TN-5900 Series

EN 50155 16-port NAT routers

Features and Benefits

- Designed for rolling stock backbone networks

- Dual bypass relay

- Isolated power input range from 24 to 110 VDC

- Complies with all EN 50155 mandatory test items[1]

- -40 to 75°C operating temperature range

- Turbo Ring and RSTP/STP for network redundancy

Certifications

EN 50155   EN 50121-4   CE   FC

Introduction

The ToughNet TN-5900 Series, designed for rolling stock backbone networks, are high-performance M12 routers with four bypass relay backbone ports. They support NAT and routing functionality to facilitate the deployment of applications across networks. The TN-5900 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-5900 Series routers provide a wide power input range of 24 to 110 VDC. TN-5900 Series switches operate in an extended operating temperature range of -40 to 75°C and are compliant with the mandatory requirements of EN 50155/50121-4, making them suitable for a variety of industrial applications.

Additional 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 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
- Panel mounting or DIN-rail mounting installation capability

- 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

Specifications

Input/Output Interface

Alarm Contact Channels	2 x relay output in one M12 A-coded 5-pin male connector with current carrying capacity of 1 A @ 30 VDC

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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

Ethernet Interface

10/100BaseT(X) Ports (M12 D-coded 4-pin female connector)	12
10/100BaseT(X) Ports (M12 D-coded 4-pin female connector with bypass relay)	4
Standards	IEEE 802.1D-2004 for Spanning Tree Protocol IEEE 802.1p for Class of Service IEEE 802.1Q for VLAN Tagging IEEE 802.1w for Rapid Spanning Tree Protocol IEEE 802.3 for 10BaseT IEEE 802.3ad for Static Port Trunk IEEE 802.3u for 100BaseT(X) IEEE 802.3x for flow control

Ethernet Software Features

Configuration Options	Command Line Interface (CLI), Command Line Interface (CLI) through Serial/Telnet/SSH, Web Browser (HTTP/HTTPS), Windows Utility
Filter	802.1Q, IGMP v1/v2, Static Multicast
Management	Back Pressure Flow Control, DHCP server, Flow control, HTTP, IPv4, LLDP, Port Mirror, QoS/CoS/ToS, RARP, SMTP, SNMP Inform, SNMP Trap, SNMPv1/v2c/v3, Syslog, Telnet, TFTP, Account Management
MIB	RFC1213
Redundancy Protocols	Link Aggregation, RSTP, Static Port Trunk, STP, Turbo Ring v2
Routing Redundancy	VRRP
Security	Broadcast storm protection[2], HTTPS/SSL, Local Account Accessibility, TACACS+[2], Port Lock, SSH
Time Management	NTP Server/Client, SNTP
Unicast Routing	Static Route, RIPV1/V2

Switch Properties

IGMP Groups	256
MAC Table Size	8 K
Max. No. of VLANs	16
VLAN ID Range	VID 1 to 4094

LED Interface

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

NAT

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

Serial Interface

Console Port	M12 A-coded male connector

Power Parameters

Input Current	0.85 A @ 24 VDC, 0.17 A @ 110 VDC
Input Voltage	24/36/48/72/96/110 VDC, Redundant dual inputs, No. of power inputs: 2

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2.   Not supported in FW v1.2.

Operating Voltage	16.8 to 137.5 VDC
Overload Current Protection	Supported
Power Connector	M23 connector
Reverse Polarity Protection	Supported

Physical Characteristics

Housing	Metal
IP Rating	IP54
Dimensions	250 x 175.8 x 116.3 mm (9.84 x 6.92 x 4.58 in)
Weight	4,030 g (8.88 lb)
Installation	DIN-rail mounting (optional), Wall mounting
Protection	TN-5916-WV-CT-T: PCB conformal coating

Environmental Limits

Operating Temperature	-40 to 75°C (-40 to 167°F)
Storage Temperature (package included)	-40 to 85°C (-40 to 185°F)
Ambient Relative Humidity	5 to 95% (non-condensing)
Altitude	2000 m

Standards and Certifications

EMC	EN 55032/24
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
Freefall	IEC 60068-2-31
Radio Frequency	FCC
Railway	EN 50121-4, EN 50155, IEC 60571
Railway Fire Protection	EN 45545-2
Safety	IEC 60950-1, UL 61010-2-201
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	556,025 hrs
Standards	Telcordia SR332

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Reliable Networks ▲ Sincere Service

Warranty

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

Package Contents

Device	1 x TN-5900 Series router
Cable	1 x M12-to-DB9 console port
Installation Kit	2 x cap, female, metal, for M12 port 1 x wall-mounting kit
Documentation	1 x document and software CD 1 x quick installation guide 1 x warranty card

