PT-7528 Series

IEC 61850-3 28-port managed rackmount Ethernet switches



- IEC 61850-3, IEEE 1613 (power substations) compliant
- Built-in MMS server based on IEC 61850-90-4 switch data modeling for Power SCADA
- Noise Guard™ wire speed zero packet loss technology
- Turbo Ring and Turbo Chain (recovery time < 20 ms @ 250 switches), RSTP/STP, and MSTP for network redundancy
- Isolated redundant power inputs with universal 24/48 VDC or 110/220 VDC/VAC power supply range
- -40 to 85°C operating temperature range

Introduction

The PowerTrans PT-7528 series is designed for power substation automation applications that operate in extremely harsh environments. The PT-7528 series supports Moxa's new Noise Guard technology, is compliant with IEC 61850-3, and its EMC immunity exceeds IEEE 1613 Class 2 standards to ensure zero packet loss while transmitting at wire speed. The PT-7528 series also features critical packet prioritization (GOOSE, SMVs, and PTP), a built-in MMS server, and a configuration wizard designed specifically for substation automation. With Gigabit Ethernet, redundant ring, and 110/220 VDC/VAC isolated redundant power supplies, the PT-7528 series further increases the reliability of your communications and saves cabling/wiring costs. The wide range of PT-7528 models available support multiple types of port configuration, with up to 28 copper or fiber ports and 4 gigabit ports for uplink. Taken together, these features allow greater flexibility, making the PT-7528 suitable for a variety of industrial applications.

General Features and Benefits

- Built-in MMS server for linking with Power SCADA system
- Switch data modeling based on the IEC 61850-90-4 standard
- Fiber Check™ provides monitoring and diagnosis functions on MST/MSC/SSC/SFP fiber ports
- Noise Guard™ provides a high level of EMC immunity for critical applications, exceeding IEEE 1613 Class 2
- IPv6 Ready logo awarded (IPv6 Logo Committee certified)
- Software-based IEEE 1588v2 PTP (Precision Time Protocol) for precise time synchronization of networks
- VLAN Unaware: Supports priority-tagged frames to be received by specific IEDs
- DHCP Option 82 for IP address assignment with different policies
- EtherNet/IP and Modbus/TCP industrial Ethernet protocols 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 from industrial Ethernet protocols
- IEEE 802.3ad, LACP for optimum bandwidth utilization
- Bandwidth management prevents unpredictable network status
- Multiport mirroring for online debugging
- Automatic warning by exception through email, relay output
- RMON for efficient network monitoring and proactive capability
- Automatic recovery of connected device's IP addresses
- Line-swap fast recovery
- Configurable by Web browser, Telnet/USB console, CLI, Windows utility, and ABC-02 automatic backup configurator

Cyber-security Features

- User passwords with multiple levels of security protect against unauthorized configuration
- SSH/HTTPS is used to encrypt passwords and data
- Lock switch ports with 802.1X port-based network access control so that only authorized clients can access the port
- Disable one or more ports to block network traffic
- 802.1Q VLAN allows you to logically partition traffic transmitted between selected switch ports
- Secure switch ports so that only specific devices and/or MAC addresses can access the ports
- Radius/TACACS+ allows you to manage passwords from a central location
- SNMPv3 provides encrypted authentication and access security

Specifications

Technology

Standards:

IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100Base FX
IEEE 802.3ab for 1000BaseT(X)
IEEE 802.3z for 1000BaseX
IEEE 802.3x for Flow Control
IEEE 802.1D for Spanning Tree Protocol
IEEE 802.1w for Rapid Spanning Tree Protocol
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, BootP, TFTP, SNTP, SMTP, RARP, LACP, RMON, HTTP, HTTPS, Telnet, Syslog, DHCP Option 66/67/82, SSH, LLDP, IEEE 1588v2 PTP, EtherNet/IP, Modbus/TCP, IPv6, SNMP Inform, NTP Server/Client, MMS
MIB: MIB-II, Ethernet-like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Group 1, 2, 3, 9
Flow Control: IEEE 802.3x flow control, back pressure flow control

Switch Properties

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

Interface

RJ45 Ports: 10/100/1000BaseT(X) auto negotiation speed
Fiber Ports: 100/1000BaseSFP slot, 100BaseFX Multi-mode ST/SC Connector
Console Port: USB console port (Type B connector)
Storage Port: USB storage port (Type A connector)
System LED Indicators: STAT, PWR1, PWR2, FAULT, MSTR/HEAD, CPLR/TAIL
Mode LED Indicators: LNK/ACT, SPEED
Alarm Contact: 1 relay output with current carrying capacity of 3 A @ 30 VDC or 3 A @ 240 VAC

