

PT-7710 Series

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



Features and Benefits

- IEC 61850-3, IEEE 1613 (power substations), and EN50121-4 (railway applications) compliant
- Complies with a portion of EN 50155 specifications
- 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),¹ 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

Certifications



Introduction

The PT-7710 is designed to meet the demands of power substation automation systems (IEC 61850-3, IEEE 1613), and railway applications (EN 50121-4). The PT-7710's Gigabit and Fast Ethernet backbone, redundant ring, and 12/24/48 VDC redundant power inputs 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.

Additional Features and Benefits

- Command line interface (CLI) for quickly configuring major managed functions
- 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
- Automatic recovery of connected device's IP addresses
- Line-swap fast recovery
- IGMP snooping and GMRP for filtering multicast traffic from industrial Ethernet protocols
- IEEE 802.3ad, LACP for optimum bandwidth utilization
- Bandwidth management to prevent unpredictable network status
- Multi-port mirroring for online debugging
- Automatic warning by exception through email and relay output
- RMON for proactive and efficient network monitoring
- Configurable by Web browser, Telnet/Serial console, CLI, Windows utility, and ABC-01 automatic backup configurator
- Turbo Ring and Turbo Chain (recovery time < 20 ms @ 250 switches),¹ RSTP/STP, and MSTP for network redundancy

Cybersecurity 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
- RADIUS/TACACS+ allows you to manage passwords from a central location
- 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
- Disable one or more ports to block network traffic
- SNMPv3 provides encrypted authentication and access security

1. Gigabit Ethernet recovery time < 50 ms

Specifications

Ethernet Interface

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|--------------------|---|
| Cabling Direction | PT-7710-F Series: Front cabling PT-7710-D Series: Down cabling |
| Compatible Modules | Slot 1: 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-7200-8SFP, PM-7200-4M12, PM-7200-8MTRJ Slot 2: PM-7200-2GTXSFP, PM-7200-1MSC, PM-7200-1MST, PM-7200-2MSC, PM-7200-2MST, PM-7200-2SSC |
| Standards | IEEE 802.1D-2004 for Spanning Tree Protocol IEEE 802.1p for Class of Service IEEE 802.1Q for VLAN Tagging IEEE 802.1s for Multiple Spanning Tree Protocol IEEE 802.1w for Rapid Spanning Tree Protocol IEEE 802.1X for authentication IEEE 802.3 for 10BaseT IEEE 802.3ab for 1000BaseT(X) IEEE 802.3ad for Port Trunk with LACP IEEE 802.3u for 100BaseT(X) and 100BaseFX IEEE 802.3x for flow control IEEE 802.3z for 1000BaseSX/LX/LHX/ZX |

Ethernet Software Features

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|----------------------|---|
| Filter | 802.1Q, GMRP, GVRP, IGMP v1/v2c, Port-based VLAN, VLAN unaware |
| Industrial Protocols | EtherNet/IP, Modbus TCP |
| Management | Back Pressure Flow Control, BOOTP, DHCP Option 66/67/82, DHCP Server/Client, Flow control, HTTP, IPv4/IPv6, LLDP, Port Mirror, RARP, RMON, SMTP, SNMP Inform, SNMPv1/v2c/v3, Syslog, Telnet, TFTP |
| MIB | Bridge MIB, Ethernet-like MIB, MIB-II, P-BRIDGE MIB, Q-BRIDGE MIB, RMON MIB Groups 1, 2, 3, 9, RSTP MIB |
| Power Substation | IEC 61850 QoS, MMS |
| Redundancy Protocols | Link Aggregation, MSTP, RSTP, STP, Turbo Chain, Turbo Ring v1/v2 |
| Security | Broadcast storm protection, HTTPS/SSL, TACACS+, Port Lock, RADIUS, Rate Limit, SSH |
| Time Management | NTP Server/Client, SNTP |

Switch Properties

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| IGMP Groups | 256 |
| Max. No. of VLANs | 64 |
| VLAN ID Range | VID 1 to 4094 |
| Priority Queues | 4 |

Serial Interface

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| Console Port | RS-232 (RJ45) |
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Input/Output Interface

