

PT-G7728 Series

IEC 61850-3 28-port Layer 2 full Gigabit modular managed Ethernet switches



Features and Benefits

- IEC 61850-3 Edition 2 Class 2 compliant
- Wide operating temperature range: -40 to 85°C (-40 to 185°F)
- Hot-swappable interface and power modules for continuous operation
- IEEE 1588 hardware time stamp supported
- Supports IEEE C37.238 and IEC 61850-9-4 power profiles
- IEC 62439-3 Clause 4 (PRP) and Clause 5 (HSR) compliant
- GOOSE Check for easy troubleshooting
- Built-in MMS server based on IEC 61850-90-4 switch data modeling for power SCADA

Certifications



Introduction

The PT-G7728 Series modular switches provide up to 28 Gigabit ports, including 4 fixed ports, 6 interface module slots, and 2 power module slots to ensure sufficient flexibility for a variety of applications. The PT-G7728 Series is designed to meet evolving network requirements, featuring a hot-swappable module design that enables you to change, add, or remove modules without having to shut down the switch.

Multiple types of interface modules (RJ45, SFP, PoE, PRP/HSR) and power units (24/48 VDC, 110/220 VAC/VDC) provide even greater flexibility to suit different operating conditions. The PT-G7728 Series complies with the IEC 61850-3 Edition 2 Class 2 standard to ensure reliable data transmissions when the device is subjected to high levels of EMI, shock, or vibration.

Specifications

Ethernet Interface

| | |
|--|---|
| 10/100/1000BaseT(X) Ports (RJ45 connector) | 2 |
| 100/1000BaseSFP Ports | 2 |
| Module | 6 |
| Slot Combination | See the LM-7000H datasheet for information about the Ethernet, PoE+, and PRP/HSR modules. |
| Standards | IEEE 802.3 for 10BaseT IEEE 802.3u for 100BaseT(X) and 100BaseFX IEEE 802.3ab for 1000BaseT(X) IEEE 802.3z for 1000BaseX IEEE 802.1D-2004 for Spanning Tree Protocol IEEE 802.1w for Rapid Spanning Tree Protocol IEEE 802.1p for Class of Service IEEE 802.1Q for VLAN Tagging IEEE 802.1X for authentication IEEE 802.3ad for Port Trunk with LACP IEEE 802.3x for flow control |

Ethernet Software Features

| | |
|----------------------|---|
| Management | IPv4/IPv6, SNMP Inform, SNMPv1/v2c/v3, DHCP Server/Client, DHCP Option 66/67/82, BOOTP, TFTP, LLDP, RARP, HTTP, HTTPS, Telnet, Flow control, Back Pressure Flow Control, Port Mirror, Fiber check, Dying Gasp, SMTP, Syslog |
| MIB | MIB-II, Ethernet-like MIB, Bridge MIB, P-BRIDGE MIB, Q-BRIDGE MIB, RSTP MIB, RMON MIB Groups 1, 2, 3, 9 |
| Filter | IGMP v1/v2/v3, GMRP, GVRP, 802.1Q, QinQ VLAN |
| Redundancy Protocols | Link Aggregation, MSTP, RSTP, STP, Turbo Chain, Turbo Ring v1/v2, V-ON |
| Security | RADIUS, TACACS+, SSH, Port Lock, Broadcast storm protection, MAB authentication, Sticky MAC, Access control list |
| Time Management | NTP Server/Client, SNTP, IEEE 1588v2 PTP (hardware-based) |
| Power Substation | IEC 61850 QoS, GOOSE Check |
| Industrial Protocols | EtherNet/IP, Modbus TCP |

Switch Properties

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|--------------------|-----------|
| Priority Queues | 8 |
| Max. No. of VLANs | 512 |
| VLAN ID Range | 1 to 4094 |
| IGMP Groups | 4096 |
| MAC Table Size | 16 K |
| Packet Buffer Size | 12 Mbits |
| Jumbo Frame Size | 9.6 KB |

Serial Interface

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|--------------|------------------|
| Console Port | Micro USB Type B |
|--------------|------------------|

USB Interface

| | |
|--------------|------------|
| Storage Port | USB Type A |
|--------------|------------|

