

PT-7728 Series

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



- > IEC 61850-3, IEEE 1613 (power substations), NEMA TS2 (traffic control systems), and EN50155/ EN50121-4 (railway applications) compliant
- > Turbo Ring, Turbo Chain, and IEEE 802.1D-2004 RSTP/STP for Ethernet 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
- > NERC CIP compliance
- > -40 to 85°C operating temperature range



Introduction

The PowerTrans PT-7728 is designed to meet the demands of power substation automation systems (IEC 61850-3, IEEE 1613), traffic control systems (NEMA TS2), and railway applications (EN50155/EN50121-4). The PT-7728'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/wiring costs. The modular design of the PT-7728 also makes network planning easy, and allows greater flexibility by letting you install up to 4 Gigabit ports and 24 fast Ethernet ports. Along with the optional front or rear wiring, these features together make the PT-7728 suitable for a variety of industrial applications.

General Features and Benefits

- IPv6 Ready logo awarded (IPv6 Logo Committee certified)
- IEEE 1588 PTP (Precision Time Protocol) for precise time synchronization of networks
- DHCP Option 82 for IP address assignment with different policies
- Modbus/TCP industrial Ethernet protocol supported
- Turbo Ring, Turbo Chain, and IEEE 802.1D-2004 RSTP/STP
- 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, 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 (available in Q1 Y2011)
- SNMPv3 provides encrypted authentication and access security

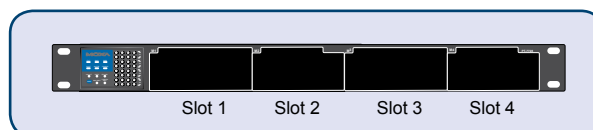
Specifications

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 STP
 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

Modular Rackmount Ethernet Switch System, PT-7728



Protocols: IGMPv1/v2, GMRP, GVRP, SNMPv1/v2c/v3, DHCP Server/Client, BootP, TFTP, SNTP, SMTP, RARP, RMON, HTTP, HTTPS, Telnet, SSH, Syslog, DHCP Option 66/67/82, LLDP, Modbus/TCP, IEEE 1588 PTP, IPv6, SNMP Inform

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: 64

VLAN ID Range: VID 1 to 4094

IGMP Groups: 256

Interface

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

Mode LED Indicators: LNK/ACT, FDX/HDX, RING 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)

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)

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)

