

# TN-5524-8PoE Series

## EN 50155 24-port managed Ethernet switches with 8 PoE ports



- > IEEE 802.3af compliant PoE ports
- > Provides up to 15.4 watts at 48 VDC per PoE port
- > Isolated power inputs with universal 24 VDC power supply
- > Essential compliance with EN 50155\*
- > -40 to 75°C operating temperature range (T models)
- > Turbo Ring and Turbo Chain (recovery time < 20 ms @ 250 switches), RSTP/STP, and MSTP for network redundancy

\*Moxa defines "essential compliance" to include those EN 50155 requirements that make products more suitable for rolling stock railway applications.



### Introduction

The ToughNet TN-5500 series M12 PoE managed Ethernet switches are designed for railway applications, such as rolling stock, and wayside installations. The TN 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-5524-8PoE series Ethernet switches provide 24 Fast Ethernet M12 ports with 8 IEEE 802.3af compliant PoE (Power-over-Ethernet) ports. The PoE switches are classified as power source equipment (PSE) and provide up to 15.4 watts of power

per port, and can be used to power IEEE 802.3af compliant powered devices (PDs) (such as surveillance cameras, wireless access points, and IP phones). Models with an extended operating temperature range of -40 to 75°C are also available. The TN-5500-PoE series Ethernet switches are compliant with essential 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.

### Features and Benefits

- Advanced PoE management function
- IPv6 Ready logo awarded (IPv6 Logo Committee certified)
- Leading EN50155-compliant PoE switches for rolling stock applications
- DHCP Option 82 for IP address assignment with different policies
- EtherNet/IP and Modbus/TCP industrial Ethernet protocol supported
- Turbo Ring and Turbo Chain (recovery time < 20 ms @ 250 switches), RSTP/STP, and MSTP for network redundancy
- 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) to increase determinism
- IEEE 802.3ad, LACP for optimum bandwidth utilization
- TACACS+, SNMPv3, IEEE 802.1X, HTTPS, and SSH to enhance network security
- SNMPv1/v2c/v3 for different levels of network management
- 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, relay output
- Line-swap fast recovery
- Automatic recovery of connected device's IP addresses
- LLDP for automatic topology discovery in network management software
- Configurable by web browser, Telnet/serial console, CLI, and Windows utility
- Panel mounting installation capability

### Specifications

#### Technology

##### Standards:

- IEEE 802.3af for Power-over-Ethernet
- IEEE 802.3 for 10BaseT
- IEEE 802.3u for 100BaseT(X)
- IEEE 802.3x for Flow Control
- IEEE 802.1D-2004 for Spanning Tree Protocol
- IEEE 802.1w for Rapid STP
- IEEE 802.1s for Multiple Spanning Tree Protocol
- IEEE 802.1Q for VLAN Tagging
- IEEE 802.1p for Class of Service
- IEEE 802.1X for Authentication
- IEEE 802.3ad for Port Trunk with LACP

#### Software Features

- Management:** IPv4/IPv6, SNMP v1/v2c/v3, Telnet, LLDP, Port Mirror, Syslog, RMON, BootP, DHCP Server/Client, DHCP Option 66/67/82, TFTP, SMTP, RARP, HTTP, HTTPS, SNMP inform, Flow Control, Back pressure flow control
- Filter:** 802.1Q VLAN, Port-Based VLAN, GVRP, IGMPv1/v2, GMRP, Static Multicast
- Redundancy Protocols:** STP/RSTP, MSTP, Turbo Ring v1/v2, Turbo Chain, Link Aggregation
- Security:** RADIUS, TACACS+, SSL, SSH, Port Lock, Broadcast Storm Protection, Rate Limit
- Time Management:** SNTP, NTP Server/Client, IEEE 1588v2 PTP (software-based)

**Industrial Protocols:** EtherNet/IP, Modbus/TCP

**MIB:** MIB-II, Ethernet-like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Group 1, 2, 3, 9

**Switch Properties**

- Priority Queues:** 4
- Max. Number of VLANs:** 64
- VLAN ID Range:** VID 1 to 4094
- IGMP Groups:** 256

