EDS-G512E-8PoE-4GSFP Series

12G-port full gigabit PoE+ managed Ethernet switches

> 12 10/100/1000BaseT(X) ports and 4 100/1000BaseSFP ports
> 8 IEEE 802.3af and IEEE 802.3at PoE+ standard ports
> • 36-watt output per PoE+ port in high-power mode
> • Intelligent PoE power management functions
> Operate with 240 watts full PoE+ loading at -40 to 75°C
> Turbo Ring and Turbo Chain (recovery time < 20 ms @ 250 switches), RSTP/STP, and MSTP for network redundancy

Turbo Ring Self-Healing Ethernet
Turbo Chain Beyond Redundant Rings

EN 50121 CE FC

: Introduction

The EDS-G512E-8PoE Series are full gigabit managed PoE+ Ethernet switches that come standard with 8 10/100/1000BaseT(X), 802.3af (PoE), and 802.3at (PoE+)-compliant Ethernet ports, and up to 4 fiber optic ports.

With the gigabit Ethernet PoE+ ports, it is perfect for high bandwidth PD device communications, such as IEEE 802.11n and IEEE 802.1ac wireless access points and high resolution GigE machine vision cameras for tolling systems. It can provide up to 30 watts of power per PoE+ port in standard mode and allow high power output of up to 36

watts for industrial heavy-duty PoE devices, such as weather-proof IP surveillance cameras with wipers/heaters, and rugged IP phones.

The EDS-G512E-8PoE Ethernet switches are highly versatile, and the SFP fiber ports can transmit data up to 120 km from the device to the control center with high EMI immunity. The Ethernet switches support a variety of management functions, including STP/RSTP, Turbo Ring, Turbo Chain, PoE power management, PoE device auto-checking, PoE power scheduling, IGMP, VLAN, QoS, RMON, bandwidth management, and port mirroring.

Features and Benefits

- Advanced PoE management function (PoE port setting, PD failure check, and PoE scheduling)
- 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
- Command Line Interface (CLI) for quickly configuring major managed functions
- IPv6 Ready logo awarded (IPv6 Logo Committee certified)
- IEEE 1588 PTP V2 (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
- TACACS+, IEEE 802.1X, SNMPv3, HTTPS, and SSH to enhance network security
- Lock port function for blocking unauthorized access based on MAC address
- SNMPv1/v2c/v3 for different levels of network management
- RMON for efficient network monitoring and proactive capability
- Bandwidth management to prevent unpredictable network status
- Port mirroring for online debugging
- Lock port function for blocking unauthorized access based on MAC address
- Automatic warning by exception through e-mail, relay output Features and Benefits
- ABC-02-USB (Automatic Backup Configurator) for system

: Specifications

Technology

Standards:
IEEE 802.3af/at for Power-over-Ethernet
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

MOXA®

Protocols: IGMPv1/v2/v3, GMRP, GVRP, SNMPv1/v2c/v3, DHCP Server/Client, DHCP Option 66/67/82, BootP, TFTP, SNTP, SMTP, RARP, RMON, HTTP, HTTPS, Telnet, SSH, Syslog, EtherNet/IP, PROFINET, Modbus/TCP, SNMP Inform, LLDP, IEEE 1588, 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: 256
VLAN ID Range: VID 1 to 4094
IGMP Groups: 2048
MAC Table Size: 8 K
Packet Buffer Size: 1 Mbit
Jumbo Frame Size: 9.6 KB

Interface

RJ45 Ports: 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)
PoE Pinout: V+, V+, V-, V-, for pin 1, 2, 3, 6 (Endspan, MDI, Mode A)
DIP Switches: Turbo Ring, Master, Coupler, Reserve
LED Indicators: PWR1, PWR2, FAULT, STATE, 10/100/1000M, 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 +30 V for state "1"
• -30 to +3 V for state "0"
• Max. input current: 8 mA
Button: Reset button

Power Requirements

Input Voltage: 48 VDC (46 to 57 VDC), redundant dual inputs (> 50 VDC for PoE+ output recommended)
Input Current: 0.33A @ 48 VDC (w/o PDs connected)
Overload Current Protection: Present
Connection: 2 removable 2-contact terminal blocks
Reverse Polarity Protection: Present
Note: When selecting power supply, check the PD power consumption.

