

# **EDS-G205 Hardware Installation Guide**

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**Moxa EtherDevice Switch**

**Third Edition, April 2014**

**MOXA<sup>®</sup>**

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**P/N: 1802002051012**

## Overview

The EDS-G205 series is equipped with 5 Gigabit Ethernet ports, making it an ideal and economical solution for demanding, high bandwidth Gigabit Ethernet applications. In addition, the built-in relay warning function alerts system administrators when power failures or port breaks occur. The EDS-G205 series includes 2 models: one with an operating temperature range of 0 to 60°C, and the other one with extended operating temperature range of -40 to 75°C. These 2 models have passed a 100% burn-in test to ensure that they fulfill the special needs of industrial automation control. The EDS-G205 series can be easily installed with DIN-Rail mounting as well as distribution boxes.

**NOTE** Throughout this Hardware Installation Guide, we use **EDS** as an abbreviation for Moxa EtherDevice Switch:

**EDS = Moxa EtherDevice Switch**

## Package Checklist

Your EDS is shipped with the following items. If any of these items is missing or damaged, please contact your customer service representative for assistance.

- Moxa EtherDevice™ Switch
- Hardware Installation Guide
- Moxa Product Warranty booklet

## Features

### ***High Performance Network Switching Technology***

- 10/100/1000BaseT(X) (RJ45), auto negotiation speed, F/H duplex mode
- IEEE 802.3/802.3u/802.3ab.
- Store and Forward switching process type, 8K MAC address entries.

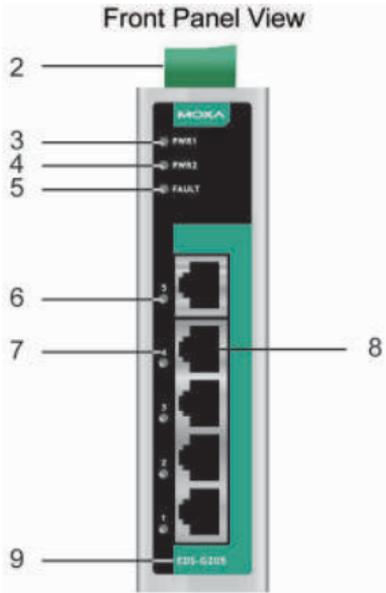
### ***Industrial Grade Reliability***

- Power failure, port break alarm by relay output
- Redundant dual 12/24/48VDC power inputs

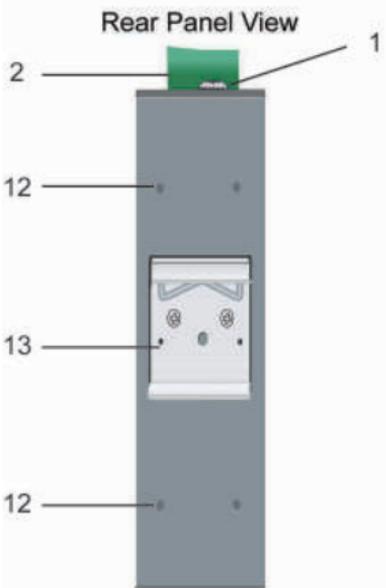
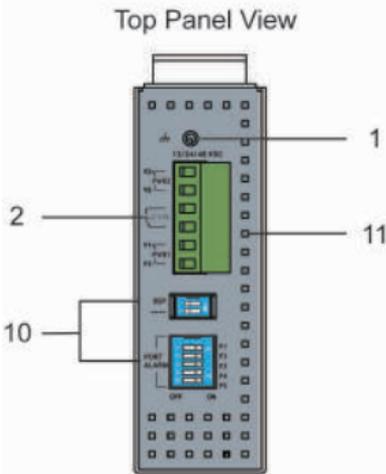
### ***Rugged Design***

- Operating temperature range of 0 to 60°C, or extended operating temperature of -40 to 75°C for (-T) models
- IP30, rugged high-strength case
- DIN-Rail or panel mounting ability

