TN-G6500 Series

EN 50155 Full Gigabit Ethernet switches with up to 8 PoE ports

Features and Benefits

- 12 Gigabit ports with push-pull M12 connectors
- Isolated power with 24 to 110 VDC power supply range
- Complies with all EN 50155 mandatory test items[1]
- -40 to 70°C operating temperature range
- IP67-rated housing protection
- Turbo Ring and Turbo Chain (recovery time < 50 ms @ 250 switches), and RSTP/STP for network redundancy
- 8 IEEE 802.3at/af compliant PoE and Ethernet combo ports
- Provides up to 30 W per PoE port

Certifications

EN 50155   EN 50121-4   CE   FC

Introduction

The ToughNet TN-G6500 Series M12 managed Ethernet switches are designed for railway applications, including rolling stock and wayside installations. The switches use M12 and other circular connectors to ensure tight, robust connections, and guarantee reliable operation in industrial environments where vibration and shock are commonplace. The TN-G6500 Series Ethernet switches provide 12 Gigabit Ethernet M12 ports; 8 ports support IEEE 802.3at/af-compliant PoE functionality. These PoE switches are classified as power source equipment (PSE); they provide up to 30 watts of power per port, and can be used to power IEEE 802.3at/af-compliant powered devices (PDs), such as IP cameras, wireless access points, and IP phones.

The TN-G6500 Series has push-pull M12 connectors that are tailor-made for push-pull cables in order to facilitate quick installation, and also allow M12 rotary cables to be utilized. The 24 to 110 VDC wide power input range and isolated dual power inputs not only allow you to use the same type of power source at different sites around the globe, but also increase the reliability of your communications system. Furthermore, the -40 to 70°C operating temperature and IP67-rated enclosure allow deployment in harsh environments. The TN-G6512 Series Ethernet switches are compliant with the essential sections of the EN 50155 standard, covering operating temperature, power input voltage, surge, ESD, vibration, power isolation, and includes a model with conformal coating to ensure suitability for a variety of industrial applications.

Additional Features and Benefits

- Provides up to 30 watts per PoE port with a total power budget of 96 watts per switch
- IPv6 Ready logo awarded (IPv6 Logo Committee certified)
- DHCP Option 82 for IP address assignment with different policies
- IGMP snooping and GMRP for filtering multicast traffic
- EtherNet/IP and Modbus/TCP industrial Ethernet protocols supported
- Port-based VLAN, IEEE 802.1Q VLAN, and GVRP to ease network planning
- QoS (IEEE 802.1p/1Q and ToS/DiffServ) allows real-time traffic classification and prioritization
- IEEE 802.3ad, LACP for optimal bandwidth utilization
- SNMPv1/v2c/v3 for different levels of network management
- TACACS+, SNMPv3, IEEE 802.1X, HTTPS, and SSH to enhance network security
- RMON for efficient network monitoring and proactive capability
- Bandwidth management prevents unpredictable network conditions
- Port locking to only allow access to authorized MAC addresses
- Port mirroring for online debugging
- Automatic warning notifications through email and relay output
- Line-swap fast recovery
- LLDP for automatic topology discovery in network management software
- Configurable by web browser, Telnet/serial console, CLI, and Windows utility
- Loop protection to prevent network loops
- Panel mounting installation

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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

