# *EtherDevice™ Switch EDS-726 Series*

## 26-Port Gigabit Ethernet Switch—Modular, Managed, Redundant

## Features

### Industrial Networking Capability

- **Redundant Gigabit Ethernet Ring Capability (recovery time < 300 ms at full load)**
- **IGMP Snooping and GMRP for filtering multicast traffic from industrial Ethernet Protocols**
- **Supports IEEE 802.1Q VLAN and GVRP protocol to ease network planning**
- **Supports QoS-IEEE 802.1p/1Q and TOS/DiffServ to increase determinism**
- **Supports 802.3ad, LACP for optimum bandwidth utilization**
- **Supports IEEE 802.1X and SSL to enhance network security.**
- **SNMP V1/ V2C/ V3 for different levels of network management security**

### Designed for Industrial Applications

- **Modular Managed Switch with up to 26 ports. Choose from the following modules:**
  - **Three 1-port Gigabit modules, with 10/100/1000BaseT(X) (RJ45 connector), or 1000BaseSX/LX (SC connector)**
  - **Eight 4-port fast Ethernet Modules with a combination of 10/100BaseT(X) (RJ45 connectors) and 100BaseFX (Single/Multimode, SC/ST connectors)**
- **Compact-flash card for upgrading firmware and loading or saving configurations**
- **Bandwidth management prevents unpredictable network status**
- **Lock port for authorized only MAC address access**

- **Port mirroring for online debugging**
- **Automatic warning by exception through email, relay output**
- **Digital inputs to integrate sensors and alarms with IP networks**
- **Automatic recovery of connected device's IP addresses**
- **Line-swap fast recovery (Patented)**
- **Redundant, dual DC power inputs**
- **IP 30, rugged high-strength case**
- **Long-haul transmit distance of 40 km or 80 km**
- **DIN-Rail or panel mounting capability**
- **Configurable by Web browser, Telnet/Serial console, Windows utility, CF card**
- **Send ping commands to identify network segment integrity**

### Recommended Software and Accessories

- **EDS-SNMP OPC Server Pro**
- **DR-4524, DR-75-24, DR-120-24 DIN-Rail 24 VDC Power Supply Series**

## Future-Proof Investment

Network planning is easy and flexible. The modular design lets you install up to 2 Gigabit ports and 24 fast Ethernet ports. Choose from three 1-port Gigabit modules, with copper or fiber optic connectors, and eight 4-port Fast Ethernet modules with copper or fiber optic (SC/ST) connectors. EDS-726 meets the demands of any industrial application, and also leaves room for future expansion. EDS-726 is designed with the user in mind. Features include a tilted LED display for convenient viewing from any vertical angle, plug-able Compact Flash for configuration back-up, and redundant and intelligent network management. EDS-726 provides more flexibility, reliability, and application-oriented functions to meet the demands of any harsh industrial application.

## Gigabit Ethernet Redundant Ring Capability (< 300 ms)

Ethernet has become the default data communications medium for industrial automation applications. In fact, it's not uncommon for video, voice, and high-rate industrial application data transfers to be integrated into one network. MOXA EDS-726, which comes equipped with a redundant Gigabit Ethernet protocol called Gigabit Turbo Ring, gives system maintainers a convenient means of setting up a versatile yet stable Gigabit Ethernet network. With Gigabit Turbo Ring, if any segment of the network is disconnected, your automation system will be back to normal in under 300 ms.



**Gigabit Turbo Ring**
Recovery Time < 300 ms

Backup Path
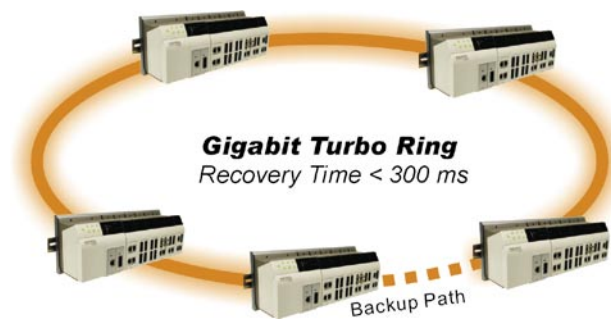
## LACP for flexible network connections

IEEE 802.3ad (LACP, Link Aggregation Control Protocol), provides flexible network connections and a redundant path for critical devices. EDS-726 allows devices to communicate by aggregating up to six links in parallel, with a maximum of eight ports for each link for optimum and flexible network connection. If one of the eight ports fails, the other seven ports will back up and share the traffic automatically. LACP will exchange information to determine whether the ports selected in a group can be trunked together.



