

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
- Supports regular and push-pull M12 connectors
- Isolated power input range from 24 to 110 VDC
- Complies with all EN 50155 mandatory test items¹
- -40 to 70°C operating temperature range
- IEC 62443-4-2:2019 certified

Certifications



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
- Wall 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

MX-ROS Addresses Growing Cybersecurity Threats

Moxa's MX-ROS (<https://www.moxa.com/en/spotlight/portfolio/mx-ros/index>) is a software platform for industrial security routers and firewalls. The platform supports the robust security and user-friendly operation of secure routers through simplified web and CLI interfaces. In addition to adhering to IEC 62443-4-2, MX-ROS devices offer a wealth of the latest cross-industry Operational Technology (OT) network management features with each release to safeguard hardware and software.

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

Specifications

Ethernet Interface

| | |
|--|--|
| 10/100BaseT(X) Ports (M12 D-coded 4-pin female connector) | TN-4908-WV-CT-T: 8 TN-4908-ETBN-4TXBP-WV-CT-T: 4 TN-4908-ETBN-F-4TXBP-WV-CT-T: 4 TN-4908-4GTX-WV-CT-T: 4 TN-4908-ETBN-4GTX-4GTXBP-WV-CT-T: 4 TN-4908-ETBN-F-4GTX-4GTXBP-WV-CT-T: 4 TN-4916-4GTX-WV-CT-T: 12 TN-4916-ETBN-4GTXBP-WV-CT-T: 12 TN-4916-ETBN-F-4GTXBP-WV-CT-T: 12 |
| 10/100BaseT(X) Ports (M12 D-coded 4-pin female connector with bypass relay) | 4TXBP Models: 4 |
| PoE Ports (10/100BaseT(X), M12 D-coded 4-pin female connector) | 8PoE Models: 8 12PoE Models: 12 |
| PoE Ports (100/1000BaseT(X), M12 X-coded 8-pin female connector) | 4GPoE Models: 4 |
| 10/100/1000BaseT(X) Ports (M12 X-coded 8-pin female connector) | 4GTX Models: 4 8GTX Models: 8 |
| 10/100/1000BaseT(X) Ports (M12 X-coded 8-pin female connector with bypass relay) | 4GTXBP 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

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|-----------------------|--|
| 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 HTTPS Flow control SMTP QoS/CoS/ToS Port Mirror SNMP Trap SNMPv1/v2c/v3 IPv4 Telnet DHCP Server SFTP SCP TFTP RARP Account Management DHCP Client (Option 1/3/12/50/51/53/54/55/57/61/66/67/124/255) DHCP Server (Option 1/3/6/12/15/28/42/50/55) DHCP Relay Agent |

| | |
|----------------------|---|
| Redundancy Protocols | RSTP Static Port Trunk Turbo Ring v2 STP |
| Routing Redundancy | VRRP |
| Security | Secure Boot IPsec L2TP (server) RADIUS Trust access control |
| Time Management | SNTP NTP Server/Client |
| Unicast Routing | RIPV1/V2 OSPF Static Route |
| Railway | TRDP |
| Multicast Routing | Static Route |
| Routing Throughput | 450,000 FPS (pure routing) |

DoS and DDoS Protection

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

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|---------------------------|---|
| Filter | ICMP MAC address Ethernet protocols Ports IP address DDoS |
| Quick Automation Profiles | DNP DPI EtherCAT EtherNet/IP FOUNDATION Fieldbus FTP HTTP IEC 60870-104 IPsec L2TP LonWorks Modbus TCP PPTP PROFINET RADIUS SSH Telnet VPN |
| Stateful Inspection | Router firewall Transparent (bridge) firewall |
| Throughput | Max. 350,000 packets per second |

IPsec VPN

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|------------------------|---|
| Authentication | MD5 and SHA (SHA-256) RSA (key size: 1024-bit, 2048-bit) X.509 v3 certificate |
| Encryption | 3DES DES AES-128 AES-192 AES-256 |
| Concurrent VPN Tunnels | Max. 250 IPsec VPN tunnels |

Switch Properties

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| IGMP Groups | 1024 |
| MAC Table Size | 16 K |
| Max. No. of VLANs | 32 |
| VLAN ID Range | VID 1 to 4094 |

LED Interface

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

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|----------|-------------------------------------|
| Features | 1-to-1 Port forwarding N-to-1 |
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Serial Interface

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

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

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|-----------------------------|---|
| Input Current | TN-4908 Non-PoE Models: 0.65 A @ 24 V TN-4908 PoE Models: 3.6 A @ 24 V TN-4916 non-PoE Models: 1.1 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 |
| Power Connector | M12 K-coded 5-pin male connector |
| Total PoE Power Budget | TN-4908 PoE Models: 50 W TN-4916 PoE Models: 95 W |
| Overload Current Protection | Supported |
| Reverse Polarity Protection | Supported |

