

# EDS-510E Series

## 7+3G-port Gigabit managed Ethernet switches



- > 3 Gigabit Ethernet ports for redundant ring or uplink solutions
- > Turbo Ring and Turbo Chain (recovery time < 20 ms @ 250 switches), RSTP/STP, and MSTP for network redundancy
- > RADIUS, TACACS+, SNMPv3, IEEE 802.1x, HTTPS, and SSH to enhance network security
- > EtherNet/IP, PROFINET, and Modbus/TCP protocols supported for device management and monitoring



### Introduction

The EDS-510E Gigabit managed Ethernet switch is designed to meet rigorous mission critical applications, such as factory automation, ITS and process control. The 3 Gigabit Ethernet ports allows great

flexibility to build up a Gigabit redundant Turbo Ring and a Gigabit uplink. The switch adopts USB interfaces for switch configuration, system file backup, and firmware upgrade, making it easier to manage.

### Features and Benefits

- Command Line Interface (CLI) for quickly configuring major managed functions
- IPv6 Ready logo awarded (IPv6 Logo Committee certified)
- Software-based IEEE 1588 PTPv2 (Precision Time Protocol) for precise time synchronization of networks
- DHCP Option 82 for IP address assignment with different policies
- Support EtherNet/IP, PROFINET, and Modbus/TCP protocols for device management and monitoring
- 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
- Port-based VLAN, IEEE 802.1Q VLAN, and GVRP to ease network planning
- QoS (IEEE 802.1p/1Q) and TOS/DiffServ to increase determinism
- Port Trunking for optimum bandwidth utilization
- RADIUS, TACACS+, SNMPv3, IEEE 802.1X, HTTPS, and SSH to enhance network security
- SNMPv1/v2c/v3 for different levels of network management
- RMON for efficient network monitoring and proactive capability
- Bandwidth management prevents unpredictable network status
- Lock port function for blocking unauthorized access based on MAC address
- Automatic warning by exception through e-mail, relay output
- Configurable by web browser, Telnet/USB console, CLI, MXconfig, and ABC-02 automatic backup configurator

### 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 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/v3, GMRP, GVRP, SNMPv1/v2c/v3, DHCP Server/Client, BootP, TFTP, SNMP, SMTP, RARP, RMON, HTTP, HTTPS, Telnet, Syslog, DHCP Option 66/67/82, SSH, SNMP Inform, EtherNet/IP, PROFINET, Modbus/TCP, LLDP, IEEE 1588 PTPv2, IPv6, 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:** 2048
- MAC Table Size:** 8 K
- Packet Buffer Size:** 1 Mbit

#### Interface

- RJ45 Ports:** 10/100BaseT(X) or 10/100/1000BaseT(X) auto negotiation speed
- Fiber Ports:** 100/1000BaseSFP slot
- Console Port:** USB-serial console (Type B connector)
- Storage Port:** USB storage (Type A connector for ABC-02-USB)
- DIP Switches:** Turbo Ring, Master, Coupler, Reserve
- LED Indicators:** PWR1, PWR2, FAULT, STATE, 10/100M (TP port), 100/1000M (Gigabit port), MSTR/HEAD, CPLR/TAIL

**Alarm Contact:** 1 relay output with current carrying capacity of 1 A @ 24 VDC

**Digital Inputs:** 1 input with the same ground, but electrically isolated from the electronics.

- +13 to +30V for state “1”
- -30 to +3V for state “0”
- Max. input current: 8 mA

**Button:** Reset button

**Power Requirements**

**Input Voltage:** 12/24/48/-48 VDC, redundant dual inputs

**Input Current:** 0.68 A @ 24 V

**Overload Current Protection:** Present

**Connection:** 2 removable 4-contact terminal blocks

**Reverse Polarity Protection:** Present

**Physical Characteristics**

**Housing:** Metal, IP30 protection

**Dimensions:** 79.2 x 135 x 116 mm (3.12 x 5.31 x 4.57 in)

**Weight:** 1690 g

**Installation:** DIN-rail mounting, wall mounting (with optional kit)

**Environmental Limits**

**Operating Temperature:**

Standard Models: -10 to 60°C (14 to 140°F)

