EDS-510A Series
7+3G-port Gigabit managed Ethernet switch

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 802.1x 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, GMRP, GVRP, SNMPv1/v2c/v3, DHCP Server/Client, Bootstrap Protocol (BootP), TFTP, SMTP, SNMP, RARP, RMON, HTTP, HTTPS, Telnet, Syslog, DHCP Option 66/67/82, SSH, SNMP Inform, EtherNet/IP, 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: 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

Industrial Ethernet Solutions

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- 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 (12 to 45 VDC), redundant dual inputs
Input Current:
- EDS-510A-3GT: 0.65 A @ 24 V
- EDS-510A-1GT2SFP: 0.44 A @ 24 V
- EDS-510A-3SFP: 0.46 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: 0 to 60°C (32 to 140°F)
- Wide Temp. Models: -40 to 75°C (-40 to 167°F)

Dimensions
Unit: mm (inch)

Ordering Information
Available Models

<table>
<thead>
<tr>
<th>Standard Temperature (0 to 60°C)</th>
<th>Wide Temperature (40 to 75°C)</th>
<th>Port Interface</th>
<th>Gigabit Ethernet</th>
<th>Fast Ethernet</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDS-510A-3GT</td>
<td>EDS-510A-3GT-T</td>
<td>10/100/1000BaseT(X)</td>
<td>1000BaseSFP*</td>
<td>10/100BaseT(X)</td>
</tr>
<tr>
<td>EDS-510A-1GT2SFP</td>
<td>EDS-510A-1GT2SFP-T</td>
<td>1</td>
<td>2</td>
<td>7</td>
</tr>
<tr>
<td>EDS-510A-3SFP</td>
<td>EDS-510A-3SFP-T</td>
<td>–</td>
<td>3</td>
<td>7</td>
</tr>
</tbody>
</table>

*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-4524/75/120-24: 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: Wall mounting kit

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

MTBF (mean time between failures)
Time: 204,000 hrs
Database: MIL-HDBK-217J, GB 25°C
Warranty
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Standards and Certifications
Safety: UL 508, UL 60950-1, CSA C22.2 No. 60950-1
Hazardous Location: UL/cUL Class I Division 2 Groups A/B/C/D, ATEX Zone 2 Ex nC IIC
EMI: FCC Part 15 Subpart B Class A, EN 55022 Class A
EMS:
- EN 61000-4-2 (ESD) Level 3, EN 61000-4-3 (RS) Level 3
- EN 61000-4-4 (EFT) Level 3, EN 61000-4-5 (Surge) Level 3
- EN 61000-4-6 (CS) Level 3, EN 61000-4-8
Traffic Control: NEMA TS2
Marine: DNV, GL
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.

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Database: MIL-HDBK-217J, GB 25°C
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Warranty Period: 5 years
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Standards and Certifications
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Hazardous Location: UL/cUL Class I Division 2 Groups A/B/C/D, ATEX Zone 2 Ex nC IIC
EMI: FCC Part 15 Subpart B Class A, EN 55022 Class A
EMS:
- EN 61000-4-2 (ESD) Level 3, EN 61000-4-3 (RS) Level 3
- EN 61000-4-4 (EFT) Level 3, EN 61000-4-5 (Surge) Level 3
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Warranty
Warranty Period: 5 years
Details: See www.moxa.com/warranty
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

<table>
<thead>
<tr>
<th>Fiber Cable Type</th>
<th>SFP-SX</th>
<th>SFP-LSX</th>
<th>SFP-LX</th>
<th>SFP-LH</th>
<th>SFP-LHX</th>
<th>SFP-ZX</th>
<th>SFP-EZX</th>
<th>SFP-EZX-120</th>
</tr>
</thead>
<tbody>
<tr>
<td>OM1</td>
<td>OM2</td>
<td>OM2</td>
<td>OM1</td>
<td>G.652</td>
<td>G.652</td>
<td>G.652</td>
<td>G.652</td>
<td>G.652</td>
</tr>
<tr>
<td>Typical Distance</td>
<td>300 m</td>
<td>550 m</td>
<td>1 km</td>
<td>2 km</td>
<td>10 km</td>
<td>30 km</td>
<td>40 km</td>
<td>80 km</td>
</tr>
</tbody>
</table>

Wavelength

- TX Range (nm): 830 to 860
- RX Range (nm): 770 to 860

Optical Power

- TX Range (dBm): -4 to -9.5
- RX Range (dBm): 0 to -18

Dispersion Penalty (dB)

