# Moxa EtherDevice Switch

**EDS-726 Hardware Installation Guide**
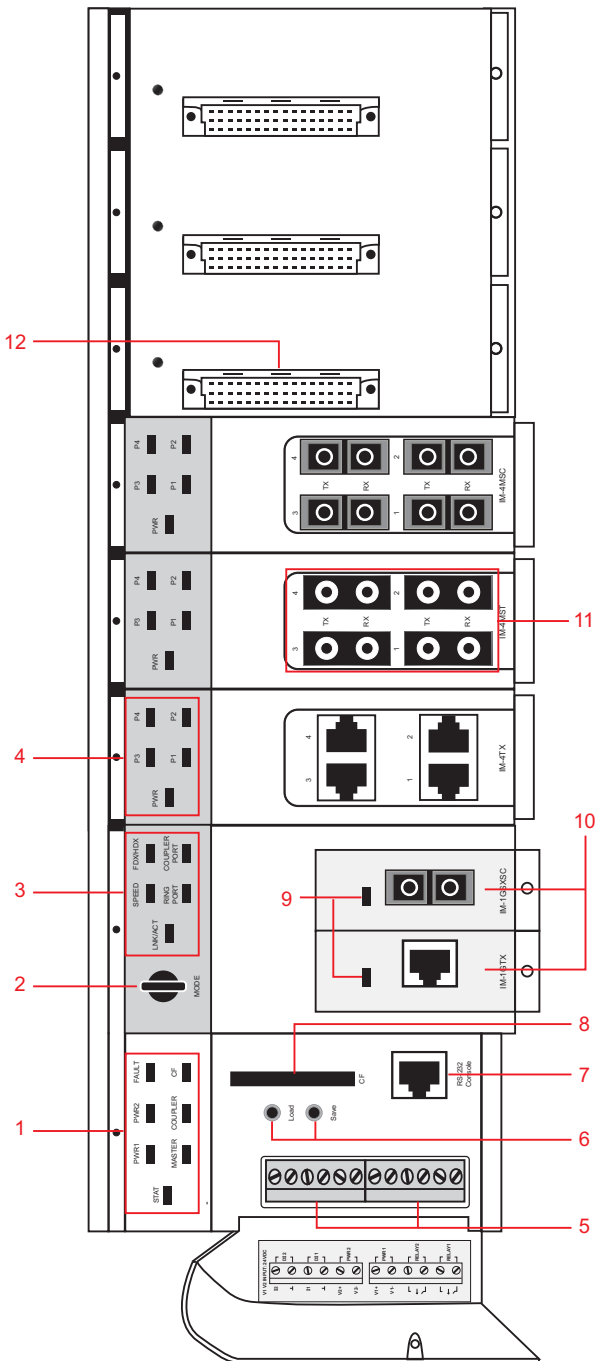
**Second Edition, June 2008**
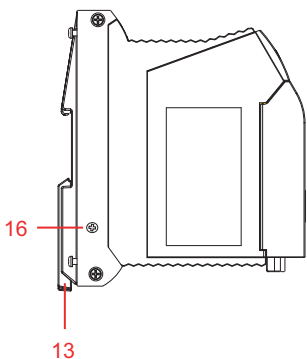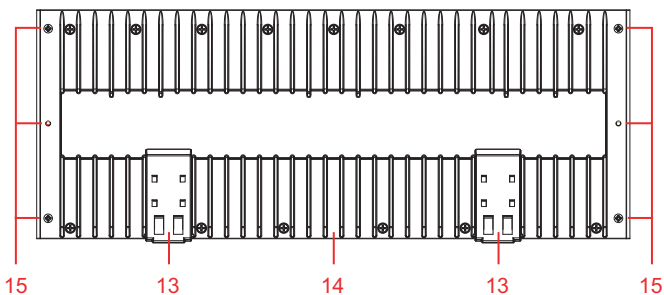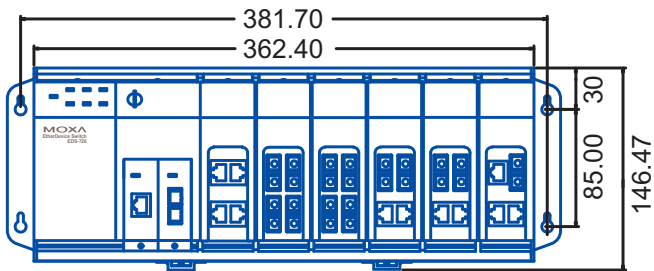
**MOXA**®