Wide Temp. Models: -40 to 75°C (-40 to 167°F)

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

**Ambient Relative Humidity:** 5 to 95% (non-condensing)

**Standards and Certifications**

**Safety:** UL 508

**Hazardous Location:** UL/cUL Class 1 Division 2 Groups A/B/C/D, ATEX Zone 2 Ex nA nC IIC T4 Gc

**EMI:** FCC Part 15 Subpart B Class A, EN 61000-6-4 (Industrial)

**EMS:**

EN 61000-6-2 (Industrial), EN 61000-4-2 (ESD) Level 4, EN 61000-4-3 (RS) Level 3, EN 61000-4-4 (EFT) Level 4, EN 61000-4-5 (Surge) Level 4, EN 61000-4-6 (CS) Level 3, EN 61000-4-8, IEEE 1613

**Traffic Control:** NEMA TS2

**Rail Traffic:** EN 50121-4

**Shock:** IEC 60068-2-27

**Freefall:** IEC 60068-2-32

**Vibration:** IEC 60068-2-6

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

**MTBF (mean time between failures)**

**Time:** 723,532 hours

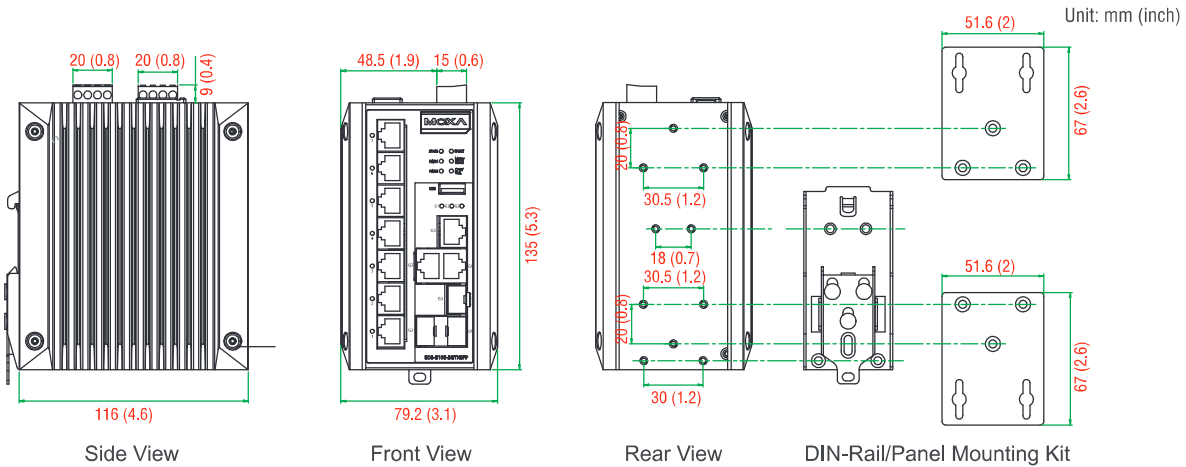
**Database:** Telcordia (Bellcore), GB

**Warranty**

**Warranty Period:** 5 years

**Details:** See [www.moxa.com/warranty](http://www.moxa.com/warranty)

**Dimensions**



**Ordering Information**

Available Models		Port Interface	
		Gigabit Ethernet	Fast Ethernet
Standard Temperature (-10 to 60°C)	Wide Temperature (-40 to 75°C)	10/100/1000BaseT(X) or 100/1000BaseSFP*	10/100BaseT(X)
EDS-510E-3GTXSFP	EDS-510E-3GTXSFP-T	3	7

\*The EDS-510E series supports up to 3 100/1000BaseSFP slots. See the SFP-1G and SFP-1FE datasheets for Gigabit / Fast Ethernet SFP module product information.

