

# EDS-510A Series

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



- > 2 Gigabit Ethernet ports for redundant ring and 1 Gigabit Ethernet port for uplink solution
- > Turbo Ring and Turbo Chain (recovery time < 20 ms @ 250 switches), RSTP/STP, and MSTP for network redundancy
- > TACACS+, SNMPv3, IEEE 802.1X, HTTPS, and SSH to enhance network security
- > Easy network management by web browser, CLI, Telnet/serial console, Windows utility, and ABC-01



### Introduction

The EDS-510A Gigabit managed redundant Ethernet switch is equipped with up to 3 Gigabit Ethernet ports, making it ideal for building a Gigabit Turbo Ring, but leaving a spare Gigabit port for uplink use. The Ethernet redundant Turbo Ring and Turbo Chain (recovery time < 20 ms), RSTP/STP, and MSTP can increase system reliability and

the availability of your network backbone. The EDS-510A Series is designed especially for communication demanding applications such as process control, shipbuilding, ITS, and DCS systems, which can benefit from a scalable backbone construction.

### 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
- Supports EtherNet/IP 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
- 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

### 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

#### Software Features

- Management:** IPv4/IPv6, SNMP v1/v2c/v3, LLDP, Port Mirror, DDM, RMON, DHCP Server/Client, DHCP Option 66/67/82, BootP, TFTP, SNTP, SMTP, RARP, Telnet, Syslog, SNMP inform, Flow Control, Backpressure flow control
- Filter:** 802.1Q, Port-Based VLAN, GVRP, IGMP v1/v2, GMRP
- Redundancy Protocols:** STP, RSTP, MSTP, Turbo Ring v1/v2, Turbo Chain, Link Aggregation
- Security:** RADIUS, TACACS+, SSL, SSH, Port Lock, Broadcast Storm Protection (EDS-516A only)
- Time Management:** SNTP, NTP Server/Client, IEEE 1588 PTP v1/v2 (SW-based)
- Industrial Protocols:** EtherNet/IP, Modbus/TCP
- MIB:** MIB-II, Ethernet-Like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Group 1, 2, 3, 9

### Switch Properties

- Priority Queues:** 4
- Max. Number of Available VLANs:** 64
- VLAN ID Range:** VID 1 to 4094
- IGMP Groups:** 256
- 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:** 1000BaseSFP slot
- Console Port:** RS-232 (RJ45 connector)
- DIP Switches:** Turbo Ring, Master, Coupler, Reserve
- LED Indicators:** PWR1, PWR2, FAULT, 10/100M (TP port), 1000M (Gigabit port), MSTR/HEAD, CPLR/TAIL
- Alarm Contact:** 2 relay outputs with current carrying capacity of 1 A @ 24 VDC
- Digital Inputs:** 2 inputs 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

### Power Requirements

- Input Voltage:** 24 VDC, redundant dual inputs
- Operating Voltage:** 12 to 45 VDC
- Input Current:**
  - EDS-510A-3GT: 0.48 A @ 24 V
  - EDS-510A-1GT2SFP: 0.38 A @ 24 V
  - EDS-510A-3SFP: 0.33 A @ 24 V

- Overload Current Protection:** Present
- Connection:** 2 removable 6-contact terminal blocks
- Reverse Polarity Protection:** Present

### Physical Characteristics

- Housing:** Metal, IP30 protection
- Dimensions:** 80.2 x 135 x 105 mm (3.16 x 5.31 x 4.13 in)
- Weight:** 1170 g
- Installation:** DIN-Rail mounting, wall mounting (with optional kit)

### Environmental Limits

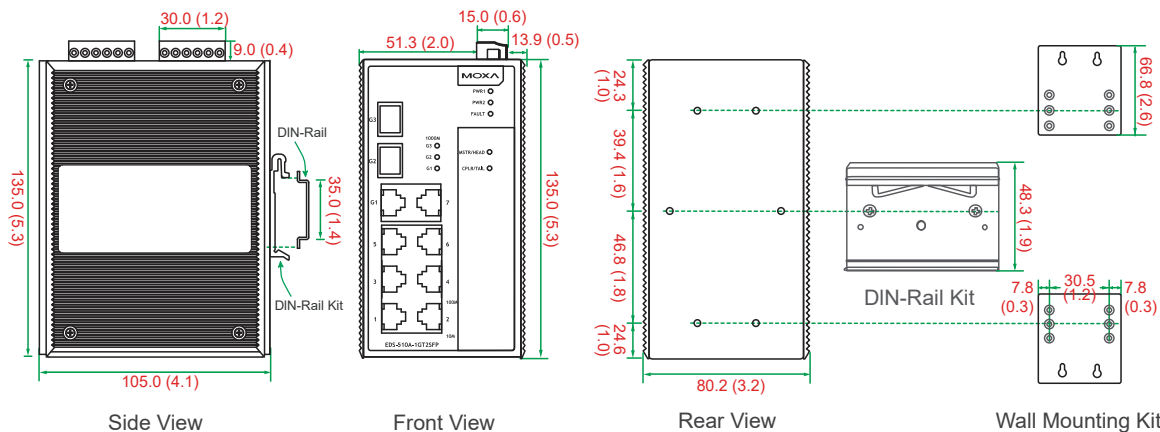
- Operating Temperature:**
  - Standard Models: -10 to 60°C (14 to 140°F)
  - Wide Temp. Models: -40 to 75°C (-40 to 167°F)
- Storage Temperature:** -40 to 85°C (-40 to 185°F)
- Ambient Relative Humidity:** 5 to 95% (non-condensing)