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| Alarm Contact Channels | Resistive load: 3 A @ 30 VDC, 240 VAC |
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Power Parameters

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| Connection | 10-pin terminal block |
| Input Voltage | PT-7710-LV Series: 12/24/48 VDC (9 to 60 VDC) |

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| | PT-7710-HV Series: 110/220 VAC/VDC (88 to 300 VAC, 85 to 264 VDC) |
| Overload Current Protection | Supported |
| Reverse Polarity Protection | Supported |
| Input Current | PT-7710-LV Series: 0.75 A @ 0.24 VDC, 0.39 A @ 48 VDC PT-7710-HV Series: 0.19/0.11 A @ 110/220 VAC, 0.16/0.10 A @ 110/220 VDC |
| Physical Characteristics | |
| Housing | Aluminum |
| IP Rating | IP30 |
| Dimensions (without ears) | 266.5 x 44 x 195 mm (10.5 x 1.7 x 7.7 in) |
| Weight | 2200 g (4.89 lb) |
| Installation | PT-7710-F Series: 19-inch rack mounting, PT-7710-D Series: Wall mounting |
| Environmental Limits | |
| Operating Temperature | -40 to 85°C (-40 to 185°F) Note: Cold start requires minimum of 100 VAC @ -40°C |
| Storage Temperature (package included) | -40 to 85°C (-40 to 185°F) |
| Ambient Relative Humidity | 5 to 95% (non-condensing) |
| Standards and Certifications | |
| Safety | EN 60950-1, UL 60950-1, CSA C22.2 No. 60950-1 |
| EMI | EN 55032 Class A, CISPR 32, FCC Part 15B Class A |
| EMS | IEC 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 35 V/m IEC 61000-4-4 EFT: Power: 4 kV; Signal: 4 kV PT-7710-HV Series: IEC 61000-4-5 Surge: Power: 4 kV; Signal: 4 kV PT-7710-LV Series: IEC 61000-4-5 Surge: Power: 2 kV; Signal: 4 kV IEC 61000-4-6 CS: 10 V IEC 61000-4-8 PFMF IEC 61000-4-11 DIPs |
| Power Substation | IEC 61850-3, IEEE 1613 |
| Railway | EN 50121-4, EN 50155 (complies with a portion of EN 50155 specifications) |
| Traffic Control | NEMA TS2 |
| MTBF | |
| Time | 316,716 hrs |
| Standards | Telcordia SR332 |
| Warranty | |
| Warranty Period | 5 years |
| Details | See www.moxa.com/warranty |
| Package Contents | |
| Device | 1 x PT-7710 Series switch |
| Cable | 1 x DB9 female to RJ45 10-pin |
| Installation Kit | 4 x cap, plastic, for RJ45 port |

