TN-4900 Series

EN 50155 Gigabit Security Router

Features and Benefits

- 8 Gigabit ports and up to 12 PoE ports
- IEC 61375 ETBN functionality (ETBN models)
- Dual bypass relay
- Isolated power input range from 24 to 110 VDC
- Complies with all EN 50155 mandatory test items[1]
- -40 to 70°C operating temperature range
- Complies with IEC 62443-4-2:2019[2]

Certifications

EN 50155   EN 50121-4   CE   FC

Introduction

The ToughNet TN-4900 Series, designed for rolling stock Ethernet networks, is a set of high-performance M12 routers with 8 Gigabit ports and up to four bypass relay ports. These routers feature firewall, ETBN, and routing functionality to facilitate the deployment of applications across networks. The TN-4900 Series routers use M12 and other circular connectors to ensure tight, robust connections that guarantee reliability against environmental disturbances, such as vibration and shock.

The TN-4900 Series supports a wide power input range of 24 to 110 VDC and can operate in temperatures of -40 to 70°C for extended periods of time. Furthermore, these routers are compliant with the mandatory requirements of EN 50155, making them suitable for a variety of industrial applications.

Additional Features and Benefits

- IEC 61375-2-3, 61375-2-5–compliant ETBN
- IEC 62443-4-2:2019–compliant cybersecurity features
- Firewall to protect the network and filter untrusted network traffic
- Routing functionality to divide a large network into hierarchical subnets and allow data and information to communicate across networks
- NAT makes IP management easier as end devices in different carriages can use the same IP addresses
- Leading EN 50155 Ethernet router for rolling stock applications

- Turbo Ring and RSTP/STP for network redundancy
- Panel mounting installation
- 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, and CLI Windows utility

Specifications

Ethernet Interface

10/100/1000BaseT(X) Ports (M12 X-coded 8-pin female connector)	TN-4908 non-PoE non-ETBN Models: 8 TN-4908 non-PoE ETBN Models: 4 TN-4908 PoE non-ETBN Models: 4 TN-4916 PoE non-ETBN models: 4
10/100/1000BaseT(X) Ports (M12 X-coded 8-pin female connector with bypass relay)	ETBN Models: 4
PoE Ports (10/100BaseT(X), M12 D-coded 4-pin female connector)	TN-4916 PoE Models: 8

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1. This product is suitable for rolling stock railway applications, as defined by the EN 50155 standard. For a more detailed statement, click here: www.moxa.com/doc/specs/EN_50155_Compliance.pdf
2. Expected to be ready by the end of Q2, 2023.

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PoE Ports (100/1000BaseT(X), M12 X-coded 8-pin female connector)	PoE Models: 4
Standards	IEEE 802.1Q for VLAN Tagging IEEE 802.1w for Rapid Spanning Tree Protocol IEEE 802.3af/at for PoE/PoE+ output IEEE 802.3ab for 1000BaseT(X) IEEE 802.1X for authentication IEEE 802.1D-2004 for Spanning Tree Protocol IEEE 802.3x for flow control IEEE 802.3u for 100BaseT(X) IEEE 802.1p for Class of Service IEEE 802.3 for 10BaseT

Ethernet Software Features

Configuration Options	Command Line Interface (CLI) through Serial/Telnet/SSH Web Console (HTTP/HTTPS) Windows Utility
Filter	IGMP v1/v2 Static Multicast 802.1Q
Management	Back Pressure Flow Control SNMP Inform LLDP Syslog HTTP Flow control SMTP QoS/CoS/ToS Port Mirror SNMP Trap SNMPv1/v2c/v3 IPv4 Telnet DHCP server TFTP RARP Account Management
Redundancy Protocols	RSTP Static Port Trunk Turbo Ring v2 STP
Routing Redundancy	VRRP
Security	Port Lock SSH Broadcast storm protection TACACS+ Local Account Accessibility HTTPS/SSL
Time Management	SNTP NTP Server/Client
Unicast Routing	RIPV1/V2 OSPF Static Route
Multicast Routing	Static Route

DoS and DDoS Protection

Technology	NMAP-ID Scan ARP-Flood SYN/FIN Scan Null Scan ICMP-Death FIN Scan SYN-Flood NEWWithout-SYN Scan Xmas Scan NMAP-Xmas Scan SYN/RST Scan