**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-02-USB:** Configuration backup and restoration tool for managed Ethernet switches, 0 to 60°C operating temperature

**DR-4524/75-24/120-24:** 45/75/120 W DIN-rail 24 VDC power supplies

**MDR-40-24/60-24:** 40/60 W DIN-rail 24 VDC power supplies, -20 to 70°C operating temperature

**WK-51-01:** Wall mounting kit

**RK-4U:** 4U-high 19" rack mounting kit

**Package Checklist**

- EDS-510E switch
- USB-IF certified cable
- Protective caps for unused ports
- Documentation and software CD
- Warranty card
- Hardware installation guide (printed)

# 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

#### 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 <sup>a</sup>	2 km <sup>b</sup>	10 km <sup>c</sup>	30 km <sup>c</sup>	40 km <sup>c</sup>	80 km <sup>c</sup>	110 km <sup>c</sup>	120 km <sup>c</sup>	10 km <sup>c</sup>		20 km <sup>c</sup>		40 km <sup>c</sup>	
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.

#### 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.

#### 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

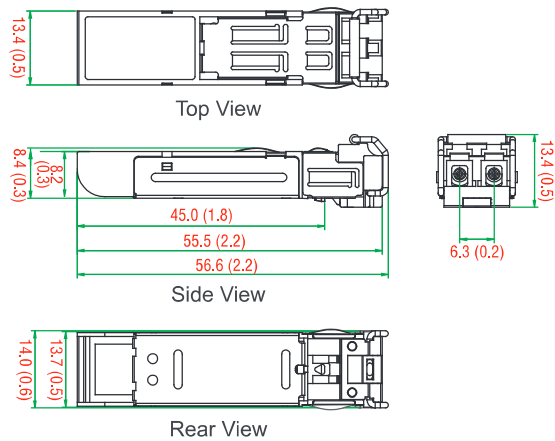
Warranty Period: 5 years

Details: See [www.moxa.com/warranty](http://www.moxa.com/warranty)

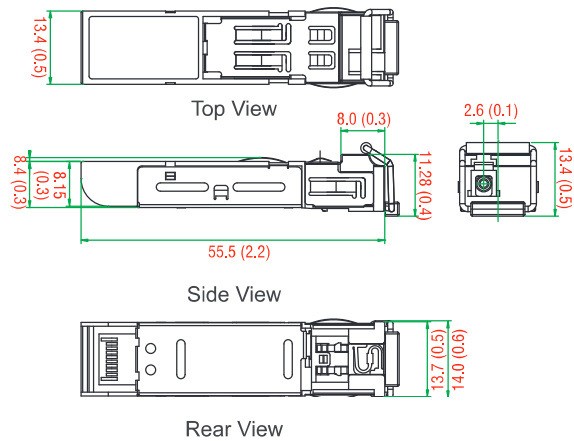
## Dimensions

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, PT-7528 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

#### 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 <sup>a</sup>	40 km <sup>b</sup>	80 km <sup>b</sup>
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

#### Interface

Ethernet Ports: 1

Connectors: Duplex LC Connector

#### 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

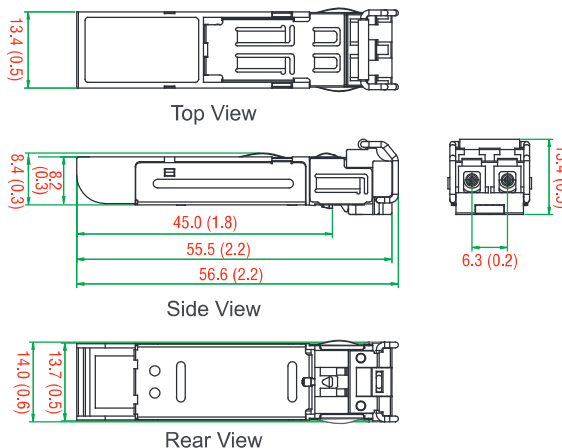
#### Warranty

Warranty Period: 5 years

Details: See [www.moxa.com/warranty](http://www.moxa.com/warranty)

#### Dimensions

Unit: mm (inch)



### Ordering Information

Available Models	Port Interface		
	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, PT-7528 series, PT-G7509 series, PM-7500-2GTXSFP, PM-7500-4GTXSFP

#### Package Checklist

- SFP-1FE module
- Warranty card

