

PT-7828 Series

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



- > Layer 3 routing interconnects multiple LAN segments
- > IEC 61850-3, IEEE 1613 (power substations), NEMA TS2 (traffic control systems), and EN50121-4 (railway applications) compliant
- > Turbo Ring, Turbo Chain, and IEEE 802.1D-2004 RSTP/STP for Ethernet Redundancy
- > Isolated redundant power inputs with universal 24/48 VDC or 110/220 VDC/VAC power supply range
- > Modular design for various media options: RJ45, fiber optic, M12, and SFP ports
- > -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), traffic control systems (NEMA TS2), and railway applications (EN50121-4).

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.

Features and Benefits

- Layer 3 switching functionality to divide a large network into hierarchical subnets and allow data and information to communicate across networks
- 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 802.1Q VLAN and GVRP protocols to ease network planning
- QoS (IEEE802.1p/1Q) and TOS/DiffServ to increase determinism
- IEEE 802.3ad, LACP for optimum bandwidth utilization
- SNMPv3, 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
- Bandwidth management prevents unpredictable network status
- Lock port to restrict access to authorized MAC addresses
- Port mirroring for online debugging
- Automatic warning by exception through email, relay output
- Automatic recovery of connected devices' IP addresses
- Line-swap fast recovery
- Configurable by web browser, Telnet/serial console, Windows utility, and ABC-01 automatic backup configurator

Specifications

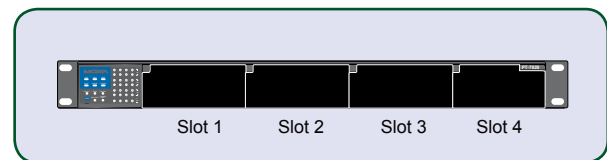
Technology

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

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

Layer 3 Modular Rackmount Ethernet Switch System, PT-7828



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

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 any combination 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, MASTER, COUPLER

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 (17.3 x 1.7 x 12.8 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)

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

Shock: IEC 60068-2-27

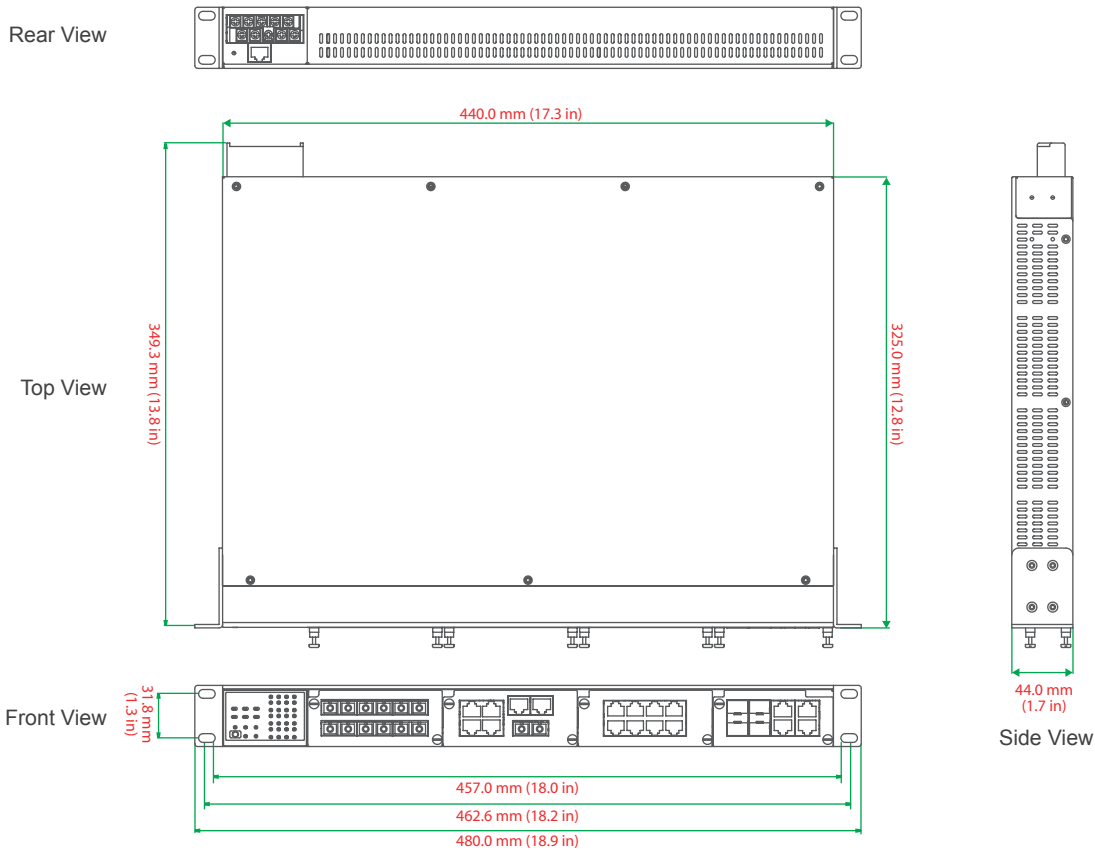
Note: Please check Moxa's website for the most up-to-date certification status.