Firewall

Filter	ICMP MAC address Ethernet protocols Ports IP address DDoS
Quick Automation Profiles	Telnet HTTP RADIUS PROFINET EtherCAT IPsec SSH PPTP IEC 60870-104 FOUNDATION Fieldbus L2TP EtherNet/IP LonWorks DNP Modbus TCP FTP
Stateful Inspection	Router firewall Transparent (bridge) firewall
Throughput	Max. 500,000 packets per second

Switch Properties

IGMP Groups	256
MAC Table Size	16 K
Max. No. of VLANs	16
VLAN ID Range	VID 1 to 4094

LED Interface

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

NAT

Features	1-to-1 Port forwarding N-to-1

Serial Interface

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

USB Interface

M12 Connector	M12 A-coded 5-pin female (for ABC-02 USB storage)

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Power Parameters

Input Current	TN-4908 Non-PoE Models: 0.68 A @ 24 V TN-4908 PoE Models: 3.6 A @ 24 V TN-4916 PoE Models: 5.9 A @ 24 V
Input Voltage	24/36/48/72/96/110 VDC Redundant dual inputs No. of power inputs: 2
Operating Voltage	16.8 to 137.5 VDC
Overload Current Protection	Supported
Power Connector	M12 K-coded 5-pin male connector
Reverse Polarity Protection	Supported
Total PoE Power Budget	TN-4908 PoE Models: 50 W TN-4916 PoE Models: 95 W

Physical Characteristics

Housing	Metal
Dimensions	TN-4908 Non-PoE Models: 160 x 115 x 70 mm (6.30 x 4.53 x 2.76 in) TN-4908 PoE Models: 160 x 115 x 100 mm (6.30 x 4.53 x 3.94 in) TN-4916 PoE Models: 206 x 115 x 100 mm (8.10 x 4.53 x 3.94 in)
IP Rating	IP40
Weight	TN-4908 Non-PoE Models: 1120 g (2.47 lb) TN-4908 PoE Models: 1640 g (3.62 lb) TN-4916 PoE Models: 1990 g (4.39 lb)
Installation	Wall mounting
Protection	Optional 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)

## Standards and Certifications

EMC	EN 55032, EN 55035
EMS	IEC 61000-4-3 RS: 80 MHz to 1 GHz: 20 V/m IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV IEC 61000-4-4 EFT: Power: 2 kV; Signal: 2 kV IEC 61000-4-5 Surge: Power: 2 kV; Signal: 2 kV IEC 61000-4-6 CS: 10 V IEC 61000-4-8 PFMF
Freefall	IEC 60068-2-31
Radio Frequency	FCC
Railway	EN 50121-4 EN 50155 IEC 60571
Railway Fire Protection	EN 45545-2
Safety	IEC 62368, UL 62368

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-4908 Non-PoE Models: 795,840 hrs TN-4908 Non-PoE ETBN Models: 648,903 hrs TN-4908 PoE Models: 644,898 hrs TN-4908 PoE ETBN Models: 545,021 hrs TN-4916 PoE Models: 550,148 hrs TN-4916 PoE ETBN Models: 472,578 hrs
Standards	Telcordia SR332

