**Introduction**

The EDS-G509 is equipped with 9 Gigabit Ethernet ports and up to 5 fiber optic ports, making it ideal for upgrading an existing network to Gigabit speed or building a new full Gigabit backbone. Gigabit transmission increases bandwidth for higher performance and transfers large amounts of video, voice, and data across a network quickly. Redundant Ethernet Turbo Ring and RSTP/STP (IEEE 802.1w/D) increase system reliability and the availability of your network backbone. The EDS-G509 series is designed especially for communication demanding applications, such as video and process monitoring, shipbuilding, ITS, and DCS systems, all of which can benefit from a scalable backbone construction.

**Features and Benefits**

- IPv6 Ready logo awarded (IPv6 Logo Committee certified)
- IEEE 1588 PTP (Precision Time Protocol) for precise time synchronization of networks
- DHCP Option 82 for IP address assignment with different policies
- Modbus/TCP industrial Ethernet protocol supported
- IEC 61850 GOOSE messaging compliance
- Turbo Ring and RSTP/STP (IEEE 802.1w/D)
- 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
- 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
- Port mirroring for online debugging
- Automatic warning by exception through e-mail, relay output
- ABC-01 (Automatic Backup Configurator) for system configuration backup

**Specifications**

**Technology**

- Standards:
  - IEEE 802.3 for 10BaseT
  - IEEE 802.3u for 100BaseT(X) and 100Base FX
  - IEEE 802.3ab for 1000BaseT(X)
  - IEEE 802.3z for 1000BaseSX/LX/LHX/ZX/EZX
  - IEEE 802.3x for Flow Control
  - IEEE 802.1D for Spanning Tree Protocol
  - IEEE 802.1w for Rapid STP
  - 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


- MIB: MIB-II, Ethernet-Like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Group 1, 2, 3, 9, 12

- 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**

- **Fiber Ports:** 100/1000BaseSFP slot
- **RJ45 Ports:** 10/100/1000BaseT(X) auto negotiation speed

**Console Port:** RS-232 (RS-232 connector)

**DIP Switches:** Turbo Ring, Master, Coupler, Reserve

**LED Indicators:** PWR1, PWR2, FAULT, 10/100/1000M, MASTER, COUPLER

**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:** 12/24/48 VDC redundant dual inputs
- **Input Current:** 0.81 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:** 87.1 × 135 × 107 mm (3.43 × 5.31 × 4.21 in)
- **Weight:** 1510 g
- **Installation:** DIN-Rail mounting, wall mounting (with optional kit)

### Environmental Limits
- **Operating Temperature:**
  - Standard Models: 0 to 60°C (32 to 140°F)
  - Wide Temp. Models: -40 to 75°C (-40 to 167°F) for T models
- **Storage Temperature:** -40 to 85°C (-40 to 185°F)
- **Ambient Relative Humidity:** 5 to 95% (non-condensing)

### Regulatory Approvals
- **Safety:** UL508 (Pending), EN60950-1
- **Hazardous Location:** UL/cUL Class I, Division 2, Groups A, B, C, and D (Pending); ATEX Zone 2, Ex nC IIC (Pending)
- **EMI:** FCC Part 15, CISPR (EN55022) class A
- **EMS:**
  - EN61000-4-2 (ESD), level 3
  - EN61000-4-3 (RS), level 3
  - EN61000-4-4 (EFT), level 3
  - EN61000-4-5 (Surge), level 3
  - EN61000-4-6 (CS), level 3
  - EN61000-4-8
  - EN61000-4-11
- **Maritime:** DNV (Pending), GL (Pending)
- **Shock:** IEC 60068-2-27
- **Freefall:** IEC 60068-2-32
- **Vibration:** IEC 60068-2-6

### Ordering Information

#### Available Models
- **EDS-G509:** Industrial full Gigabit managed Ethernet switch with 4 10/100/1000BaseT(X) ports, and 5 10/100/1000BaseT(X) or 100/1000BaseSFP slot combo ports, 0 to 60°C operating temperature
- **EDS-G509-T:** Industrial full Gigabit managed Ethernet switch with 4 10/100/1000BaseT(X) ports, and 5 10/100/1000BaseT(X) or 100/1000BaseSFP slot combo ports, -40 to 75°C operating temperature