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 pages ??? 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 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 1 slot for a Gigabit Ethernet interface module and 3 slots for fast Ethernet interface modules. See pages ??? 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

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	PM-7200-1MST6TX	PM-7200-1SSC6TX	PM-7200-1MSC6TX	PM-7200-8PoE	PM-7200-8SFP	PM-7200-4MT2
Slot 1	-	-	-	-	-	-	-	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	✓	✓
Slot 2	-	-	-	-	-	-	-	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	✓	✓
Slot 3	-	-	-	-	-	-	-	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	✓	✓
Slot 4	✓	✓	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Optional Accessories (can be purchased separately)

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

PT-G7509 Series

IEC 61850-3 9G-port full Gigabit managed rackmount Ethernet switches



- > 9 combo 10/100/1000BaseT(X) or 100/1000BaseSFP slot Gigabit ports
- > 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
- > 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-G7509 is equipped with 9 combo Gigabit Ethernet ports, making it ideal for upgrading an existing network to Gigabit speeds and building a new full Gigabit backbone. The PT-G7509 is designed to meet the demands of power substation automation systems (IEC 61850-3, IEEE 1613), traffic control systems (NEMA TS 2), and railway applications (EN50155/EN50121-4). Gigabit transmission increases bandwidth to provide higher performance and transfer large amounts of video, voice,

and data across a network quickly. The redundant Ethernet Turbo Ring and RSTP/STP (IEEE 802.1w/D) functions increase system reliability and the availability of your network backbone. The choice of either front or rear wiring makes the PT-G7509 suitable for different types of application.

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 802.1Q VLAN and GVRP protocols to ease network planning
- QoS (IEEE 802.1p/1Q) and TOS/DiffServ to increase determinism
- IEEE 802.3ad, LACP for optimum bandwidth utilization
- SNMPv3, 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
- Bandwidth management prevents unpredictable network status
- Lock port limits access to authorized MAC addresses only
- 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 automatic backup configurator

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

Protocols: IGMPv1/v2 device, 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

RJ45 Ports: 10/100/1000BaseT(X) auto negotiation speed

Fiber Ports: 100/1000BaseSFP slot

Console Port: RS-232 (RJ45)

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

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. 1.17 A @ 24 VDC
- Max. 0.59 A @ 48 VDC
- Max. 0.27/0.16 A @ 110/220 VDC
- Max. 0.61/0.35 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 254 mm (17.3 x 1.7 x 10.0 in)

