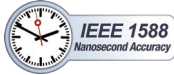


PT-7728-PTP Series

IEC 61850-3 14-port IEEE 1588v2 PTP rackmount Ethernet switches



- > IEEE 1588v2 PTP with hardware time stamping for precise time synchronization of networks
- > IEC 61850-3 and IEEE 1613 (power substations) compliant
- > Turbo Ring and Turbo Chain (recovery time < 20 ms @ 250 switches), and RSTP/STP for network redundancy
- > Isolated redundant power supplies with universal 24 VDC, or 48 VDC, or 110/220 VDC/VAC power supply range
- > -40 to 85°C operating temperature range



Introduction

The PowerTrans PT-7728-PTP switches are designed to meet the demands of power substation automation systems (IEC 61850-3, IEEE 1613). The PT-7728-PTP's redundant ring, and dual isolated redundant power supplies increase the reliability of your communications and save on cabling/wiring costs.

Moxa's PT-7728-PTP IEC 61850-3 Fast Ethernet switches support the latest version of IEEE 1588 technology (IEEE 1588v2 PTP) to fulfill precision time synchronization requirements for protection and control applications. These Ethernet switches guarantee time-stamping

accuracy within 1 μ s for the IEC 61850 process layer. They can be configured for 1588 v2 Master, Boundary Clock, and Transparent Clock functionality.

The modular design of the PT-7728-PTP also makes network planning easy, and allows greater flexibility by letting you install up to 14 IEEE 1588 Fast Ethernet ports or up to 24 non-IEEE 1588 Ethernet ports and 4 Gigabit ports. Along with a choice of either front or rear wiring, these features together make the PT-7728-PTP suitable for a variety of industrial applications.

IEEE 1588 PTP Features

- IEEE 1588v2 PTP (Precision Time Protocol) with hardware time stamping for precise time synchronization of networks
- Support for both IEEE 1588 Boundary Clock and Transparent Clock
- Support for both End to End (2-step) and Peer to Peer (2-step) modes in Transparent Clock
- High precision time accuracy (under 1 μ s)

General Features and Benefits

- IPv6 Ready logo awarded (IPv6 Logo Committee certified)
- DHCP Option 82 for IP address assignment with different policies
- Modbus/TCP industrial Ethernet protocol supported
- Turbo Ring and Turbo Chain (recovery time < 20 ms @ 250 switches), and RSTP/STP 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
- SNMPv3 provides encrypted authentication and access security

Specifications

Technology

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 802.3x for Flow Control
- IEEE 802.1D-2004 for Spanning Tree Protocol
- IEEE 802.1w for Rapid 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, DHCP Option 66/67/82, BootP, TFTP, SNTP, SMTP, RARP, LACP, RMON, HTTP, HTTPS, Telnet, SSH, Syslog, Modbus/TCP, SNMP Inform, LLDP, IEEE 1588v2 PTP, IPv6

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

IEEE 1588 PTP: Up to 12 10/100BaseT(X) or 14 100BaseFX (multi-mode, ST or SC connector) IEEE 1588 ports with hardware time stamping

Fast Ethernet:

- Slots 1, 2, and 3 for combinations of 2, 4, 6, or 8-port PM-7200 Fast Ethernet modules with 10/100BaseT(X) (TP/M12 interface), 100BaseFX (SC/ST/MTRJ connector), or 100BaseSFP
- Slot 4 for BNC port and 100BaseFX (ST connector)

Gigabit Ethernet: Slot 4 for 2 or 4-port PM-7200 Gigabit Ethernet combo module, 10/100/1000BaseT(X) or 1000BaseSFP

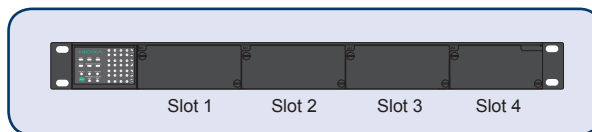
Console Port: RS-232 (RJ45)

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

Modular Rackmount Ethernet Switch System, PT-7728-PTP



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 block

Reverse Polarity Protection: Present

Physical Characteristics

Housing: IP30 protection

Dimensions: 440 x 44 x 325 mm (17.32 x 1.73 x 12.80 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)