# Panel Layout of EDS-726 Series

1. System status LEDs
2. Push-button switch to select mode for Interface Module
3. Interface Module mode LEDs
4. Fast Ethernet Interface Module port LEDs
5. Terminal block for 2 power inputs,
   2 DIs, and 2 DOs
6. Save and load buttons for CF card
7. Serial Console port
8. CF card socket
9. Gigabit Ethernet Module LEDs
10. Two cartridge receptors for Gigabit Ethernet Interface Modules
11. Fast Ethernet Interface Modules
12. Sockets for Fast Ethernet Interface Modules
13. DIN-Rail braces
14. Ribs for radiating heat
15. Screw holes for wall mounting kit
16. Grounding screw

# Mounting Dimensions (unit = mm)

**Front View**
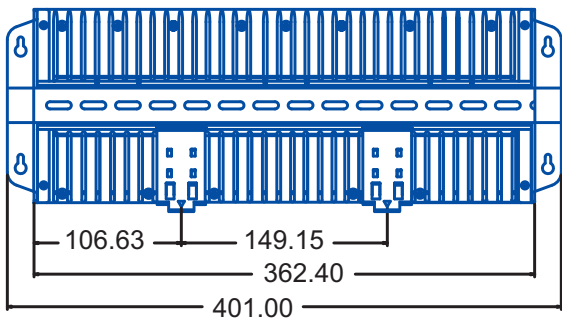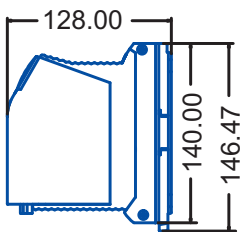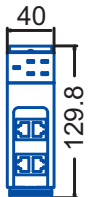
381.70
362.40
30
85.00
146.47

**Rear View**

106.63
149.15
362.40
401.00

**Side View**

128.00
140.00
146.47

## Fast Ethernet Interface Modules

**Front View**

40
129.8

**Side View**

100
129.8

## Gigabit Ethernet Interface Modules

**Front View**

24
66.20

**Side View**

101.20
95.60
66.20
66.20
59.00
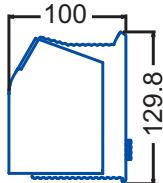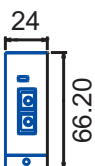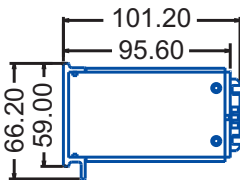
# DIN-Rail Mounting

The DIN-Rail attachment plates are permanently fixed to the back panel of EDS-726. Do not attempt to remove the attachment plates, since doing so could damage the product.

**STEP 1**:

Insert the top of the DIN-Rail into the notches at the bottom of the top array of heat radiating ribs.

**STEP 2**:

The bottom of the DIN-Rail will snap into place behind the DIN-Rail attachment plate.
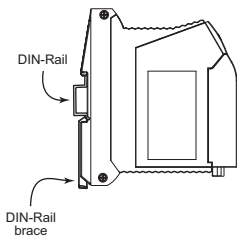




As shown in the figure at the right, use a flat-blade screw driver as a lever to force the DIN-Rail attachment plates downwards, and then pull EDS-726 out away from the DIN-Rail. The DIN-Rail attachment plates have an internal spring that keeps the attachment plate pushed upwards.
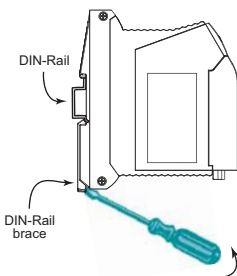


# Wall Mounting (optional)

For some applications, you will find it convenient to mount EDS-726 on the wall, as illustrated below.