Weight: 3300 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

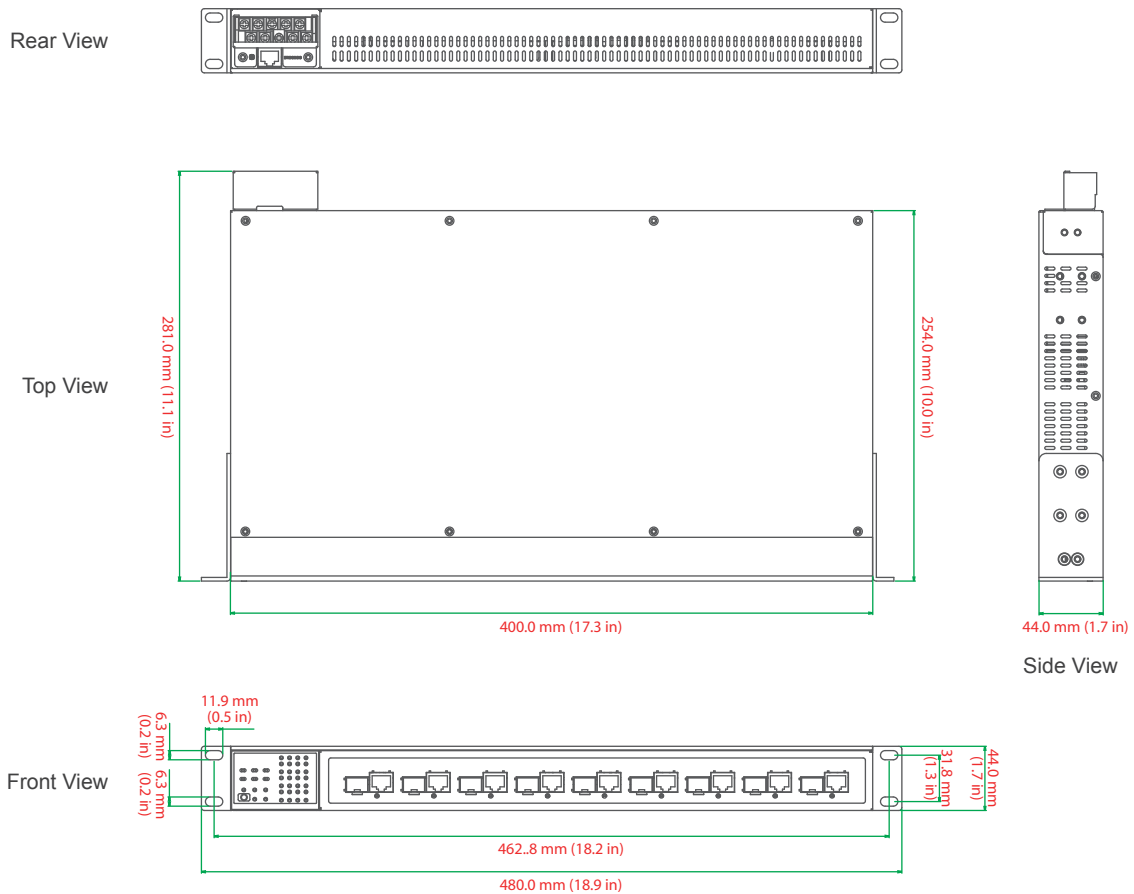
Note: Please check Moxa's website for the most up-to-date certification status.

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Dimensions



Ordering Information

PT-G7509 Full Gigabit Managed Rackmount Ethernet Switch System

The PT-G7509 switch system consists of 9 combo 10/100/1000BaseT(X) or 100/1000BaseSFP slot Gigabit ports and the switch can be used in a temperature range from -40 to 85°C.

Note: See page ??? for SFP-1G/1FE series Gigabit/fast Ethernet SFP module product information.

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-G7509-F-24	PT-G7509-R-24	1	-	-	-	-	-
PT-G7509-F-24-24	PT-G7509-R-24-24	1	-	-	1	-	-
PT-G7509-F-24-48	PT-G7509-R-24-48	1	-	-	-	1	-
PT-G7509-F-24-HV	PT-G7509-R-24-HV	1	-	-	-	-	1
PT-G7509-F-48	PT-G7509-R-48	-	1	-	-	-	-
PT-G7509-F-48-48	PT-G7509-R-48-48	-	1	-	-	1	-
PT-G7509-F-48-HV	PT-G7509-R-48-HV	-	1	-	-	-	1
PT-G7509-F-HV	PT-G7509-R-HV	-	-	1	-	-	-
PT-G7509-F-HV-HV	PT-G7509-R-HV-HV	-	-	1	-	-	1

PT-G7509-F series
(Front Cabling, Front Display)



PT-G7509-R series
(Rear Cabling, Front Display)



Optional Accessories (can be purchased separately)

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

Note: See page ??? for SFP-1G/1FE series Gigabit and fast Ethernet SFP module product information.