**Port Trunking up to 1.6 Gbps**
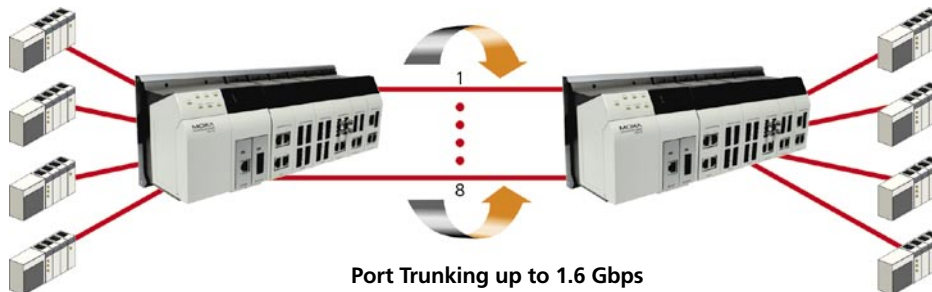
## IEEE 802.1X enhances user authentication

EDS-726 supports IEEE 802.1X (Port-Based Network Access Control) to enhance user authentication. Only authorized users can access the port. Authentication is done using the local user database or an external RADIUS server.



**Device without IEEE802.1X authorized**

**RADIUS**

**Device with IEEE802.1X authorized**
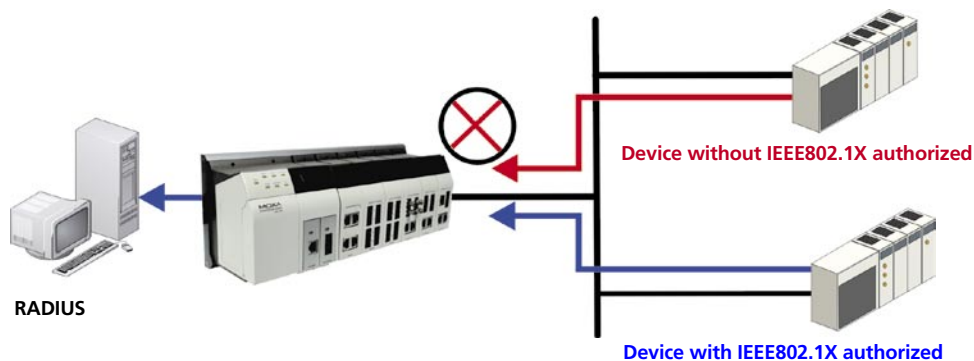
## IGMP Snooping and GMRP for filtering multicast traffic

EDS-726 supports IEEE 802.1D-1998 GMRP (GARP Multicast Registration Protocol) and IGMP Snooping provides the ability to prune multicast traffic so that it travels only to those end destinations that require this kind of traffic, reducing the amount of traffic on the Ethernet LAN.

## ▰ Appearance and Functions

**1** **User Friendly LED display**
**Titled LED display** provides clear viewing from all vertical angles, making it easy to check the status of the switch and each port.
**Separate LEDs** for the System and interface modules show clearly the current status of the system and each port.
**The Mode Switch** shows the modes selected for the Interface Module, giving you an easy way to view the status of all the ports at one glance.

**2**

**4** **Easy Configuration**
EDS-726 is easily configured over the network by web browser, Telnet console, Compact Flash card, or a Windows utility provided by Moxa. Moxa's Windows utility can also be used to store and copy configuration parameters to multiple EDS-726 units simultaneously. In addition, EDS-726 has import, export, and TFTP functions for convenient back up and duplication of the configuration file.

**8**

**1**

**7**

**5** **Future Proven Investment**
When Industrial Ethernet penetrates the device level, 100 Mbps of bandwidth is not enough to meet the requirements posed by video and voice applications. EDS-726, with its two Gigabit ports and Gigabit Turbo, gives you a reliable and high performance backbone. Select from three different 1-port Gigabit modules—10/100/1000BaseT(X) (RJ45 connector), 1000BaseSX (SC connector), or 1000BaseLX—to meet current needs or prepare for future demands.