**STEP 1**: Remove the aluminum DIN-Rail attachment plate from EDS-726's rear panel, and then attach the wall mounting plates, as shown in the diagram.
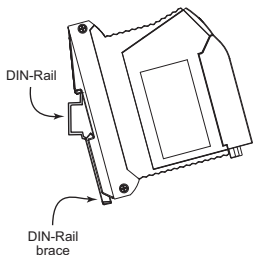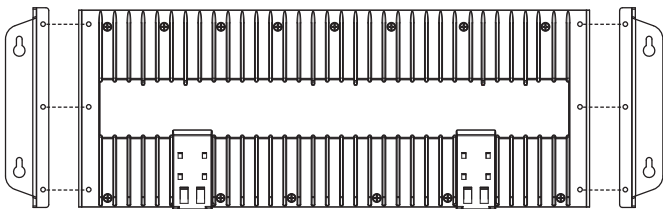


**STEP 2**:

Mounting EDS-726 on the wall requires 4 screws to ensure that the switch does not come loose from the wall. Use the switch, with wall mounting plates attached, as a guide to mark the correct locations of the 4 screws. The heads of the screws should be less than 6.0 mm in diameter, and the shafts should be less than 3.5 mm in diameter, as shown in the figure at the right.
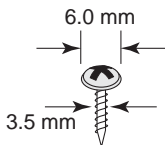
| NOTE | Before tightening the screws into the wall, make sure the screw head and shank size are suitable by inserting the screw into one of the keyhole-shaped apertures of the Wall Mounting Plates. |
|------|---|

Do not screw the screws in all the way—leave about 2 mm to allow room for sliding the wall mount panel between the wall and the screws.

**STEP 3**: Once the screws are fixed in the wall, insert the four screw heads through the large parts of the keyhole-shaped apertures, and then slide Moxa EDS downwards, as indicated. Tighten the four screws for added stability.



# Wiring Requirements

> **WARNING**
>
> **Safety First!**
>
> Be sure to disconnect the power cord before installing and/or wiring your Moxa EDS-726.
>
> Calculate the maximum possible current in each power wire and common wire. Observe all electrical codes dictating the maximum current allowable for each wire size.
>
> If the current goes above the maximum ratings, the wiring could overheat, causing serious damage to your equipment.

You should also pay attention to the following guidelines:

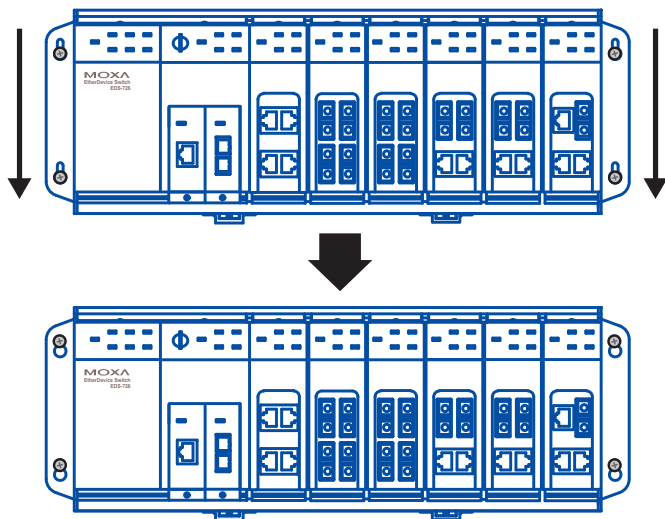• Use separate paths to route wiring for power and devices. If power wiring and device wiring paths must cross, make sure the wires are perpendicular at the intersection point.

• NOTE: Do not run signal or communications wiring and power wiring in the same wire conduit. To avoid interference, wires with different signal characteristics should be routed separately.

• You can use the type of signal transmitted through a wire to determine which wires should be kept separate. The rule of thumb is that wiring that shares similar electrical characteristics can be bundled together.

- Keep input wiring and output wiring separated.
- It is strongly advised that you label wiring to all devices in the system when necessary.