Power Requirements

Input Voltage:
• WV: 24/48 VDC (18 to 72 V)
• HV: 110/220 VDC/VAC (88 to 300 VDC and 85 to 264 VAC)
Input Current:
For models with fewer than 8 fiber ports:
• Max. 0.741 A @ 24 VDC
• Max. 0.364 A @ 48 VDC
• Max. 0.147/0.077 A @ 110/220 VDC
• Max. 0.283/0.19 A @ 110/220 VAC
For models with 8 or more fiber ports:
• Max. 1.428 A @ 24 VDC
• Max. 0.735 A @ 48 VDC
• Max. 0.313/0.167 A @ 110/220 VDC
• Max. 0.586/0.382 A @ 110/220 VAC
Overload Current Protection: Present
Connection: 10-pin terminal block
Reverse Polarity Protection: Present

Physical Characteristics

Housing: IP40 protection
Dimensions: 440 x 44 x 325 mm (17.32 x 1.73 x 12.80 in)
Weight: 4900 g
Installation: 19" rack mounting

Environmental Limits

Operating Temperature: -40 to 85°C (-40 to 185°F), cold start requires min. of 100 VAC at -40°C
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
Power Automation: IE C61850-3, IEEE 1613 Class 2 (models with MSC and SSC fiber ports are compliant with IEEE 1613 Class 1)
Traffic Control: NEMA TS2
Rail Traffic: EN 50121-4