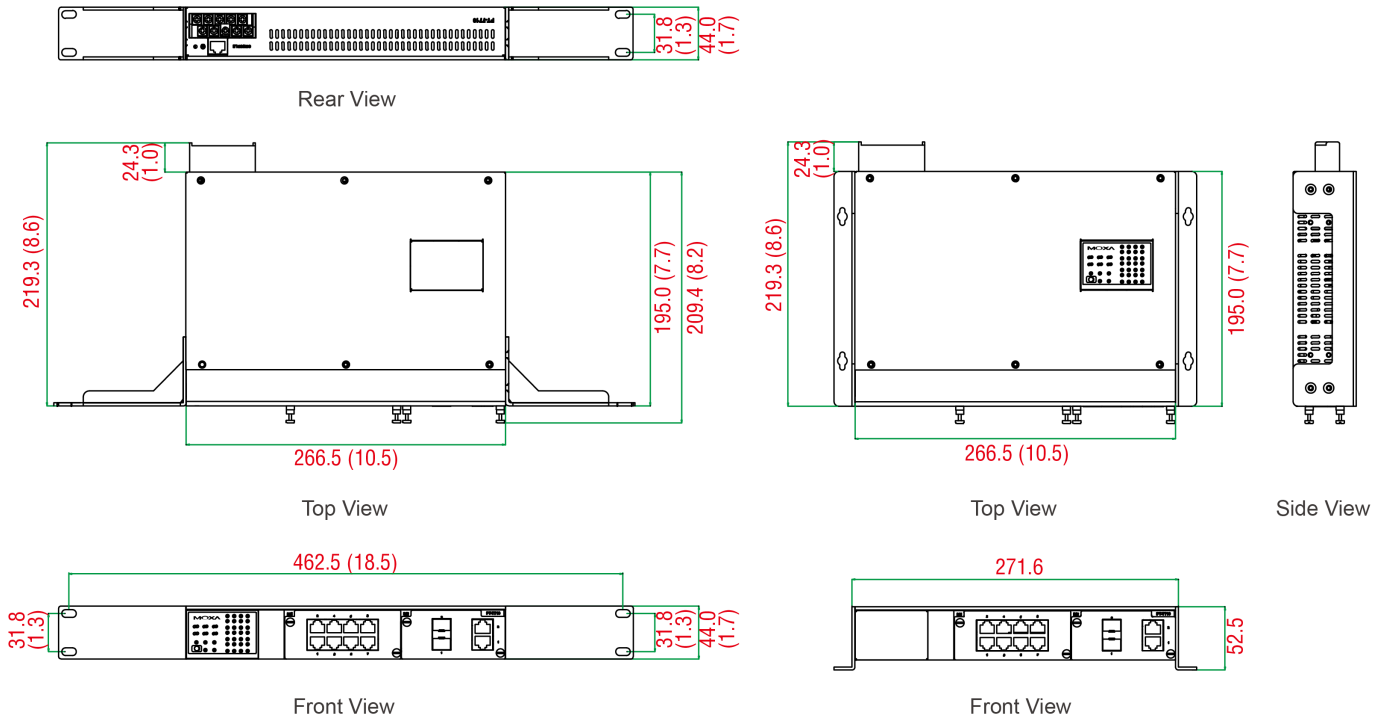
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|---------------|---|
| | 2 x rack-mounting ear |
| Documentation | 1 x document and software CD 1 x quick installation guide 1 x warranty card 1 x product certificates of quality inspection, Simplified Chinese 1 x product notice, Simplified Chinese |
| Note | SFP modules and/or modules from the PM-7200 Module Series need to be purchased separately for use with this product. |

Dimensions

Rack Mounting

Wall Mounting

Unit: mm (inch)



Ordering Information

| Model Name | Max. No. of Ports | Max. No. of Gigabit Ports | Max. No. of Fast Ethernet Ports | Cabling | Input Voltage | Operating Temp. |
|--------------|-------------------|---------------------------|---------------------------------|---------|-----------------|-----------------|
| PT-7710-F-HV | 10 | 2 | 8 | Front | 110/220 VDC/VAC | -45 to 85°C |
| PT-7710-F-LV | 10 | 2 | 8 | Front | 12/24/48 VDC | -45 to 85°C |
| PT-7710-D-HV | 10 | 2 | 8 | Down | 110/220 VDC/VAC | -45 to 85°C |
| PT-7710-D-LV | 10 | 2 | 8 | Down | 12/24/48 VDC | -45 to 85°C |

Accessories (sold separately)

PM-7200 Module Series

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|----------------------|---|
| PM-7200-1BNC2MST-PTP | Fast Ethernet module for PT-7728-PTP series with 2 100BaseFX multi-mode ports with ST connectors, 1 PPS output with BNC connector, hardware-based IEEE 1588 PTP V2 protocol support |
| PM-7200-1MSC | Fast Ethernet module with 1 100BaseFX multi-mode port with SC connector |
| PM-7200-1MST | Fast Ethernet module with 1 100BaseFX multi-mode port with ST connector |