# Grounding Moxa EtherDevice Switch

Grounding and wire routing help limit the effects of noise due to electromagnetic interference (EMI). Run the ground connection from the ground screw, on the side panel of EDS-726, to the grounding surface prior to connecting devices.

> ⚠️ **ATTENTION**
>
> This product is intended to be mounted to a well-grounded mounting surface, such as a metal panel.

# Wiring the Relay Contact

In this section, we explain the meaning of the two contacts used to connect the alarm contact.

EDS-726 has two sets of relay output—relay 1 and relay 2. Each relay contact consists of the two contacts of the terminal block on EDS-726's top panel. Refer to the next section for detailed instructions on how to connect the wires to the terminal block connector, and how to attach the terminal block connector to the terminal block receptor.

**Top View**

**Front View**
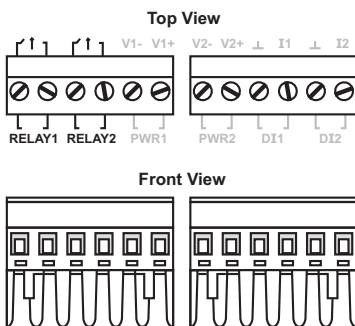
**FAULT**: The two sets of relay contacts of the 6-pin terminal block connector are used to detect user-configured events. The two wires attached to the Fault contacts form an open circuit when a user-configured event is triggered. If a user-configured event does not occur, the Fault circuit will be closed.

# Wiring the Redundant Power Inputs

EDS-726 has two sets of power input—power input 1 and power input 2.The top two contacts and the bottom two contacts of the 6-pin terminal block connector on EDS's top panel are used for EDS's two digital inputs.

**Top View**

**Front View**
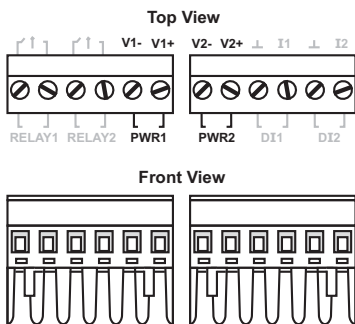
**STEP 1**: Insert the negative/positive DC wires into the V-/V+ terminals.

**STEP 2**: To keep the DC wires from pulling loose, use a small flat-blade screwdriver to tighten the wire-clamp screws on the front of the terminal block connector.

**STEP 3**: Insert the plastic terminal block connector prongs into the terminal block receptor, which is located on EDS-726's top panel.

# Wiring the Digital Inputs

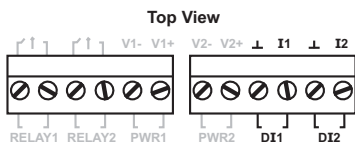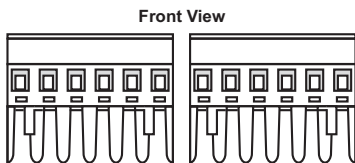EDS-726 has two sets of digital input—DI 1 and DI 2. Each DI comprises two contacts of the 6-pin terminal block connector on EDS's top panel. The terminal block is also used for EDS's two DC inputs. Top and front views of one of the terminal block connectors are shown here.

**Top View**



**STEP 1**: Insert the negative (ground)/ positive DI wires into the ⊥/I1 terminals.

**STEP 2**: To keep the DI wires from pulling loose, use a small flat-blade screwdriver to tighten the wire-clamp screws on the front of the terminal block connector.

**Front View**



**STEP 3**: Insert the plastic terminal block connector prongs into the terminal block receptor, which is located on EDS-726's top panel.

# Communication Connections

The pinout and cable wiring diagrams in this section show how the ports on EDS-726 connect to other devices:

**Pinouts** are diagrams that indicate the type of signal passing through each of the port's pins.

> **NOTE** 1. The pin numbers for male DB9 and DB25 connectors, and hole numbers for female DB9 and DB25 connectors are labeled *on the connector*. However, the numbers are typically quite small, so you may need to use a magnifying glass to see the numbers clearly.
>
> 2. The pin numbers for both 8-pin and 10-pin RJ45 connectors (and ports) are typically *not* labeled on the connector (or port). Refer to the Pinout diagram below to see how RJ45 pins are numbered.