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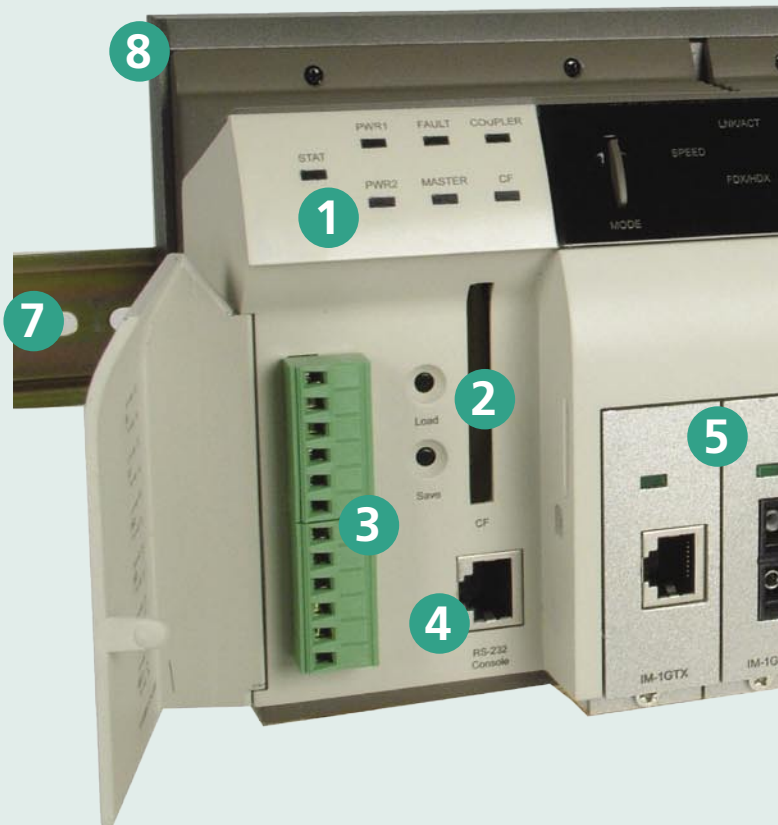
**6** **Flexible Network Topology Planning**
**Flexible Fast Ethernet module** EDS-726 lets you install up to 24 Fast Ethernet ports. Select from eight 4-port fast Ethernet Modules with a combination of 10/100BaseT(X) (RJ45 connectors) and 100BaseFX (Single/Multimode, SC/ST connectors).
**Long-haul transmit distance** Long-haul single mode fiber optics for a transmission distance of 40 km or 80 km are also available.

## Reduce System Downtime

**The switch's firmware, configurations for the switch and connected devices, as well as any relevant data can be backed up on a compact flash card, reducing downtime when replacing faulty devices.**

## ❸ Industrial Application Oriented Design

**Dual redundant DC power inputs** help guarantee non-stop operation. The backup power input will take over immediately when the primary DC power input fails.

**Two relay outputs** let you configure two warning levels to notify engineers in the field automatically when important events occur.

**Two digital inputs** can be used to integrate sensors into an automatic alarm mechanism, sending warning messages to an IP network by e-mail, SNMP trap, or OPC.

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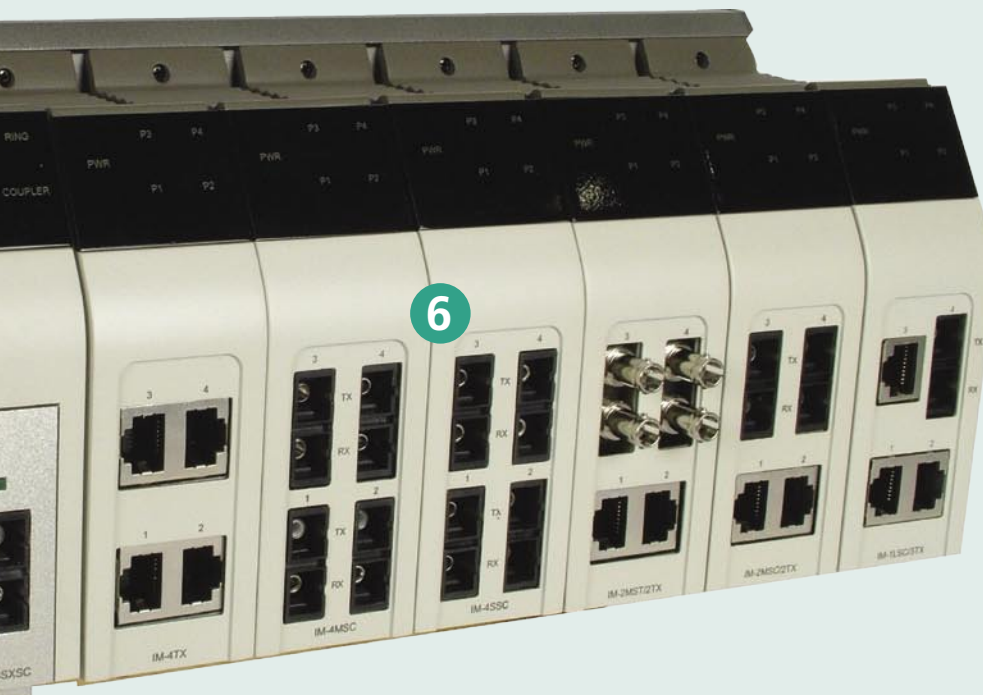
## Industrial Grade Capability and Reliability

