

PT-7828 Series

IEC 61850-3 / EN50155 24+4G-port Layer 3 Gigabit modular managed rackmount Ethernet switches



- > IEC 61850-3, IEEE 1613 (power substations), and EN 50155, EN 50121-4 (railway applications) compliant
- > Turbo Ring and Turbo Chain (recovery time < 20 ms @ 250 switches), RSTP/STP, and MSTP for network redundancy
- > Up to 12 ports with M12 connectors
- > Isolated redundant power inputs with universal 24/48 VDC or 110/220 VDC/VAC power supply range
- > Supports multicast routing protocols PIM-DM/DVMRP
- > NERC CIP compliance
- > -40 to 85°C operating temperature range



Introduction

The PowerTrans PT-7828 switches are high performance Layer 3 Ethernet switches that support Layer 3 routing functionality to facilitate the deployment of applications across networks. The PT-7828 switches are also designed to meet the strict demands of power substation automation systems (IEC 61850-3, IEEE 1613), and railway applications (EN 5015/EN 50121-4).

The PT-7828's Gigabit and Fast Ethernet backbone, redundant ring, and 24/48 VDC or 110/220 VDC/VAC dual isolated redundant power supplies increase the reliability of your communications and save on cabling and wiring costs. The modular design of the PT-7828 makes network planning easy, and allows greater flexibility by letting you install up to 4 Gigabit ports and 24 Fast Ethernet ports. Optional front or rear wiring makes the PT-7828 switches suitable for a variety of applications.

General Features and Benefits

- Layer 3 switching functionality to divide a large network into hierarchical subnets and allow data and information to communicate across networks
- Command Line Interface (CLI) for quickly configuring major managed functions
- Software-based IEEE 1588 PTP V2 (Precision Time Protocol) for precise time synchronization of networks
- 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
- Supports multicast routing protocols PIM-DM/DVMRP
- Supports advanced VLAN capability with Q-in-Q tagging
- 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
- Multi-port 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/Serial console, CLI Windows utility, and ABC-01 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

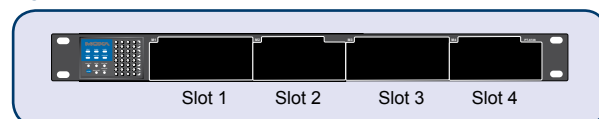
Specifications

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-2004 for Spanning Tree Protocol

Layer 3 Modular Rackmount Ethernet Switch System, PT-7828



IEEE 802.1s for Multiple Spanning Tree Protocol
 IEEE 802.1w for Rapid STP
 IEEE 802.1Q for VLAN Tagging
 IEEE 802.1p for Class of Service

Protocols: IGMPv1/v2, GMRP, GVRP, SNMPv1/v2c/v3, DHCP Server/Client, BootP, TFTP, SNTP, SMTP, RARP, RMON, RIP V1/V2, HTTP, HTTPS, Telnet, SSH, Syslog, DHCP Option 66/67/82, LLDP, Modbus/TCP, IEEE 1588 PTP V2, SNMP Inform, NTP Server/Client

Layer 3 Switching: Static routing, RIP V1/V2, OSPF, PIM-DM/DVMRP
Layer 3 Switching Redundancy: VRRP

MIB: MIB-II, Ethernet-like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Groups 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: 64

VLAN ID Range: VID 1 to 4094

IGMP Groups: 256

Interface

Fast Ethernet: Slots 1, 2, and 3 for combinations of 2, 4, 6, 7, or 8-port PM-7200 Fast Ethernet modules with 10/100BaseT(X) (TP/M12 interface), 100BaseFX (SC/ST/MTRJ connector), or 100BaseSFP

Gigabit Ethernet: Slot 4 for 2 or 4-port PM-7200 Gigabit Ethernet combo module, 10/100/1000BaseT(X) or 1000BaseSFP

Console Port: RS-232 (RJ45)

System LED Indicators: STAT, PWR1, PWR2, FAULT, MSTR/HEAD, CPLR/TAIL

Mode LED Indicators: LNK/ACT, FDX/HDX, RING/CHAIN PORT, COUPLER PORT, SPEED

Alarm Contact: 1 relay output with current carrying capacity of 3 A @ 30 VDC or 3 A @ 240 VAC

Power Requirements

Input Voltage:

- 24 VDC (18 to 36 V)
- 48 VDC (36 to 72 V)
- 110/220 VDC/VAC (88 to 300 VDC, 85 to 264 VAC)

Note: Compliant with EN 50155 on 24/48/110 VDC

Input Current: (all ports are equipped with fiber)

- Max. 2.58 A @ 24 VDC
- Max. 1.21 A @ 48 VDC
- Max. 0.64/0.33 A @ 110/220 VDC
- Max. 0.53/0.28 A @ 110/220 VAC

Overload Current Protection: Present

Connection: 10-pin terminal blocks

Reverse Polarity Protection: Present

Physical Characteristics

Housing: IP30 protection

Dimensions: 440 x 44 x 325 mm (17.32 x 1.73 x 12.80 in)

Weight: 5900 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 60950-1

EMI: FCC Part 15 Subpart B Class A, EN 55022 Class A

Power Automation: IEC 61850-3, IEEE 1613

Traffic Control: NEMA TS2

Rail Traffic: EN 50155, EN 50121-4

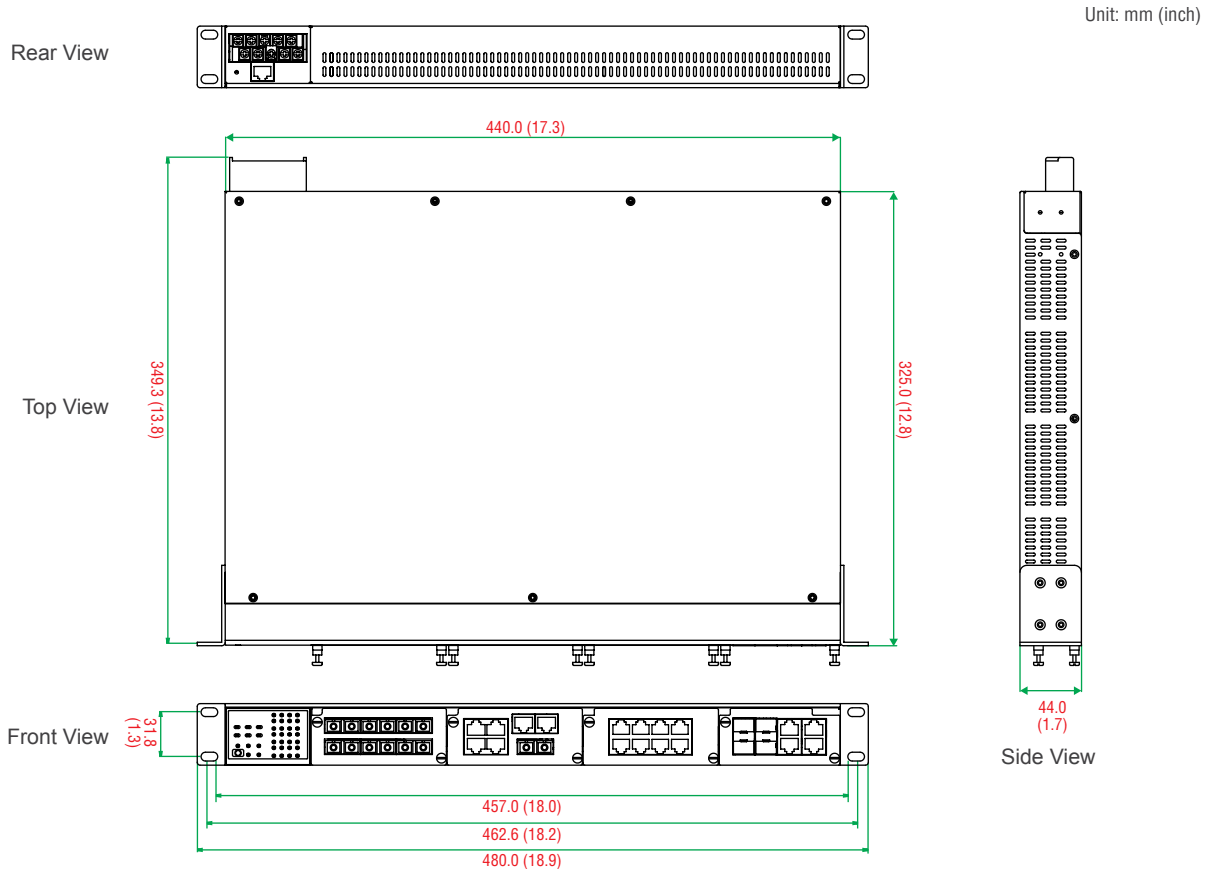
Note: Please check Moxa's website for the most up-to-date certification status.