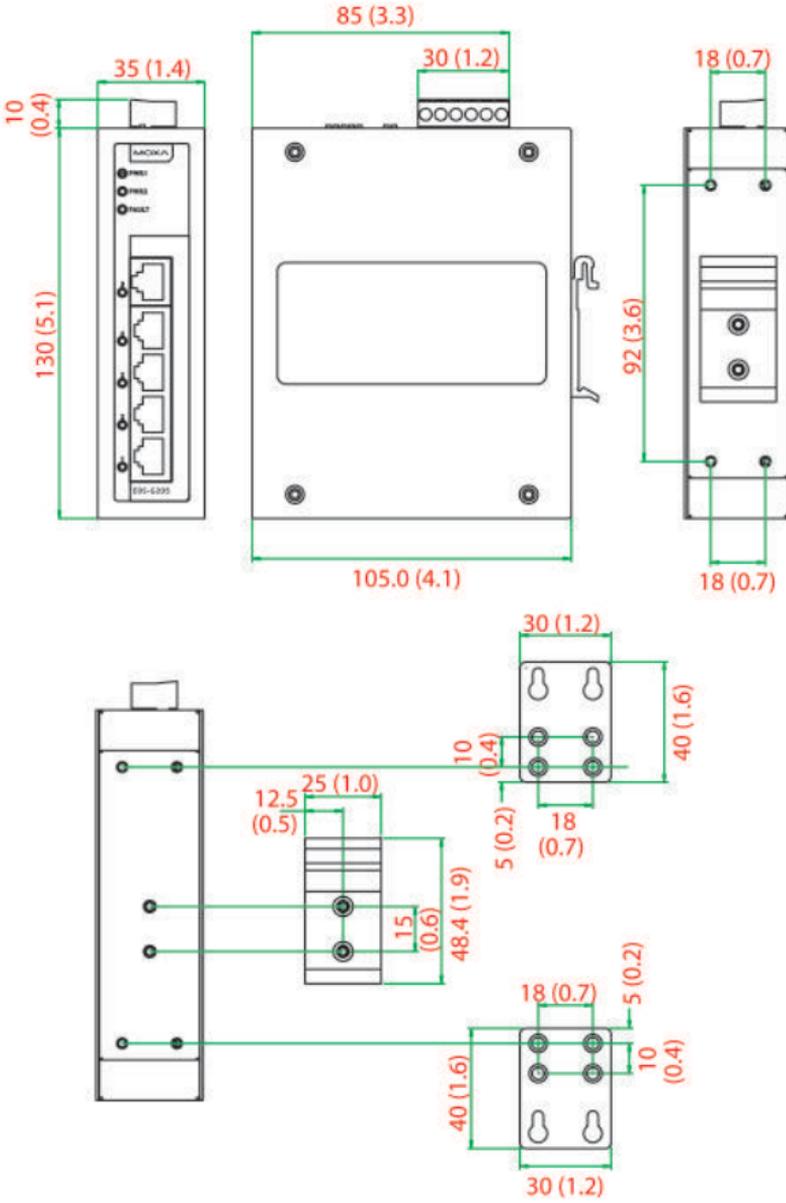
# Panel Layout of EDS-G205



1. Grounding screw
2. Terminal block for power input (PWR1, PWR2) and relay output
3. Power input PWR1 LED
4. Power input PWR2 LED
5. Fault LED
6. TP port's 10/10/1000 Mbps LED
7. Port number
8. 10/100/1000BaseT(X) Port
9. Model Name
10. DIP switches
11. Heat dissipation orifices
12. Screw hole for wall mounting kit
13. DIN-rail Kit



# Mounting Dimensions



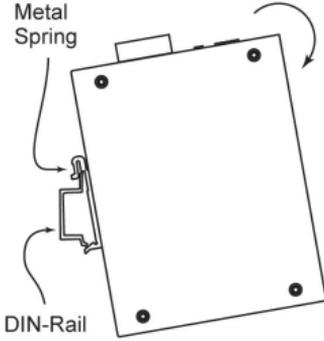
Unit = mm (inch)

## DIN-Rail Mounting

The aluminum DIN-rail attachment plate should already be fixed to the back panel of the EDS when you take it out of the box. If you need to reattach the DIN-rail attachment plate, make sure the stiff metal spring is situated towards the top, as shown in the figures below.

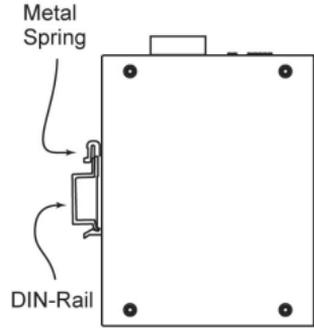
### STEP 1:

Insert the top of the DIN-rail into the slot just below the stiff metal spring.