**Heat Sink** on the back panel increases system performance and reliability.

**High MTBF and Low Maintenance** Industrial grade design is due in part to the "no moving parts" construction.

**Industrial Strength Safety Regulations** Ensures that your Ethernet equipment can withstand critical industrial applications, such as in hazardous locations (UL/cUL Class 1 Div. 2 and ATEX Class 1 Zone 2), and follow CE Standards.

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## Easy and Flexible Installation

### Rugged and User-friendly DIN-Rail Kit

**The rugged DIN-Rail kit, which is easily installed with a flat-head screw driver, has passed stringent industrial vibration, free fall, and shock tests.**

### Wall mounting kit

**A handy option that meets the requirements of many different industrial applications.**

*EDS-726 Series Modular Gigabit Managed Switch*

## VLAN eases network planning

VLANs can be used to segment your network without being restricted by physical connections, a limitation imposed by traditional network design. If devices belong to different VLANs, they cannot communicate with each other, providing extra security and protection from unwanted invasion or traffic. EDS-726 supports IEEE 802.1Q standard and GVRP protocol that can exchange the same interoperable parameters to keep consistent VLAN settings over the entire network.

## QoS increases determinism

Quality of Service (QoS) provides a traffic prioritization capability to ensure that important data is delivered consistently and predictably. EDS-726 Series can inspect IEEE 802.1p/1Q layer 2 CoS tags, and even layer 3 TOS information, to provide a consistent classification of the entire network. EDS-726 Series' QoS capability improves your industrial network's performance and determinism for mission critical applications.

## RMON for efficient network monitoring and proactive capability

RMON, Remote Network Monitoring, is an Internet Engineering Task Force (IETF) standard monitoring specification that allows various network agents and console systems to exchange network monitoring data. RMON provides you with comprehensive network-fault diagnosis, planning, and performance-tuning information. It helps you manage your network in a more proactive manner. If configured correctly, RMON probes deliver information before problems occur. This means that you can take action before the problems affect users.

## Bandwidth management prevents unpredictable network status

The EDS-726 Series not only prevents broadcast storms, but also configures the ingress/egress rate of unicast/multicast/broadcast packets, and in this way gives administrators full control of limited bandwidth to prevent unpredictable faults.

## Port Mirroring for online monitoring

In some cases, a network is so large that it is difficult to achieve the expected communications level. Industrial communications applications use more of a command-response style than the file-transfer style used in office network environments. This means that when first setting up an industrial Ethernet network, control engineers may need to use a second port to monitor the actual activity between their devices and computer host. EDS-726 Series' mirroring port function helps to ensure that the system behaves as expected.

## Automatic warning by event

### Warning by e-mail
The EDS-726 Series can send out a warning e-mail when an exception is detected, providing system managers with real-time alarm messages.

### Warning by relay output
The EDS-726 Series provides two relay outputs that can be set up to indicate events with different importance to notify or warn engineers in the field, so the engineer can use the appropriate emergency maintenance procedures to respond quickly to higher priority messages.

### DI to integrate other important sensors
With two digital inputs, the EDS-726 Series can integrate sensors into its automatic alarm mechanism, sending warning messages to an IP network by e-mail, SNMP trap, or OPC.