**Interface**

**Fast Ethernet:** Front cabling, M12 D-coded 4-pin female connector, 10/100BaseT(X) auto negotiation speed, F/H duplex mode, and auto MDI/MDI-X connection

**Console Port:** M12 A-coded 5-pin male connector

**Alarm Contact:** 2 relay outputs in one M12 A-coded 5-pin male connector with current carrying capacity of 3 A @ 30 VDC

**Power Requirements**

- Input Voltage:** 24 VDC
- Operating Voltage:** 16.8 to 30 VDC
- Input Current:** 8.4 (max.) @ 24 VDC
- Overload Current Protection:** Present
- Connection:** M23 connector
- Reverse Polarity Protection:** Present

**Physical Characteristics**

- Housing:** Metal
- IP Rating:** IP40 protection (optional protective caps available for unused ports)
- Dimensions:** 390 x 132 x 122.3 mm (15.35 x 5.20 x 4.81 in)
- Weight:** 3,506 g (7.73 lb)
- Installation:** Panel-mounting kit

**Environmental Limits**

- Operating Temperature:** -40 to 75°C (-40 to 167°F)
  - Storage Temperature:** -40 to 85°C (-40 to 185°F)
  - Ambient Relative Humidity:** 5 to 95% (non-condensing)
  - Altitude:** 2000 m
- Please contact Moxa if you require products guaranteed to function at higher altitudes

**Standards and Certifications**

- Safety:** UL/cUL 508
- EMI:** FCC Part 15 Subpart B Class A, EN 55022 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
- Rail Traffic:** (for panel-mounting installations)
  - EN 50155 (essential compliance\*), EN 50121-4, EN 45545-2
  - \*Moxa defines "essential compliance" to include those EN 50155 requirements that make products more suitable for rolling stock railway applications.
- Shock:** EN 50155, IEC 61373
- Freefall:** IEC 60068-2-32
- Vibration:** EN 50155, IEC 61373

Note: Please check Moxa's website for the most up-to-date certification status.

**MTBF** (mean time between failures)

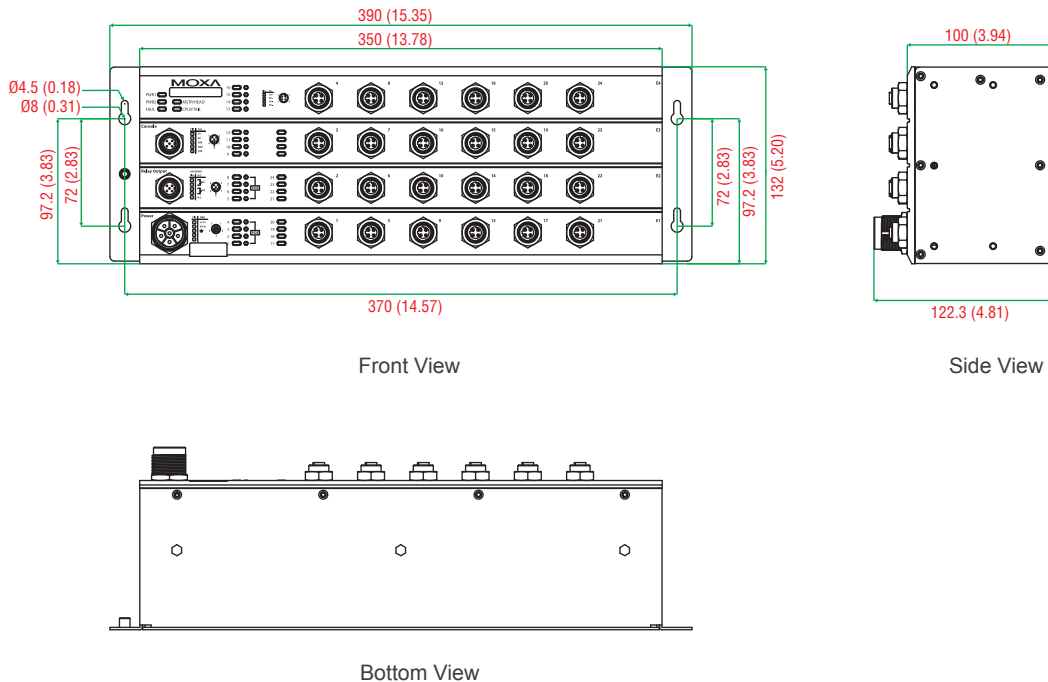
- Time:** 663,533 hrs
- Standard:** Telcordia SR332