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| PM-7200-2GTXSFP | Gigabit Ethernet module with 2 10/100/1000BaseT(X) or 1000BaseSFP slot combo ports |
| PM-7200-2MSC | Fast Ethernet module with 2 100BaseFX multi-mode ports with SC connectors |
| PM-7200-2MSC4TX | Fast Ethernet module with 2 100BaseFX multi-mode ports with SC connectors and 4 10/100BaseT(X) ports |
| PM-7200-2MST | Fast Ethernet module with 2 100BaseFX multi-mode ports with ST connectors |
| PM-7200-2MST4TX | Fast Ethernet module with 2 100BaseFX multi-mode ports with ST connectors and 4 10/100BaseT(X) ports |
| PM-7200-2SSC | Fast Ethernet module with 2 100BaseFX single-mode ports with SC connectors |
| PM-7200-2SSC4TX | Fast Ethernet module with 2 100BaseFX single-mode ports with SC connectors and 4 10/100BaseT(X) ports |
| PM-7200-4GTXSFP | Gigabit Ethernet module with 4 10/100/1000BaseT(X) or 1000BaseSFP slot combo ports |
| PM-7200-4M12 | Fast Ethernet module with 4 10/100BaseT(X) ports with M12 connectors |
| PM-7200-4MSC2TX | Fast Ethernet module with 4 100BaseFX multi-mode ports with SC connectors and 2 10/100BaseT(X) ports |
| PM-7200-4MST2TX | Fast Ethernet module with 4 100BaseFX multi-mode ports with ST connectors and 2 10/100BaseT(X) ports |
| PM-7200-4SSC2TX | Fast Ethernet module with 4 100BaseFX single-mode ports with SC connectors and 2 10/100BaseT(X) ports |
| PM-7200-6MSC | Fast Ethernet module with 6 100BaseFX multi-mode ports with SC connectors |
| PM-7200-6MST | Fast Ethernet module with 6 100BaseFX multi-mode ports with ST connectors |
| PM-7200-6SSC | Fast Ethernet module with 6 100BaseFX single-mode ports with SC connectors |
| PM-7200-8SFP | Fast Ethernet module with 8 100BaseSFP slots |
| PM-7200-8TX | Fast Ethernet module with 8 10/100BaseT(X) ports |
| PM-7200-8MTRJ | Fast Ethernet module with 8 100BaseFX multi-mode ports with MTRJ connectors |
| PM-7200-4TX-PTP | Fast Ethernet module for PT-7728-PTP series with 4 10/100BaseT(X) ports, hardware-based IEEE 1588 PTP V2 protocol support |
| PM-7200-4MST-PTP | Fast Ethernet module for PT-7728-PTP series with 4 100BaseFX multi-mode ports with ST connectors, hardware-based IEEE 1588 PTP V2 protocol support |
| PM-7200-4MSC-PTP | Fast Ethernet module for PT-7728-PTP series with 4 100BaseFX multi-mode ports with SC connectors, hardware-based IEEE 1588 PTP V2 protocol support |
| PM-7200-4GTX-PHR-PTP | Gigabit Ethernet module with 4 1000Base T(X) ports, PRP/HSR protocol support |
| PM-7200-4GSFP-PHR-PTP | Gigabit Ethernet module with 4 100/1000Base SFP slots, PRP/HSR protocol support |

Software

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|--------|---|
| MXview | Industrial network management software designed for converged automation networks |
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SFP Modules

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| SFP-1FELLC-T | SFP module with 1 100Base single-mode with LC connector for 80 km transmission, -40 to 85°C operating temperature |
| SFP-1FEMLC-T | SFP module with 1 100Base multi-mode with LC connector for 4 km transmission, -40 to 85°C operating temperature |
| SFP-1FESLC-T | SFP module with 1 100Base single-mode with LC connector for 40 km transmission, -40 to 85°C operating temperature |
| SFP-1G10ALC | WDM-type (BiDi) SFP module with 1 1000BaseSFP port with LC connector for 10 km transmission; TX 1310 nm, RX 1550 nm, 0 to 60°C operating temperature |
| SFP-1G10ALC-T | WDM-type (BiDi) SFP module with 1 1000BaseSFP port with LC connector for 10 km transmission; TX 1310 nm, RX 1550 nm, -40 to 85°C operating temperature |
| SFP-1G10BLC | WDM-type (BiDi) SFP module with 1 1000BaseSFP port with LC connector for 10 km transmission; TX 1550 nm, RX 1310 nm, 0 to 60°C operating temperature |
| SFP-1G10BLC-T | WDM-type (BiDi) SFP module with 1 1000BaseSFP port with LC connector for 10 km transmission; TX 1550 nm, RX 1310 nm, -40 to 85°C operating temperature |