### STEP 2:

The DIN-rail attachment unit will snap into place as shown below.



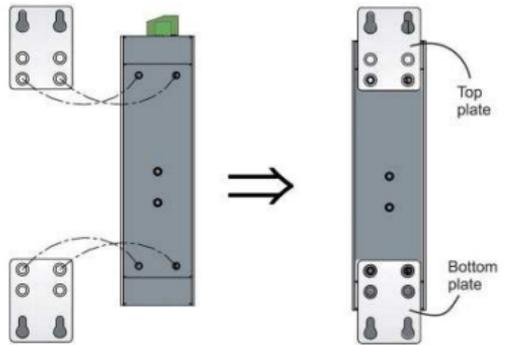
To remove the DIN-rail from the EDS, simply reverse Steps 1 and 2.

## Wall Mounting (optional)

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

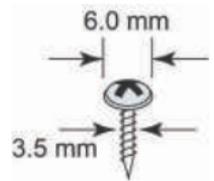
### STEP 1:

Remove the aluminum DIN-rail attachment plate from the EDS's rear panel, and then attach the wall mount plates, as shown in the figure.



### STEP 2:

Mounting the EDS on the wall requires 4 screws. Use the switch, with wall mount 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.

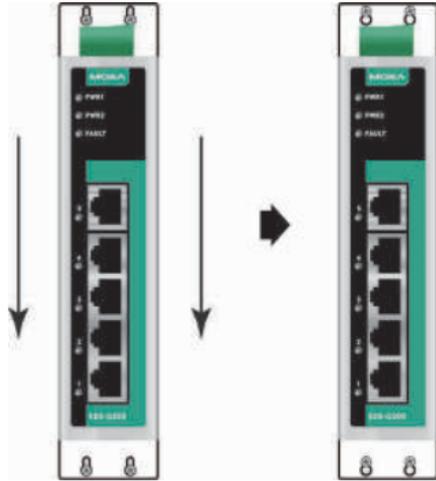


**NOTE** Before tightening screws into the wall, make sure the screw head and shank size are suitable by inserting the screw into one of the keyhole-shaped apertures of the Wall Mounting Plates.

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 the EDS downwards, as indicated. Tighten the four screws for added stability.



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### ATEX Information

1. Certificate number DEMKO 09 ATEX 0906311X
2. Ambient range ( $-40^{\circ}\text{C} \leq T_{\text{amb}} \leq 75^{\circ}\text{C}$ )
3. Certification string (Ex nA nC IIC T4 Gc)
4. Standards covered (EN 60079-0:2012, EN 60079-15:2010)
5. The conditions of safe usage:
  - Subject devices are for use in ambient temperature  $-40^{\circ}\text{C} \leq T_{\text{amb}} \leq +75^{\circ}\text{C}$ .
  - Subject devices are to be installed in an IP54 enclosure.
  - Subject devices are for use in an area of not more than pollution degree 2 in accordance with IEC 60664-1.
  - Subject devices are to use Conductors suitable for use in an ambient temperature of  $100^{\circ}\text{C}$  must be used for the Power Supply Terminal.



### Wiring Requirements



#### WARNING

##### Safety First!

Turn the power off before disconnecting modules or wires. The proper power supply voltage is listed on the product label. Check the voltage of your power source to make sure you are using the correct voltage. Do NOT use a voltage greater than what is specified on the product label.

These devices must be supplied by an AELV source as defined in the Low Voltage Directive 2006/95/EC and 2004/108/EC.



## **WARNING**

### **Safety First!**

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 items:

- 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 with similar electrical characteristics can be bundled together.
- Keep input wiring and output wiring separated.
- It is strongly advised that you label wiring for 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 to the grounding surface prior to connecting devices.



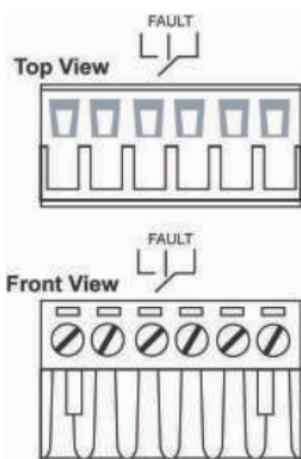
## **ATTENTION**

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

## **Wiring the Alarm Contact**

The Alarm Contact consists of the two middle contacts of the terminal block on the EDS's top panel. You may 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.