**Warranty**

- Warranty Period:** 5 years
- Details:** See [www.moxa.com/warranty](http://www.moxa.com/warranty)

**Dimensions**

Unit: mm (inch)



## Ordering Information

Available Models	Port Interface				Power Supply				
	PoE, 10/100 BaseT(X), M12 Connector	10/100 BaseT(X), M12 Connector	10/100/1000 BaseT(X), M12 Connector	1000 Mbps Fiber Optic Q-ODC	P24 VDC (16.8 to 30 V)	PLV: 36/48 VDC (25.2 to 60 VDC)	PMV: 72/96/110 VDC (50.4 to 137.5 VDC)	WV: 24/36/48/72/96/110 VDC	Conformal Coating
TN-5524-8PoE-P24-T	8	16	–	–	1	–	–	–	–
TN-5524-8PoE-P24-CT-T	8	16	–	–	1	–	–	–	✓

### Optional Accessories (can be purchased separately)

**Power Cords, M12 Connectors, Protective Caps:** See the EN 50155 Switch Accessories datasheet for details

**MXview:** Moxa industrial network management software with 50, 100, 250, 500, 1000, or 2000 nodes

**EDS-SNMP OPC Server Pro:** OPC server software that works with all SNMP devices

**ABC-01-M12:** Configuration backup and restoration tool for TN series managed Ethernet switches, 0 to 60°C operating temperature

### Package Checklist

- TN-5524-8PoE switch
- M12-to-DB9 console port cable
- 2 protective caps for console and relay output ports
- Panel-mounting kit
- Documentation and software CD
- Hardware installation guide
- Warranty card

# EN 50155 Switch Accessories

## : M12/M23 Cords

### **CBL-M12D(MM4P)/RJ45-100 IP67**

1-meter M12-to-RJ45 Cat-5C UTP Ethernet cable with IP67-rated 4-pin male D-coded M12 connector



### **CBL-M12(FF5P)/OPEN-100 IP67**

1-meter M12-to-5-pin power cable with IP67-rated 5-pin female A-coded M12 connector



### **CBL-M23(FF6P)/Open-BK-100 IP67**

1-meter M23-to-6-pin power cable with IP67-rated 6-pin female M23 connector



### **CBL-M12XMM8PRJ45-Y-200-IP67**

2-meter M12-to-RJ45 Cat-5 UTP Ethernet cable with IP67-rated 8-pin male X-coded crimp type M12 connector



### **CBL-M12XMM8P-Y-300-IP67**

3-meter M12-to-M12 Cat-5 UTP Ethernet cable with IP67-rated 8-pin male X-coded crimp type M12 connector



### **CBL-M12XMM8P-Y-100-IP67**

1-meter M12-to-M12 Cat-5 UTP Ethernet cable with IP67-rated 8-pin male X-coded crimp type M12 connector



## : M12 Connectors

### **M12D-4P-IP68**

Field-installable M12 D-coded screw-in sensor connector, 4-pin male, IP68-rated



### **M12A-5P-IP68**

Field-installable M12 A-coded screw-in sensor connector, 5-pin female, IP68-rated



### **M12X-8PMM-IP67-HTG**

Field-installable M12 X-coded crimp type, slim design connector, 8-pin male, IP67-rated



## : M12 IP67 Protective Caps

### **A-CAP-M12F-M**

Metal cap for M12 female connector



### **A-CAP-M12M-M**

Metal cap for M12 male connector



## : M23 Connectors

### **A-PLG-WPM23-01**

M23 cable connector, 6-pin female, crimp type