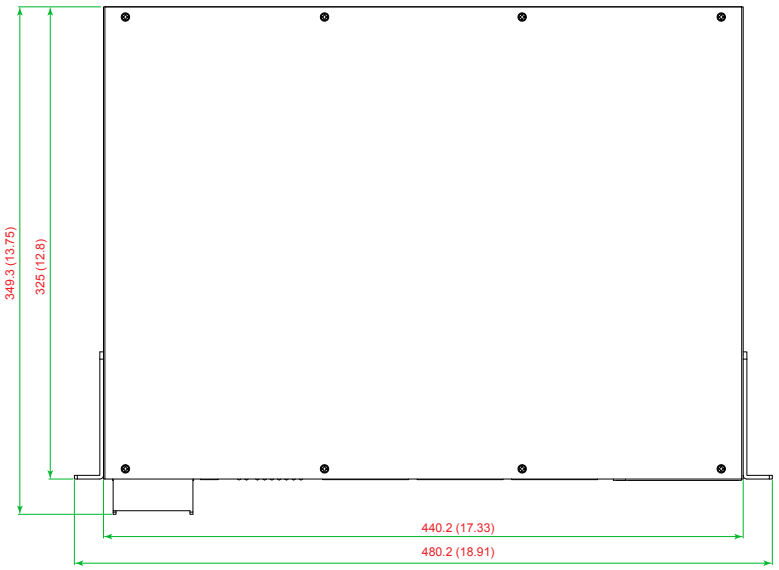
Warranty

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

Dimensions



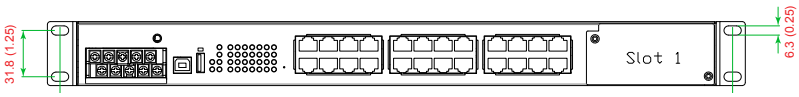
Rear View



Top View



Side View



Front View

Ordering Information

Available Models	Port Interface						Power Supply			
Rackmount, Front Cabling, Front & Rear Display	Gigabit Ethernet	Fast Ethernet				Slot for PM-7500 Series	Isolated Power Supply 1		Isolated Power Supply 2	
	1000BaseX SFP Slot	100BaseFX Multi-mode, ST Connector	100BaseFX Multi-mode, SC Connector	100BaseFX Single-mode, SC Connector	10/100BaseT(X) RJ45		WV	HV	WV	HV
PT-7528-24TX-WV	–	–	–	–	24	1	✓	–	–	–
PT-7528-24TX-HV	–	–	–	–	24	1	–	✓	–	–
PT-7528-24TX-WV-WV	–	–	–	–	24	1	✓	–	✓	–
PT-7528-24TX-WV-HV	–	–	–	–	24	1	✓	–	–	✓
PT-7528-24TX-HV-HV	–	–	–	–	24	1	–	✓	–	✓
PT-7528-8MST-16TX-4GSFP-WV	4	8	–	–	16	–	✓	–	–	–
PT-7528-8MST-16TX-4GSFP-WV-WV	4	8	–	–	16	–	✓	–	✓	–
PT-7528-8MST-16TX-4GSFP-HV	4	8	–	–	16	–	–	✓	–	–
PT-7528-8MST-16TX-4GSFP-HV-HV	4	8	–	–	16	–	–	✓	–	✓
PT-7528-12MST-12TX-4GSFP-WV	4	12	–	–	12	–	✓	–	–	–
PT-7528-12MST-12TX-4GSFP-WV-WV	4	12	–	–	12	–	✓	–	✓	–
PT-7528-12MST-12TX-4GSFP-HV	4	12	–	–	12	–	–	✓	–	–
PT-7528-12MST-12TX-4GSFP-HV-HV	4	12	–	–	12	–	–	✓	–	✓
PT-7528-16MST-8TX-4GSFP-WV	4	16	–	–	8	–	✓	–	–	–
PT-7528-16MST-8TX-4GSFP-WV-WV	4	16	–	–	8	–	✓	–	✓	–
PT-7528-16MST-8TX-4GSFP-HV	4	16	–	–	8	–	–	✓	–	–
PT-7528-16MST-8TX-4GSFP-HV-HV	4	16	–	–	8	–	–		–	✓
PT-7528-20MST-4TX-4GSFP-WV	4	20	–	–	4	–	✓	–	–	–
PT-7528-20MST-4TX-4GSFP-WV-WV	4	20	–	–	4	–	✓	–	✓	–
PT-7528-20MST-4TX-4GSFP-HV	4	20	–	–	4	–	–	✓	–	–
PT-7528-20MST-4TX-4GSFP-HV-HV	4	20	–	–	4	–	–	✓	–	✓
PT-7528-8MSC-16TX-4GSFP-WV	4	–	8	–	16	–	✓	–	–	–
PT-7528-8MSC-16TX-4GSFP-WV-WV	4	–	8	–	16	–	✓	–	✓	–
PT-7528-8MSC-16TX-4GSFP-HV	4	–	8	–	16	–	–	✓	–	–
PT-7528-8MSC-16TX-4GSFP-HV-HV	4	–	8	–	16	–	–	✓	–	✓
PT-7528-12MSC-12TX-4GSFP-WV	4	–	12	–	12	–	✓	–	–	–
PT-7528-12MSC-12TX-4GSFP-WV-WV	4	–	12	–	12	–	✓	–	✓	–
PT-7528-12MSC-12TX-4GSFP-HV	4	–	12	–	12	–	–	✓	–	–
PT-7528-12MSC-12TX-4GSFP-HV-HV	4	–	12	–	12	–	–	✓	–	✓
PT-7528-16MSC-8TX-4GSFP-WV	4	–	16	–	8	–	✓	–	–	–
PT-7528-16MSC-8TX-4GSFP-WV-WV	4	–	16	–	8	–	✓	–	✓	–
PT-7528-16MSC-8TX-4GSFP-HV	4	–	16	–	8	–	–	✓	–	–
PT-7528-16MSC-8TX-4GSFP-HV-HV	4	–	16	–	8	–	–	✓	–	✓

Available Models	Port Interface						Power Supply			
Rackmount, Front Cabling, Front & Rear Display	Gigabit Ethernet	Fast Ethernet				Slot for PM-7500 Series	Isolated Power Supply 1		Isolated Power Supply 2	
	1000BaseX SFP Slot	100BaseFX Multi-mode, ST Connector	100BaseFX Multi-mode, SC Connector	100BaseFX Single-mode, SC Connector	10/100BaseT(X) RJ45		WV	HV	WV	HV
PT-7528-20MSC-4TX-4GSFP-WV	4	–	20	–	4	–	✓	–	–	–
PT-7528-20MSC-4TX-4GSFP-WV-WV	4	–	20	–	4	–	✓	–	✓	–
PT-7528-20MSC-4TX-4GSFP-HV	4	–	20	–	4	–	–	✓	–	–
PT-7528-20MSC-4TX-4GSFP-HV-HV	4	–	20	–	4	–	–	✓	–	✓
PT-7528-8SSC-16TX-4GSFP-WV-WV	4	–	–	8	16	–	✓	–	✓	–
PT-7528-8SSC-16TX-4GSFP-HV-HV	4	–	–	8	16	–	–	✓	–	✓

Note:
- PT-7528-24TX high density copper port models have a slot reverved for PM-7500 series modules for fiber and gigabit extension. A selection table of PM-7500 interface modules is included towards the end of this datasheet.
- Models with mixed WV and HV power and models with mixed Multi-mode and Single-mode fiber are available by request on a project basis.

Optional Accessories (can be purchased separately)

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-02 Series: Configuration backup and restoration tool for managed Ethernet switches, 0 to 60°C operating temperature

Package Checklist

- PT-7528 switch
- USB-IF certified cable
- Protective caps for unused ports
- 2 rackmount ears
- Documentation and software CD
- Hardware installation guide
- Warranty card

Optical Fiber

	Multi-mode	Single-mode	Single-mode,80 km	Multi-mode
Wavelength	1300 nm	1310 nm	1550 nm	1300 nm
Max. TX	-10 dBm	0 dBm	0 dBm	-10 dBm
Min. TX	-20 dBm	-5 dBm	-5 dBm	-20 dBm
RX Sensitivity	-32 dBm	-34 dBm	-34 dBm	-32 dBm
Link Budget	12 dB	29 dB	29 dB	12 dB
Typical Distance	5 km[a] 4 km[b]	40 km[c]	80 km[d]	5 km[a] 4 km[b]
Saturation	-6 dBm	-3 dBm	-3 dBm	-6 dBm

a. 50/125 µm, 800 MHz*km fiber optic cable
b. 62.5/125 µm, 500 MHz*km fiber optic cable
c. 9/125 µm single-mode fiber optic cable
d. 9/125 µm single-mode fiber optic cable (80 km)

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