#### Optional Accessories  
(can be purchased separately)
- **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
- **WK-46:** Wall mounting kit
- **RK-4U:** 4U-high 19” rack mounting kit

#### Dimensions (unit = mm)

![Dimensions Diagram]

**Side View**

**Front View**

**Rear View**

**DIN-Rail/Panel Mounting Kit**
# SFP-1G Series

**1G-port Gigabit Ethernet SFP modules**

- Compliant with IEEE 802.3z
- Differential LVPECL inputs and outputs
- Single 3.3 V power supply
- TTL signal detect indicator
- Hot pluggable
- Class 1 laser product, complies with EN60825-1

## 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-1GXXALC and SFP-1GXXBLC)

## Optical Fiber

**Wave-\*lengths:**
- SFP-SX: 850 nm, 1310 nm
- SFP-LSX: 1310 nm
- SFP-LX: 1310 nm
- SFP-LH: 1310 nm
- SFP-LHX: 1310 nm
- SFP-ZX: 1310 nm
- SFP-EZX: 1310 nm
- SFP-10A: 1550 nm
- SFP-10B: 1550 nm
- SFP-20A: 1550 nm
- SFP-20B: 1550 nm
- SFP-40A: 1550 nm
- SFP-40B: 1550 nm

### Gigabit Ethernet

| Wave-length | SFP-SX | SFP-LSX | SFP-LX | SFP-LH | SFP-LHX | SFP-ZX | SFP-EZX | SFP-10A | SFP-10B | SFP-20A | SFP-20B | SFP-40A | SFP-40B |
|-------------|--------|---------|--------|--------|---------|--------|---------|---------|---------|---------|---------|---------|---------|---------|
| TX 1310 nm, RX 1550 nm | TX 1310 nm, RX 1550 nm | TX 1310 nm, RX 1550 nm | TX 1310 nm, RX 1550 nm | TX 1310 nm, RX 1550 nm | TX 1310 nm, RX 1550 nm | TX 1310 nm, RX 1550 nm | TX 1310 nm, RX 1550 nm | TX 1310 nm, RX 1550 nm | TX 1310 nm, RX 1550 nm | TX 1310 nm, RX 1550 nm | TX 1310 nm, RX 1550 nm | TX 1310 nm, RX 1550 nm | TX 1310 nm, RX 1550 nm |

### Specifications

- Max. TX: -4 dBm, -1 dBm, -3 dBm, 1 dBm, 5 dBm, 5 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, -9 dBm, -8 dBm, -3 dBm
- RX Sensitivity: -18 dBm, -19 dBm, -20 dBm, -23 dBm, -24 dBm, -24 dBm, -30 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, 12 dB, 15 dB, 20 dB
- Typical Distance:
  - 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
- Saturations:
  - 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

## Environmental Limits

**Operating Temperature:**
- Standard Models: 0 to 60°C (32 to 140°F)
- Wide Operating 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)

## Regulatory Approvals

- Safety: UL, TÜV

## Warranty

- **Warranty Period:** 3 years
- **Details:** See www.moxa.com/warranty
Industrial Ethernet Solutions

Ordering Information

WDM-type (BiDi) SFP Modules

<table>
<thead>
<tr>
<th>Available Models</th>
<th>Port Interface</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1000BaseSX, LC Connector, 0.5 km</td>
</tr>
<tr>
<td>SFP-1GSXLC</td>
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<tr>
<td>SFP-1GSXLC-T*</td>
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<tr>
<td>SFP-1GLSXLCLC</td>
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<tr>
<td>SFP-1GLXLCLC-T</td>
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<tr>
<td>SFP-1GLHLC</td>
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<tr>
<td>SFP-1GLXLHLC-T</td>
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<tr>
<td>SFP-1GXLCLC</td>
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<tr>
<td>SFP-1GEZXLCLC</td>
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</tr>
</tbody>
</table>