Dimensions

Unit: mm (inch)

Front View

Side View (including DIN-Rail Mounting Kit)

Rear View

DIN-Rail Mounting Kit
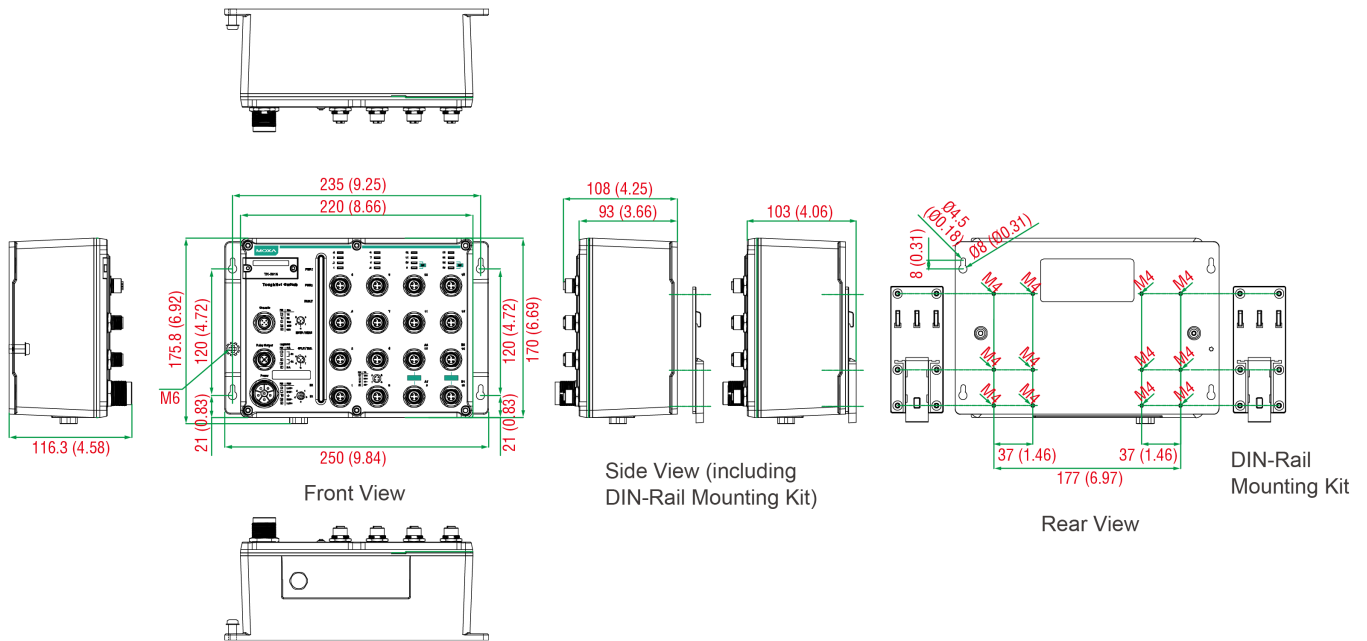
Ordering Information

Model Name	10/100BaseT(X) Ports M12 D-Coded 4-Pin Female Connector	10/100BaseT(X) Ports M12 D-Coded 4-Pin Female Connector with Bypass Relay	Conformal Coating
TN-5916-WV-T	12	4	–
TN-5916-WV-CT-T	12	4	✓

Accessories (sold separately)

Storage Kits

ABC-01-M12	Configuration backup and restoration tool with M12 connector for managed Ethernet switches and wireless APs/Bridges/Clients, 0 to 60°C operating temperature

Cables

CBL-M12D(MM4P)/RJ45-100 IP67	M12-to-RJ45 cable, IP67-rated, 1 m
CBL-M23(FF6P)/OPEN-BK-100 IP67	M23 to 6-pin power cable, IP67-rated female 6-pin M23 connector, IP67, 1 m

CBL-M12DMM4PM12DMM4P-BK-100-IP67	M12-to-M12 Cat-5E STP Ethernet cable, 4-pin D-coded M12 connector, IP67, 1 m

Connectors

M12A-5P-IP68	A-coded screw-in sensor connector, female, IP68, 4.05 cm
M12D-4PMM-IP67	M12 D-coded connector, QUICKON type, 4-pin male, IP67
M12D-4P-IP68	M12 D-coded screw-in sensor connector, male, IP68
A-PLG-WPM23-01-IP67	M23 cable connector, female 6-pin, crimp type, IP67

DIN-Rail Mounting Kits

DK-DC50131-01	DIN-rail mounting kit, 6 screws

M12 Connector Caps

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

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