TN-5510/5518 Series

iF product design award 2010

CONTROL ENGINEERING 2010 ENGINEERS' CHOICE AWARDS

EN 50155 8+2G/16+2G-port Gigabit managed Ethernet switches

> 2 Gigabit ports with optional bypass relay function
> Wide power input range from 12 to 110 VDC (LV-MV model)
> Isolated redundant power inputs with universal 12/24/36/48 VDC, 72/96/110 VDC, or 110/220 VDC/VAC power supply range
> Compliant with essential sections of EN 50155
> -40 to 75°C operating temperature range (T models)
> Turbo Ring and Turbo Chain (recovery time < 20 ms @ 250 switches), RSTP/STP, and MSTP for network redundancy

Turbo Ring — Self-Healing Ethernet   *Beyond Redundant Rings — Turbo Chain*

RoHS READY   🚆 EN 50155   🛤 EN 50121   CE FC

: Introduction

The ToughNet TN-5510/5518 series M12 managed Ethernet switches are designed for industrial applications, such as rolling stock, vehicle, and railway applications. The TN series switches use M12 and other circular connectors to ensure tight, robust connections, and guarantee reliable operation against environmental disturbances, such as vibration and shock. The TN-5500-LV-MV switches provide the wide power input range of 12/24/36/48/72/96/110 VDC that allows you to use the same type of power source at different sites around the globe. In addition, the 12/24/36/48 VDC, 72/96/110 VDC, or 110/220 VDC/VAC dual, isolated redundant power supply increases the reliability of

your communications system and saves on cabling/wiring costs. The TN-5510/5518 switches provide up to 8 or 16 Fast Ethernet M12 ports, and 2 ports on the down side to provide the Gigabit Ethernet interface with an optional bypass relay function. Models with an extended operating temperature range of -40 to 75°C are also available. The TN-5500 series are compliant with the essential sections of EN 50155, covering operating temperature, power input voltage, surge, ESD and vibration, making the switches suitable for a variety of industrial applications.

Features and Benefits

- Three rotary switches for setting the last 3 digits of the IP address makes maintenance even easier
- IPv6 Ready logo awarded (IPv6 Logo Committee certified)
- Leading EN 50155-compliant Gigabit Ethernet switches for rolling stock applications
- DHCP Option 82 for IP address assignment with different policies
- EtherNet/IP* and Modbus/TCP industrial Ethernet protocol supported
- Turbo Ring and Turbo Chain (recovery time < 20 ms @ 250 switches), RSTP/STP, and MSTP* for network redundancy
- IGMP snooping and GMRP for filtering multicast traffic
- Port-based VLAN, IEEE 802.1Q VLAN, and GVRP to ease network planning
- QoS (IEEE 802.1p/1Q and TOS/DiffServ) to increase determinism
- IEEE 802.3ad, LACP for optimum bandwidth utilization

- SNMPv3, IEEE 802.1X, HTTPS, and SSH to enhance network security
- SNMPv1/v2c/v3 for different levels of network management
- RMON for efficient network monitoring and proactive capability
- Bandwidth management prevents unpredictable network status
- Lock port allows access by only authorized MAC addresses
- Port mirroring for online debugging
- Automatic warning by exception through email, 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

*Available in Q2, 2012

: Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X)
IEEE 802.3ab for 1000BaseT(X)
IEEE 802.3x for Flow Control
IEEE 802.1D-2004* for Spanning Tree Protocol
IEEE 802.1w for Rapid STP
IEEE 802.1s* for Multiple Spanning Tree Protocol
IEEE 802.1Q for VLAN Tagging
IEEE 802.1p for Class of Service
IEEE 802.1X for Authentication
IEEE 802.3ad for Port Trunk with LACP
Protocols: IGMPv1/v2, GMRP, GVRP, SNMPv1/v2c/v3, DHCP Server/Client, DHCP Option 66/67/82, BootP, TFTP, SNTP, SMTP, RARP, RMON, HTTP, HTTPS, Telnet, SSH, Syslog, EtherNet/IP*, Modbus/TCP, SNMP Inform, LLDP, IEEE 1588 PTP V2*, IPv6, NTP Server/Client*
MIB: MIB-II, Ethernet-like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Group 1, 2, 3, 9