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

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

- **EDS-728/828 series**: IM-2GSFP series Gigabit Ethernet interface modules
- **EDS-G509 series**: 9G-port full Gigabit managed Ethernet switches
- **EDS-518A series**: 16+2G-port Gigabit managed Ethernet switches
- **EDS-510A series**: 7+3G-port Gigabit managed Ethernet switches
- **EDS-P510 series**: 7+3G-port Gigabit PoE managed Ethernet switches
- **PT and IKS series**: PM-7200-2G/4G series Gigabit Ethernet interface modules
- **EDS-G308 series**: 8G-port full Gigabit unmanaged Ethernet switches
- **IMC-101G series**: Industrial Gigabit media converters

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**SFP Modules**

<table>
<thead>
<tr>
<th>Available Models</th>
<th>Port Interface</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Standard Temperature (0 to 60˚C)</td>
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<tr>
<td></td>
<td>1000BaseSX, LC Connector, 0.5 km</td>
</tr>
<tr>
<td>SFP-1G10ALC</td>
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<tr>
<td>SFP-1G10BLT</td>
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<tr>
<td>SFP-1G20ALC</td>
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<td>SFP-1G20BLC</td>
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<tr>
<td>SFP-1G40BLC</td>
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</table>

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

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**WDM-type (BiDi) SFP Modules**

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<tr>
<th>Available Models</th>
<th>Port Interface</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Standard Temperature (0 to 60˚C)</td>
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<tr>
<td></td>
<td>1000BaseSFP, LC Connector, 10 km</td>
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<tr>
<td></td>
<td>TX 1310 nm, RX 1550 nm</td>
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<td>SFP-1G20ALC</td>
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<td>SFP-1G40ALC</td>
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<tr>
<td>SFP-1G40BLC</td>
<td>---</td>
</tr>
</tbody>
</table>
SFP-1FE Series
1-port fast Ethernet SFP modules

- Single + 3.3 V power Supply
- Small From Factor Pluggable MSA Compliant
- PECL Differential Inputs and Output
- TTL Signal Detect Indicator
- Compliant with SONET / SDH Standard
- LC Duplex Connector
- EEPROM with serial ID functionality
- Class 1 Laser International Safety Standard IEC 825 Compliant

Specifications

Interface
Ethernet Ports: 1
Connectors: Duplex LC Connector

Optical Fiber

<table>
<thead>
<tr>
<th>Fast Ethernet</th>
<th>SFP-M</th>
<th>SFP-S</th>
<th>SFP-L</th>
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<tbody>
<tr>
<td>Wavelength</td>
<td>1300 nm</td>
<td>1310 nm</td>
<td>1550 nm</td>
</tr>
<tr>
<td>Max. TX</td>
<td>-16 dBm</td>
<td>0 dBm</td>
<td>0 dBm</td>
</tr>
<tr>
<td>Min. TX</td>
<td>-8 dBm</td>
<td>-5 dBm</td>
<td>-5 dBm</td>
</tr>
<tr>
<td>RX Sensitivity</td>
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<td>-34 dBm</td>
<td>-34 dBm</td>
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<tr>
<td>Link Budget</td>
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<td>29 dB</td>
<td>29 dB</td>
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<td>Typical Distance</td>
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<td>40 km b</td>
<td>80 km b</td>
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<tr>
<td>Saturation</td>
<td>0 dBm</td>
<td>-3 dBm</td>
<td>-3 dBm</td>
</tr>
</tbody>
</table>

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)

Regulatory Approvals
- Safety: UL, TÜV

Warranty
Warranty Period: 3 years
Details: See www.moxa.com/warranty

Dimensions (unit = mm)

Ordering Information

<table>
<thead>
<tr>
<th>Available Models</th>
<th>Port Interface</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wide Temperature</td>
<td>100BaseFX, Multi-mode, LC Connector, 4 km</td>
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<tr>
<td>(-40 to 85 °C)</td>
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<tr>
<td>SFP-1FEMLC-T</td>
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</tr>
<tr>
<td>SFP-1FESLC-T</td>
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<tr>
<td>SFP-1FELLC-T</td>
<td>---</td>
</tr>
</tbody>
</table>

The SFP-1FE series modules can be used with the following products
- EDS-G509 series: 9G-port full Gigabit managed Ethernet switches
- EDS-G308 series: 8G-port full Gigabit unmanaged Ethernet switches
- EDS-P510 series: 7+3G-port Gigabit PoE managed Ethernet switches
- PT and IKS series: PM-7200-8SFP fast Ethernet interface modules