PT-7728 Series

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



- > IEC 61850-3, IEEE 1613 (power substations), NEMA TS2 (traffic control systems), and EN50121-4 (railway applications) compliant
- > Turbo Ring, Turbo Chain, and IEEE 802.1D-2004 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



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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.

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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
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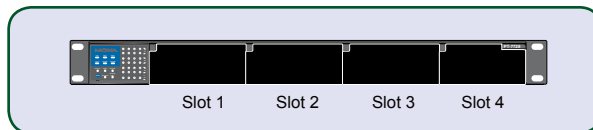
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Modular Rackmount Ethernet Switch System, PT-7728



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Switch Properties
Priority Queues: 4
Max. Number of Available VLANs: 64
VLAN ID Range: VID 1 to 4094
IGMP Groups: 256

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Fast Ethernet: Slots 1, 2, and 3 for any combination 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, MASTER, COUPLER

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Overload Current Protection: Present

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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

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Warranty

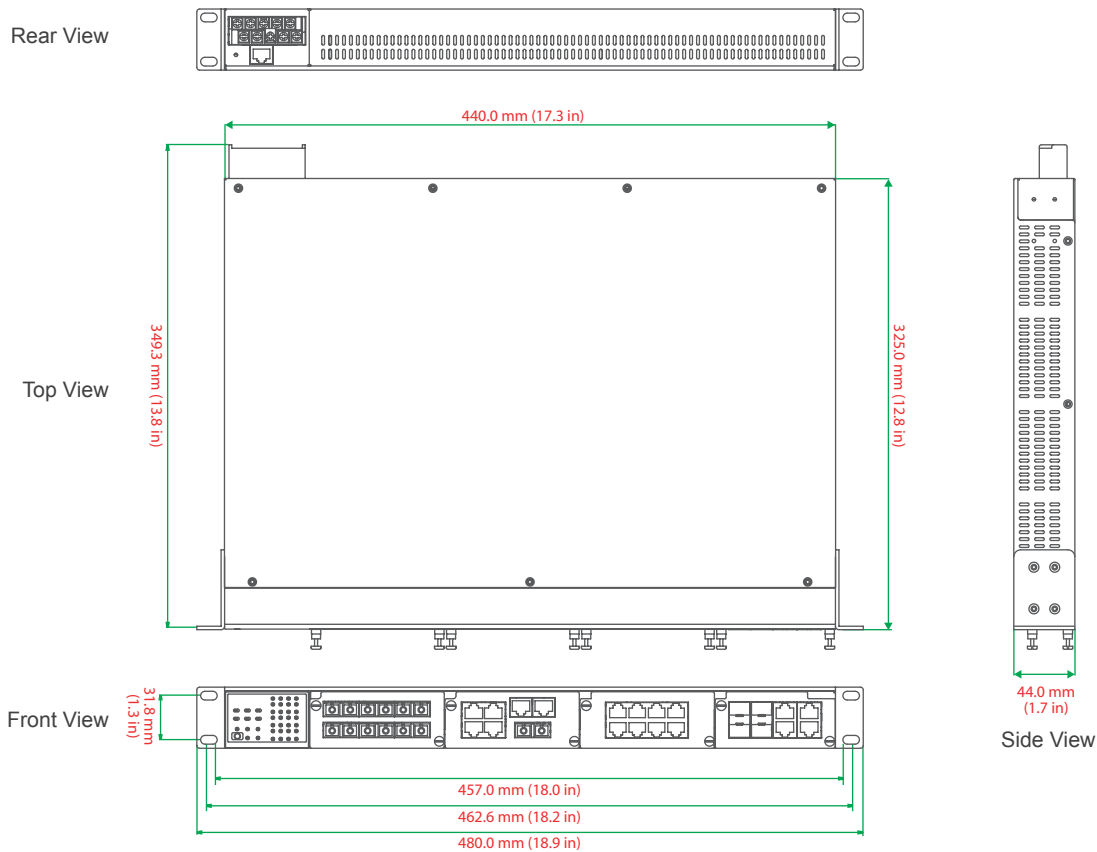
Warranty Period: 5 years

Details: See www.moxa.com/warranty

2

Industry-specific Ethernet Switches > PT-7728 Series

Dimensions



Ordering Information

Step 1: Select Ethernet switch system

Step 2: Select interface modules

PT-7728 with power supply



PM-7200 modules
(Gigabit or fast Ethernet)

Note: The PT-7728 Ethernet switch system is delivered without interface module. See pages ?? 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, and 1 slot for a Gigabit Ethernet module. A total of 24+4G ports can be installed, and the switch can be used in a temperature range from -40 to 85°C.

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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 1 slot for a Gigabit Ethernet interface modules and 3 slots for fast Ethernet interface modules. See pages ??? 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