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Dimensions



Ordering Information

Step 1: Select Ethernet switch system

Step 2: Select interface modules

PT-7828 with power supply



PM-7200 module
(Gigabit or Fast Ethernet)

Note: The PT-7828 Ethernet switch system is delivered without interface modules. See page 2-44 to choose PM-7200 interface modules.

PT-7828 Layer 3 Modular Rackmount Ethernet Switch System

The PT-7828 switch system consists of 18 Layer 3 modular managed rackmount Ethernet switch systems, each with 3 slots for Fast Ethernet modules, and 1 slot for a Gigabit Ethernet module. A total of 28 or 24+4G ports can be installed, and the switch can be used in a temperature range from -40 to 85°C.

Available Models		Power Supply					
Front Cabling, Front Display	Rear Cabling, Front Display	Isolated Power Supply 1			Isolated Power Supply 2		
		24 VDC (18 to 36 V)	48 VDC (36 to 72 V)	HV: 88 to 300 VDC and 85 to 264 VAC	24 VDC (18 to 36 V)	48 VDC (36 to 72 V)	HV: 88 to 300 VDC and 85 to 264 VAC
PT-7828-F-24	PT-7828-R-24	1	-	-	-	-	-
PT-7828-F-24-24	PT-7828-R-24-24	1	-	-	1	-	-
PT-7828-F-24-48	PT-7828-R-24-48	1	-	-	-	1	-
PT-7828-F-24-HV	PT-7828-R-24-HV	1	-	-	-	-	1
PT-7828-F-48	PT-7828-R-48	-	1	-	-	-	-
PT-7828-F-48-48	PT-7828-R-48-48	-	1	-	-	1	-
PT-7828-F-48-HV	PT-7828-R-48-HV	-	1	-	-	-	1
PT-7828-F-HV	PT-7828-R-HV	-	-	1	-	-	-
PT-7828-F-HV-HV	PT-7828-R-HV-HV	-	-	1	-	-	1

Note: The PT-7828 Layer 3 Ethernet switch systems provide combinations of 1 slot for a Gigabit Ethernet interface module, 3 slots for Fast Ethernet interface modules. See page 4 to select the PM-7200 Gigabit Ethernet and Fast Ethernet interface modules for your own application.

PT-7828-F series
(Front Cabling, Front Display)



PT-7828-R series
(Rear Cabling, Front Display)



Gigabit/Fast Ethernet Modules for the PT-7828

	Interface Modules																																
	PM-7200-4GTXSFP	PM-7200-2GTXSFP	PM-7200-1MSC	PM-7200-1MST	PM-7200-2MSC	PM-7200-2MST	PM-7200-1SSC	PM-7200-2SSC	PM-7200-8TX	PM-7200-2MSC4TX	PM-7200-2MST4TX	PM-7200-2SSC4TX	PM-7200-4MSC2TX	PM-7200-4MST2TX	PM-7200-4SSC2TX	PM-7200-6MSC	PM-7200-6MST	PM-7200-6SSC	PM-7200-1LSC6TX	PM-7200-1MST6TX	PM-7200-1SSC6TX	PM-7200-1MSC6TX	PM-7200-8PoE	PM-7200-8SFP	PM-7200-4M12	PM-7200-2MTRJ	PM-7200-8MTRJ	PM-7200-4MST-FL	PM-7200-4TX-PTP	PM-7200-4MST-PTP	PM-7200-4MSC-PTP	PM-7200-1BNC2MST-PTP	
Slot 1	-	-	-	-	-	-	-	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	✓	✓	✓	✓	✓	-	-	-	-	-
Slot 2	-	-	-	-	-	-	-	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	✓	✓	✓	✓	✓	-	-	-	-	-
Slot 3	-	-	-	-	-	-	-	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	✓	✓	✓	✓	✓	-	-	-	-	-
Slot 4	✓	✓	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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-01 Series: Configuration backup and restoration tool for managed Ethernet switches, 0 to 60°C operating temperature