MOXA®

Flow Control: IEEE802.3x flow control, back pressure flow control
*Available in Q3, 2012

Switch Properties
Priority Queues: 4
Max. Number of Available VLANs: 64
VLAN ID Range: VID 1 to 4094
IGMP Groups: 256

Interface
Fast Ethernet: Front cabling, M12 connector, 10/100BaseT(X) auto negotiation speed, F/H duplex mode, and auto MDI/MDI-X connection
Gigabit Ethernet: Down cabling, M12 connector, 10/100/1000BaseT(X) auto negotiation speed, F/H duplex mode, auto MDI/MDI-X connection, with or without bypass relay function
Console Port: M12 A-coding 5-pin male connector
System LED Indicators: PWR1, PWR2, FAULT, MSTR/HEAD, CPLR/TAIL
Port LED Indicators: 10/100M (Fast Ethernet port), 10/100/1000M (Gigabit Ethernet port)
Alarm Contact: 2 relay outputs in one M12 A-coding 5-pin male connector with current carrying capacity of 3 A @ 30 VDC
Rotary Switches: For setting the last 3 digits of the IP address

Power Requirements
Input Voltage:
• LV: 12/24/36/48 VDC (8.4 to 60 VDC)
• MV: 72/96/110 VDC (50.4 to 137.5 VDC)
• HV: 110/220 VDC/VAC (88 to 300 VDC, 85 to 264 VAC)
Note: Compliant with EN 50155 on 24/48/72/96/110 VDC
Input Current:
• TN-5510-2GTX Series
  0.416 A @ 24 VDC, 0.187 A @ 72 VDC, 0.129 A @ 110 VDC, 0.316 A @ 110 VAC, 0.208 A @ 220 VAC
• TN-5510-2GTXBP Series
  0.52 A @ 24 VDC, 0.218 A @ 72 VDC, 0.150 A @ 110 VDC, 0.369 A @ 110 VAC, 0.243 A @ 220 VAC
• TN-5518-2GTX Series
  0.635 A @ 24 VDC, 0.28 A @ 72 VDC, 0.19 A @ 110 VDC, 0.37 A @ 110 VAC, 0.238 A @ 220 VAC
• TN-5518-2GTXBP Series
  0.667 A @ 24 VDC, 0.296 A @ 72 VDC, 0.202 A @ 110 VDC, 0.387 A @ 110 VAC, 0.244 A @ 220 VAC

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

Physical Characteristics
Housing: Metal, IP54 protection (optional protective caps available for unused ports)
Dimensions:
TN-5510 Series: 185 x 180.9 x 76.0 mm (7.28 x 7.12 x 2.99 in)
TN-5518 Series: 250 x 181.4 x 76.0 mm (9.84 x 7.14 x 2.99 in)
Weight:
TN-5510 Series: 1700 g
TN-5518 Series: 2550 g
Installation: Panel mounting, DIN-Rail mounting (with optional kit)

Environmental Limits
Operating Temperature:
Standard Models: -25 to 60°C (32 to 140°F)
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)

Standards and Certifications
Safety: UL 508 (Pending)
EMI: FCC Part 15 Subpart B Class A, EN 55022 Class A
EMS:
EN 61000-4-2 (ESD) Level 3,
EN 61000-4-3 (RS) exceeds Level 3,
EN 61000-4-4 (EFT) Level 3,
EN 61000-4-5 (Surge) Level 3,
EN 61000-4-6 (CS) Level 3,
EN 61000-4-8,
EN 61000-4-11
Rail Traffic: (for panel mounting installations)
EN 50155, EN 50121-4
Shock: IEC 61373
Freefall: IEC 60068-2-32
Vibration: IEC 61373
Note: Please check Moxa's website for the most up-to-date certification status.

