TN-5300A Series
Quick Installation Guide

Moxa ToughNet Unmanaged Switch

Version 1.1, January 2024

Technical Support Contact Information
www.moxa.com/support

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P/N: 1802053050031

Overview

The ToughNet TN-5300A Series M12 unmanaged Ethernet switches are designed for industrial applications in harsh environments. The TN-5300A Series switches use M12 connectors to ensure tight, robust connections, and guarantee reliable resistance against environmental disturbances, such as vibration and shock. The TN-5300A Series Ethernet switches comply with all mandatory requirements of the EN 50155 standard including operating temperature, power input voltage, surge, ESD, and vibration, making these switches suitable for rolling stock and a variety of other industrial applications.

The TN-5300A Series Ethernet switches provide 5 or 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. The TN-5308A PoE models provide 8 IEEE 802.3af/at compliant PoE ports. These switches are classified as power source equipment (PSE) and provide up to 30 watts of power per port.

Package Checklist

Your ToughNet TN-5300A unmanaged switch is shipped with the following items. If any of these items are missing or damaged, please contact your customer service representative for assistance.

- TN-5300A Series unmanaged switch
- Metal caps, male, for M12 Ethernet ports (TN-5305A models: x 2; TN-5308A models: x 4), preinstalled on the switch
- Wall-mounting kit (including 3 screws)
- Quick installation guide (printed)
- Warranty card

*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

ATTENTION

The equipment is intended to be supplied by an external power source (UL listed/IEC 60950-1/IEC 62368-1). TN-5300A non-PoE models require an output rating of 24 to 110 VDC, 0.1 A min. and TN-5300A PoE models require 3.2 A min. at an ambient temperature of min. 70°C at altitudes under 3000 m.

ATTENTION

Restricted Access Location

This equipment is intended to be used in restricted access locations, such as control rooms. Access should be restricted to qualified service personnel or authorized users.

ATTENTION (For PoE Models)

For safety reasons, the product is considered not likely to require connection to an Ethernet network with outside plant routing.

ATTENTION

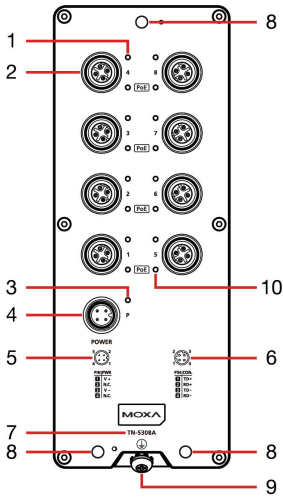
Exposed connectors must be tightly covered with protective caps (an optional accessory) when not in use to ensure IP67-rated protection.

We recommend the following connector caps:

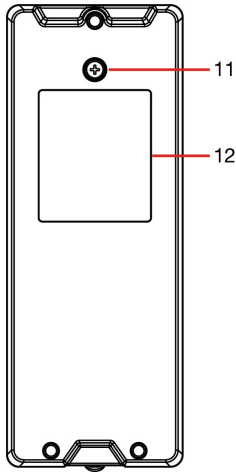
- For male connectors: A-CAP-M12M-M connector caps.
- For female connectors: A-CAP-M12F-M-PP connector caps.

Panel Layouts

Front View



Rear View



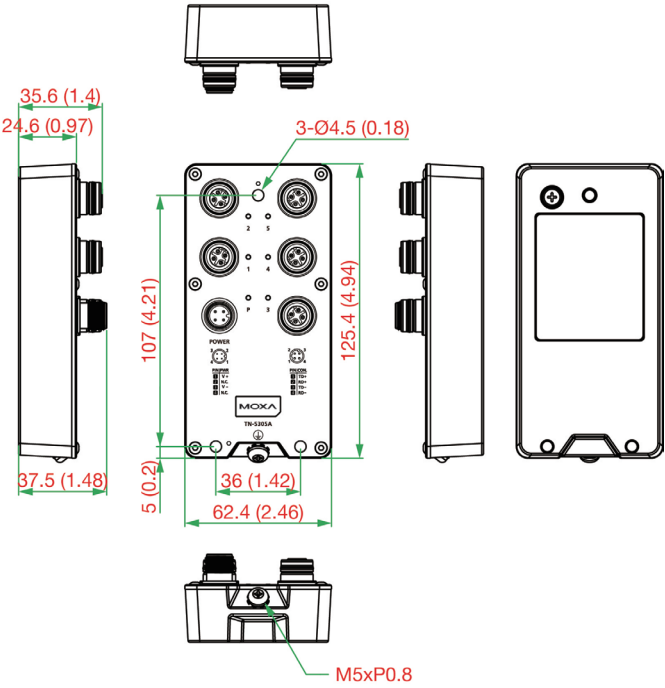
Descriptions

1. 10/100BaseT(X) port LED
2. 10/100BaseT(X) port (M12 D-coded 4-pin female connector)
3. Power input port LED
4. Power input port (M12 A-coded 4-pin male connector)
5. Pin definition for Power input port
6. Pin definition for Data transmission port
7. Model name
8. Wall mounting hole
9. Grounding screw
10. PoE Label and LED (* Only in PoE models)
11. Protection screw for vent hole
12. Model label

