

# PT-7728 Series

## IEC 61850-3 24+4G-port Gigabit modular managed Ethernet switch



- > IEC 61850-3, IEEE 1613 (power substations), NEMA TS2 (traffic control systems), and EN50121-4 (railway applications) compliant
- > Turbo Ring and RSTP/STP for Ethernet Redundancy
- > Isolated redundant power inputs with universal 24/48 VDC or 110/220 VDC/VAC power supply range
- > Modular design lets you choose from a variety of media combinations
- > -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 (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.

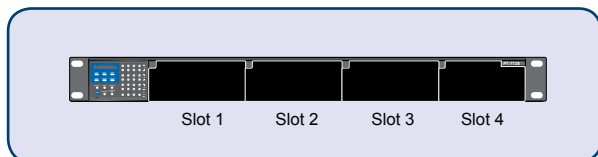
The modular design of the PT-7728 also makes network planning easy, and allows greater flexibility by letting you install up to 4 Gigabit ports and 24 fast Ethernet ports. Along with the optional front or rear wiring, these features together make the PT-7728 suitable for a variety of industrial applications.

### Features and Benefits

- Turbo Ring and RSTP/STP (IEEE 802.1w/D)
- IGMP Snooping and GMRP for filtering multicast traffic from industrial Ethernet protocols
- IEEE 802.1Q VLAN and GVRP protocol to ease network planning
- QoS-IEEE 802.1p/1Q and TOS/DiffServ to increase determinism
- 802.3ad, LACP for optimum bandwidth utilization
- 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
- ABC-01 for system configuration backup
- Bandwidth management prevents unpredictable network status
- Lock port for only authorized MAC address access
- Port mirroring for online debugging
- Automatic warning by exception through email, relay output
- Automatic recovery of connected device's IP addresses
- Line-swap fast recovery
- Configurable by Web browser, Telnet/Serial console, Windows utility, and ABC-01

### Specifications

#### Modular Rackmount Ethernet Switch System, PT-7728



#### Technology

**Standards:** IEEE 802.3 for 10BaseT,  
 IEEE 802.3u for 100BaseT(X) and 100BaseFX,  
 IEEE 802.3ab for 1000BaseT(X),  
 IEEE 802.3z for 1000BaseSX/LX/LHX/ZX,

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

**Protocols:** IGMP v1/v2 device, GMRP, GVRP, SNMPv1/v2c/v3, DHCP Server/Client, DHCP Option 82, BootP, TFTP, SNTP, SMTP, RARP, RMON, HTTP, HTTPS, Telnet, SSH, Syslog

**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:** Slot 1, 2, 3 for any combination of 8-, 7-, or 6-port PM-7200 fast Ethernet modules with 10/100BaseT(X) or 100BaseFX (SC/ST connector)

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

**Console:** RS-232 (RJ45)

**System LED Indicators:** STAT, PWR1, PWR2, FAULT, MASTER, COUPLER

**Module LED Indicators:** LNK/ACT, FDX/HDX, RING PORT, COUPLER PORT, SPEED

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

**Power Requirements**

**Input Voltage:** 24 VDC (18 to 36 V), or 48 VDC (36 to 72 V), or 110/220 VDC/VAC (88 to 300 VDC and 85 to 264 VAC)

**Input Current:** (all ports are equipped with fiber)

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

**Connection:** 10-pin terminal block  
**Overload Current Protection:** Present  
**Reverse Polarity Protection:** Present

**Physical Characteristics**

**Casing:** IP30 protection  
**Dimensions (W x H x D):** 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 of min. 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:** EN60950-1 (Pending)  
**Power Automation:** IEC 61850-3, IEEE 1613

**Road Traffic:** NEMA TS2

**Rail Traffic:** EN50121-4 (Pending)

**Maritime:** DNV (Pending), GL (Pending)

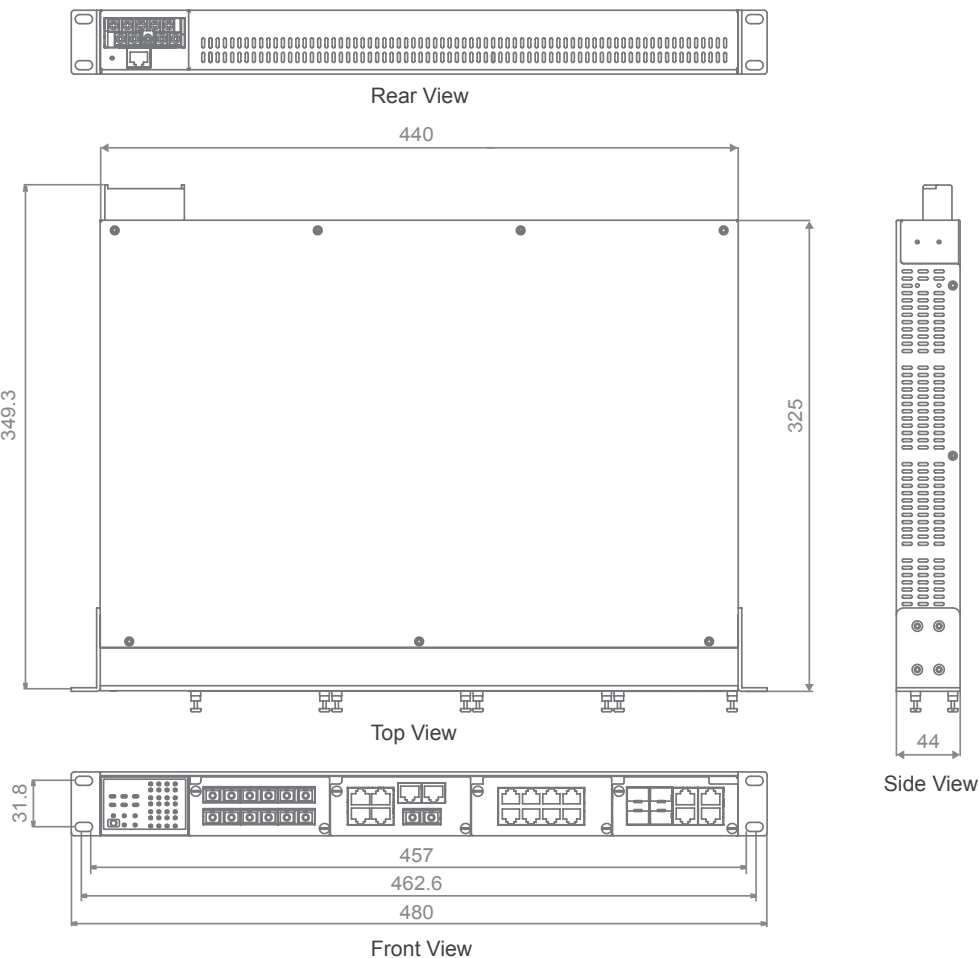
**EMI:** FCC Part 15, CISPR (EN55022) class A

