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 for EMC
- 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 61850-9-3 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

EN 50121-4   IEC 61850-3 / IEEE 1613   c UL us LISTED   CE

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 MRP
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

Priority Queues	8
Max. No. of VLANs	256
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

Console Port	RS-232 (RJ45)

USB Interface

Storage Port	USB Type A

Power Parameters

Input Voltage	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) 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) With PWR-HV-NP installed: 110/220 VDC/VAC for the switch system With PWR-LV-NP installed: 24/48 VDC for the switch system
Operating Voltage	With PWR-HV-P48 installed: 88 to 300 VDC, 90 to 264 VAC for the switch system 46 to 57 VDC for PoE systems With PWR-LV-P48 installed: 18 to 72 VDC for the switch system 46 to 57 VDC for PoE systems With PWR-HV-NP installed: 88 to 300 VDC, 90 to 264 VAC for the switch system With PWR-LV-NP installed: 18 to 72 VDC for the switch system
Input Current	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) 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) 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 With PWR-LV-NP installed: PWR input current (switch system) Max. 0.53 A @ 24 VDC Max. 0.28 A @ 48 VDC

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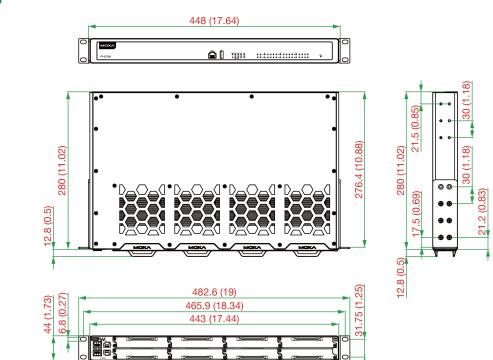
Physical Characteristics

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

EMC	EN 55032/35
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 Class 2 (EMC) IEEE 1613
Railway	EN 50121-4
Safety	IEC 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

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

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

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-1GEZXLC	SFP module with 1 1000BaseEZX 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-1GEZXLC-120	SFP module with 1 1000BaseEZX 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-1GLHXLC	SFP module with 1 1000BaseLHX port with LC connector for 40 km transmission, 0 to 60°C operating temperature
SFP-1GLHXLC-T	SFP module with 1 1000BaseLHX port with LC connector for 40 km transmission, -40 to 85°C operating temperature
SFP-1GLSXLC	SFP module with 1 1000BaseLSX port with LC connector for 1km/2km transmission, 0 to 60°C operating temperature
SFP-1GLSXLC-T	SFP module with 1 1000BaseLSX port with LC connector for 1km/2km transmission, -40 to 85°C operating temperature
SFP-1GLXLC	SFP module with 1 1000BaseLX port with LC connector for 10 km transmission, 0 to 60°C operating temperature
SFP-1GLXLC-T	SFP module with 1 1000BaseLX port with LC connector for 10 km transmission, -40 to 85°C operating temperature
SFP-1GSXLC	SFP module with 1 1000BaseSX port with LC connector for 300m/550m transmission, 0 to 60°C operating temperature
SFP-1GSXLC-T	SFP module with 1 1000BaseSX port with LC connector for 300m/550m transmission, -40 to 85°C operating temperature
SFP-1GZXLC	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

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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