Package Checklist

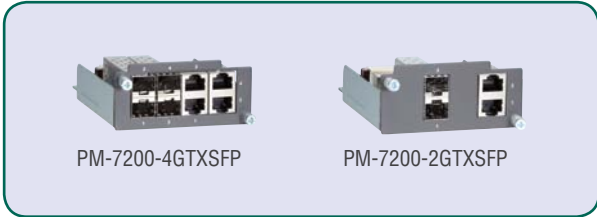
- PT-7828 switch
- RJ45-to-DB9 console port cable
- Protective caps for unused ports
- 2 rackmount ears
- Documentation and software CD
- Hardware installation guide
- Warranty card

PM-7200 Series

Gigabit and fast Ethernet modules for PT and IKS series switches

Specifications

Gigabit Ethernet Interface Modules, PM-7200-2G/4G series



Interface

RJ45 Ports: 10/100/1000BaseT(X) auto negotiation speed, and auto MDI/MDI-X connection

Fiber Ports: 1000BaseSFP slots

Note: The PM-7200-2G/4G series Gigabit Ethernet combo modules support 2 or 4 SFP slots. See page 1-87 to select the SFP-1G series Gigabit Ethernet modules for your application.

Fast Ethernet Interface Modules, PM-7200 series



* See page 1-87 and 1-89 to select SFP-1G/1FE series Gigabit Ethernet and fast Ethernet modules.

Fast Ethernet Modules for PT and IKS Series Rackmount Ethernet Switches, PM-7200 Series

Available Models	Port Interface									
	10/100BaseT(X)			100BaseFX					100BaseSFP	PPS output, BNC connector
	TP	PoE	M12	Multi-mode, SC Connector	Multi-mode, ST Connector	Multi-mode, MTRJ Connector	Single-mode, SC Connector	Single-mode, SC Connector, 80 km		
PM-7200-8TX	8	-	-	-	-	-	-	-	-	-
PM-7200-6MSC	-	-	-	6	-	-	-	-	-	-
PM-7200-6MST	-	-	-	-	6	-	-	-	-	-
PM-7200-6SSC	-	-	-	-	-	-	6	-	-	-
PM-7200-4MSC2TX	2	-	-	4	-	-	-	-	-	-
PM-7200-4MST2TX	2	-	-	-	4	-	-	-	-	-
PM-7200-4SSC2TX	2	-	-	-	-	-	4	-	-	-
PM-7200-2MSC4TX	4	-	-	2	-	-	-	-	-	-
PM-7200-2MST4TX	4	-	-	-	2	-	-	-	-	-
PM-7200-2SSC4TX	4	-	-	-	-	-	2	-	-	-
PM-7200-1LSC6TX	6	-	-	-	-	-	-	1	-	-
PM-7200-2MSC	-	-	-	2	-	-	-	-	-	-
PM-7200-2MST	-	-	-	-	2	-	-	-	-	-
PM-7200-2SSC	-	-	-	-	-	-	2	-	-	-
PM-7200-1MSC	-	-	-	1	-	-	-	-	-	-
PM-7200-1MST	-	-	-	-	1	-	-	-	-	-
PM-7200-1SSC	-	-	-	-	-	-	1	-	-	-
PM-7200-1MSC6TX	6	-	-	1	-	-	-	-	-	-
PM-7200-1MST6TX	6	-	-	-	1	-	-	-	-	-
PM-7200-1SSC6TX	6	-	-	-	-	-	1	-	-	-
PM-7200-8SFP	-	-	-	-	-	-	-	-	8	-
PM-7200-4M12	-	-	4	-	-	-	-	-	-	-
PM-7200-2MTRJ	-	-	-	-	-	2	-	-	-	-
PM-7200-8MTRJ	-	-	-	-	-	8	-	-	-	-
PM-7200-4MST-FL	-	-	-	-	4	-	-	-	-	-
PM-7200-4TX-PTP	4	-	-	-	-	-	-	-	-	-
PM-7200-4MST-PTP	-	-	-	-	4	-	-	-	-	-
PM-7200-4MSC-PTP	-	-	-	4	-	-	-	-	-	-
PM-7200-1BNC2MST-PTP	-	-	-	-	2	-	-	-	-	1
PM-7200-8PoE	-	8	-	-	-	-	-	-	-	-