Physical Characteristics

Housing: Metal, IP30 protection
Dimensions: 79.2 x 135 x 137 mm (3.1 x 5.3 x 5.4 in)
Weight: 1540 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, EN60950-1 (LVD)
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
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.

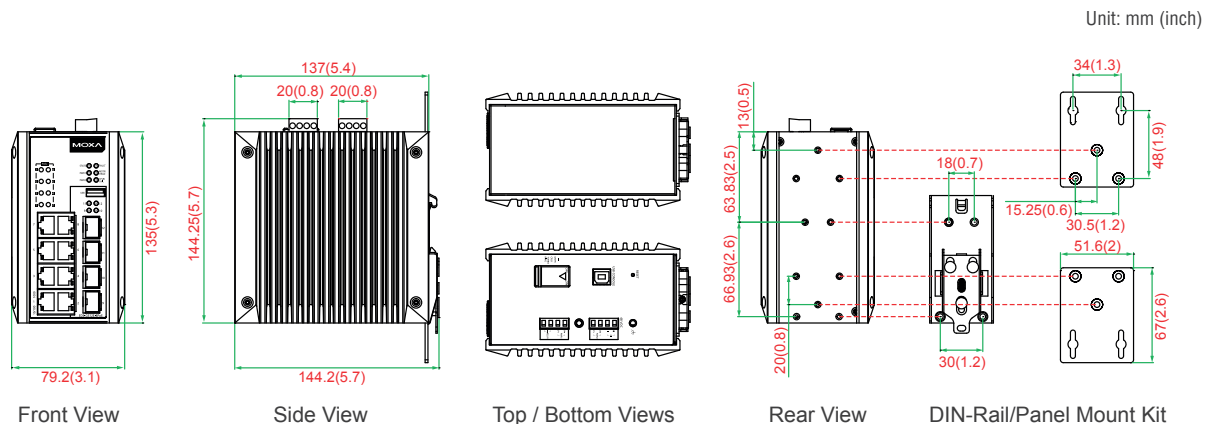## MTBF (mean time between failures)

Time: 361,368 hrs.
Database: Telcordia (Bellcore), GB

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)

Front View   Side View   Top / Bottom Views   Rear View   DIN-Rail/Panel Mount Kit

Ordering Information

Available Models		Port Interface	
Standard Temperature (-10 to 60˚C)	Wide Temperature (-40 to 75˚C)	PoE+, 10/100/1000BaseT(X)	100/1000BaseSFP*
EDS-G512E-8PoE-4GSFP	EDS-G512E-8PoE-4GSFP-T	8	4

*Note: The EDS-G512E-8PoE series supports up to 4 100/1000BaseSFP slots. See page 4 and 5 for SFP-1G/1FE series 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-75-48/120-48: 75/120 W DIN-rail 48 VDC power supplies
DRP-240-48: 240 W DIN-rail 48 VDC power supplies
SDR-480P-48: 480 W DIN-rail 48 VDC power supplies
WK-51-01: Wall mounting kit
RK-4U: 4U-high 19" rack mounting kit

Package Checklist
• EDS-G512E-8PoE switch
• USB-IF certified cable
• Protective caps for unused ports
• Documentation and software CD
• Warranty card
• Hardware installation guide (printed)

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

EN : 60825   c **RU** US

: 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 [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

