

PT-7710 Series

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



- > 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), 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



Introduction

The PowerTrans 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.

General Features and Benefits

- Command Line Interface (CLI) for quickly configuring major managed functions
- IPv6 Ready logo awarded (IPv6 Logo Committee certified)
- Software-based IEEE 1588v2 PTP (Precision Time Protocol) for precise time synchronization of networks
- 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
- Turbo Ring and Turbo Chain (recovery time < 20 ms @ 250 switches), RSTP/STP, and MSTP 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
- Radius/TACACS+ allows you to manage passwords from a central location
- SNMPv3 provides encrypted authentication and access security

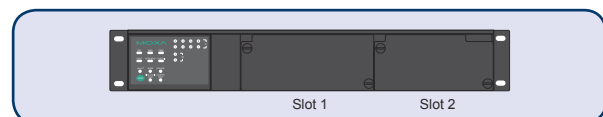
Specifications

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

Modular Rackmount Ethernet Switch System, PT-7710



IEEE 802.1D-2004 for Spanning Tree Protocol
 IEEE 802.1w for Rapid STP
 IEEE 802.1s for Multiple 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, BootP, TFTP, SNMP, SMTP, RARP, LACP, RMON, HTTP, HTTPS, Telnet, Syslog, DHCP Option 66/67/82, SSH, LLDP, IEEE 1588v2 PTP, EtherNet/IP, Modbus/TCP, IPv6, SNMP Inform, NTP Server/Client
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 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 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, 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

Power Requirements

Input Voltage:

- LV: 12/24/48 VDC (9 to 60 V)
 - HV: 110/220 VDC/VAC (88 to 300 VDC, 85 to 264 VAC)
- Note:** Compliant with EN 50155 on 12/24/48/110 VDC

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 block

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)

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

Traffic Control: NEMA TS2

Rail Traffic: EN 50155*, EN 50121-4

*Complies with a portion of EN 50155 specifications. Please contact Moxa or a Moxa distributor for details.

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

Warranty

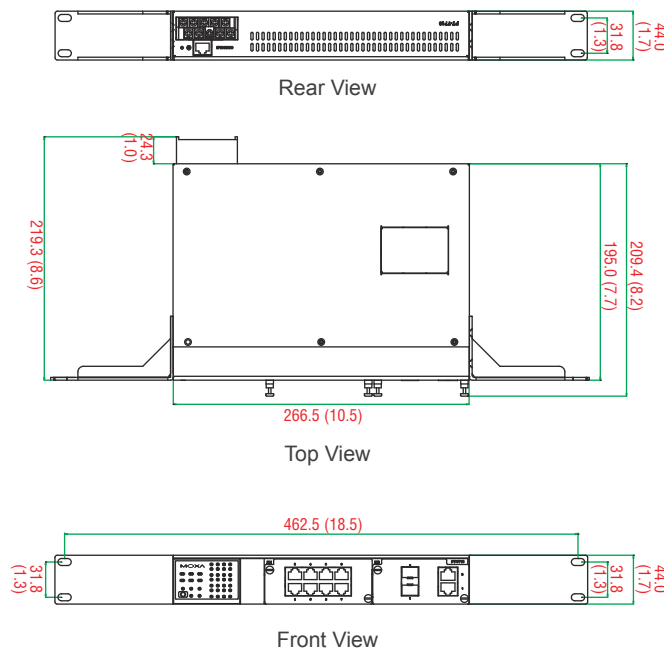
Warranty Period: 5 years

Details: See www.moxa.com/warranty

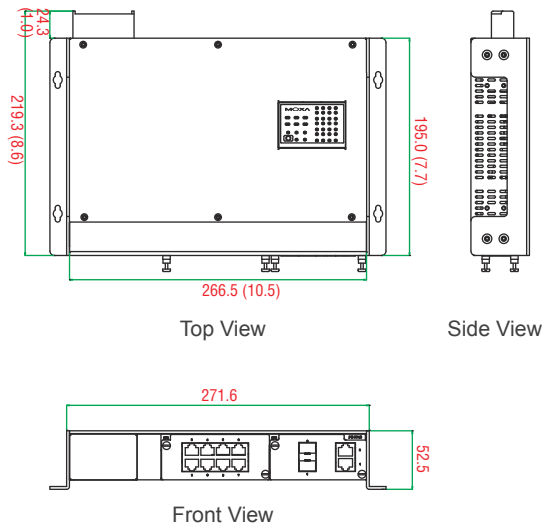
Dimensions

Unit: mm (inch)

Rack Mounting



Wall Mounting



Ordering Information

Step 1: Select Ethernet switch system

PT-7710 with power supply



Step 2: Select interface modules

PM-7200 modules
(Gigabit or Fast Ethernet)

Note: The PT-7710 Ethernet switch system is delivered without interface module. See page 2-52 to choose PM-7200 interface modules.