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

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

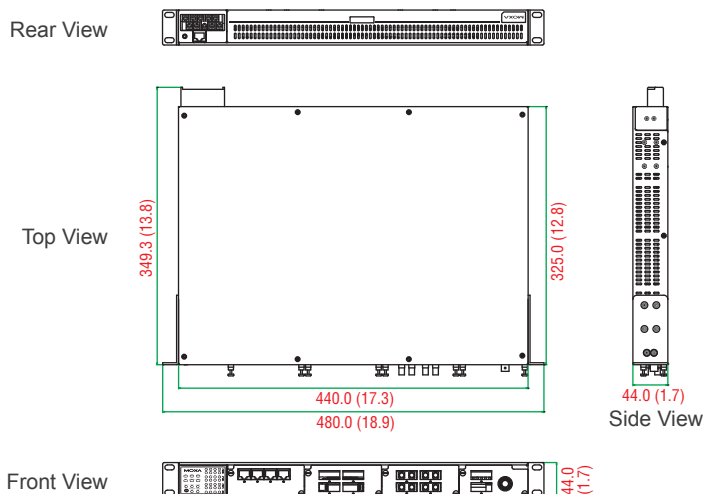
Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Ordering Information

Step 1: Select Ethernet switch system

PT-7728-PTP with power supply



Step 2: Select interface modules

PM-7200 modules (Gigabit or Fast Ethernet)

Note: The PT-7728-PTP Ethernet switch system is delivered without interface module. See page 2-52 to choose PM-7200 interface modules.

PT-7728-PTP Modular Rackmount Ethernet Switch System

The PT-7728-PTP switch system consists of 14 modular managed rackmount Ethernet switch systems. A total of up to 14 IEEE 1588 Fast Ethernet ports or up to 24 non-IEEE 1588 Ethernet ports and 4 Gigabit port 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-7728-PTP-F-24	PT-7728-PTP-R-24	1	-	-	-	-	-
PT-7728-PTP-F-24-24	PT-7728-PTP-R-24-24	1	-	-	1	-	-
PT-7728-PTP-F-24-HV	PT-7728-PTP-R-24-HV	1	-	-	-	-	1
PT-7728-PTP-F-48	PT-7728-PTP-R-48	-	1	-	-	-	-
PT-7728-PTP-F-48-48	PT-7728-PTP-R-48-48	-	1	-	-	1	-
PT-7728-PTP-F-HV	PT-7728-PTP-R-HV	-	-	1	-	-	-
PT-7728-PTP-F-HV-HV	PT-7728-PTP-R-HV-HV	-	-	1	-	-	1

Note: The PT-7728-PTP Ethernet switch systems provide combinations of 1 slot for a Gigabit Ethernet interface module, 3 slots for Fast Ethernet interface modules. See page 2-52 to select the PM-7200 Gigabit Ethernet and Fast Ethernet interface modules that you need for your own application.

PT-7728-PTP-F series (Front Cabling, Front Display)



PT-7728-PTP-R series (Rear Cabling, Front Display)



Gigabit/Fast Ethernet Modules for the PT-7728-PTP

	IEEE 1588 Interface Modules			non-IEEE 1588 Interface Modules																						
	PM-7200-4TX-PTP	PM-7200-4MST-PTP	PM-7200-4MSC-PTP	PM-7200-1BNC2MST-PTP	PM-7200-4GTXSFP	PM-7200-2GTXSFP	PM-7200-1MSC	PM-7200-1MST	PM-7200-2MSC	PM-7200-2MST	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-7200-8SFP	PM-7200-4MH2	PM-7200-8MTRJ	PM-7200-4MST-FL	
Slot 1	✓	✓	✓	-	-	-	-	-	-	-	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Slot 2	✓	✓	✓	-	-	-	-	-	-	-	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Slot 3	✓	✓	✓	-	-	-	-	-	-	-	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Slot 4	-	-	-	✓	✓	✓	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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-7728-PTP 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-1FE series 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)

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			10BaseFL
	Multi-mode	Single-mode	Single-mode, 80 km	Multi-mode
Wave-length	1300 nm	1310 nm	1550 nm	820 nm
Max. TX	-10 dBm	0 dBm	0 dBm	-7 dBm
Min. TX	-20 dBm	-5 dBm	-5 dBm	-16 dBm
RX Sensitivity	-32 dBm	-34 dBm	-34 dBm	-34 dBm
Link Budget	12 dB	29 dB	29 dB	18 dB
Typical Distance	5 km ^a 4 km ^b	40 km ^c	80 km ^d	2.7 km ^e
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)
- e. Based on the 20 MBd data rate