In this section, we explain the meaning of the two contacts used to connect the Alarm Contact.



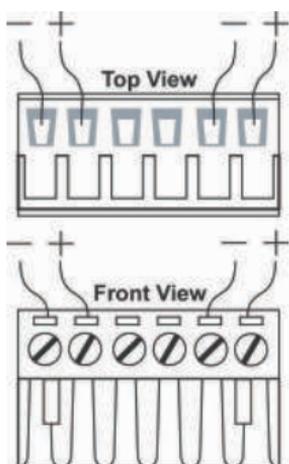
**FAULT:** The two middle contacts of the 6-contact terminal block connector are used to detect both power faults and port faults. The two wires attached to the Fault contacts form an open circuit when:

1. EDS has lost power from one of the DC power inputs.
- OR
2. The PORT ALARM DIP switch for one of the ports is set to ON, but the port is not connected properly.

If neither of these two conditions is satisfied, the Fault circuit will be closed.

## Wiring the Redundant Power Inputs

The top two contacts and the bottom two contacts of the 6-contact terminal block connector on the EDS's top panel are used for the EDS's DC inputs. Top and front views of one of the terminal block connectors are shown here.



**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's top panel.



### ATTENTION

Before connecting the EDS to the DC power inputs, make sure the DC power source voltage is stable.

## Communication Connections

EDS-G205 Models have 5 10/100/1000BaseT(X) Ethernet ports.

### 10/100/1000BaseT(X) Ethernet Port Connection

The 10/100/1000BaseT(X) ports located on Moxa EtherDevice Switch's front panel are used to connect to Ethernet-enabled devices. Most users will choose to configure these ports for Auto MDI/MDI-X mode, in which case the port's pinouts are adjusted automatically depending on the type of Ethernet cable used (straight-through or cross-over), and the type of device (NIC-type or HUB/Switch-type) connected to the port.

In what follows, we give pinouts for both MDI (NIC-type) ports and MDI-X (HUB/Switch-type) ports. We also give cable wiring diagrams for straight-through and cross-over Ethernet cables.

### 10 / 100Base T(x) RJ45 Pinouts

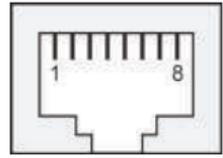
#### MDI Port Pinouts

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

#### MDI-X Port Pinouts

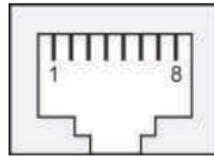
| Pin | Signal |
|-----|--------|
| 1   | Rx+    |
| 2   | Rx-    |
| 3   | Tx+    |
| 6   | Tx-    |