Mounting Dimensions (unit = mm)

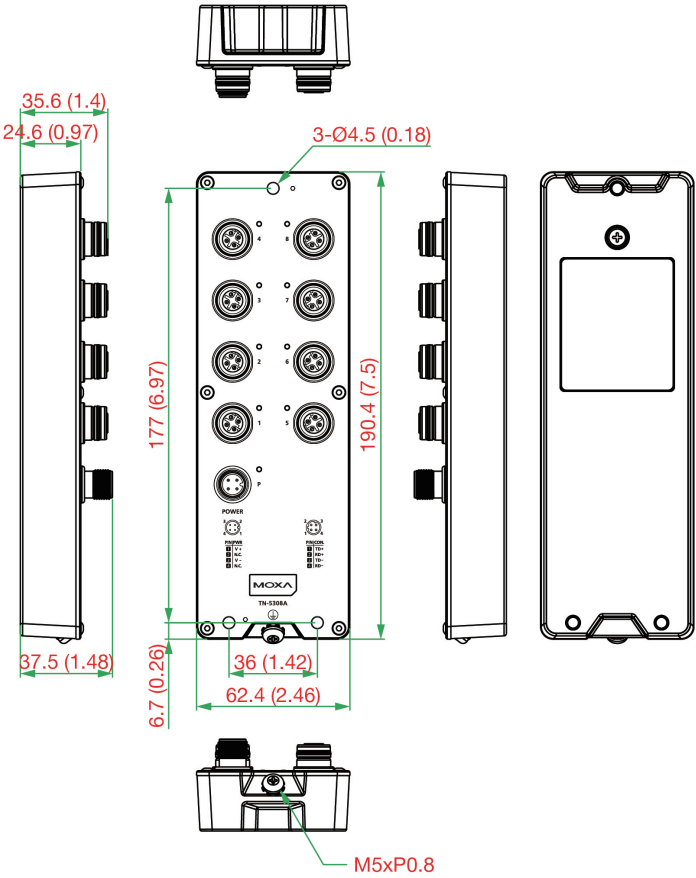
TN-5305A Models

Unit: mm (inch)



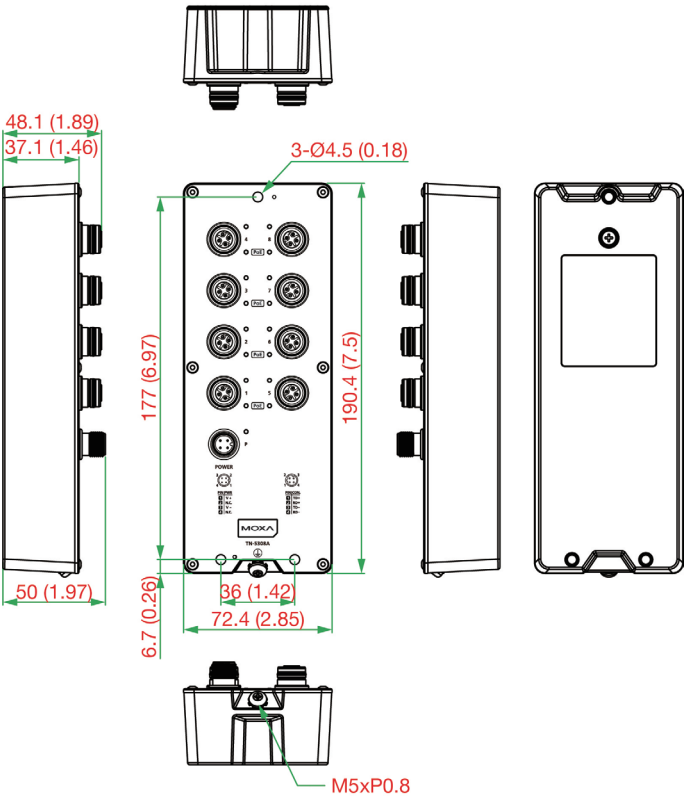
TN-5308A Non-PoE Models

Unit: mm (inch)



TN-5308A PoE Models

Unit: mm (inch)