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-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-7200-2SSC	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-7200-8SFP*	PM-7200-4M12	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-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 Series

Available Models	Port Interface									
	10/100BaseT(X)		10BaseFL	100BaseFX					100BaseSFP	PPS output, BNC connector
	TP	M12	Multi-mode, ST Connector	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-7200-2MSC	–	–	–	2	–	–	–	–	–	–
PM-7200-2MST	–	–	–	–	2	–	–	–	–	–
PM-7200-2SSC	–	–	–	–	–	–	2	–	–	–
PM-7200-1MSC	–	–	–	1	–	–	–	–	–	–
PM-7200-1MST	–	–	–	–	1	–	–	–	–	–
PM-7200-8SFP	–	–	–	–	–	–	–	–	8	–
PM-7200-4M12	–	4	–	–	–	–	–	–	–	–
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-7200-1BNC-2MST-PTP	–	–	–	–	2	–	–	–	–	1

Package Checklist

- PM-7200 interface modules
- Warranty card

SFP-1G Series

1-port Gigabit Ethernet SFP modules



- > IEEE 802.3z compliant
- > Differential LVPECL inputs and outputs
- > TTL signal detect indicator
- > Hot pluggable LC duplex connector
- > Class 1 laser product, complies with EN 60825-1



Specifications

Interface

Ethernet Ports: 1

Connectors: Duplex LC Connector or Simplex LC Connector (WDM-type only)

Note: WDM-type SFP modules must be used in pairs (e.g., SFP-1G10ALC and SFP-1G10BLC)

Note: When connecting long distance SFP (SFP-ZX, EZX or EZX-120), please ensure at least 5 dB attenuation between both ends. Without attenuation, excessive optical power may damage the transceivers.

Optical Fiber

	Gigabit Ethernet													
	SFP-SX	SFP-LSX	SFP-LX	SFP-LH	SFP-LHX	SFP-ZX	SFP-EZX	SFP-EZX-120	SFP-10A	SFP-10B	SFP-20A	SFP-20B	SFP-40A	SFP-40B
Wavelength	850 nm	1310 nm	1310 nm	1310 nm	1310 nm	1550 nm	1550 nm	1550 nm	TX 1310 nm, RX 1550 nm	TX 1550 nm, RX 1310 nm	TX 1310 nm, RX 1550 nm	TX 1550 nm, RX 1310 nm	TX 1310 nm, RX 1550 nm	TX 1550 nm, RX 1310 nm
Max. TX	-4 dBm	-1 dBm	-3 dBm	-2 dBm	1 dBm	5 dBm	5 dBm	3 dBm	-3 dBm		-2 dBm		2 dBm	
Min. TX	-9.5 dBm	-9 dBm	-9.5 dBm	-8 dBm	-4 dBm	0 dBm	0 dBm	-2 dBm	-9 dBm		-8 dBm		-3 dBm	
RX Sensitivity	-18 dBm	-19 dBm	-20 dBm	-23 dBm	-24 dBm	-24 dBm	-30 dBm	-33 dBm	-21 dBm		-23 dBm		-23 dBm	
Link Budget	8.5 dB	10 dB	10.5 dB	15 dB	20 dB	24 dB	30 dB	31 dB	12 dB		15 dB		20 dB	
Typical Distance	550 m ^a	2 km ^b	10 km ^c	30 km ^c	40 km ^c	80 km ^c	110 km ^c	120 km ^c	10 km ^c		20 km ^c		40 km ^c	
Saturation	0 dBm	-3 dBm	-3 dBm	-3 dBm	-3 dBm	-3 dBm	-3 dBm	-8 dBm	-1 dBm		-1 dBm		-1 dBm	

a. 50/125 μm, 400 MHz-km or 62.5/125 μm, 500 MHz-km @ 850 nm multi-mode fiber optic cable

b. 62.5/125 μm, 750 MHz-km @ 1310 nm multi-mode fiber optic cable

c. 9/125 μm single-mode fiber optic cable

Note: The actual communication distance depends on many factors, including connector loss, cable deployment, and the age of the cabling system. We recommend doing a link budget analysis and reserving a 3 dB margin for such factors.