## Easy Browser-based Configuration

The EDS-726 Series is easily configured over the network by web browser, Telnet console, or a Moxa provided Windows utility. In addition, Moxa's Batch Configurator can also be used to store and copy configuration parameters to multiple EDS-726 units simultaneously.
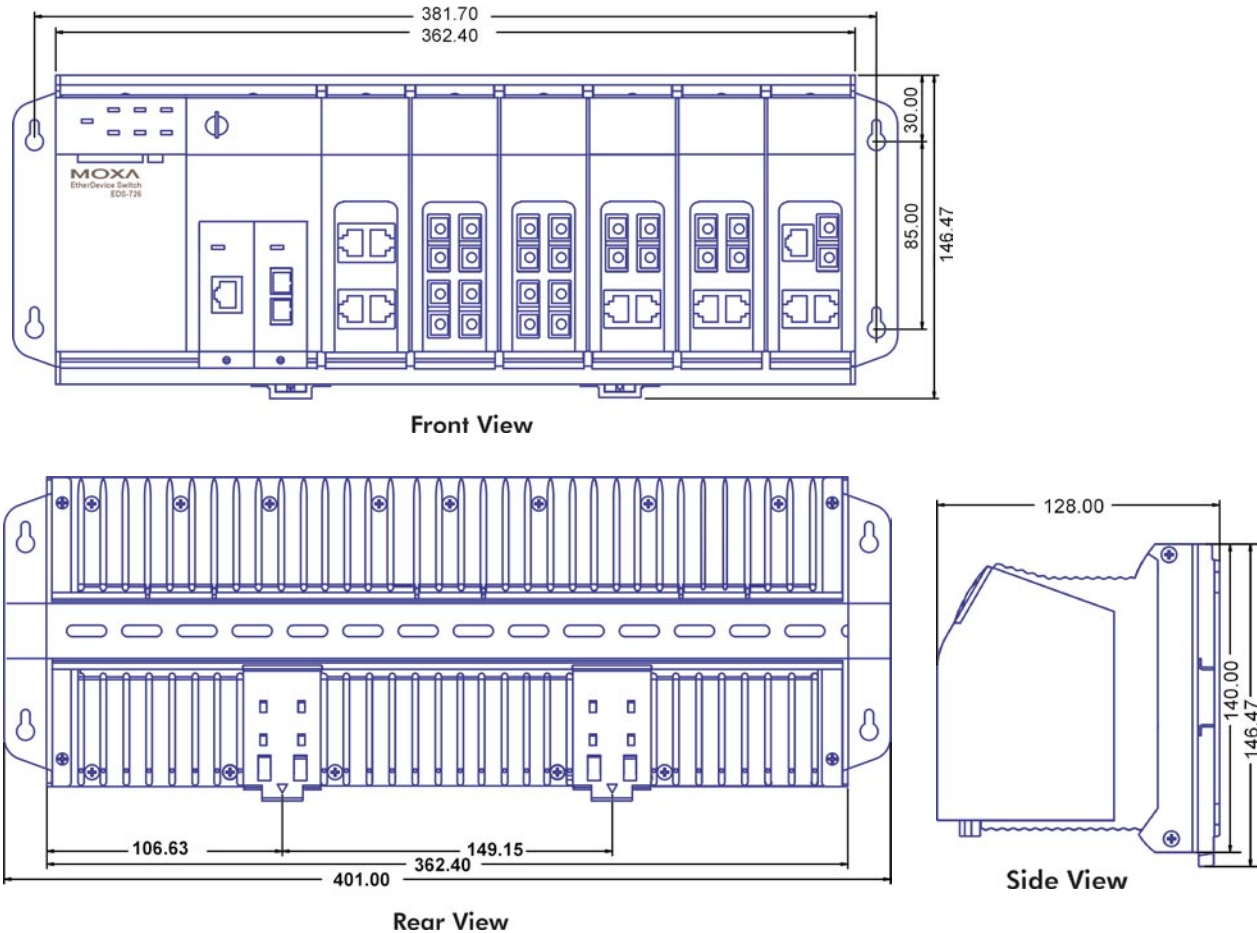
## ◤ Network Management with EDS-SNMP OPC Server Pro