## RS-232 Connection

EDS-726 has one RS-232 (10-pin RJ45) console port, located on the side panel. Use either an RJ45-to-DB9 or RJ45-to-DB25 cable to connect Moxa EDS-726's console port to your PC's COM port. You may then use a console terminal program, such as Moxa PComm Terminal Emulator or Hyper Terminal, to access Moxa EDS-726's console configuration utility.

### 10-pin RJ45 Console Pinouts

| 10-Pin | Description |
|--------|-------------|
| 1 | ------ |
| 2 | DSR |
| 3 | ------ |
| 4 | GND |
| 5 | TxD |
| 6 | RxD |
| 7 | GND |
| 8 | ------ |
| 9 | DTR |
| 10 | ------ |
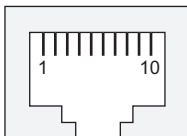
# 10/100BaseT(X) Ethernet Port Connection

The 10/100BaseT(X) ports located on EDS-726's front panel are used to connect to Ethernet-enabled devices.

Below we show pinouts for both MDI (NIC-type) ports and MDI-X (HUB/Switch-type) ports.

**MDI Port Pinouts**

| Pin | Signal |
|-----|--------|
| 1 | Tx+ |
| 2 | Tx- |
| 3 | Rx+ |
| 6 | Rx- |

**MDI-X Port Pinouts**

| Pin | Signal |
|-----|--------|
| 1 | Rx+ |
| 2 | Rx- |
| 3 | Tx+ |
| 6 | Tx- |

**8-pin RJ45**
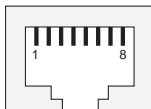
# 1000BaseT Ethernet Port Connection

1000BaseT data is transmitted on differential TRD+/- signal pairs over copper wires.

**MDI/MDI-X Port Pinouts**

| Pin | Signal |
|-----|--------|
| 1 | TRD(0)+ |
| 2 | TRD(0)- |
| 3 | TRD(1)+ |
| 4 | TRD(2)+ |
| 5 | TRD(2)- |
| 6 | TRD(1)- |
| 7 | TRD(3)+ |
| 8 | TRD(3)- |
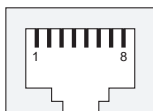
# 100/1000BaseFX Ethernet Port Connection

The concept behind the SC/ST port and cable is quite straightforward. Suppose you are connecting devices I and II. Contrary to electrical signals, optical signals do not require a circuit in order to transmit data. Consequently, one of the optical lines is used to transmit data from device I to device II, and the other optical line is used to transmit data from device II to device I, for full-duplex transmission.

All you need to remember is to connect the Tx (transmit) port of device I to the Rx (receive) port of device II, and the Rx (receive) port of device I to the Tx (transmit) port of device II. If you make your own cable, we suggest labeling the two sides of the same line with the same letter (A-to-A and B-to-B, as shown below, or A1-to-A2 and B1-to-B2).

**SC-Port Pinouts**
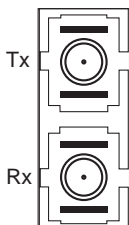
**SC-Port to SC-Port Cable Wiring**

**Cable Wiring**

**ST-Port Pinouts**    **ST-Port to ST-Port Cable Wiring**



**Cable Wiring**

```
A ——————————————— A
B ——————————————— B
```
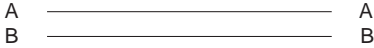
> ⚠️ **ATTENTION**
>
> This is a Class 1 Laser/LED product. To avoid causing serious damage to your eyes, do not stare directly into the Laser Beam.

# LED Indicators

The front panel of Moxa EDS-726 contains several LED indicators. The function of each LED is described in the table below.