Environmental Limits

Operating Temperature:

Standard Models: 0 to 60°C (32 to 140°F)

Wide Temp. Models: -40 to 85°C (-40 to 185°F)

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, TÜV

Marine: DNV, GL, LR, NK

Warranty

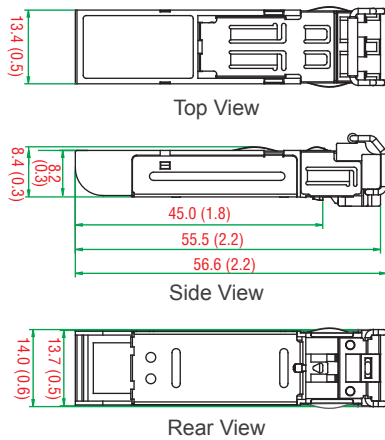
Warranty Period: 5 years

Details: See www.moxa.com/warranty

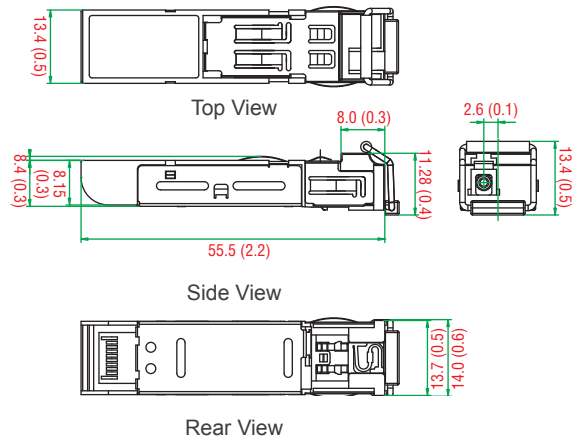
Dimensions

Unit: mm (inch)

SFP-1G Series



SFP-1G Series (WDM Type)



: Ordering Information

SFP Modules

Available Models		Port Interface							
Standard Temperature (0 to 60°C)	Wide Temperature (-40 to 85°C)	1000BaseSX, LC Connector, 0.5 km	1000BaseLSX, LC Connector, 2 km	1000BaseLX, LC Connector, 10 km	1000BaseLH, LC Connector, 30 km	1000BaseLHX, LC Connector, 40 km	1000BaseZX, LC Connector, 80 km	1000BaseEZ, LC Connector, 110 km	1000BaseEZ, LC Connector, 120 km
SFP-1GSXLC	SFP-1GSXLC-T*	1	-	-	-	-	-	-	-
SFP-1GLSXL	SFP-1GLSXL-T	-	1	-	-	-	-	-	-
SFP-1GLXL	SFP-1GLXL-T	-	-	1	-	-	-	-	-
SFP-1GLHLC	SFP-1GLHLC-T	-	-	-	1	-	-	-	-
SFP-1GLHXL	SFP-1GLHXL-T	-	-	-	-	1	-	-	-
SFP-1GZXL	SFP-1GZXL-T	-	-	-	-	-	1	-	-
SFP-1GEZXL	-	-	-	-	-	-	-	1	-
SFP-1GEZXL-120	-	-	-	-	-	-	-	-	1

*SFP-1GSXLC-T: -20 to 75°C operating temperature

WDM-type (BiDi) SFP Modules

Available Models		Port Interface					
Standard Temperature (0 to 60°C)	Wide Temperature (-40 to 85°C)	1000BaseSFP, LC Connector, 10 km		1000BaseSFP, LC Connector, 20 km		1000BaseSFP, LC Connector, 40 km	
		TX 1310 nm, RX 1550 nm	TX 1550 nm, RX 1310 nm	TX 1310 nm, RX 1550 nm	TX 1550 nm, RX 1310 nm	TX 1310 nm, RX 1550 nm	TX 1550 nm, RX 1310 nm
SFP-1G10ALC	SFP-1G10ALC-T	1	-	-	-	-	-
SFP-1G10BLC	SFP-1G10BLC-T	-	1	-	-	-	-
SFP-1G20ALC	SFP-1G20ALC-T	-	-	1	-	-	-
SFP-1G20BLC	SFP-1G20BLC-T	-	-	-	1	-	-
SFP-1G40ALC	SFP-1G40ALC-T	-	-	-	-	1	-
SFP-1G40BLC	SFP-1G40BLC-T	-	-	-	-	-	1

Available Models

The SFP-1G series modules can be used with the following products:

ICS-G7850A/G7852A series, ICS-G7850/G7852 series, ICS-G7750A/G7752A series, ICS-G7750/G7752 series, IM-G7000A-4GSFP, IM-G7000-4GSFP, ICS-G7826A/G7828A series, ICS-G7826/G7828 series, ICS-G7526A/G7528A series, ICS-G7526/G7528 series, IKS-G6524A/G6824A series, IKS-G6524/G6824 series, IKS-6726A/6728A series, IKS-6726/6728 series, IM-2GSFP, EDS-611/619 series, EDS-G516E series, EDS-G512E series, EDS-G509 series, EDS-518A series, EDS-510A series, EDS-510E series, EDS-G308 series, EDS-210A series, IKS-6728A-8PoE series, IKS-6728-8PoE series, EDS-P510A-8PoE series, EDS-P510 series, EDS-G205A-4PoE series, PM-7200-2G/4G series, PM-7500-2G/4G series, PT-G7509 series, IMC-101G series, EDR-G903/G902 series, EDR-810 series

Package Checklist

- SFP-1G module
- Warranty card

SFP-1FE Series

1-port Fast Ethernet SFP modules



- > IEEE 802.3u compliant
- > Differential PECL inputs and outputs
- > TTL signal detect indicator
- > Hot pluggable LC duplex connector
- > Class 1 laser product; complies with EN 60825-1



Specifications

Interface

Ethernet Ports: 1

Connectors: Duplex LC Connector

Optical Fiber

	Fast Ethernet		
	SFP-M	SFP-S	SFP-L
Wavelength	1300 nm	1310 nm	1550 nm
Max. TX	-8 dBm	0 dBm	0 dBm
Min. TX	-18 dBm	-5 dBm	-5 dBm
RX Sensitivity	-34 dBm	-34 dBm	-34 dBm
Link Budget	26 dB	29 dB	29 dB
Typical Distance	4 km ^a	40 km ^b	80 km ^b
Saturation	0 dBm	-3 dBm	-3 dBm

a. 50/125 μm or 62.5/125 μm, 800 MHz * km @ 1300 nm multi-mode fiber optic cable
 b. 9/125 μm single-mode fiber optic cable

Environmental Limits

Operating Temperature: -40 to 85°C (-40 to 185°F)

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, TÜV

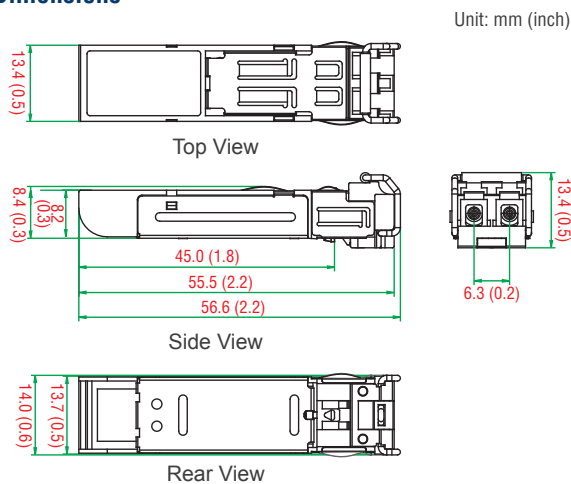
Marine: DNV, GL, LR, NK

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Dimensions



Ordering Information

Available Models	Port Interface			
	Wide Temperature (-40 to 85°C)	100BaseFX, Multi-mode, LC Connector, 4 km	100BaseFX, Single-mode, LC Connector, 40 km	100BaseFX, Single-mode, LC Connector, 80 km
SFP-1FEMLC-T		1	-	-
SFP-1FESLC-T		-	1	-
SFP-1FELLC-T		-	-	1

Available Models

The SFP-1FE series modules can be used with the following products:

IM-G7000A-4GSFP, IM-G7000-4GSFP, ICS-G7826A/ G7828A series, ICS-G7826/G7828 series, ICS-G7526A/G7528A series, ICS-G7526/G7528 series, IKS-G6524A/G6824A series, IKS-G6524/G6824 series, IKS-G726A/G728A series, IKS-6726/6728 series, IM-6700A-8SFP, IM-6700-8SFP, EDS-611/619 series, EDS-G516E series, EDS-G512E series, EDS-G509 series, EDS-510E series, EDS-G308-2SFP, EDS-210A series, IKS-6728A-8PoE series, IKS-6728-8PoE series, EDS-P510A-8PoE series, EDS-P510 series, PM-7200-8SFP, EDR-G903/G902 series

Package Checklist

- SFP-1FE module
- Warranty card