

# PT-7710 Series

## IEC 61850-3 / EN 50155 8+2G-port Gigabit modular managed rackmount Ethernet switches



- > IEC 61850-3, IEEE 1613 (power substations), and EN50155/EN50121-4 (railway applications) compliant
- > VLAN Unaware: Supports priority-tagged frames to be received by specific IEDs
- > Up to 4 ports with M12 connectors
- > Turbo Ring and Turbo Chain (recovery time < 20 ms @ 250 switches), RSTP/STP, and MSTP for network redundancy
- > Universal power supply range, 12/24/48 VDC or 110/220 VDC/VAC
- > -40 to 85°C operating temperature range



### Introduction

The PowerTrans PT-7710 is designed to meet the demands of power substation automation systems (IEC 61850-3, IEEE 1613), and railway applications (EN50155/EN50121-4). The PT-7710's Gigabit and Fast Ethernet backbone, redundant ring, and 12/24/48 VDC redundant dual power input increase the reliability of the communications and

reduce cabling and wiring costs. The modular design of the PT-7710 makes network planning easy, and allows greater flexibility by letting you install up to 2 Gigabit ports and 8 Fast Ethernet ports, or 10 Fast Ethernet ports.

### General Features and Benefits

- Command Line Interface (CLI) for quickly configuring major managed functions
- IPv6 Ready logo awarded (IPv6 Logo Committee certified)
- Software-based IEEE 1588 PTP V2 (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
- 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

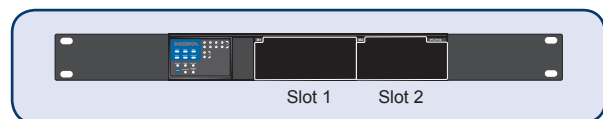
### Specifications

#### 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

### Modular Rackmount Ethernet Switch System, PT-7710



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, BootP, TFTP, SNTP, SMTP, RARP, RMON, HTTP, HTTPS, Telnet, Syslog, DHCP Option 66/67/82, SSH, LLDP, IEEE 1588 PTP V2, EtherNet/IP, Modbus/TCP, SNMP Inform, 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

**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 for any combination 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; Slot 2 for 1 or 2-port interface modules with 100BaseFX (SC/ST connector)

**Gigabit Ethernet:** Slot 2 for 2-port PM-7200 Gigabit Ethernet combo module, 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:**

- 24/48 VDC (9 to 60 V)
  - 110/220 VDC/VAC (88 to 300 VDC, 85 to 264 VAC)
- Note:** Compliant with EN 50155 on 12/24/48/110 VDC

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

- Max. 0.81 A @ 24 VDC
- Max. 0.42 A @ 48 VDC
- Max. 0.17/0.10 A @ 110/220 VDC
- Max. 0.20/0.12 A @ 110/220 VAC

**Overload Current Protection:** Present

**Connection:** 10-pin terminal blocks

**Reverse Polarity Protection:** Present

**Physical Characteristics**

**Housing:** IP30 protection

**Dimensions:** 266.5 x 44 x 195 mm (10.5 x 1.7 x 7.7 in)

**Weight:** 2200 g

**Installation:** 19" rack mounting, wall mounting (with optional kit)

**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, CSA C22.2 No. 60950-1, EN 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**