- 4.3
- 3.6
- 5
- 5
- 1
- 1
- 1
- 1
- 2

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

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

### Dimensions

#### SFP-1G Series

- **Top View**
- **Side View**
- **Rear View**

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

- **Top View**
- **Side View**
- **Rear View**

### Ordering Information

#### Gigabit Ethernet SFP Models

<table>
<thead>
<tr>
<th>Standard Temperature Models (0 to 60°C)</th>
<th>Wide Temperature Models (-40 to 85°C)</th>
<th>Transceiver Type</th>
<th>Typical Distance</th>
<th>Standard Temperature (0 to 60°C)</th>
<th>Wide Temperature (-40 to 85°C)</th>
<th>Transceiver Type</th>
<th>Typical Distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>SFP-1GSXLC</td>
<td>SFP-1GSXLC-T*</td>
<td>Multi-Mode</td>
<td>300/550 m</td>
<td>SFP-1G10ALC</td>
<td>SFP-1G10ALC-T</td>
<td>Single-Mode</td>
<td>10 km</td>
</tr>
<tr>
<td>SFP-1GLSXLTC</td>
<td>SFP-1GLSXLCL-T</td>
<td>Multi-Mode</td>
<td>1/2 km</td>
<td>SFP-1G10BLCL-T</td>
<td>SFP-1G10BLCL-T</td>
<td>Single-Mode</td>
<td>10 km</td>
</tr>
<tr>
<td>SFP-1GLXLC</td>
<td>SFP-1GLXLC-T</td>
<td>Single-Mode</td>
<td>10 km</td>
<td>SFP-1G120ALC</td>
<td>SFP-1G120ALC-T</td>
<td>Single-Mode</td>
<td>20 km</td>
</tr>
<tr>
<td>SFP-1GLHLC</td>
<td>SFP-1GLHLC-T</td>
<td>Single-Mode</td>
<td>30 km</td>
<td>SFP-1G20BLCL</td>
<td>SFP-1G20BLCL-T</td>
<td>Single-Mode</td>
<td>20 km</td>
</tr>
<tr>
<td>SFP-1GLHXLCL</td>
<td>SFP-1GLHXLCL-T</td>
<td>Single-Mode</td>
<td>40 km</td>
<td>SFP-1G40ALC</td>
<td>SFP-1G40ALC-T</td>
<td>Single-Mode</td>
<td>40 km</td>
</tr>
<tr>
<td>SFP-1GEXLCL</td>
<td>SFP-1GEXLCL-T</td>
<td>Single-Mode</td>
<td>80 km</td>
<td>SFP-1G40BLCL</td>
<td>SFP-1G40BLCL-T</td>
<td>Single-Mode</td>
<td>40 km</td>
</tr>
<tr>
<td>SFP-1GEXLCL-129</td>
<td>–</td>
<td>Single-Mode</td>
<td>110 km</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>SFP-1GEXLCL-129</td>
<td>–</td>
<td>Single-Mode</td>
<td>120 km</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
</tbody>
</table>

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

#### WDM Gigabit Ethernet SFP Models

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</tr>
</thead>
<tbody>
<tr>
<td>SFP-1G10ALC</td>
<td>SFP-1G10ALC-T</td>
<td>Single-Mode</td>
<td>10 km</td>
</tr>
<tr>
<td>SFP-1G10BLCL-T</td>
<td>SFP-1G10BLCL-T</td>
<td>Single-Mode</td>
<td>10 km</td>
</tr>
<tr>
<td>SFP-1G120ALC</td>
<td>SFP-1G120ALC-T</td>
<td>Single-Mode</td>
<td>20 km</td>
</tr>
<tr>
<td>SFP-1G20BLCL</td>
<td>SFP-1G20BLCL-T</td>
<td>Single-Mode</td>
<td>20 km</td>
</tr>
<tr>
<td>SFP-1G40ALC</td>
<td>SFP-1G40ALC-T</td>
<td>Single-Mode</td>
<td>40 km</td>
</tr>
<tr>
<td>SFP-1G40BLCL</td>
<td>SFP-1G40BLCL-T</td>
<td>Single-Mode</td>
<td>40 km</td>
</tr>
</tbody>
</table>

#### Package Checklist
- SFP-1G module
- Warranty card

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