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	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)

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

PT-7710 Series

IEC 61850-3 8+2G-port Gigabit modular managed rackmount Ethernet switches



- > IEC 61850-3, IEEE 1613 (power substations), NEMA TS2 (traffic control systems), and EN50121-4 (railway applications) compliant
- > Turbo Ring, Turbo Chain, and IEEE 802.1D-2004 RSTP/STP for Ethernet redundancy
- > Universal power supply range, 12/24/48 VDC or 110/220 VDC/VAC
- > Modular design lets you choose from a variety of media combinations
- > -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), traffic control systems (NEMA TS2), and railway applications (EN50121-4). The PT-7710's Gigabit and fast Ethernet backbone, redundant ring, and 12/24/48 VDC dual redundant power supplies or 110/220 VDC/

VAC power supplies 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.

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
- Port-based VLAN, IEEE 802.1Q VLAN, and GVRP protocol to ease network planning
- QoS (IEEE 802.1p/1Q) and TOS/DiffServ to increase determinism
- IEEE 802.3ad, LACP for optimum bandwidth utilization
- SNMPv3, 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
- Bandwidth management prevents unpredictable network status
- Lock port to limit access to authorized MAC addresses only
- 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 automatic backup configurator

Specifications

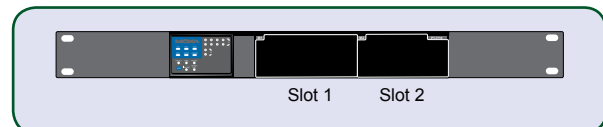
Technology

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

Protocols: IGMPv1/v2 device, 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

Modular Rackmount Ethernet Switch System, PT-7710



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 4, 6, 7, or 8-port PM-7200 fast Ethernet modules with 10/100BaseT(X) (TP/M12 interface), 100BaseFX (SC/ST 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, MASTER, COUPLER

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:

- 12/24/48 VDC (9 to 60 V)
- 110/220 VDC/VAC (88 to 300 VDC and 85 to 264 VAC)

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)

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.