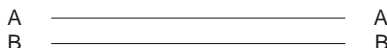| LED | Color | State | Description |
|---|---|---|---|
| **System LEDs** | | | |
| **STAT** | GREEN | On | System has passed self-diagnosis test on boot-up and is ready to run. |
| | GREEN | Blinking | System is undergoing the self-diagnosis test. |
| | RED | On | System failed self-diagnosis on boot-up. |
| **PWR1** | AMBER | On | Power is being supplied to the main module's power input PWR1. |
| | AMBER | Off | Power is not being supplied to the main module's power input PWR1. |
| **PWR2** | AMBER | On | Power is being supplied to the main module's power input PWR2. |
| | AMBER | Off | Power is not being supplied to the main module's power input PWR2. |
| **FAULT** | RED | On | The corresponding PORT alarm is enabled and a user-configured event has been triggered. |
| | RED | Off | The corresponding PORT alarm is enabled and a user-configured event has not been triggered, or the corresponding PORT alarm is disabled. |
| **MASTER** | GREEN | On | This EDS-726 is the Master of this Turbo Ring. |
| | GREEN | Blinking | This EDS-726 has become Ring Master of this Turbo Ring after the Turbo Ring was broken. |
| | GREEN | Off | This EDS-726 is not the Master of this Turbo Ring. |
| **COUPLER** | GREEN | On | When this EDS-726 enables the coupling function to form a back-up path. |
| | GREEN | Off | When this EDS-726 disables the coupling function. |

| | | Off | The CF card is not in the CF slot or the CF card is not in FAT/FAT32 format. |
|---|---|---|---|
| **CF** | GREEN | Blinking | Loading or saving data to the CF card failed. |
| | | On | The CF card is in the CF slot in FAT/FAT32 format. |

> **NOTE** Use the Mode push-button switch to cycle among the LNK/ACT, SPEED, FDX/HDX, RING PORT, and COUPLER PORT LEDs. The status of these five settings is indicated by the LEDs for the various ports.

| Mode LEDs | | | |
|---|---|---|---|
| **LNK/ACT** | GREEN | On | The corresponding module port's link is active. |
| | | Blinking | The corresponding module port's data is being transmitted. |
| | | Off | The corresponding module port's link is inactive. |
| **FDX/HDX** | GREEN | On | The corresponding module port's data is being transmitted at full duplex. |
| | | Off | The corresponding module port's data is not being transmitted. |
| **RING PORT** | GREEN | On | The corresponding module's port is the ring port of this EDS-726. |
| | | Off | The corresponding module's port is not the ring port of this EDS-726. |
| **COUPLER** | GREEN | On | The corresponding module's port is the coupler port of this EDS-726. |
| | | Off | The corresponding module's port is not the coupler port of this EDS-726. |
| **SPEED** | GREEN | Off | The corresponding module port's data is being transmitted at 10 Mbps. |
| | | On | The corresponding module port's data is being transmitted at 100 Mbps. |
| | | Blinking | The corresponding module port's data is being transmitted at 1000 Mbps. |

| Fast Ethernet Module LEDs | | | |
|---|---|---|---|
| **PWR** | GREEN | On | Power is being supplied to the interface module. |
| | | Off | Power is not being supplied to the interface module. |
| **P1/P2/ P3/P4** | GREEN | On/ Off/ Blinking | Displays the module port's status by mode. |

| Gigabit Ethernet Module LED | | | |
|---|---|---|---|
| **GREEN** | | On/ Off/ Blinking | Displays the module port's status by mode. |

# Specifications

## Modular Managed Switch System, EDS-72610G

Modular Managed Switch System with 6 slots, and up to 26 ports.
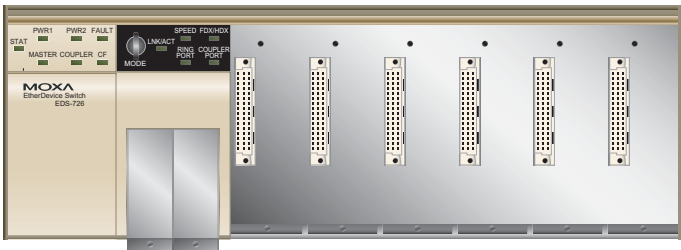


**Technology**

| | |
|---|---|
| Standards | IEEE802.3, 802.3u, 802.3x, 802.1D, 802.1w, 802.1Q, 802.1p, 802.1X, 802.3ad, 802.3z |
| Protocols | IGMP Snooping, 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 Groups 1, 2.3, 9 (available soon) |
| Flow Control | IEEE802.3x flow control/back pressure |

