                  | 8                                                                    | 16                                                                        | 2                                                                               | -                    |
| TN-4528A-16PoE-2GPoE-2GTXPB-WV-CT-T | -                                                            | -                                                                             | 2                                                                                                  | 8                                                                    | 16                                                                        | 2                                                                               | ✓                    |
| TN-4528A-16PoE-2GPoE-2GODC-WV-T     | 2                                                            | -                                                                             | -                                                                                                  | 8                                                                    | 16                                                                        | 2                                                                               | -                    |
| TN-4528A-16PoE-2GPoE-2GODC-WV-CT-T  | 2                                                            | -                                                                             | -                                                                                                  | 8                                                                    | 16                                                                        | 2                                                                               | ✓                    |

## 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 |

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

### Connectors

|                     |                                                                             |
|---------------------|-----------------------------------------------------------------------------|
| 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                         |
| M12A-5P-IP68        | A-coded screw-in sensor connector, female, IP68, 4.05 cm                    |
| M12X-8PMM-IP67-HTG  | X-coded screw-in Gigabit Ethernet connector, 8-pin male M12 connector, IP67 |

### M12 Connector Caps

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

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