Warranty

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

Package Contents

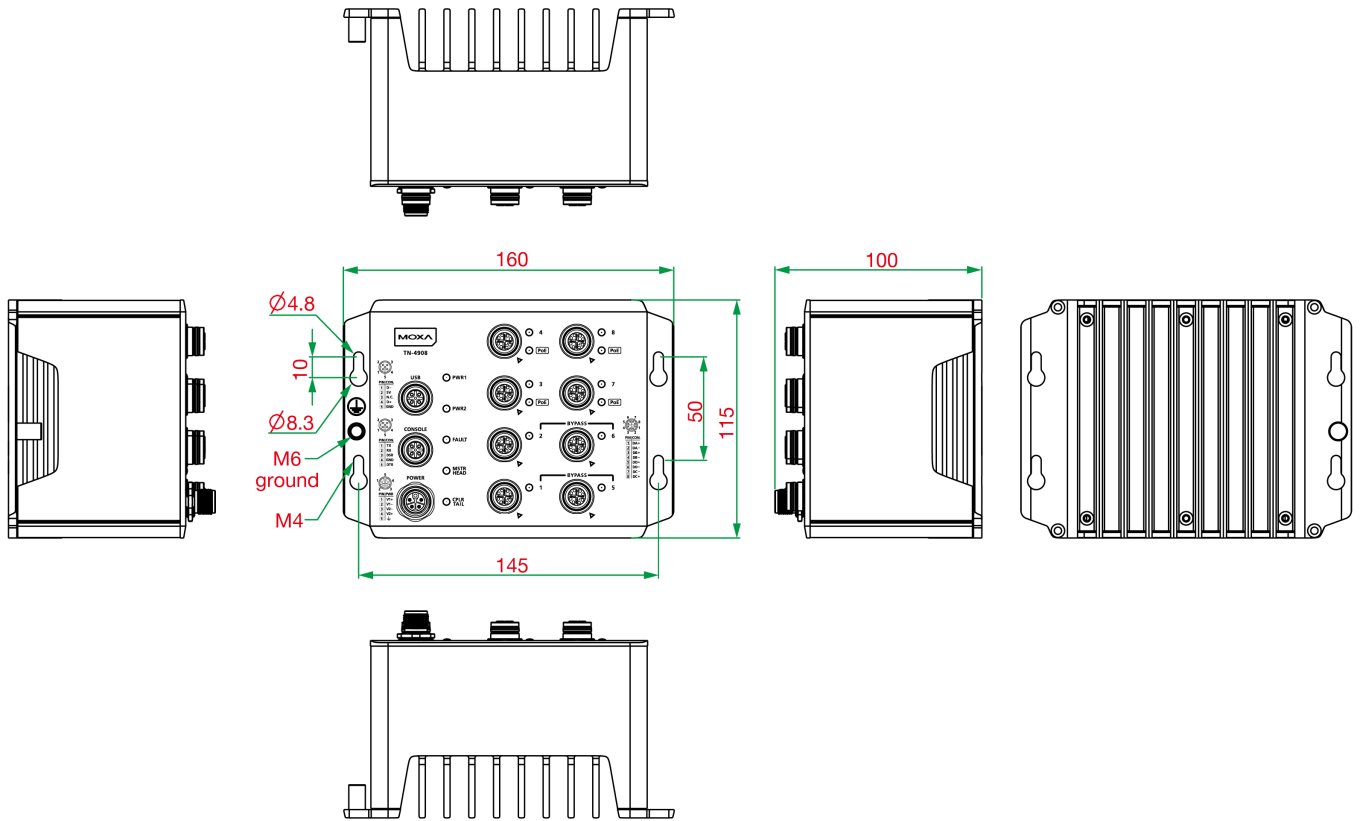| Device	1 x TN-4900 Series router
Installation Kit	2 x cap, male, metal, for M12 port (Console and USB storage ports, fixed on switch) 4/8 x cap, male, metal, for M12 port (Ethernet ports, fixed on switch) 1 x wall-mounting kit
Documentation	1 x quick installation guide 1 x warranty card