The SNMP OPC Server Pro software package can convert SNMP into OPC format. The vertical integration of SNMP-Management Information into existing OPC-based SCADA-packages gives 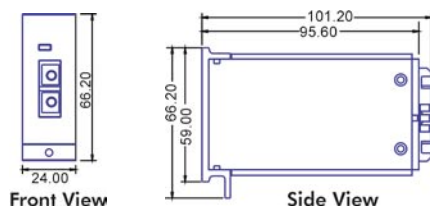the customer the ability to establish an Ethernet Network Management Application that is integrated with existing Visualization and Control applications.
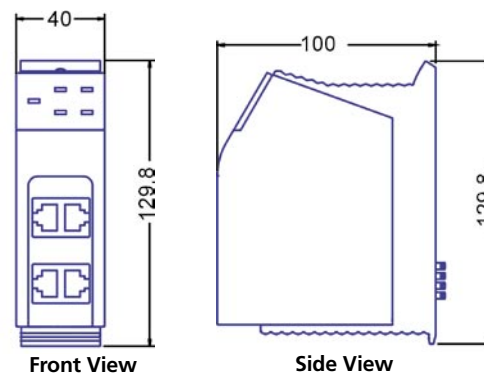
## ◤ Dimensions (unit = mm)

### EDS-726



**Front View**



**Rear View**

**Side View**

### Gigabit Ethernet Interface Modules



**Front View**　　**Side View**

### Fast Ethernet Interface Modules



**Front View**　　**Side View**

## ▰ Specifications

### Modular Managed Switch System, EDS-72610G

#### Technology

**Standards:** IEEE802.3, 802.3u, 802.3x, 802.1D, 802.1W, 802.1Q, 802.1p, 802.1X, 802.3ad, 802.3z

**Protocols:** IGMP V1/ V2/ V3 device, GMRP, GVRP, SNMP V1/ V2C/V3, DHCP Server/Client, BootP, TFTP, SNTP, SMTP, RARP, RMON and EDS-SNMP OPC server Pro (Optional)

**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:** IEEE802.3x flow control, back pressure flow control

#### Interface

**Fast Ethernet:** 6 slots for any combination of 4-port Interface Module with 10/100BaseT(X) or 100BaseFX

**Gigabit Ethernet:** 2 sockets for any combination of 1-port Interface Module with 10/100/1000BaseT(X), 1000BaseSX, or1000BaseLX.

**Compact Flash Interface:** Present

**Console:** RS-232 (RJ45)

**System LED Indicators:** STAT, PWR1, PWR2, FAULT, MASTER, COUPLER and CF

**Module LED Indicators:** LNK/ACT, FDX/HDX, RING PORT, COUPLER PORT, SPEED

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

**Digital Inputs:** Two inputs with the same ground, but electrically isolated from the electronics.

• For state "1": +13 to +30V

• For state "0": -30 to +3V

• Max. input current: 8 mA

#### Power

**Input Voltage:** 24 VDC (12 to 45 VDC), redundant dual inputs

**Connection:** Two removable 6-pin terminal blocks

**Overload Current Protection:** Present

**Reverse Polarity Protection:** Present

#### Mechanical

**Casing:** IP30 protection

**Dimensions:** 362 x 146 x 128 mm (W x H x D)

**Installation:** DIN-Rail, Wall Mounting (optional kit)

### Gigabit Ethernet Interface Modules, IM

| IM-1GTX | IM-1GSXSC | IM-1GLXSC |

#### Interface

**LED Indicators:** Port Status

**RJ45 Ports:** 10/100/1000BaseT(X) auto negotiation speed, and auto MDI/MDI-X connection

**Fiber Ports:** 1000BaseSX/LX (SC connector)

#### Optical Fiber

**Distance:**

Multi mode: IM-1GSXSC

$\qquad$ 0 to 500 m, 850 nm (50/125 $\mu$m, 400 MHz*km)

$\qquad$ 0 to 275 m, 850 nm (62.5/125 $\mu$m, 200 MHz*km)

$\qquad$ IM-1GLXSC

$\qquad$ 0 to 1100 m, 1310 nm (50/125 $\mu$m, 800 MHz*km)

$\qquad$ 0 to 550 m, 1310 nm (62.5.125 $\mu$m, 500 MHz*km)

Single mode: IM-1GLXSC

$\qquad$ 0 to 10 km, 1310 nm (9/125 $\mu$m, 3.5 PS/(nm*km))