**Interface**

| | |
|---|---|
| Fast Ethernet | 6 slots for any combination of 4-port Interface Modules with 10/100BaseT(X) or 100BaseFX |
| Gigabit Ethernet | 2 sockets for any combination of 1-port Interface Modules with 10/100/1000BaseT(X), 1000BaseSX, 1000BaseLX, 1000BaseLHX, 1000BaseZX |
| Compact Flash Interface | Present |
| Console | RS-232 (RJ45) |
| System LED Indicators | STAT, PWR1, PWR2, FAULT, MASTER, COUPLER, 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. <br> • For state "1": +13 to +30V <br> • For state "0": -30 to +3V <br> • Max. input current: 8 mA |

**Power**

| | | |
|---|---|---|
| Input Voltage | 24 VDC (12 to 45 VDC), redundant dual inputs | |
| Connection | Two removable 6-pin terminal blocks | |
| Power Consumption | EDS-72610G | 21.5W |
| | IM-4TX | 2.5W |
| | IM-2MSC/2TX | 5W |
| | IM-2MST/2TX | 5W |
| | IM-2SSC/2TX | 5W |

|        | IM-4MSC | 7.2W |
|--------|---------|------|
|        | IM-4MST | 7.2W |
|        | IM-4SSC | 7.2W |
|        | IM-1LSC/3TX | 4W |
|        | IM-1GTX | 2.5W |
|        | IM-1GSXSC | 1.5W |
|        | IM-1GLXSC | 1.5W |
|        | IM-1GLHXSC | 1.5W |
|        | IM-1GZXSC | 1.5W |

| | |
|---|---|
| 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 Module, IM series

**IM-1GTX:** Interface Module with 1 10/100/1000BaseT(X) port, RJ45 connector.
**IM-1GSXSC:** Interface Module with 1 1000BaseSX port, SC connector.
**IM-1GLXSC:** Interface Module with 1 1000BaseLX port, SC connector.
**IM-1GLHXSC:** Interface Module with 1 1000BaseLHX port, SC connector, 40 km.
**IM-1GZXSC:** Interface Module with 1 1000BaseZX port, SC connector, 80 km.



| IM-1GTX | IM-1GSXSC, IM-1GLXSC, IM-1GLHXSC, IM-1GZXSC |
|---------|---------------------------------------------|
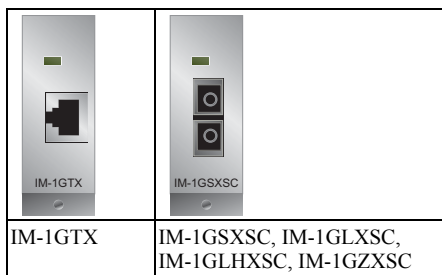
**Interface**

| | |
|---|---|
| LED Indicators | Port Status |
| RJ45 Ports | 10/100/1000BaseT(X) auto negotiation speed, and auto MDI/MDI-X connection |
| Distance | 100 m |
| Fiber Ports | 1000BaseSX/LX/LHX/ZX (SC connector) |

**Optical Fiber**

Distance

> Multi mode: IM-1GSXSC
> 0 to 500 m, 850 nm (50/125 μm, 400 MHz*km)
> 0 to 275 m, 850 nm (62.5/125 μm, 200 MHz*km)
> IM-1GLXSC
> 0 to 1100 m, 1310 nm (50/125 μm, 800 MHz*km)
> 0 to 550 m, 1310 nm (62.5/125 μm, 500 MHz*km)

|  | Single mode: | IM-1GLXSC |
|--|--|--|
|  |  | 0 to 10 km, 1310 nm (9/125 μm, 3.5 PS/(nm*km)) |
|  |  | IM-1GLHXSC |
|  |  | 0 to 40 km, 1310 nm (9/125 μm, 19 PS/(nm*km)) |
|  |  | IM-1GZXSC |
|  |  | 0 to 80 km, 1550 nm (9/125 μm, 19 PS/(nm*km)) |