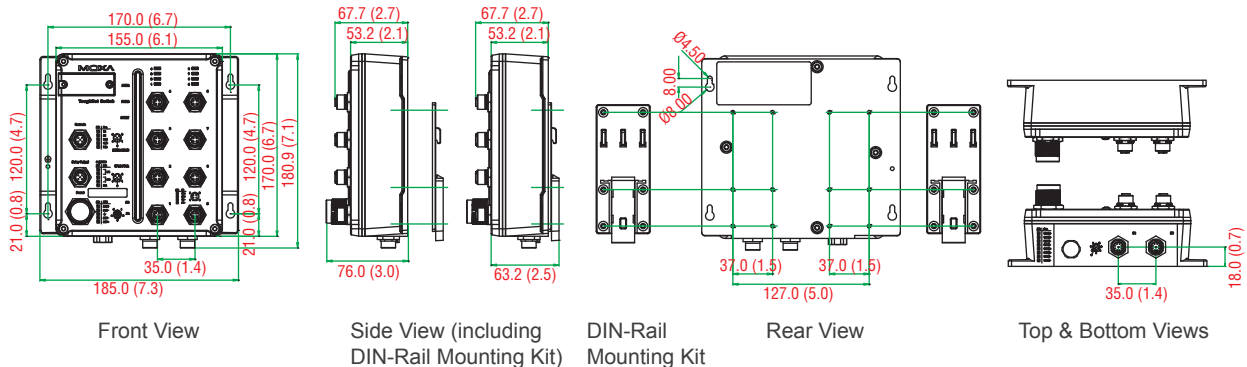## Warranty
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

TN-5510 Series

Unit: mm (inch)

Front View

Side View (including DIN-Rail Mounting Kit)

DIN-Rail Mounting Kit

Rear View

Top & Bottom Views

Dimensions

TN-5518 Series

Unit: mm (inch)

Front View | Side View (including DIN-Rail Mounting Kit) | DIN-Rail Mounting Kit | Rear View | Top & Bottom Views
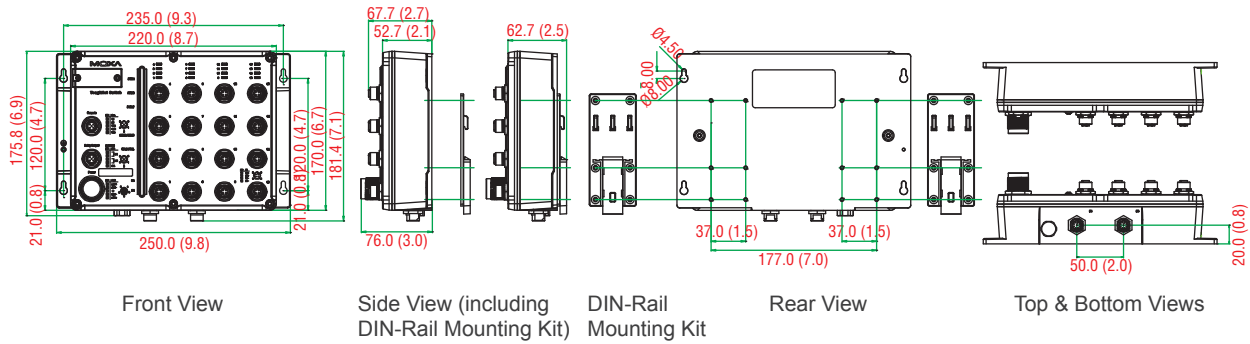
Ordering Information