Power Parameters

| | |
|-------------------|---|
| Input Voltage | <p>with PWR-HV-P48 installed: 110/220 VDC/VAC for the switch system 48 VDC for PoE system (53 to 57 VDC is recommended for PoE+ devices)</p> <p>with PWR-LV-P48 installed: 24/48 VDC for the switch system 48 VDC for PoE system (53 to 57 VDC is recommended for PoE+ devices)</p> <p>with PWR-HV-NP installed: 110/220 VDC/VAC for the switch system</p> <p>with PWR-LV-NP installed: 24/48 VDC for the switch system</p> |
| Operating Voltage | <p>with PWR-HV-P48 installed: 88 to 300 VDC, 90 to 264 VAC for the switch system 46 to 57 VDC for PoE systems</p> <p>with PWR-LV-P48 installed: 18 to 72 VDC for the switch system 46 to 57 VDC for PoE systems</p> <p>with PWR-HV-NP installed: 88 to 300 VDC, 90 to 264 VAC for the switch system</p> <p>with PWR-LV-NP installed: 18 to 72 VDC for the switch system</p> |
| Input Current | <p>with PWR-HV-P48 installed: PWR input current (switch system) Max. 0.11 A @ 110 VDC Max. 0.06 A @ 220 VDC Max. 0.29 A @ 110 VAC Max. 0.18 A @ 220 VAC EPS input current (PoE system) Max. 0.53 A @ 48 VDC (excluding power consumption of PoE devices)</p> <p>with PWR-LV-P48 installed: PWR input current (switch system) Max. 0.53 A @ 24 VDC Max. 0.28 A @ 48 VDC EPS input current (PoE system) Max. 0.53 A @ 48 VDC (excluding power consumption of PoE devices)</p> <p>with PWR-HV-NP installed: PWR input current (switch system) Max. 0.11 A @ 110 VDC Max. 0.06 A @ 220 VDC Max. 0.29 A @ 110 VAC Max. 0.18 A @ 220 VAC</p> <p>with PWR-LV-NP installed: PWR input current (switch system) Max. 0.53 A @ 24 VDC Max. 0.28 A @ 48 VDC</p> |

Physical Characteristics

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|--------------|---|
| IP Rating | IP30 |
| Dimensions | 443 x 44 x 280 mm (17.44 x 1.73 x 11.02 in) |
| Weight | 3080 g (6.8 lb) |
| Installation | 19-inch rack mounting |

Environmental Limits

| | |
|--|----------------------------|
| Operating Temperature | -40 to 85°C (-40 to 185°F) |
| Storage Temperature (package included) | -40 to 85°C (-40 to 185°F) |
| Ambient Relative Humidity | 5 to 95% (non-condensing) |

Standards and Certifications

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|------------------|---|
| EMC | EN 55032/24 |
| EMI | 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: 20 V/m IEC 61000-4-4 EFT: Power: 4 kV; Signal: 4 kV IEC 61000-4-5 Surge: Power: 4 kV; Signal: 4 kV IEC 61000-4-6 CS: 10 V IEC 61000-4-8 PFMF |
| Power Substation | IEC 61850-3 Edition 2.0 Class 2, IEEE 1613 |
| Railway | EN 50121-4 |
| Safety | EN 62368-1, UL 62368-1 |

MTBF

| | |
|-----------|--------------------------|
| Time | 449,542 hrs |
| Standards | Telcordia (Bellcore), GB |

Warranty

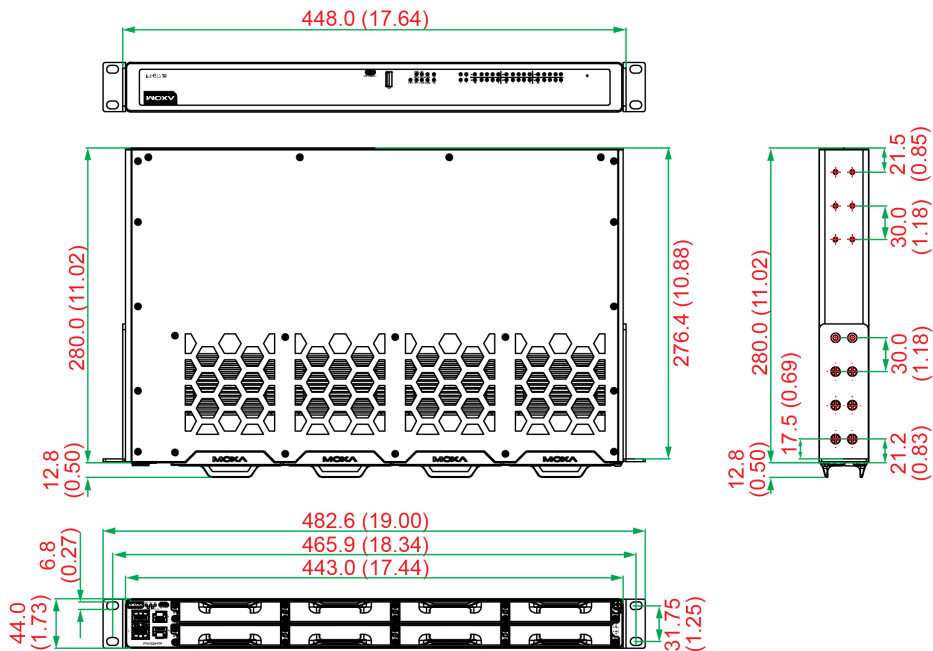
| | |
|-----------------|--|
| Warranty Period | 5 years |
| Details | See www.moxa.com/warranty |