Regulatory Approvals

Safety: UL60950-1, CSA C22.2 No. 60950-1, EN60950-1

EMI: FCC Part 15, CISPR (EN55022) class A

Power Automation: IEC 61850-3, IEEE 1613

Traffic Control: NEMA TS2

Rail Traffic: EN50155, EN50121-4

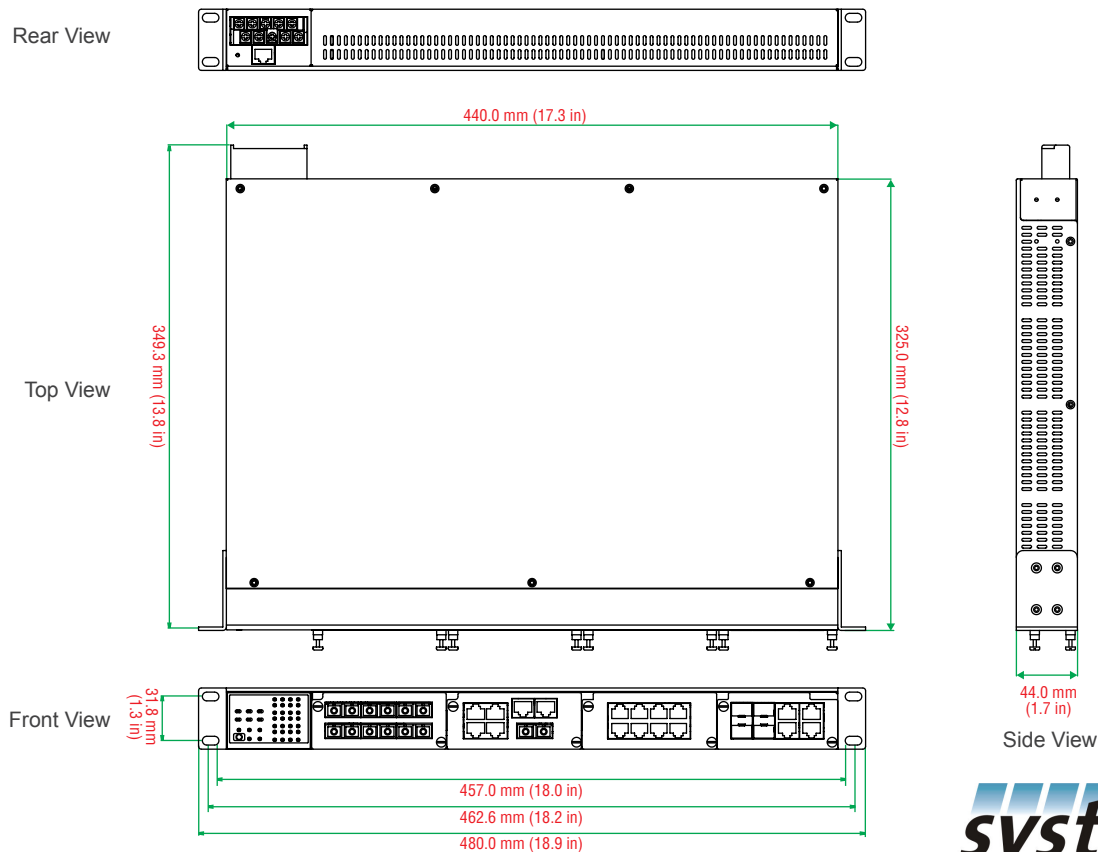
Note: Please check Moxa's website for the most up-to-date certification status.

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Dimensions



systemerra
computer

systemerra computer GmbH • Kreuzberger Ring 22
D-65205 Wiesbaden • +49 (0) 611 9748 470
info@systemerra.de • www.systemerra.de

: Ordering Information

Step 1: Select Ethernet switch system

PT-7728 with power supply

Step 2: Select interface modules

PM-7200 modules
(Gigabit or fast Ethernet)

Note: The PT-7728 Ethernet switch system is delivered without interface module. See page 2-39 to choose PM-7200 interface modules.

PT-7728 Modular Rackmount Ethernet Switch System

The PT-7728 switch system consists of 18 modular managed rackmount Ethernet switch systems with 3 slots for fast Ethernet modules, 1 slot for a Gigabit Ethernet module, or 4 slots for fast Ethernet modules. 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-7728-F-24	PT-7728-R-24	1	–	–	–	–	–
PT-7728-F-24-24	PT-7728-R-24-24	1	–	–	1	–	–
PT-7728-F-24-48	PT-7728-R-24-48	1	–	–	–	1	–
PT-7728-F-24-HV	PT-7728-R-24-HV	1	–	–	–	–	1
PT-7728-F-48	PT-7728-R-48	–	1	–	–	–	–
PT-7728-F-48-48	PT-7728-R-48-48	–	1	–	–	1	–
PT-7728-F-48-HV	PT-7728-R-48-HV	–	1	–	–	–	1
PT-7728-F-HV	PT-7728-R-HV	–	–	1	–	–	–
PT-7728-F-HV-HV	PT-7728-R-HV-HV	–	–	1	–	–	1

Note: The PT-7728 Ethernet switch systems provide combinations of 1 slot for a Gigabit Ethernet interface module, 3 slots for fast Ethernet interface modules, or 4 slots for fast Ethernet interface modules. See page 2-39 to select the PM-7200 Gigabit Ethernet and fast Ethernet interface modules that you need for your own application.

PT-7728-F series
(Front Cabling, Front Display)



PT-7728-R series
(Rear Cabling, Front Display)



Gigabit/Fast Ethernet Modules for the PT-7728

	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
Slot 1	-	-	-	-	-	-	-	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	✓	✓
Slot 2	-	-	-	-	-	-	-	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	✓	✓
Slot 3	-	-	-	-	-	-	-	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	✓	✓
Slot 4	✓	✓	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Optional Accessories (can be purchased separately)

MXview: Moxa industrial network management software with 50, 100, 250, or 500 nodes

EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices

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

PM-7200 Series

Gigabit and fast Ethernet modules for PT and IKS series switches

: Specifications

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



PM-7200-4GTXSFP



PM-7200-2GTXSFP

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 1-69 to select the SFP-1G series Gigabit Ethernet modules for your application.