Dimensions

TN-4908 Non-PoE Models

Unit: mm
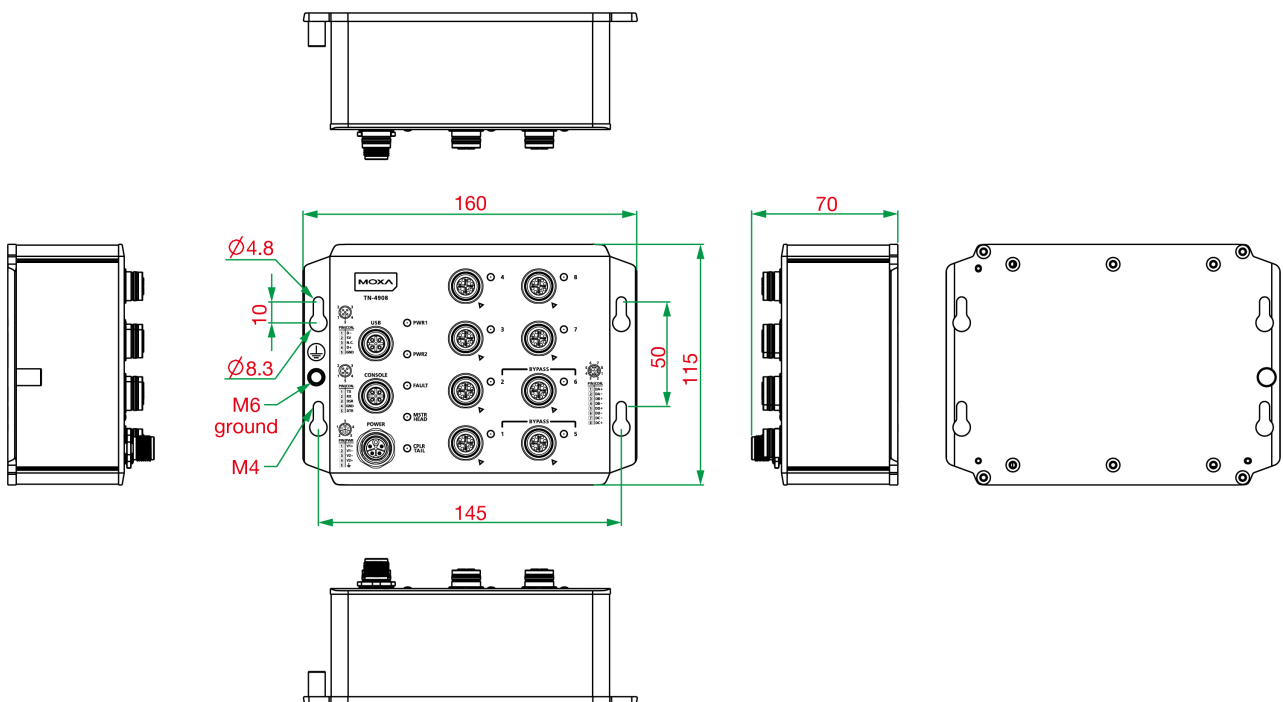
TN-4908 PoE Models

Unit: mm

TN-4916 PoE Models

Unit: mm

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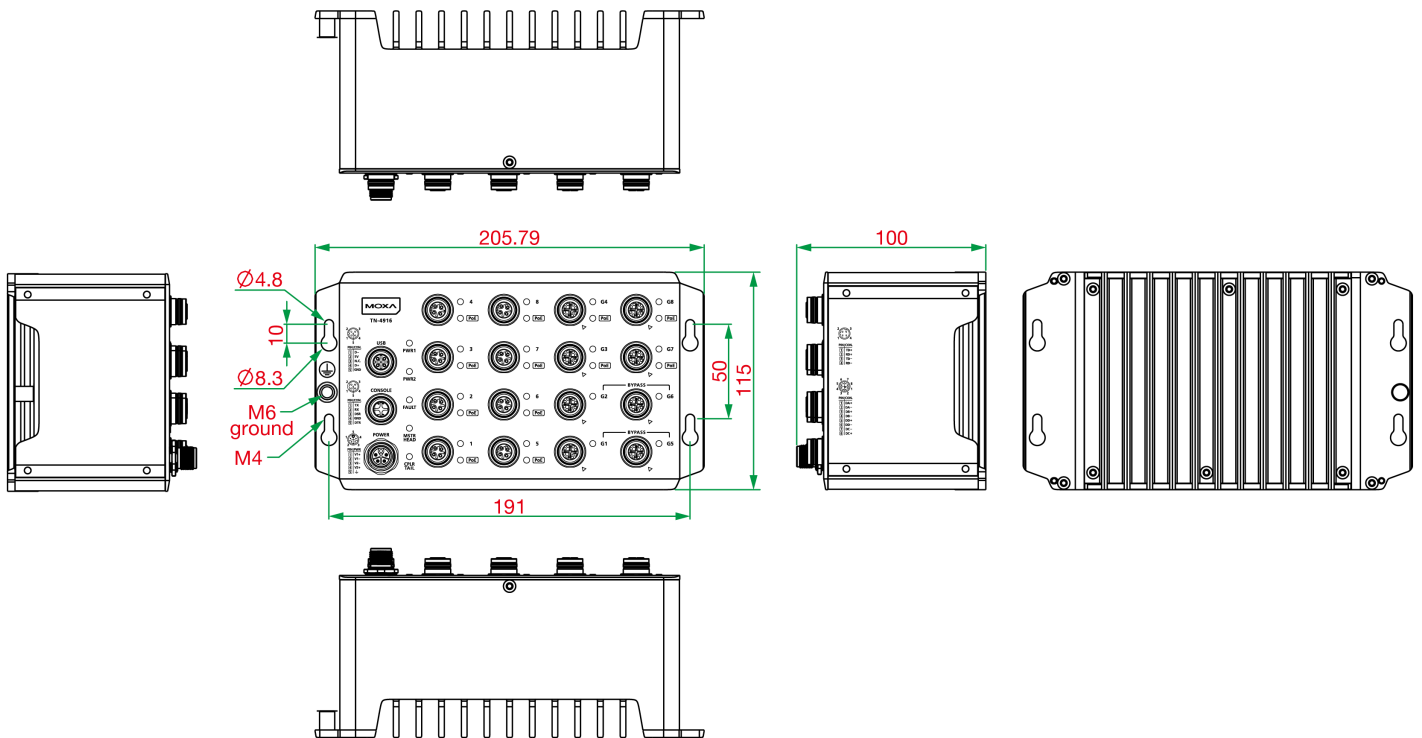
Ordering Information