Specifications

Ethernet Interface

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

Ethernet Software Features

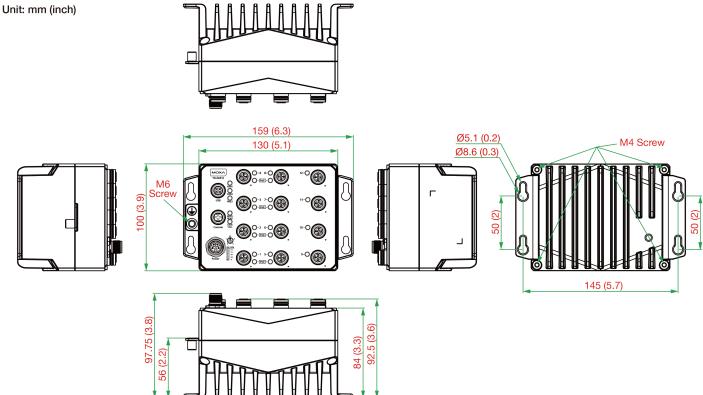|	
Broadcast Forwarding	Broadcast forwarding
Configuration Options	Command Line Interface (CLI), Command Line Interface (CLI) through Serial/Telnet/SSH, Web Console (HTTP/HTTPS), Windows Utility
Filter	802.1Q GMRP GVRP Port-based VLAN Static Multicast IGMP Querier DHCP Filter IGMP Snooping v1/v2/v3
Industrial Protocols	SNMPv1/v2c/v3
Management	Account Management Back Pressure Flow Control Flow control HTTP IPv4/IPv6 LLDP Port Mirror QoS/CoS/ToS RARP RMON SMTP SNMP Inform Syslog Telnet SNMP Trap DHCP Client (options 1/3/50/51/53/54/55/57/66/67) DHCP Server (options 1/3/12/15/42/50/55) DNS Server Port-based DHCP Server DHCP option 82 (relay agent) Loop Protection ICMP
MIB	Bridge MIB Ethernet-like MIB MIB-II P-BRIDGE MIB Q-BRIDGE MIB RMON MIB Groups 1, 2, 3, 9 RSTP MIB
Redundancy Protocols	Static Port Trunk

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	MSTP RSTP Turbo Ring v2 STP LACP Turbo Chain Turbo Ring with DRC
Security	Trust access control TACACS+ Broadcast storm protection HTTPS/SSL Local Account Accessibility Port Lock RADIUS Rate Limit Access control list SSH
Time Management	NTP Server/Client SNTP

Switch Properties

IGMP Groups	256
Max. No. of VLANs	256
Priority Queues	4
VLAN ID Range	VID 1 to 4094
Jumbo Frame Size	9.216 KB

LED Interface

LED Indicators	PWR1, PWR2, FAULT, MSTR/HEAD, CPLR/TAIL, Ethernet, PoE

Serial Interface

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

Power Parameters

Input Voltage	24/36/48/72/96/110 VDC
No. of Power Inputs	2
Operating Voltage	16.8 to 137.5 VDC
Overload Current Protection	Supported
Reverse Polarity Protection	Supported
Total PoE Power Budget	96 W
Input Current	5.8 A @ 24 VDC
Power Connector	M12 K-coded 5-pin male connector

Physical Characteristics

Housing	Metal
IP Rating	IP67
Dimensions	159 x 97 x 100 mm (6.26 x 3.82 x 3.94 in)
Weight	1,750 g (3.86 lb)

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Installation	Wall mounting
Protection	TN-G6512-8GPoE-WV-CT-T: 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	2000 m

Standards and Certifications

EMC	EN 55032/35
EMS	IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV IEC 61000-4-3 RS: 80 MHz to 6 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 62368-1 UL 62368-1
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	478,246 hrs
Standards	Telcordia SR332

Warranty

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

Package Contents

Device	1 x TN-G6500 Series switch
Installation Kit	1 x wall-mounting kit 1 x cap, male, metal, for M12 port 14 x cap, female, metal, for M12 port
Cable	1 x M12-to-DB9 console port
Documentation	1 x quick installation guide 1 x warranty card

Dimensions

Unit: mm (inch)

Ordering Information

Model Name	10/100/1000BaseT(X) Ports, 10M12 X-Coded 8-Pin Female Connector	PoE Ports 100/1000BaseT(X), 10M12 X-Coded 8-Pin Female Connector	Conformal Coating
TN-G6512-8GPoE-WV-T	4	8	–
TN-G6512-8GPoE-WV-CT-T	4	8	✓

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

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-M12KFF5POPEN-O-150-IP67	CBL-M12KFF5POPEN-O-150-IP67
CBL-M12BMM5PF9-BK-150-IP68	CBL-M12BMM5PF9-BK-150-IP68

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

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