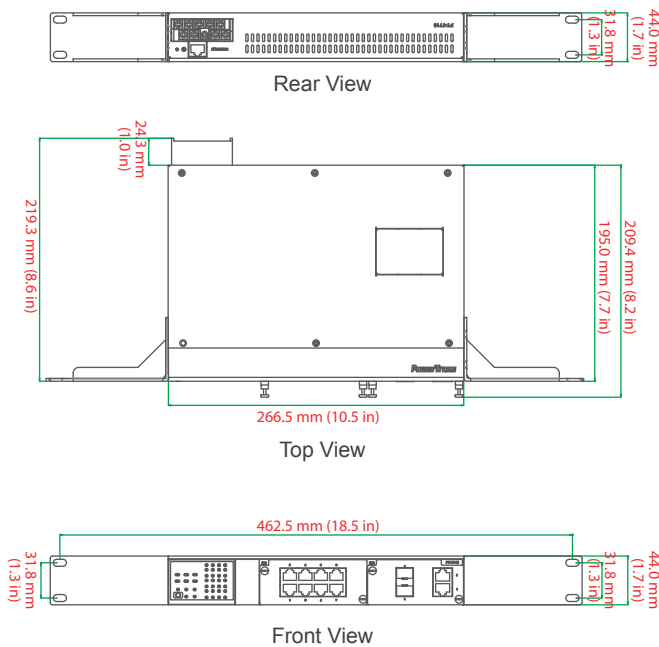
Warranty

Warranty Period: 5 years

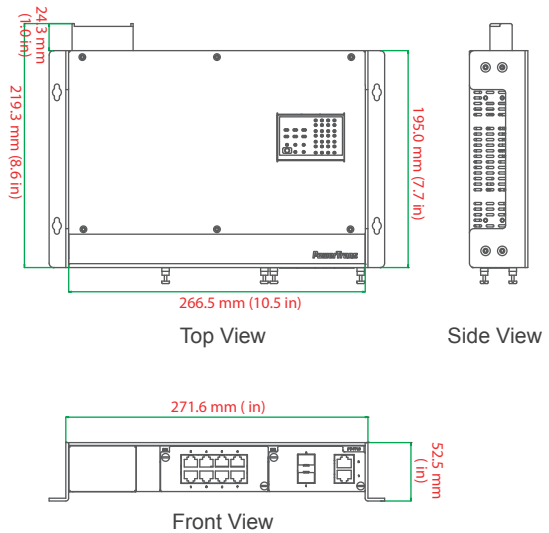
Details: See www.moxa.com/warranty

Dimensions

Rackmounting



Wall mounting



Ordering Information

Step 1: Select Ethernet switch system

Step 2: Select interface modules

PT-7710 with power supply



PM-7200 modules
(Gigabit or fast Ethernet)

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

PT-7710 Modular Rackmount Ethernet Switch System

The PT-7710 switch system consists of 4 modular managed 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 interface module and 1 slot for a fast Ethernet interface module. See pages ??? and ??? to select the PM-7200 Gigabit Ethernet and fast Ethernet interface modules that you need for your own application.

PT-7710-F series
(Rackmounting, Front Cabling, Front Display)



PT-7710-D series
(Wall mounting, Down Cabling, Front Display)



Gigabit/Fast Ethernet Modules for the PT-7710

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-7200-1LS06TX	PM-7200-1MST6TX	PM-7200-1SSC6TX	PM-7200-1MSC6TX	PM-7200-8PoE	PM-7200-8SFP	PM-7200-4M12
Slot 1	-	-	-	-	-	-	-	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	✓	✓
Slot 2	-	✓	✓	✓	✓	✓	✓	✓	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Optional Accessories (can be purchased separately)

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

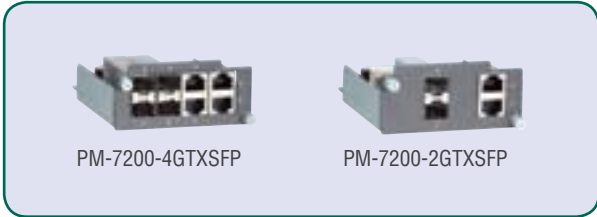
ABC-01: Configuration backup and restoration tool for managed Ethernet switches, 0 to 60°C operating temperature

PM-7200 Series

Gigabit and fast Ethernet modules for PT and IKS series switches

Specifications

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



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 3-48 to select the SFP-1G series Gigabit Ethernet modules for your application.

Fast Ethernet Interface Modules, PM-7200 series



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 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)

2 Industry-specific Ethernet Switches > PM-7200 Series

: Ordering Information

Rackmount Ethernet Switch System and Interface Module Compatibility Chart

Product Model	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	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	✓	✓
PT-7324	-	✓	✓	✓	✓	✓	✓	✓	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
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	-	-	-	-	-

2

Industry-specific Ethernet Switches > PM-7200 Series