Physical Characteristics

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|------------|---|
| 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 Models: 206 x 115 x 100 mm (8.10 x 4.53 x 3.94 in) |

| | |
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| 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 Models: 1990 g (4.39 lb) |
| Installation | Wall mounting |
| Protection | 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 | 3,000 m |
| Standards and Certifications | |
| EMC | EN 55032, EN 55035 |
| EMI | CISPR 32, FCC Part 15B 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 PFMF |
| Radio Frequency | FCC |
| Railway | EN 50121-4 EN 50155 IEC 60068-2-1, EN 50155 IEC 60068-2-14, EN 50155 IEC 60068-2-2, EN 50155 IEC 60068-2-30, EN 50155 IEC 60068-2-78 IEC 60571 |
| Railway Fire Protection | EN 45545-2 |
| Safety | IEC 62368, UL 62368 |
| Salt Spray Test | EN 50155 |
| Shock | IEC 60068-2-27, IEC 61373, EN 50155 |
| Vibration | IEC 60068-2-64, IEC 61373, EN 50155 |
| Package Drop Test | ISTA 1A |
| 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 Issue 2 |

Warranty

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

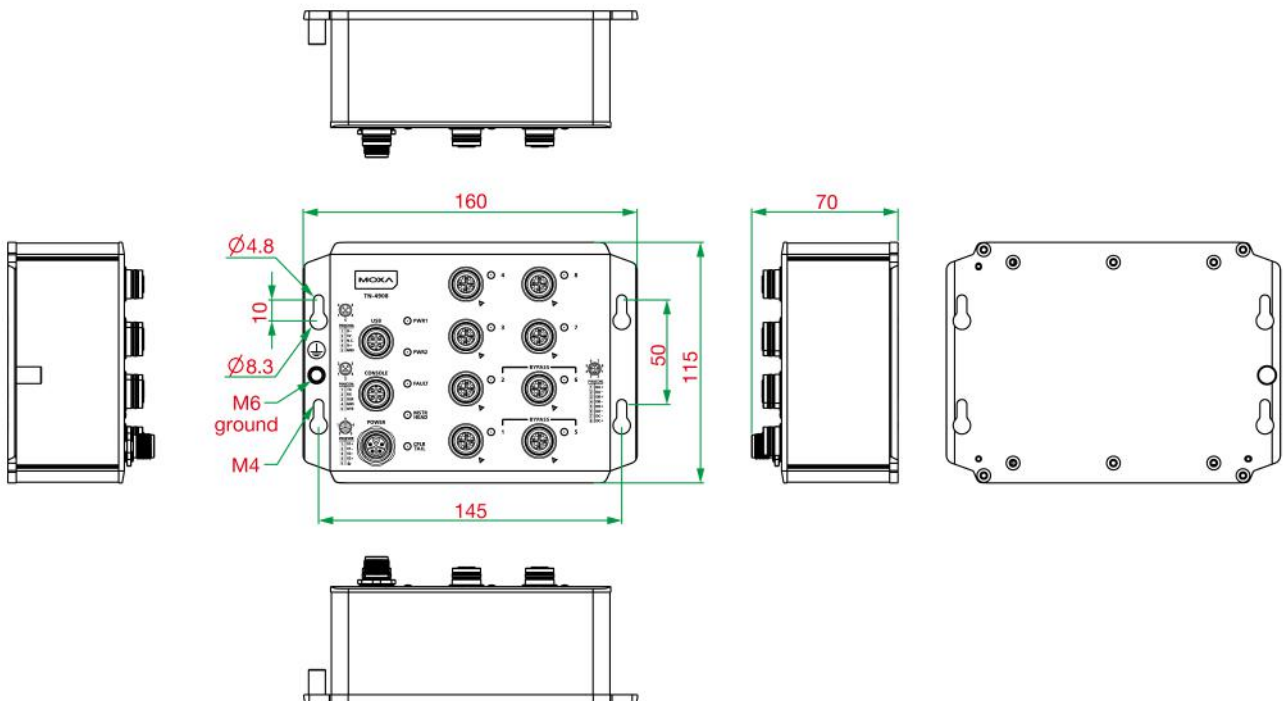
Package Contents

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

Dimensions

TN-4908 Non-PoE Models

Unit: mm



Ordering Information

| Model Name | Firewall | ETBN | 10/ 100BaseT(X), M12 D-coded 4-pin Female Connector | 10/ 100BaseT(X), M12 D-coded 4-pin Female Connector With Bypass Relay | 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 |
|--|----------|------|---|---|--|---|---|---|
| TN-4908-WV-CT-T | ✓ | - | 8 | - | - | - | - | - |
| TN-4908-ETBN-4TXBP-WV-CT-T | - | ✓ | 4 | 4 | - | - | - | - |
| TN-4908-ETBN-F-4TXBP-WV-CT-T | ✓ | ✓ | 4 | 4 | - | - | - | - |
| TN-4908-4GTX-WV-CT-T | ✓ | - | 4 | - | - | 4 | - | - |
| TN-4908-ETBN-4GTXBP-WV-CT-T | - | ✓ | 4 | - | - | - | 4 | - |
| TN-4908-ETBN-F-4GTXBP-WV-CT-T | ✓ | ✓ | 4 | - | - | - | 4 | - |
| TN-4908-8GTX-WV-CT-T | ✓ | - | - | - | - | 8 | - | - |
| TN-4908-ETBN-4GTX-4GTXBP-WV-CT-T | - | ✓ | - | - | - | 4 | 4 | - |
| TN-4908-ETBN-F-4GTX-4GTXBP-WV-CT-T | ✓ | ✓ | - | - | - | 4 | 4 | - |