*\*Please check Moxa's website for the most up-to-date certification status*

**Warranty**

5 years (see [www.moxa.com/warranty](http://www.moxa.com/warranty) for details)

**Dimensions (unit = mm)**



## Ordering Information

Step 1: Select Ethernet switch system

Step 2: Select interface modules

PT-7728 with power supply



PM-7200 series  
(Gigabit or fast Ethernet)

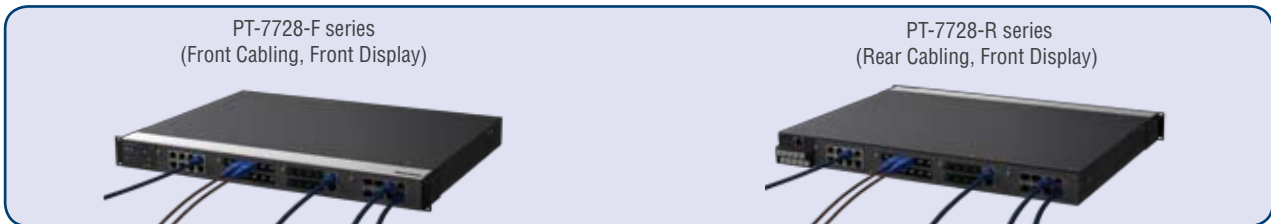
\*The PT-7728 Ethernet switch system is delivered without interface module. Please refer to page 4-23 to choose PM-7200 interface modules.

### Modular Rackmount Ethernet Switch System, PT-7728

Modular managed rackmount Ethernet switch system with 3 slots for fast Ethernet modules, and 1 slot for Gigabit Ethernet modules, for a total of up to 24+4G ports, -40 to 85°C

Product Model		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

\* The PT-7728 Ethernet switch systems provide 1 slot for Gigabit Ethernet interface modules and 3 slots for fast Ethernet interface modules. Please refer to page 4-23 to select the PM-7200 Gigabit Ethernet and fast Ethernet interface modules that you need for your own application.



### Gigabit/Fast Ethernet Modules for the PT-7728

	Interface Module												
	PM-7200-4GTXSFP	PM-7200-2GTXSFP	PM-7200-8TX	PM-7200-2M5C4TX	PM-7200-2M5T4TX	PM-7200-2SSC4TX	PM-7200-4M5C2TX	PM-7200-4M5T2TX	PM-7200-4SSC2TX	PM-7200-6MSC	PM-7200-6MST	PM-7200-6SSC	PM-7200-1L5C6TX
Slot 1			√	√	√	√	√	√	√	√	√	√	√
Slot 2			√	√	√	√	√	√	√	√	√	√	√
Slot 3			√	√	√	√	√	√	√	√	√	√	√
Slot 4	√	√											

### Optional Accessories

- **ABC-01:** Industrial RS-232, RJ45-based, automatic backup configurator
- **EDS-SNMP OPC Server Pro:** CD with EDS-SNMP OPC server software and manual

# PM-7200 Series Interface Modules

**4- or 2-port Gigabit Ethernet and 8-, 7-, 6-, 2-, or 1-port fast Ethernet interface modules for PT and IKS series rackmount Ethernet 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

\* The PM-7200-2G/4G series Gigabit Ethernet combo modules support 2 or 4 SFP slots. Please refer to page 2-23 to select the SFP-1G series Gigabit Ethernet modules.

### 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

#### 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 connector)

#### 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 <sup>a</sup> 4 km <sup>b</sup>	40 km <sup>c</sup>	80 km <sup>d</sup>
Saturation	-6 dBm	-3 dBm	-3 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, 3.5 PS/(nm\*km) fiber optic cable

d. 9/125 μm, 19 PS/(nm\*km) fiber optic cable

Ordering Information

Rackmount Ethernet Switch System and Interface Module Compatibility Chart

Product Model	Interface Module																		
	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
PT-7828	✓	✓							✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
PT-7728	✓	✓							✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
PT-7710		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
PT-7324		✓	✓	✓	✓	✓	✓	✓											
IKS-6726		✓							✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
IKS-6324		✓	✓	✓	✓	✓	✓	✓											

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

Product Model	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 4 or 2 SFP slots. Please see page 2-23 for the product information of SFP-1G series Gigabit Ethernet SFP modules.

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

Product Model	Port Interface			
	10/100BaseT(X)	100BaseFX		
		Multi Mode, SC Connector	Multi Mode, ST Connector	Single Mode, SC Connector
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