#### Mechanical

**Dimensions:** 24 x 66 x 101 mm (W x H x D)

# Fast Ethernet Interface Modules, IM series

**IM-4TX**

**IM-4MSC**
**IM-4MST**
**IM-4SSC**

**IM-2MSC/2TX**
**IM-2MST/2TX**
**IM-2SSC/2TX**

**IM-1LSC/3TX**

## Technology

**LED Indicators:** PWR, P1, P2, P3, P4 port status

**RJ45 Ports:** 10/100BaseT(X) auto negotiation speed, F/H duplex mode, and auto MDI/MDI-X connection

**Fiber Ports:** 100BaseFX ports (SC/ST connector)

## Optical Fiber

**Distance:**

Multi mode: 0 to 5 km, 1310 nm (50/125 $\mu$m, 800 MHz*km)

                 0 to 4 km, 1310 nm (62.5/125 $\mu$m, 500 MHz*km)

Single mode: 0 to 40 km, 1310 nm (9/125 $\mu$m, 3.5 PS/(nm*km))

                0 to 80 km, 1550 nm (9/125 $\mu$m, 19 PS/(nm*km))

**Min. TX Output:**

Multi mode : -20 dBm

Single mode: 0 to 40 km, -5 dBm; 0 to 80 km, -5 dBm

**Max. TX Output:**

Multi mode : -14 dBm

Single mode: 0 to 40 km, 0 dBm; 0 to 80 km, 0 dBm

**Sensitivity:** -36 to -32 dBm (Single), -34 to -30 dBm (Multi)

## Mechanical

**Casing:** IP30 protection

**Dimensions:** 40 x 130 x 100 mm (W x H x D)

## Environmental

**Operating Temperature:** 0 to 60°C (32 to 140°F)

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

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

## Regulatory Approvals

**Safety:** UL60950, UL 508, CSA C22.2 No. 60950, EN60950 (Pending)

**Hazardous location:**

UL/cUL Class I, Division 2, Groups A, B, C and D (Pending)

ATEX Class I, Zone 2, EEx 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

      EN61000-4-12

**Shock:** IEC60068-2-27

**Free Fall:** IEC60068-2-32

**Vibration:** IEC60068-2-6

**WARRANTY:** 5 years

*Preliminary specifications are subject to change without notice.

## Ordering information

**EDS-72610G:** Modular Managed Switch System with 6 slots, up to 26 ports.

**IM-4TX:** Interface Module with 4 10/100BaseT(X) ports, RJ45 connectors.

**IM-4MSC:** Interface Module with 4 multi mode 100BaseFX ports, SC connectors.

**IM-4MST:** Interface Module with 4 multi mode 100BaseFX ports, ST connectors.

**IM-4SSC:** Interface Module with 4 single mode 100BaseFX ports, SC connectors, 40 km.

**IM-2MSC/2TX:** Interface Module with 2 multi mode 100BaseFX ports, SC connectors, and 2 10/100BaseT(X) ports, RJ45 connectors.

**IM-2MST/2TX:** Interface Module with 2 multi mode 100BaseFX ports, ST connectors, and 2 10/100BaseT(X) ports, RJ45 connectors.

**IM-2SSC/2TX:** Interface Module with 2 single mode 100BaseFX ports, SC connectors, and 2 10/100BaseT(X) ports, RJ45 connectors, 40 km.

**IM-1LSC/3TX:** Interface Module with 1 single mode 100BaseFX port, 80 km SC connector and 3 10/100BaseT(X) ports, RJ45 connectors.

**IM-1GTX:** Interface Module with 1 10/100/1000BaseT(X), RJ45 connector.

**IM-1GSXSC:** Interface Module with 1 1000BaseSX port, SC connector.

**IM-1GLXSC:** Interface Module with 1 1000BaseLX port, SC connector.

## Optional Accessories

**DR-4524:** 45W/2A DIN-Rail 24 VDC Power Supply with universal 85 to 264 VAC input

**DR-75-24:** 75W/3.2A DIN-Rail 24 VDC Power Supply with universal 85 to 264 VAC input

**DR-120-24:** 120W/5A DIN-Rail 24 VDC Power Supply with 88 to 132 VAC/176 to 264 VAC input by switch

**\*See page 9-5 for more details about these DIN-Rail Power Supplies.**

**EDS-SNMP OPC Server Pro:** CD with EDS-SNMP OPC Server Software and Manual

**WK-32:** EDS-726 Wall Mounting Kit

*EDS-726 Series Modular Gigabit Managed*