| TN-4908-4GPoE-4GTX-WV-CT-T | ✓ | - | - | - | - | 4 | - | 4 |
| TN-4908-ETBN-4GPoE-4GTXBP-WV-CT-T | - | ✓ | - | - | - | - | 4 | 4 |
| TN-4908-ETBN-F-4GPoE-4GTXBP-WV-CT-T | ✓ | ✓ | - | - | - | - | 4 | 4 |
| TN-4916-4GTX-WV-CT-T | ✓ | - | 12 | - | - | 4 | - | - |
| TN-4916-ETBN-4GTXBP-WV-CT-T | - | ✓ | 12 | - | - | - | 4 | - |
| TN-4916-ETBN-F-4GTXBP-WV-CT-T | ✓ | ✓ | 12 | - | - | - | 4 | - |
| TN-4916-12PoE-4GTX-WV-CT-T | ✓ | - | - | - | 12 | 4 | - | - |
| TN-4916-ETBN-12PoE-4GTXBP-WV-CT-T | - | ✓ | - | - | 12 | - | 4 | - |
| TN-4916-ETBN-F-12PoE-4GTXBP-WV-CT-T | ✓ | ✓ | - | - | 12 | - | 4 | - |
| TN-4916-8PoE-4GPoE-4GTX-WV-CT-T | ✓ | - | - | - | 8 | 4 | - | 4 |
| TN-4916-ETBN-8PoE-4GPoE-4GTXBP-WV-CT-T | - | ✓ | - | - | 8 | - | 4 | 4 |
| TN-4916-ETBN-F-8PoE-4GPoE-4GTXBP-WV-CT-T | ✓ | ✓ | - | - | 8 | - | 4 | 4 |

Accessories (sold separately)

M12 Connector Caps

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

Connectors

| | |
|--------------------|---|
| M12D-4P-IP68 | Solder type M12 connector, male 4-pin, D-coded, IP68-rated |
| M12D-4PMM-IP67 | IDC type M12 connector, male 4-pin, D-coded, IP67-rated |
| M12K-5PFF-IP65-PxC | Crimp type M12 connector, female 5-pin, K-coded, IP65-rated |
| M12X-8PMM-IP67-HTG | Crimp type M12 connector, male 8-pin, X-coded, IP67-rated |

Cables

| | |
|----------------------------------|---|
| CBL-M12XMM8P-Y-300-IP67 | X-coded male M12-to-8-pin open wire cable, yellow, IP67-rated, 3 m |
| CBL-M12XMM8PRJ45-Y-200-IP67 | X-coded male M12-to-RJ45 Ethernet cable, yellow, IP67-rated, 2 m |
| CBL-M12XMM8P-Y-100-IP67 | X-coded male M12-to-8-pin open wire cable, yellow, IP67-rated, 1 m |
| CBL-M12BMM5PF9-BK-150-IP68 | B-coded male M12-to-5-pin DB9 console cable, black, IP68-rated, 1.5 m |
| CBL-M12DMM4PM12DMM4P-BK-100-IP67 | D-coded male M12-to-D-coded female M12 Ethernet cable, black, IP67-rated, 1 m |
| CBL-M12KFF5POPEN-O-150-IP67 | K-coded female M12-to-5-pin open wire power cable, orange, IP67-rated, 1.5 m |
| CBL-M12D(MM4P)/RJ45-100 IP67 | D-coded male M12-to-RJ45 Ethernet cable, black, IP67-rated, 1 m |

Storage Kits

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