Cooling Requirements

The thermal design of this product uses convection cooling. Make sure the ambient temperature is within the device's operating temperature range and ensure the airflow around the product is not obstructed. The recommended minimum ventilation space for each side is listed below:

Top and bottom: 50 mm

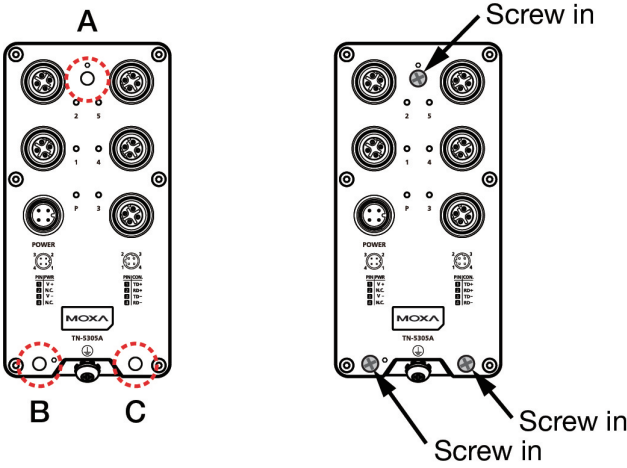
Sides: 50 mm

Front: 50 mm

Wall Mounting

STEP 1: Mounting the TN-5300A to a wall requires 3 screws (non-PoE models: M4 x P 0.7, 35 mm length; PoE models: M4 x P 0.7, 45 mm length). Use the ToughNet device as a guide to mark the correct positions of the 3 screws (marked A, B, C on the diagram) and drill the screw holes.

STEP 2: Align the wall-mounting holes of the device with the screw holes, put the screws in, and tighten the screws for stability with a suggested torque of 7 kgf-cm.



DIN-rail Mounting (Optional)

The DIN-rail mounting kit (sold separately) should be installed to the back panel of the TN device. Mount the TN device on corrosion-free mounting rails that meet the EN 60715 standard.

NOTE We recommend the following DIN-rail kits:

- For TN-5305A models: DK-TN-5305A (124 x 60 x 7 mm).
- For TN-5308A non-PoE models: DK-TN-5308A (188 x 60 x 7 mm).
- For TN-5308A PoE models: DK-TN-5308A-PoE (188 x 60 x 7 mm).

Installation

STEP 1: Align the wall-mounting holes on the back of the ToughNet device with the DIN-rail kit (marked A, B, C on the diagram). Tighten the screws (non-PoE models: M4 x P 0.7, 30 mm length; PoE models: M4 x P 0.7, 40 mm length) with a torque of 5 kgf-cm to secure the DIN-rail kit to the device.

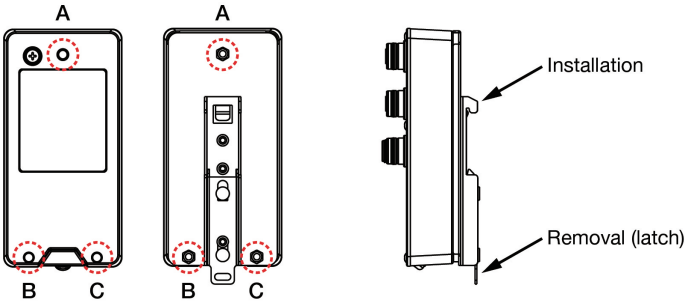
STEP 2: Pull down the latch and insert the upper lip of the DIN rail into the DIN-rail mounting kit.

Removal

NOTE Our DIN-rail kit now utilizes a quick release mechanism to make it easier for users to remove the device from the DIN rail.

STEP 1: Pull down the latch on the mounting kit with a screwdriver.

STEP 2: Slightly pull the ToughNet device forward and lift up to remove it from the DIN rail.



Wiring Requirements

WARNING

Turn the power off before disconnecting modules or wires. The correct power supply voltage is listed on the product label. Check the voltage of your power source to make sure you are using the correct voltage. Do NOT use a voltage greater than what is specified on the product label.

ATTENTION

Safety First!

Observe all electrical codes dictating the maximum current allowable for each wire size. If the current goes above the maximum ratings, the wiring could overheat, causing serious damage to your equipment.

Please read and follow these guidelines:

- Use separate paths to route wiring for power and devices. If power wiring and device wiring paths must cross, make sure the wires are

perpendicular at the intersection point.
NOTE: Do not run signal or communications wiring and power wiring through the same wire conduit. To avoid interference, wires with different signal characteristics should be routed separately.