### Standards and Certifications

- Note:** Please check Moxa's website for the most up-to-date certification status.
- Safety:** UL 508, UL 60950-1, CSA C22.2 No. 60950-1, EN 60950-1
- Hazardous Location:** UL/cUL Class I Division 2 Groups A/B/C/D, ATEX Zone 2 Ex nA nC IIC T4 Gc
- EMC:** EN 55032 Class A
- EMI:** CISPR 32, FCC Part 15B Class A
- EMS:**
  - IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV
  - IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m
  - IEC 61000-4-4 EFT: Power: 2 kV; Signal: 1 kV
  - IEC 61000-4-5 Surge: Power: 2 kV; Signal: 2 kV
  - IEC 61000-4-6 CS: 10 V
  - IEC 61000-4-8
- Traffic Control:** NEMA TS2
- Shock:** IEC 60068-2-27
- Freefall:** IEC 60068-2-32
- Vibration:** IEC 60068-2-6
- MTBF (mean time between failures):**
  - Time: 204,000 hrs
  - Standard: MIL-HDBK-217J, GB 25°C
- 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		
		Gigabit Ethernet		Fast Ethernet
Standard Temperature (-10 to 60°C)	Wide Temperature (-40 to 75°C)	10/100/1000BaseT(X)	1000BaseSFP*	10/100BaseT(X)
EDS-510A-3GT	EDS-510A-3GT-T	3	–	7
EDS-510A-1GT2SFP	EDS-510A-1GT2SFP-T	1	2	7
EDS-510A-3SFP	EDS-510A-3SFP-T	–	3	7

\*The EDS-510A series supports up to 3 1000BaseSFP slots. See the SFP-1G series datasheet for Gigabit 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-01:** 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

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

**WK-46-01:** Wall mounting kit

### Package Checklist

- EDS-510A switch
- RJ45 to DB9 console port cable
- Protective caps for unused ports
- Hardware installation guide (printed)
- Warranty card

# SFP-1G Series

## 1-port Gigabit Ethernet SFP modules



- > Digital Diagnostic Monitor Function
- > -40 to 85°C operating temperature range (T models)
- > 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)

#### Optical Fiber

		Gigabit Ethernet SFP									
		SFP-SX		SFP-LSX		SFP-LX	SFP-LH	SFP-LHX	SFP-ZX	SFP-EZX	SFP-EZX-120
Transceiver Type		Multi-Mode		Multi-Mode		Single-Mode	Single-Mode	Single-Mode	Single-Mode	Single-Mode	Single-Mode
Fiber Cable Type		OM1	OM2	OM2	OM1	G.652	G.652	G.652	G.652	G.652	G.652
Typical Distance		300 m	550 m	1 km	2 km	10 km	30 km	40 km	80 km	110 km	120 km
Wave-length	Typical (nm)	850		1310		1310	1310	1310	1550	1550	1550
	TX Range (nm)	830 to 860		1270 to 1355		1280 to 1355	1280 to 1355	1280 to 1340	1530 to 1570	1530 to 1570	1530 to 1570
	RX Range (nm)	770 to 860		1260 to 1610		1260 to 1610	1260 to 1610	1260 to 1610	1260 to 1610	1260 to 1610	1100 to 1600
Optical Power	TX Range (dBm)	-4 to -9.5		-1 to -9		-3 to -9	-3 to -8	+3 to -4	+5 to 0	+5 to 0	+3 to -2
	RX Range (dBm)	0 to -18		-1 to -19		-3 to -21	-3 to -23	-1 to -24	-1 to -24	-9 to -30	-8 to -33
	Link Budget (dB)	8.5		10		12	15	20	24	30	31
	Dispersion Penalty (dB)	4.3	3.6	5	5	2	1	1	1	1	2

Note: When connecting the SFP-LHX, ZX, EZX, or EZX-120, we recommended using an attenuator to prevent the transceiver from being damaged by excessive optical power.