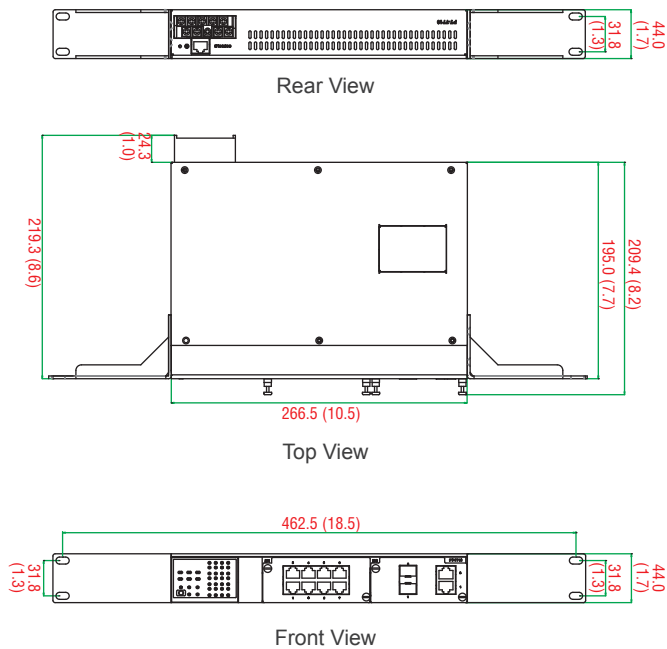
**Warranty Period:** 5 years

**Details:** See [www.moxa.com/warranty](http://www.moxa.com/warranty)

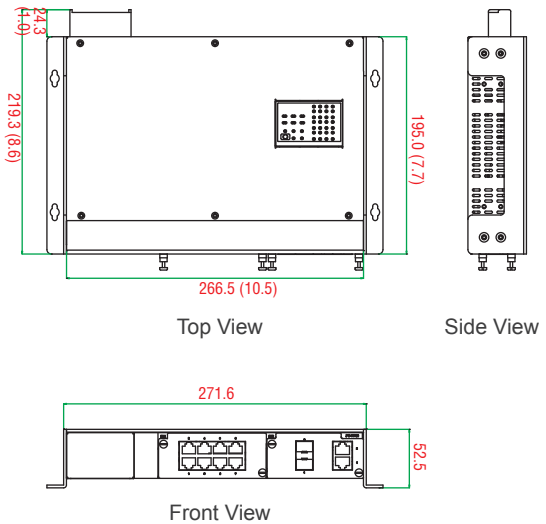
**Dimensions**

Unit: mm (inch)

**Rack Mounting**



**Wall Mounting**



## Ordering Information

### Step 1: Select Ethernet switch system

PT-7710 with power supply



### Step 2: Select interface modules

PM-7200 modules  
(Gigabit or Fast Ethernet)

Note: The PT-7710 Ethernet switch system is delivered without interface module. See page 2-44 to choose PM-7200 interface modules.

## PT-7710 Modular Rackmount Ethernet Switch System

The PT-7710 switch system consists of 4 modular managed rackmount Ethernet switch systems with 1 slot for a Fast Ethernet module, and 1 slot for a Fast Ethernet or Gigabit Ethernet module. A total of 10 or 8+2G ports can be installed, and the switch can be used in a temperature range from -40 to 85°C.

Available Models		Power Supply	
Rackmounting, Front Cabling, Front Display	Wall mounting, Down Cabling, Front Display	LV: 12/24/48 VDC (9 to 60 V) (Dual power inputs)	HV: 88 to 300 VDC and 85 to 264 VAC, isolated
PT-7710-F-LV	PT-7710-D-LV	1	–
PT-7710-F-HV	PT-7710-D-HV	–	1

Note: The PT-7710 Ethernet switch systems provide 1 slot for a Gigabit Ethernet or Fast Ethernet interface module and 1 slot for a Fast Ethernet interface module. See page 4 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-7710

	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	–	✓	✓	✓	✓	✓	✓	✓	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	

### 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-7710 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 rackmount Ethernet 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 the SFP-1G series Gigabit Ethernet information below to select the modules for your application.

## Fast Ethernet Interface Modules, PM-7200 Series



\* See the SFP-1G/1FE series Gigabit Ethernet and Fast Ethernet information below to select modules for your system.

### 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/MTRJ 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

**BNC Ports:** Time clock signal PPS (pulses per second) output for IEEE 1588 time synchronization

### Optical Fiber

	100BaseFX			10BaseFX
	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 <sup>a</sup> 4 km <sup>b</sup>	40 km <sup>c</sup>	80 km <sup>d</sup>	5 km <sup>a</sup> 4 km <sup>b</sup>
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)

## Ordering Information

### Rackmount Ethernet Switch System and Interface Module Compatibility Chart

#### Modular Rackmount Ethernet Switch System:

PT-7828/PT-7728-PTP/  
PT-7728



PT-7710



IKS-6726-8PoE



IKS-6324



		IEEE 1588 Interface Modules		Interface Modules																											
		PM-7200-4TX-PTP	PM-7200-4MSC-PTP	PM-7200-4MST-PTP	PM-7200-1BNC2MST-PTP	PM-7200-4GTXSFP	PM-7200-2GTXSFP	PM-7200-1MSC/2MSC	PM-7200-1MST/2MST	PM-7200-1SSC/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-7200-1LS6TX	PM-7200-8PoE	PM-7200-8SFP*	PM-7200-4M12	PM-7200-2MTRJ	PM-7200-8MTRJ	PM-7200-4MST-FL	
PT-7828 PT-7728	Slots 1-3	-	-	-	-	-	-	-	-	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	✓	✓	✓	✓	✓
	Slot 4	-	-	-	-	✓	✓	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PT-7728-PTP	Slots 1-3	✓	✓	✓	-	-	-	-	-	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	✓	✓	✓	✓	✓
	Slot 4	-	-	-	✓	✓	✓	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PT-7710	Slot 1	-	-	-	-	-	-	-	-	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	✓	✓	✓	✓	✓
	Slot 2	-	-	-	-	-	-	✓	✓	✓	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IKS-6726-8PoE	Slot 1	-	-	-	-	-	-	-	-	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-
	Slot 2	-	-	-	-	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IKS-6324	Slot 1	-	-	-	-	-	-	✓	✓	✓	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

### Gigabit Ethernet Modules, 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, PM-7200/7500 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-7200-4MSC-PTP	-	-	-	4	-	-	-	-	-	-
PM-7200-4MST-PTP	-	-	-	-	4	-	-	-	-	-
PM-7200-1BNC2MST-PTP	-	-	-	-	2	-	-	-	-	1
PM-7200-8PoE	-	8	-	-	-	-	-	-	-	-

### Package Checklist

- PM-7200 interface modules
- Warranty card