Available Models		Port Interface			Power Supply					
		Front Cabling	Down Cabling		Power Supply 1			Power Supply 2		
Standard Temperature (-25 to 60°C)	Wide Temperature (-40 to 75°C)	10/100 BaseT(X), M12 connector	10/100/1000 BaseT(X), M12 connector	10/100/1000 BaseT(X), M12 connector, bypass relay function	LV — 12/24/36/48 VDC (8.4 to 60 V), non-isolated	MV — 72/96/110 VDC (50.4 to 154 V), isolated	HV — 88 to 300 VDC and 85 to 264 VAC, isolated	LV — 12/24/36/48 VDC (8.4 to 60 V), non-isolated	MV — 72/96/110 VDC (50.4 to 137.5 V), isolated	HV — 88 to 300 VDC and 85 to 264 VAC, isolated
TN-5510 Series										
TN-5510-2GTX-LV-LV	TN-5510-2GTX-LV-LV-T	8	2	–	1	–	–	1	–	–
TN-5510-2GTX-LV-MV	TN-5510-2GTX-LV-MV-T	8	2	–	1	–	–	–	1	–
TN-5510-2GTX-LV-HV	TN-5510-2GTX-LV-HV-T	8	2	–	1	–	–	–	–	1
TN-5510-2GTXBP-LV-LV	TN-5510-2GTXBP-LV-LV-T	8	–	2	1	–	–	1	–	–
TN-5510-2GTXBP-LV-MV	TN-5510-2GTXBP-LV-MV-T	8	–	2	1	–	–	–	1	–
TN-5510-2GTXBP-LV-HV	TN-5510-2GTXBP-LV-HV-T	8	–	2	1	–	–	–	–	1
TN-5518 Series										
TN-5518-2GTX-LV-LV	TN-5518-2GTX-LV-LV-T	16	2	–	1	–	–	1	–	–
TN-5518-2GTX-LV-MV	TN-5518-2GTX-LV-MV-T	16	2	–	1	–	–	–	1	–
TN-5518-2GTX-LV-HV	TN-5518-2GTX-LV-HV-T	16	2	–	1	–	–	–	–	1
TN-5518-2GTX-MV-MV	TN-5518-2GTX-MV-MV-T	16	2	–	–	1	–	–	1	–
TN-5518-2GTX-MV-HV	TN-5518-2GTX-MV-HV-T	16	2	–	–	1	–	–	–	1
TN-5518-2GTX-HV-HV	TN-5518-2GTX-HV-HV-T	16	2	–	–	–	1	–	–	1
TN-5518-2GTXBP-LV-LV	TN-5518-2GTXBP-LV-LV-T	16	–	2	1	–	–	1	–	–
TN-5518-2GTXBP-LV-MV	TN-5518-2GTXBP-LV-MV-T	16	–	2	1	–	–	–	1	–
TN-5518-2GTXBP-LV-HV	TN-5518-2GTXBP-LV-HV-T	16	–	2	1	–	–	–	–	1
TN-5518-2GTXBP-MV-MV	TN-5518-2GTXBP-MV-MV-T	16	–	2	–	1	–	–	1	–
TN-5518-2GTXBP-MV-HV	TN-5518-2GTXBP-MV-HV-T	16	–	2	–	1	–	–	–	1
TN-5518-2GTXBP-HV-HV	TN-5518-2GTXBP-HV-HV-T	16	–	2	–	–	1	–	–	1

Note:
1. GTX: Gigabit Ethernet copper port
2. GTXBP: Gigabit Ethernet copper port with bypass relay
3. Comformal coating is available on request.

Optional Accessories (must be purchased separately)

Power Cords, M12/M23 Connectors, Protective Caps: See page 2-22
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 switches, 0 to 60°C operating temperature

Package Checklist

- TN-5510 or TN-5518 switch
- 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

Accessories

: M12/M23 Power 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

: M12 Connectors

M12D-4P-IP68

Field-installable M12 D-coded screw-in
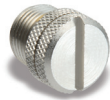sensor connector, 4-pin male, IP68-rated

M12A-5P-IP68

Field-installable M12 A-coded screw-in
sensor connector, 5-pin female, IP68-rated

: 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