#### 8-pin RJ45

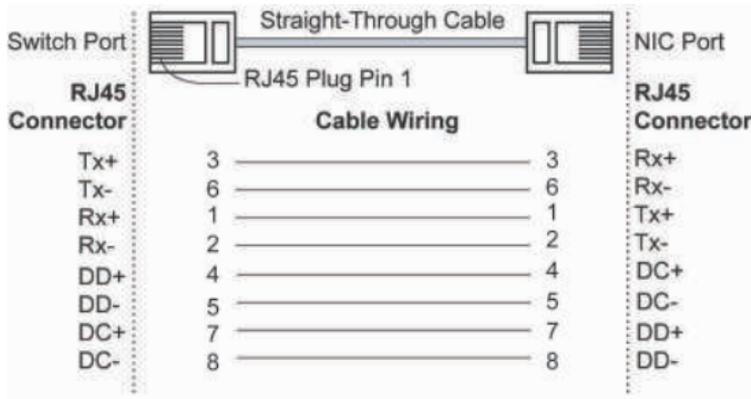


### 1000BaseT RJ45 Pinouts

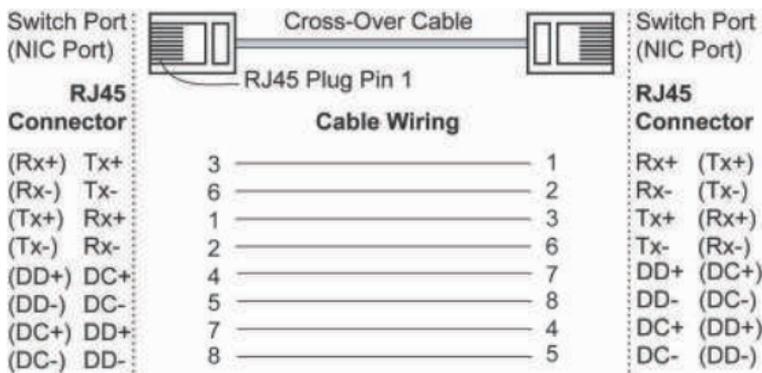
| Pin | MDI    | MDI-X  |
|-----|--------|--------|
| 1   | BI_DA+ | BI_DB+ |
| 2   | BI_DA- | BI_DB- |
| 3   | BI_DB+ | BI_DA+ |
| 4   | BI_DC+ | BI_DD+ |
| 5   | BI_DC- | BI_DD- |
| 6   | BI_DB- | BI_DA- |
| 7   | BI_DD+ | BI_DC+ |
| 8   | BI_DD- | BI_DC- |



### RJ45 (8-pin) to RJ45 (8-pin) Straight-Through Cable Wiring



### RJ45 (8-pin) to RJ45 (8-pin) Cross-Over Cable Wiring



### Redundant Power Inputs

Both power inputs can be connected simultaneously to live DC power sources. If one power source fails, the other live source acts as a backup, and automatically supplies all of the EDS's power needs.

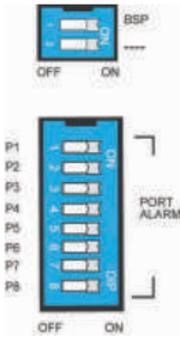
## Alarm Contact

The Moxa EtherDevice Switch has one Alarm Contact located on the top panel. For detailed instructions on how to connect the Alarm Contact power wires to the two middle contacts of the 6-contact terminal block connector, see the **Wiring the Alarm Contact** section on page 6. A typical scenario would be to connect the Fault circuit to a warning light located in the control room. The light can be set up to switch on when a fault is detected.

The Alarm Contact has two terminals that form a Fault circuit for connecting to an alarm system. The two wires attached to the Fault contacts form an open circuit when (1) EDS has lost power from one of the DC power inputs, or (2) one of the ports, for which the corresponding PORT ALARM DIP switch is set to ON, is not properly connected.

If neither of these two conditions occurs, the Fault circuit will be closed.

## DIP Switch Settings



The default setting for each DIP switch is OFF. The following table explains the effect of setting the DIP switches to the ON positions.

| DIP Switch                       | Setting | Description  |
|----------------------------------|---------|--|
| BSP                              | ON      | Enables broadcast storm protection   |
|                                  | OFF     | Disables broadcast storm protection  |
| ----<br>refers to Jumbo<br>Frame | ON      | Enables jumbo frame function   |
|                                  | OFF     | Disables jumbo frame function  |
| PORT Alarm                       | ON      | Enables the corresponding PORT Alarm. If the port's link fails, the relay will form an open circuit and the fault LED will light up. |
|                                  | OFF     | Disables the corresponding PORT Alarm. The relay will form a closed circuit and the Fault LED will never light up.                   |



### ATTENTION

To actively update DIP switch settings, power off and then power on the EDS.

## LED Indicators

The front panel of the Moxa EtherDevice Switch contains several LED indicators. The function of each LED is described in the table below.

| LED                 | Color | State    | Description   |
|---------------------|-------|----------|---|
| <b>PWR1</b>         | AMBER | On       | Power is being supplied to power input PWR1   |
|                     |       | Off      | Power is <b>not</b> being supplied to power input PWR1  |
| <b>PWR2</b>         | AMBER | On       | Power is being supplied to power input PWR2   |
|                     |       | Off      | Power is <b>not</b> being supplied to power input PWR2  |
| <b>FAULT</b>        | RED   | On       | When the corresponding PORT alarm is enabled, and the port's link is inactive.  |
|                     |       | Off      | When the corresponding PORT alarm is enabled and the port's link is active, or when the corresponding PORT alarm is disabled. |
| <b>10/100/1000M</b> | AMBER | On       | TP port's 10/100 Mbps link is active  |
|                     |       | Blinking | Data is being transmitted at 10/100 Mbps  |
|                     |       | Off      | TP Port's 10/100 Mbps link is inactive  |
|                     | GREEN | On       | TP port's 1000 Mbps link is active  |
|                     |       | Blinking | Data is being transmitted at 1000 Mbps  |
|                     |       | Off      | TP Port's 1000 Mbps link is inactive  |

## Auto MDI/MDI-X Connection

The Auto MDI/MDI-X function allows users to connect the EDS's 10/100/1000BaseT(X) ports to any kind of Ethernet device, without paying attention to the type of Ethernet cable being used for the connection. This means that you can use either a straight-through cable or cross-over cable to connect the EDS to Ethernet devices.