Model Name	Firewall	ETBN	10/100BaseT(X) PoE Ports, M12 D-coded 4-pin Female Connector	10/100/1000BaseT(X) Ports, M12 X-coded Female Connector	100/1000BaseT(X) Ports, M12 X-coded 8-pin Female Connector With Bypass Relay	10/100/1000BaseT(X) PoE Ports, M12 X-coded 8-pin Female Connector	Conformal Coating
TN-4908-8GTX-WV-T	✓	–	–	8	–	–	–
TN-4908-8GTX-WV-CT-T	✓	–	–	8	–	–	✓
TN-4908-ETBN-4GTX-4GTXBP-WV-T	–	✓	–	4	4	–	–
TN-4908-ETBN-4GTX-4GTXBP-WV-CT-T	–	✓	–	4	4	–	✓
TN-4908-ETBN-F-4GTX-4GTXBP-WV-T	✓	✓	–	4	4	–	–
TN-4908-ETBN-F-4GTX-4GTXBP-WV-CT-T	✓	✓	–	4	4	–	✓
TN-4908-4GPoE-4GTX-WV-T	✓	–	–	4	–	4	–
TN-4908-4GPoE-4GTX-WV-CT-T	✓	–	–	4	–	4	✓
TN-4908-ETBN-4GPoE-4GTXBP-WV-T	–	✓	–	–	4	4	–
TN-4908-ETBN-4GPoE-4GTXBP-WV-CT-T	–	✓	–	–	4	4	✓
TN-4908-ETBN-F-4GPoE-4GTXBP-WV-T	✓	✓	–	–	4	4	–
TN-4908-ETBN-F-4GPoE-4GTXBP-WV-CT-T	✓	✓	–	–	4	4	✓
TN-4916-8PoE-4GPoE-4GTX-WV-T	–	–	8	4	–	4	–
TN-4916-8PoE-4GPoE-4GTX-WV-CT-T	–	–	8	4	–	4	✓
TN-4916-ETBN-8PoE-4GPoE-4GTXBP-WV-T	–	✓	8	–	4	4	–
TN-4916-ETBN-8PoE-4GPoE-4GTXBP-WV-CT-T	–	✓	8	–	4	4	✓
TN-4916-ETBN-F-8PoE-4GPoE-4GTXBP-WV-T	✓	✓	8	–	4	4	–
TN-4916-ETBN-F-8PoE-4GPoE-4GTXBP-WV-CT-T	✓	✓	8	–	4	4	✓

Accessories (sold separately)

M12 Connector Caps

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

Connectors

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

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Cables

CBL-M12XMM8P-Y-300-IP67	M12-to-M12 Cat-5 UTP Ethernet cable, 8-pin male X-coded crimp type M12 connector, IP67, 3 m
CBL-M12XMM8PRJ45-Y-200-IP67	M12-to-RJ45 Cat-5 UTP Ethernet cable, 8-pin male X-coded crimp type M12 connector, IP67, 2 m
CBL-M12XMM8P-Y-100-IP67	M12-to-M12 Cat-5 UTP Ethernet cable, 8-pin male X-coded crimp type M12 connector, IP67, 1 m
CBL-M12BMM5PF9-BK-150-IP68	B-coded male M12-to-5-pin DB9 console cable, IP68-rated, 1.5 m
CBL-M12KFF5POPEN-O-150-IP67	K-coded female M12-to-5-pin open wire M12 power cable, IP67-rated, 1.5 m

Storage Kits

ABC-02-P-USB-M12-CT-T	USB-based configuration backup and restoration tool with M12 connector for Moxa's ToughNet series of managed Ethernet switches and wireless APs/bridges/clients, -40 to 75°C operating temperature, conformal coating