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| SFP-1G20ALC | WDM-type (BiDi) SFP module with 1 1000BaseSFP port with LC connector for 20 km transmission; TX 1310 nm, RX 1550 nm, 0 to 60°C operating temperature |
| SFP-1G20ALC-T | WDM-type (BiDi) SFP module with 1 1000BaseSFP port with LC connector for 20 km transmission; TX 1310 nm, RX 1550 nm, -40 to 85°C operating temperature |
| SFP-1G20BLC | WDM-type (BiDi) SFP module with 1 1000BaseSFP port with LC connector for 20 km transmission; TX 1550 nm, RX 1310 nm, 0 to 60°C operating temperature |
| SFP-1G20BLC-T | WDM-type (BiDi) SFP module with 1 1000BaseSFP port with LC connector for 20 km transmission; TX 1550 nm, RX 1310 nm, -40 to 85°C operating temperature |
| SFP-1G40ALC | WDM-type (BiDi) SFP module with 1 1000BaseSFP port with LC connector for 40 km transmission; TX 1310 nm, RX 1550 nm, 0 to 60°C operating temperature |
| SFP-1G40ALC-T | WDM-type (BiDi) SFP module with 1 1000BaseSFP port with LC connector for 40 km transmission; TX 1310 nm, RX 1550 nm, -40 to 85°C operating temperature |
| SFP-1G40BLC | WDM-type (BiDi) SFP module with 1 1000BaseSFP port with LC connector for 40 km transmission; TX 1550 nm, RX 1310 nm, 0 to 60°C operating temperature |
| SFP-1G40BLC-T | WDM-type (BiDi) SFP module with 1 1000BaseSFP port with LC connector for 40 km transmission; TX 1550 nm, RX 1310 nm, -40 to 85°C operating temperature |
| SFP-1GEZXC | SFP module with 1 1000BaseEZXC port with LC connector for 110 km transmission, 0 to 60°C operating temperature |
| SFP-1GEZXC-120 | SFP module with 1 1000BaseEZXC port with LC connector for 120 km transmission, 0 to 60°C operating temperature |
| SFP-1GLHLC | SFP module with 1 1000BaseLH port with LC connector for 30 km transmission, 0 to 60°C operating temperature |
| SFP-1GLHLC-T | SFP module with 1 1000BaseLH port with LC connector for 30 km transmission, -40 to 85°C operating temperature |
| SFP-1GLHXC | SFP module with 1 1000BaseLHX port with LC connector for 40 km transmission, 0 to 60°C operating temperature |
| SFP-1GLHXC-T | SFP module with 1 1000BaseLHX port with LC connector for 40 km transmission, -40 to 85°C operating temperature |
| SFP-1GLSXC | SFP module with 1 1000BaseLSX port with LC connector for 500 m transmission, 0 to 60°C operating temperature |
| SFP-1GLSXC-T | SFP module with 1 1000BaseLSX port with LC connector for 500 m transmission, -40 to 85°C operating temperature |
| SFP-1GLXC | SFP module with 1 1000BaseLX port with LC connector for 10 km transmission, 0 to 60°C operating temperature |
| SFP-1GLXC-T | SFP module with 1 1000BaseLX port with LC connector for 10 km transmission, -40 to 85°C operating temperature |
| SFP-1GSXC | SFP module with 1 1000BaseSX port with LC connector for 300/550 m transmission, 0 to 60°C operating temperature |
| SFP-1GSXC-T | SFP module with 1 1000BaseSX port with LC connector for 300/550 m transmission, -40 to 85°C operating temperature |
| SFP-1GZXC | SFP module with 1 1000BaseZX port with LC connector for 80 km transmission, 0 to 60°C operating temperature |
| SFP-1GZXC-T | SFP module with 1 1000BaseZX port with LC connector for 80 km transmission, -40 to 85°C operating temperature |

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