TN-5916 Series

EN 50155 16-port NAT router

- Designed for rolling stock backbone networks
- Dual bypass relay
- Isolated power input range from 24 to 110 VDC
- Compliant with essential sections of EN 50155*
- -40 to 75°C operating temperature range
- Turbo Ring and RSTP/STP 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-5916, designed for rolling stock backbone networks, is a high performance M12 router with four bypass relay backbone ports. It supports NAT and routing functionality to facilitate the deployment of applications across networks. The TN-5916 router uses M12 and other circular connectors to ensure tight, robust connections that guarantee reliability against environmental disturbances, such as vibration and shock. The TN-5916 router provides a wide power input range of 24 to 110 VDC. The TN-5916 operates in an extended operating temperature range of -40 to 75°C and is compliant with EN 50155/50121-4 requirements, making the router suitable for a variety of industrial applications.

Features and Benefits

- Routing functionality to divide a large network into hierarchical subnets and allow data and information to communicate across networks
- NAT makes IP management easier, since end devices in different carriages can use the same IP addresses
- Leading EN 50155-compliant Ethernet router for rolling stock applications
- Turbo Ring and RSTP/STP for network redundancy
- IGMP V1/V2 snooping for filtering multicast traffic
- IEEE 802.1Q VLAN to ease network planning
- QoS (IEEE 802.1p/1Q and TOS/DiffServ) to improve reliability
- IEEE 802.3ad for Static Port Trunking
- SNMPv3, HTTPS, and SSH to enhance network security
- SNMP v1/v2c/v3 for different levels of network management
- Port mirroring for online debugging
- Automatic warning by exception through email and 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, and CLI Windows utility
- Panel mounting or DIN-rail mounting installation capability

Specifications

Technology

Standards:
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 802.1Q for VLAN Tagging
IEEE 802.1p for Class of Service
IEEE 802.3ad for Static Port Trunking

Software Features

Management: SNMP v1/v2c/v3, Account Management, Telnet, Console - CLI, DHCP Server, LLDP, Port Mirror, Syslog, TFTP, SMTP Client, RARP, HTTP, HTTPS, SNMP inform, Flow Control, Back pressure flow control
Filter: 802.1Q VLAN, IGMPv1/v2, Static Multicast
Redundancy Protocols: STP/RSTP, Turbo Ring v2, Static Port Trunk
Security: Management Interface Control (TCP/UDP port blocking), Trusted Access Control
Time Management: SNTP, NTP Server/Client
Routing Redundancy: VRRP
NAT: N-1 NAT, 1-1 NAT, Port Forwarding

Router Properties

Priority Queues: 4
Max. Number of VLANs: 16
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, with 4 bypass relays on backbone ports
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 1 A @ 30 VDC

Power Requirements

Input Voltage: 24/36/48/72/96/110 VDC
Operating Voltage: 16.8 to 137.5 VDC
Input Current: 0.85 A @ 24 VDC; 0.17 A @110 VDC

Overload Current Protection: Present
Connection: M23 connector
Reverse Polarity Protection: Present

Physical Characteristics

Housing: Aluminium alloy
IP Rating: IP54 protection (optional protective caps available for unused ports)
Dimensions: 250 x 175.8 x 116.3 mm (9.84 x 6.92 x 4.58 in)
Weight: 4030 g (8.88 lb)
Installation: Panel mounting, DIN-rail mounting (with optional kit)

Environmental Limits

Operating Temperature:
Wide Temp. Models: -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: 2,000 m

Standards and Certifications

Safety: UL/cUL 508, EN 60950-1 (LVD)
EMC: EN 55022, EN 55024
EMI: CISPR 22, 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
Rail Traffic: 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, EN/IEC 61373
Freefall: IEC 60068-2-32
Vibration: EN 50155, EN/IEC 61373
Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (mean time between failures)

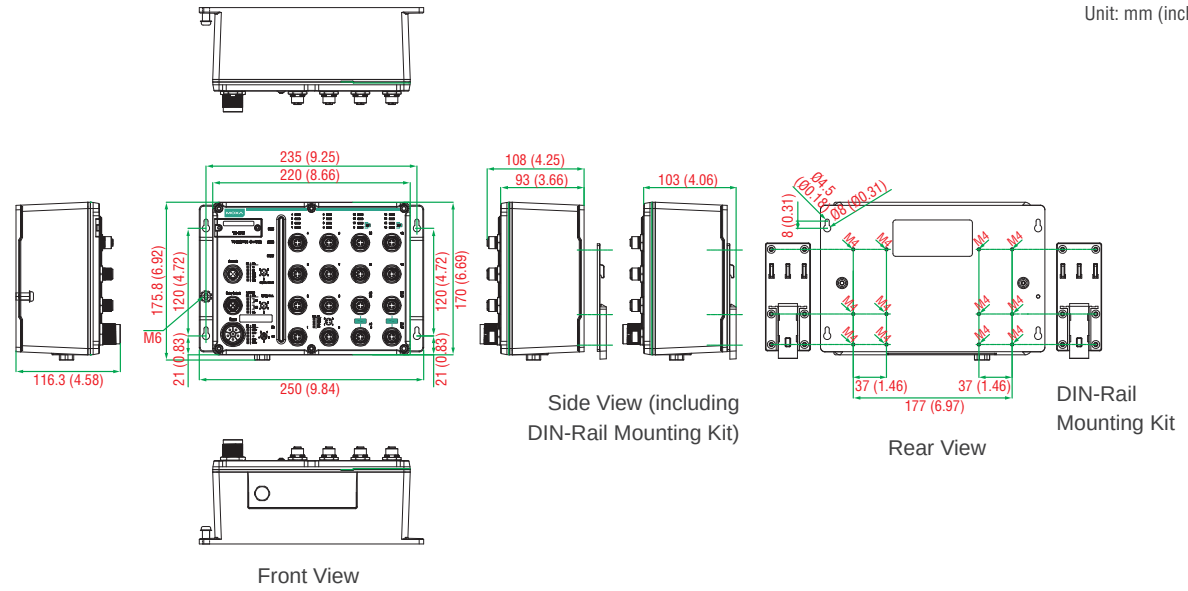
Time: 556,025 hrs
Standard: Telcordia SR332

Warranty

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

Dimensions

Unit: mm (inch)



Front View

Side View (including DIN-Rail Mounting Kit)

Rear View

DIN-Rail Mounting Kit

Ordering Information

Available Models	Port Interface				Power Supply	Conformal Coating
	Front Cabling					
Wide Temperature (-40 to 75C)	10/100BaseT(X), M12 connector	10/100BaseT(X), M12 connector with bypass relay	10/100/1000 10/100BaseT(X), M12 connector	10/100/1000BaseT(X), M12 connector with bypass relay	WV: 24 to 110 VDC (16.8 to 137.5 VDC)	
TN-5916-WV-T	16	4	–	–	1 (Dual Input)	–
TN-5916-WV-CT-T	16	4	–	–	1 (Dual Input)	✓

Optional Accessories (can be purchased separately)

Power Cords, M12/M23 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 routers, 0 to 60°C operating temperature

Package Checklist

- TN-5916 router
- 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