Min. TX Output

| 1M-GSX: | -9.5 dB |
|--|--|
| 1M-1GLX: | -9.5 dB |
| 1M-1GLHX: | -4 dB |
| 1M-1GZX: | 0 dB |

Max. TX Output

| 1M-GSX: | -4 dB |
|--|--|
| 1M-1GLX: | -3 dB |
| 1M-1GLHX: | +3 dB |
| 1M-1GZX: | +5 dB |

Sensitivity
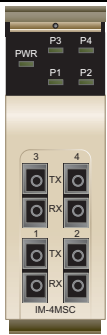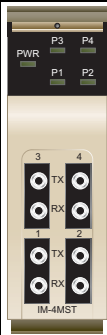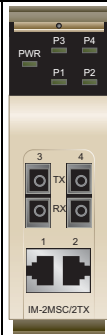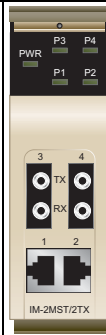
| 1M-GSX: | 0 to -18 dB |
|--|--|
| 1M-1GLX: | -3 to -20 dB |
| 1M-1GLHX: | -3 to -23 dB |
| 1M-1GZX: | -3 to -23 dB |

**Mechanical**

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

## Fast Ethernet Interface Module, IM series

**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, 40 km SC connectors.
**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, 40 km SC connectors, and 2 10/100BaseT(X) ports, RJ45 connectors.
**IM-1LSC/3TX:** Interface Module with 1 single mode 100BaseFX port, 80 km SC connector and 3 10/100BaseT(X) ports, RJ45 connectors.

|  |  |  |  |  |  |
|---|---|---|---|---|---|
| IM-4TX | IM-4MSC,<br>IM-4SSC, | IM-4MST | IM-2MSC/<br>2TX<br>IM-2SSC/<br>2TX | IM-2MST/<br>2TX | IM-1LSC/<br>3TX |

**Interface**

| | |
|---|---|
| LED Indicators | PWR, P1, P2, P3, P4 port status |
| RJ45 Ports | 10/100/1000BaseT(X) auto negotiation speed, F/H duplex mode, and auto MDI/MDI-X connection |
| Distance | 100 m |
| Fiber Ports | 100BaseFX ports (SC/ST connector) |

**Optical Fiber**

Distance

| | |
|---|---|
| Multi mode: | IM-4MSC, IM-4MST, IM-2MSC/2TX, IM-2MST/2TX<br>0 to 5 km, 1310 nm (50/125 μm, 800 MHz*km)<br>0 to 4 km, 1310 nm (62.5/125 μm, 500 MHz*km) |
| Single mode: | IM-4SSC<br>0 to 40 km, 1310 nm (9/125 μm, 3.5 PS/(nm*km))<br>IM-1LSC/3TX<br>0 to 80 km, 1550 nm (9/125 μm, 19 PS/(nm*km)) |

Min. TX Output

| | |
|---|---|
| Multi mode: | -20 dBm |
| Single mode: | 0 to 40 km, -5 dBm<br>0 to 80 km, -5 dBm |

Max. TX Output

| | |
|---|---|
| Multi mode: | -14 dBm |
| Single mode: | 0 to 40 km, 0 dBm<br>0 to 80 km, 0 dBm |

Sensitivity

| | |
|---|---|
| Multi mode: | -34 to -30 dBm |
| Single mode: | -36 to -32 dBm |

**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 |

**Technical Support Contact Information**

**www.moxa.com/support**

| | |
|---|---|
| Moxa Americas:<br>Toll-free: 1-888-669-2872<br>Tel:   +1-714-528-6777<br>Fax:  +1-714-528-6778 | Moxa China (Shanghai office):<br>Toll-free: 800-820-5036<br>Tel:   +86-21-5258-9955<br>Fax:  +86-10-6872-3958 |
| Moxa Europe:<br>Tel:   +49-89-3 70 03 99-0<br>Fax:  +49-89-3 70 03 99-99 | Moxa Asia-Pacific:<br>Tel:   +886-2-8919-1230<br>Fax:  +886-2-8919-1231 |