PT-7710 Modular Rackmount Ethernet Switch System

The PT-7710 switch system consists of 4 modular managed rackmount 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 or Fast Ethernet interface module and 1 slot for a Fast Ethernet interface module. See page 2-52 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-7710

| | Interface Modules | | | | | | | | | | | | | | | | | | | | | | | | |
|--------|-------------------|-----------------|--------------|--------------|--------------|--------------|--------------|-------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|--------------|--------------|--------------|--------------|--------------|---------------|-----------------|-----------------|------------------|------------------|----------------------|
| | 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-7200-4M12 | PM-7200-8MTRJ | PM-7200-4MST-FL | PM-7200-4TX-PTP | PM-7200-4MST-PTP | PM-7200-4MSC-PTP | PM-7200-1BNC2MST-PTP |
| Slot 1 | – | – | – | – | – | – | – | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | – | – | – | – | |
| Slot 2 | – | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | |

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

WK-195: Wall mounting kit

Package Checklist

- PT-7710 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

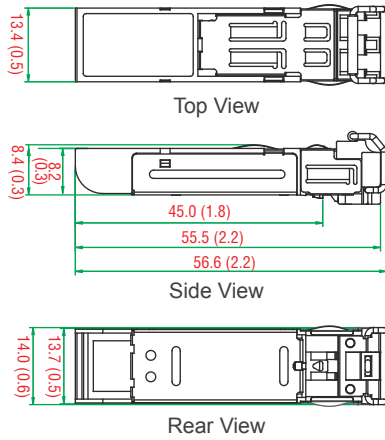
Warranty Period: 5 years

Details: See www.moxa.com/warranty

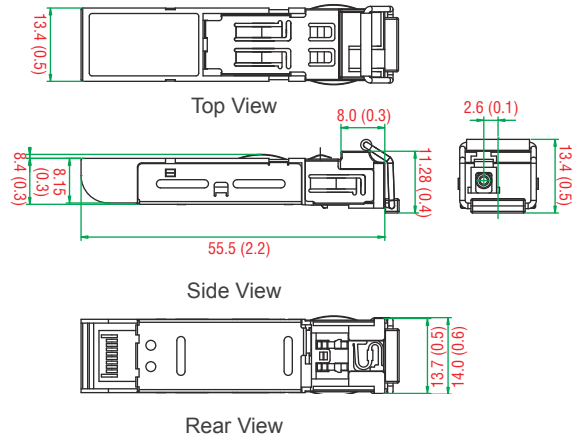
Dimensions

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 | 1000BaseZX, LC Connector, 110 km | 1000BaseZX, 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

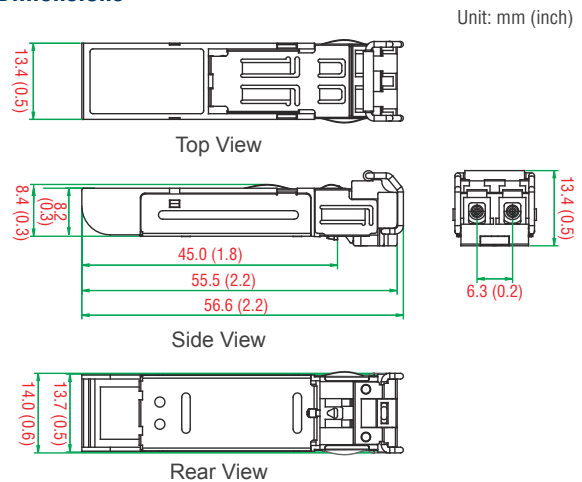
Marine: DNV, GL, LR, NK

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-6726A/6728A 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