		WDM Gigabit Ethernet SFP					
		SFP-10A		SFP-10B		SFP-20B	
Transceiver Type		Single-Mode		Single-Mode		Single-Mode	
Fiber Cable Type		G.652		G.652		G.652	
Typical Distance		10 km		20 km		40 km	
Wave-length	Typical (nm)	TX 1310, RX 1550	TX 1550, RX 1310	TX 1310, RX 1550	TX 1550, RX 1310	TX 1310, RX 1550	TX 1550, RX 1310
	TX Range (nm)	1270 to 1355		1530 to 1570		1290 to 1330	
	RX Range (nm)	1480 to 1580		1260 to 1360		1480 to 1580	
Optical Power	TX Range (dBm)	-3 to -9		-2 to -8		+2 to -3	
	RX Range (dBm)	-3 to -21		-2 to -23		-1 to -23	
	Link Budget (dB)	12		15		20	
	Dispersion Penalty (dB)	2		3		1	

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

Note: When connecting the SFP-40A and 40B, we recommend using an attenuator to prevent damage caused by excessive optical power.

**Typical Distance:** To reach the typical distance of specified fiber transceiver, please refer to formula: Link budget(dB) > dispersion penalty(dB) + total link loss(dB).

### Power Requirements

Power Consumption: Max. 1 W

### 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: CE, FCC, TÜV (EN 60825), UL 60950-1

Marine: DNV, GL

### Warranty

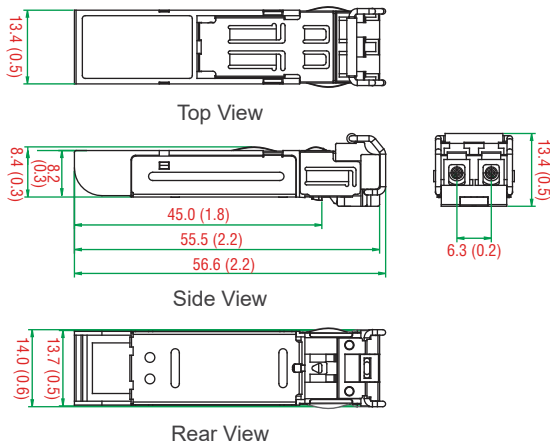
Warranty Period: 5 years

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

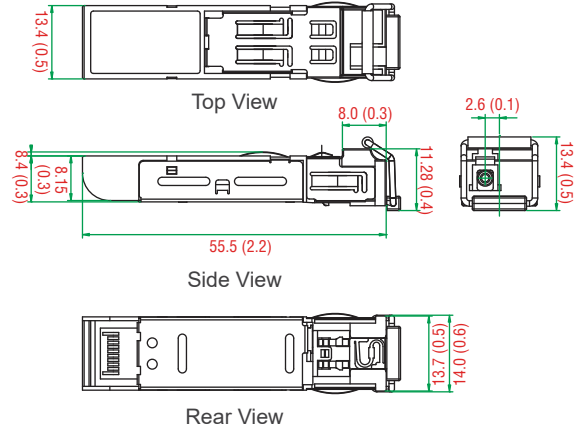
### Dimensions

Unit: mm (inch)

#### SFP-1G Series



#### SFP-1G Series (WDM Type)



## Ordering Information

Gigabit Ethernet SFP Models				WDM Gigabit Ethernet SFP Models			
Standard Temperature Models (0 to 60°C)	Wide Temperature Models (-40 to 85°C)	Transceiver Type	Typical Distance	Standard Temperature (0 to 60°C)	Wide Temperature (-40 to 85°C)	Transceiver Type	Typical Distance
SFP-1GSXLC	SFP-1GSXLC-T	Multi-Mode	300/550 m	SFP-1G10ALC	SFP-1G10ALC-T	Single-Mode	10 km
SFP-1GLSXLC	SFP-1GLSXLC-T	Multi-Mode	1/2 km	SFP-1G10BLC	SFP-1G10BLC-T	Single-Mode	10 km
SFP-1GLXLC	SFP-1GLXLC-T	Single-Mode	10 km	SFP-1G20ALC	SFP-1G20ALC-T	Single-Mode	20 km
SFP-1GLHLC	SFP-1GLHLC-T	Single-Mode	30 km	SFP-1G20BLC	SFP-1G20BLC-T	Single-Mode	20 km
SFP-1GLHXLC	SFP-1GLHXLC-T	Single-Mode	40 km	SFP-1G40ALC	SFP-1G40ALC-T	Single-Mode	40 km
SFP-1GZXLC	SFP-1GZXLC-T	Single-Mode	80 km	SFP-1G40BLC	SFP-1G40BLC-T	Single-Mode	40 km
SFP-1GEZXLC	-	Single-Mode	110 km	-	-	-	-
SFP-1GEZXLC-120	-	Single-Mode	120 km	-	-	-	-

#### Package Checklist

- SFP-1G module
- Warranty card