Package Contents

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|------------------|---|
| Device | 1 x PT-G7728 Series switch |
| Cable | USB cable (Type A male to Micro USB type B) |
| Installation Kit | 2 x cap, for Micro-B USB port 1 x cap, metal, for ABC-02 USB storage port 2 x rack-mounting ear 2 x cap, plastic, for SFP slot |
| Documentation | 1 x quick installation guide 1 x warranty card 1 x substance disclosure table 1 x product certificates of quality inspection, Simplified Chinese 1 x product notice, Simplified Chinese |
| Note | SFP modules, modules from the LM-7000H Module Series, and/or modules from the PWR Power Module Series need to be purchased separately for use with this product. |

Dimensions

Unit: mm (inch)



Ordering Information

| Model Name | Layer | 100/1000Base SFP Slots | 10/100/1000BaseT(X) Ports RJ45 Connector | PoE Ports, 10/100/1000Base T(X) RJ45 Connector | Operating Temp. |
|------------|-------|------------------------|--|--|-----------------|
| PT-G7728 | 2 | 2 to 26 | 2 to 26 | 0 to 24 | -40 to 85°C |

Accessories (sold separately)

Storage Kits

| | |
|--------------|---|
| ABC-02-USB | Configuration backup and restoration tool, firmware upgrade, and log file storage tool for managed Ethernet switches and routers, 0 to 60°C operating temperature |
| ABC-02-USB-T | Configuration backup and restoration tool, firmware upgrade, and log file storage tool for managed Ethernet switches and routers, -40 to 75°C operating temperature |

Power Supplies

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|------------|---|
| PWR-HV-P48 | Power supply module (110/220 VAC/VDC) with system power input, relay, PoE power input |
| PWR-LV-P48 | Power supply module (24/48 VDC) with system power input, relay, PoE power input |
| PWR-HV-NP | Power supply module (110/220 VAC/VDC) with system power input, relay |
| PWR-LV-NP | Power supply module (24/48 VDC) with system power input, relay |

LM-7000H Module Series

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|----------------|---|
| LM-7000H-4GTX | Gigabit Ethernet module with 4 10/100/1000BaseT(X) ports |
| LM-7000H-4GSFP | Gigabit Ethernet module with 4 100/1000BaseSFP slots |
| LM-7000H-4GPoE | Gigabit Ethernet module with 4 10/100/1000BaseT(X) IEEE 802.3af/at PoE+ ports |
| LM-7000H-4TX | Fast Ethernet module with 4 10/100BaseT(X) ports |
| LM-7000H-4PoE | Fast Ethernet module with 4 10/100BaseT(X) IEEE 802.3af/at PoE+ ports |
| LM-7000H-2GPHR | Gigabit Ethernet module with 2 100/1000BaseT(X) PRP/HSR or 100/1000BaseSFP PRP/HSR combo ports, -40 to 75°C operating temperature |

SFP Modules

| | |
|----------------|--|
| 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, LC connector for 2/4 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-1GEZXC | SFP module with 1 1000BaseEZXC port with LC connector for 110 km transmission, 0 to 60°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 |
| 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-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 1000BaseLSXC port with LC connector for 1km/2km transmission, 0 to 60°C operating temperature |
| SFP-1GLSXC-T | SFP module with 1 1000BaseLSXC port with LC connector for 1km/2km 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 300m/550m transmission, 0 to 60°C operating temperature |
| SFP-1GSXC-T | SFP module with 1 1000BaseSX port with LC connector for 300m/550m 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-1GZXLC-T | SFP module with 1 1000BaseZX port with LC connector for 80 km transmission, -40 to 85°C operating temperature |
|--------------|---|

Software

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|-------------------|---------------------------------------|
| MXview-50 | MXview license for 50 nodes |
| MXview-100 | MXview license for 100 nodes |
| MXview-250 | MXview license for 250 nodes |
| MXview-500 | MXview license for 500 nodes |
| MXview-1000 | MXview license for 1000 nodes |
| MXview-2000 | MXview license for 2000 nodes |
| MXview Upgrade-50 | MXview license expansion for 50 nodes |

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