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
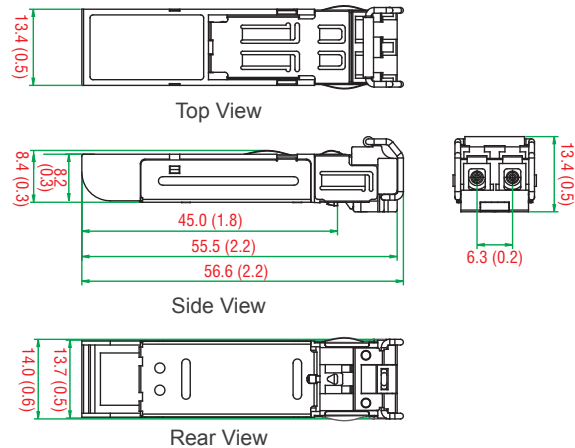**Safety:** UL 60950-1, TÜV
Marine: DNV, GL, LR, NK

Warranty
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)

13.4 (0.5)

Top View

8.4 (0.3)   8.2 (0.3)

45.0 (1.8)
55.5 (2.2)
56.6 (2.2)

Side View

13.4 (0.5)
6.3 (0.2)

14.0 (0.6)   13.7 (0.5)

Rear View

: 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, PT-7528 series, PT-G7509 series, PM-7500-2GTXSFP, PM-7500-4GTXSFP

Package Checklist
- SFP-1FE module
- 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

EN : 60825   c**RU**us

: 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[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.

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 transeivers.

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
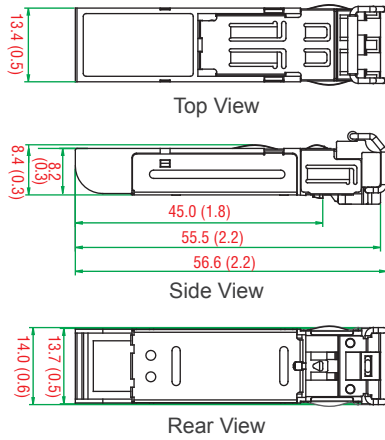**Safety:** UL 60950-1, TÜV
Marine: DNV, GL, LR, NK

Warranty
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)

SFP-1G Series

Top View

Side View

Rear View

SFP-1G Series (WDM Type)

Top View

Side View

Rear View
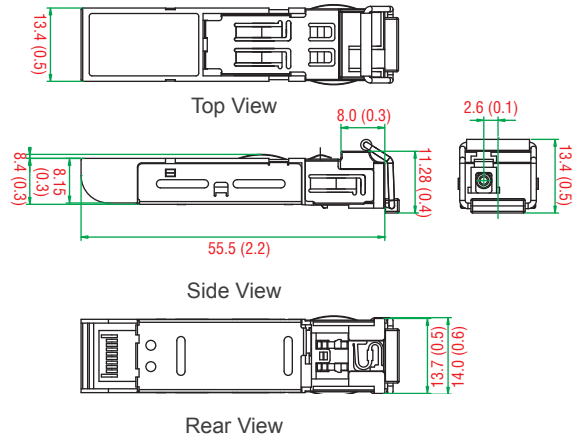
: Ordering Information

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	1000BaseEZX, LC Connector, 110 km	1000BaseEZX, LC Connector, 120 km
SFP-1GSXLC	SFP-1GSXLC-T*	1	–	–	–	–	–	–	–
SFP-1GLSXLC	SFP-1GLSXLC-T	–	1	–	–	–	–	–	–
SFP-1GLXLC	SFP-1GLXLC-T	–	–	1	–	–	–	–	–
SFP-1GLHLC	SFP-1GLHLC-T	–	–	–	1	–	–	–	–
SFP-1GLHXLC	SFP-1GLHXLC-T	–	–	–	–	1	–	–	–
SFP-1GZXLC	SFP-1GZXLC-T	–	–	–	–	–	1	–	–
SFP-1GEZXLC	–	–	–	–	–	–	–	1	–
SFP-1GEZXLC-120	–	–	–	–	–	–	–	–	1

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

WDM-type (BiDi) SFP Modules

Availabe Models		Port Interface					
		1000BaseSFP, LC Connector, 10 km		1000BaseSFP, LC Connector, 20 km		1000BaseSFP, LC Connector, 40 km	
Standard Temperature (0 to 60˚C)	Wide Temperature (-40 to 85˚C)	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