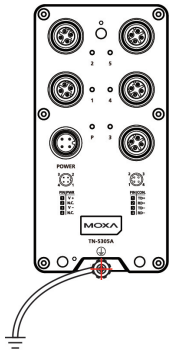
- You can use the type of signal transmitted through a wire to determine which wires should be kept separate. The rule of thumb is that wiring that shares similar electrical characteristics can be bundled together.
- Keep input wiring and output wiring separated.
- It is strongly advised that you label wiring for all devices in the system when necessary.

Grounding the ToughNet Unmanaged Switch

Grounding and wire routing help limit the effects of noise due to electromagnetic interference (EMI). Run the ground connection from the grounding screw to the grounding surface prior to connecting devices.

ATTENTION

This product is intended to be mounted to a well-grounded mounting surface such as a metal panel.



STEP 1: Connect the grounding wire (AWG 22 or larger) to the grounding screw and connect the other end of the wire to ground.

STEP 2: Fasten the grounding screw (M5 x P 0.7, 6 mm length) with a torque of 6 kgf-cm to ensure a tight connection.

Connecting the Power Supplies

The M12 A-coded 4-pin male connector on the front panel of the TN-5300A Series unmanaged switch is used for power input.

ATTENTION

Before connecting the TN-5300A Series to the power input, make sure the power source voltage is stable.

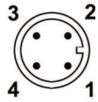
ATTENTION

Do not power on the TN-5300A Series before connecting the M12 power connector.

NOTE The suggested power cable is M12(FF4P)/Open-BK-100-IP68. The suggested plastic shell connector is M12-5P-IP68. The suggested metal shell connector is M12A-5PFF-IP67-HTG (5-pin).
The suggested cord diameter is AWG 22 or larger. The cord dimensions depend on the choice of pin number and M12 coded type.

Pinouts for the power input port

PIN	PWR
1	V+
2	N.C.
3	V–
4	N.C.



Pin	Description	Usage
1	V+	Connect "V+" to the positive (+) terminal when using a DC power source.
2	N.C.–	Not connected.
3	V-	Connect "V-" to the positive (+) terminal when using a DC power source.
4	N.C.–	Not connected.

STEP 1: Plug the power cord connector into the power input port.

STEP 2: Screw the nut on the power cord connector into the M12 power input connector of the device with a torque of 5.2 kgf-cm to ensure a tight connection.

Connecting the Data Lines

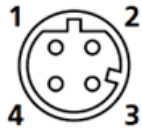
10/100BaseT(X) Ethernet Port Connection

The TN-5300A Series features 10/100BaseT(X) M12 D-coded 4-pin female connectors. The ports located on the TN-5300A Series front panel are used to connect to Ethernet-enabled devices. TN-5300A supports Auto MDI/MDI-X which automatically adjusts the port's pinouts depending on the type of Ethernet cable used (straight-through or cross-over), and the type of device (NIC-type or HUB/Switch-type) connected to the port.

NOTE The suggested cable for M12 D-coded-to-M12 D-coded connections is CBL-M12DMM4PM12DMM4P-BK-100-IP67.
The suggested cable for M12 D-coded-to-RJ45 connections is CBL-M12D(MM4P)/RJ45-100 IP67 for M12.
The suggested connector is M12D-4P-IP68 (solder type).
The suggested connector for metal shells is M12D-4PMM-IP67 (crimp type).

Pinouts for the 10/100BaseT(X) Ports

PIN	PWR
1	TD+
2	RD+
3	TD-
4	RD-



PoE Pin-out	D-coded
V+	Pin 1, 3 (TD+, TD-)
V-	Pin 2, 4 (RD+, RD-)

STEP 1: Plug the cable connector into the Ethernet port. Shielded cable is recommended.

STEP 2: Screw the nut on the cable connector into the power input connector of the device with a suggested torque of 5.2 kgf-cm to ensure a tight connection.

NOTE TN-5308A PoE models support IEEE 802.3at PoE, providing up to 30 W per port. The total PoE power budget is 50.2 W.

LED Indicators

Several LED indicators are located on the ToughNet unmanaged switch's front panel. The function of each LED is described in the table below.

LED	Color	State	Description
Port LEDs			
P (Power)	Amber	On	Power is being supplied to the power input.
		Off	Power is not being supplied to the power input.
FE Ports (10/100M)	Amber	On	The port's 10 Mbps link is active.
		Blinking	Data is being transmitted at 10 Mbps.
		Off	The port's 10 Mbps link is inactive.
	Green	On	FE port's 100 Mbps link is active.
		Blinking	Data is being transmitted at 100 Mbps.
		Off	FE port's 100 Mbps link is inactive.
PoE Ports (PoE models only)	Amber	On	Power is being supplied to a Powered Device (PD).
		Off	Power is not being supplied to a Powered Device (PD).

For full specifications and supported accessories, please refer to the TN-5300A Series datasheet available at www.moxa.com.