Fast Ethernet Interface Modules, PM-7200 series



PM-7200-8TX



PM-7200-6MSC
PM-7200-6SSC



PM-7200-6MST



PM-7200-4MSC2TX
PM-7200-4SSC2TX



PM-7200-4MST2TX



PM-7200-2MSC4TX
PM-7200-2SSC4TX



PM-7200-2MST4TX



PM-7200-1LSC6TX



PM-7200-2MSC
PM-7200-2SSC



PM-7200-2MST



PM-7200-1MSC
PM-7200-1SSC



PM-7200-1MST



PM-7200-1MST6TX



PM-7200-1MSC6TX
PM-7200-1SSC6TX



PM-7200-8PoE

COMING SOON



PM-7200-8SFP*



PM-7200-4M12

* See page 1-69 to select SFP-1G/1FE series Gigabit Ethernet and fast Ethernet modules.

Interface

RJ45 Ports: 10/100BaseT(X) auto negotiation speed, F/H duplex mode, and auto MDI/MDI-X connection

Fiber Ports: 100BaseFX ports (SC/ST or SFP LC connector)

PoE Ports: IEEE 802.3af Power-over-Ethernet Technology, provide up to 15.4 watts per port

M12 Ports: 10/100BaseT(X) auto negotiation speed, and auto MDI/MDI-X connection

Optical Fiber

	100BaseFX		
	Multi-mode	Single-mode	Single-mode, 80 km
Wavelength	1300 nm	1310 nm	1550 nm
Max. TX	-10 dBm	0 dBm	0 dBm
Min. TX	-20 dBm	-5 dBm	-5 dBm
RX Sensitivity	-32 dBm	-34 dBm	-34 dBm
Link Budget	12 dB	29 dB	29 dB
Typical Distance	5 km a 4 km b	40 km c	80 km d
Saturation	-6 dBm	-3 dBm	-3 dBm

a. 50/125 μ m, 800 MHz*km fiber optic cable

b. 62.5/125 μ m, 500 MHz*km fiber optic cable

c. 9/125 μ m single-mode fiber optic cable

d. 9/125 μ m single-mode fiber optic cable (80 km)

: Ordering Information

Rackmount Ethernet Switch System and Interface Module Compatibility Chart

	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-7200-1MSC6TX	PM-7200-1MST6TX	PM-7200-1SSC6TX	PM-7200-1LSC6TX	PM-7200-8PoE	PM-7200-8SFP*	PM-7200-4M12
PT-7828	✓	✓	–	–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	✓	✓
PT-7728	✓	✓	–	–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	✓	✓
PT-7710	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	✓	✓
IKS-6726	–	✓	–	–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	✓	✓
IKS-6726-PoE	–	✓	–	–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
IKS-6324	–	✓	✓	✓	✓	✓	✓	✓	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

* If you are using an SFP-1FELLC module, the operating temperature is limited to -40 to 75°C (-40 to 167°F).

Gigabit Ethernet Modules for PT and IKS Series Rackmount Ethernet Switches, PM-7200-2G/4G Series

Available Models	Port Interface
	Combo Port, 10/100/1000BaseT(X) or 1000BaseSFP*
PM-7200-2GTXSFP	2
PM-7200-4GTXSFP	4

*The PM-7200-2G/4G series Gigabit Ethernet combo modules support 2 or 4 SFP slots.

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

Available Models	Port Interface							
	10/100BaseT(X)			100BaseFX				100BaseSFP
	TP	PoE	M12	Multi-mode, SC Connector	Multi-mode, ST 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-7200-8PoE	–	8	–	–	–	–	–	–
PM-7200-8SFP	–	–	–	–	–	–	–	8
PM-7200-4M12	–	–	4	–	–	–	–	–