## Triple Speed Functionality and Switching

The EDS's 10/100/1000 Mbps RJ45 switched port auto negotiates with the connected device for the fastest data transmission rate supported by both devices. The EDS is a plug-and-play device, so software configuration is not required at installation or during maintenance.

The half/full duplex mode for the RJ45 switched ports is user dependent and changes (by auto-negotiation) to full or half duplex, depending on which transmission speed is supported by the attached device.

## Auto-Negotiation and Speed Sensing

The EDS's RJ45 Ethernet ports independently support auto-negotiation for transmission speeds of 10 Mbps, 100 Mbps, and 1000 Mbps, with operation according to the IEEE 802.3 standard.

This means that some nodes could be operating at 10 Mbps, while at the same time, other nodes are operating at 100 Mbps or 1000Mbps.

Auto-negotiation takes place when an RJ45 cable connection is made, and then each time a LINK is enabled. The EDS advertises its capability for using 10 Mbps, 100 Mbps, or 1000 Mbps transmission speeds, with the device at the other end of the cable expected to advertise similarly. Depending on what type of device is connected, this will result in agreement to operate at a speed of 10 Mbps, 100 Mbps, or 1000 Mbps.

If an EDS's RJ45 Ethernet port is connected to a non-negotiating device, it will default to 10 Mbps speed and half-duplex mode, as required by the IEEE 802.3 standard.

## Specifications

### Specifications and Pin Assignments

| <b>Technology</b>           |  |
|-----------------------------|--|
| Standards                   | IEEE 802.3 for 10BaseT,<br>IEEE 802.3u for 100BaseT(X),<br>IEEE 802.3ab for 1000BaseT, |
| <b>Interface</b>            |  |
| RJ45 Ports                  | 10/100/1000BaseT(X) auto negotiation speed   |
| LED Indicators              | PWR1, PWR2, FAULT, 10/100M/1000M   |
| DIP Switch                  | Port break alarm, broadcast storm protection   |
| Alarm Contact               | One relay output with current carrying capacity of 1A @ 24 VDC                         |
| <b>Power</b>                |  |
| Input Voltage               | 12/24/48 VDC (9.6 to 60 VDC)   |
| Input Current @ 24VDC       | 0.2A   |
| Connection                  | One removable 6-pin terminal block   |
| Overload Current Protection | Present  |
| Reverse Polarity Protection | Present  |
| <b>Mechanical</b>           |  |
| Casing                      | IP30 protection, metal case  |
| Dimension (W x H x D)       | 35 x 130 x 105 mm (1.37 x 4.05 x 4.13 in)  |
| Weight                      | 290g   |
| Installation                | DIN-rail, Wall Mounting (optional kit)   |
| <b>Environmental</b>        |  |
| Operating Temperature       | 0 to 60°C (32 to 140°F)<br>-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)  |
| <b>Regulatory Approvals</b> |  |
| Safety                      | UL 508(Pending)  |
| Hazardous Location          | UL/cUL Class I, Division 2, Groups A, B, C, and D;<br>ATEX Zone 2, Ex nA nC IIC T4 Gc  |

|                 |   |
|-----------------|---|
| EMI             | FCC Part 15, CISPR (EN 55022) class A   |
| EMS             | EN 61000-4-2 (ESD), Level 3<br>EN 61000-4-3 (RS), Level 3<br>EN 61000-4-4 (EFT), Level 3<br>EN 61000-4-5 (Surge), Level 3<br>EN 61000-4-6 (CS), Level 3<br>EN 61000-4-8<br>EN 61000-4-11<br>EN 61000-4-12 |
| Shock           | IEC 60068-2-27  |
| Free Fall       | IEC 60068-2-32  |
| Vibration       | IEC 60068-2-6   |
| <b>WARRANTY</b> | 5 years   |

**Technical Support Contact Information**  
**[www.moxa.com/support](http://www.moxa.com/support)**

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