

MOXA EtherDevice Switch

EDS-205 Hardware Installation Guide

1st Edition, May 2004



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Overview

The MOXA EtherDevice™ Switches, EDS-205 series, are entry-level 5-port Ethernet Switches that provide a cost-effective solution for your industrial Ethernet connection.

For EDS-205, you could choose either DC power input from 12 to 48 V or AC power input from 18 to 30V. These products can operation from –10 to 60°C, and the rugged hardware design makes EDS-205 perfect for ensuring that your Ethernet equipment can meet demanding industrial applications.

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

EDS = MOXA EtherDevice Switch

Package Checklist

MOXA EDS-205 is shipped with the following items. If any of these items is missing or damaged, please contact your customer service representative for assistance.

- 1 EDS-205
- Hardware Installation Guide
- MOXA Product Warranty booklet

Features

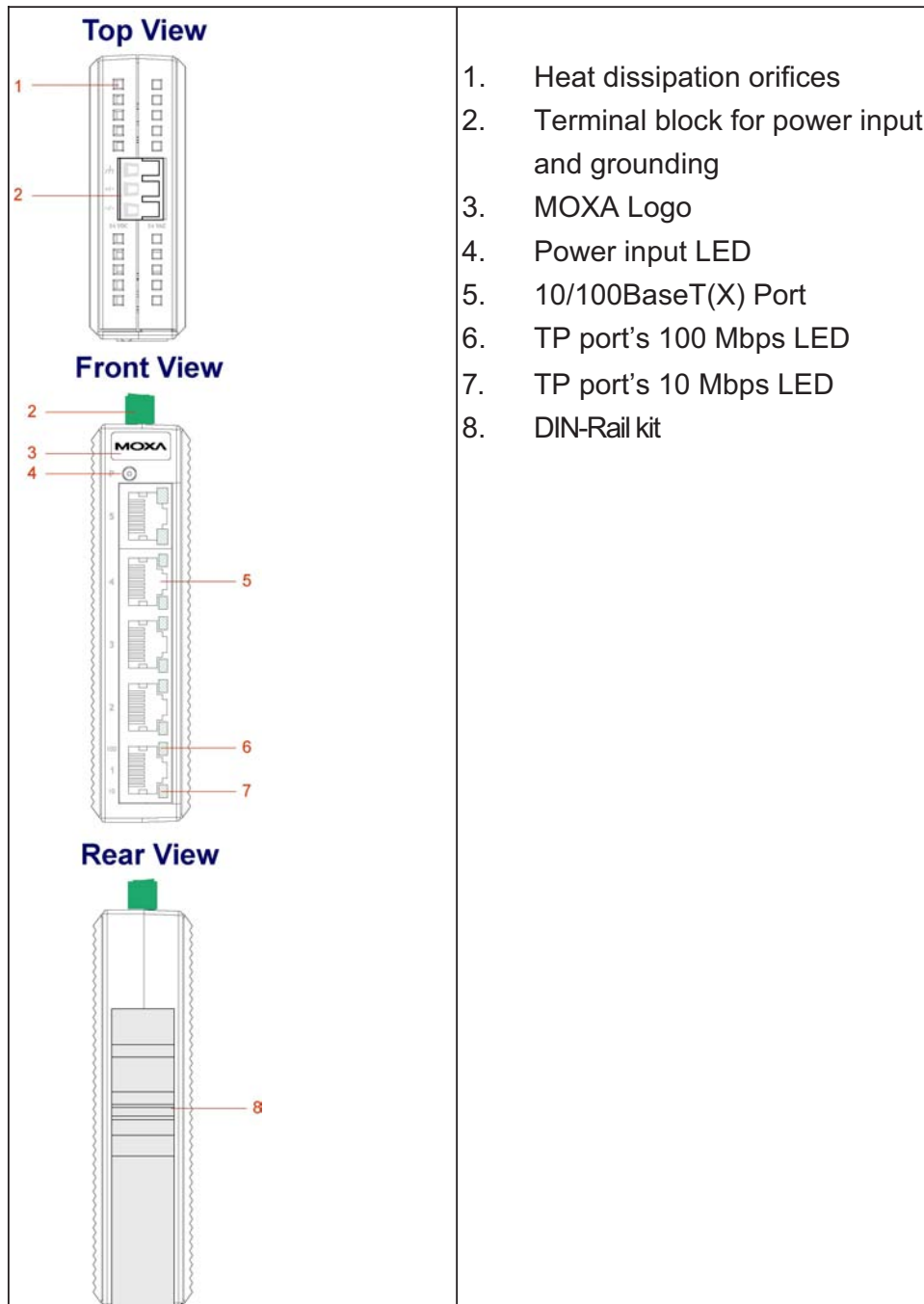
High Performance Network Switching Technology

- 10/100M, Full/Half-Duplex, MDI/MDIX auto-sensing
- IEEE 802.3/802.3u/802.3x
- Store and Forward switching process type, 1024 address entries

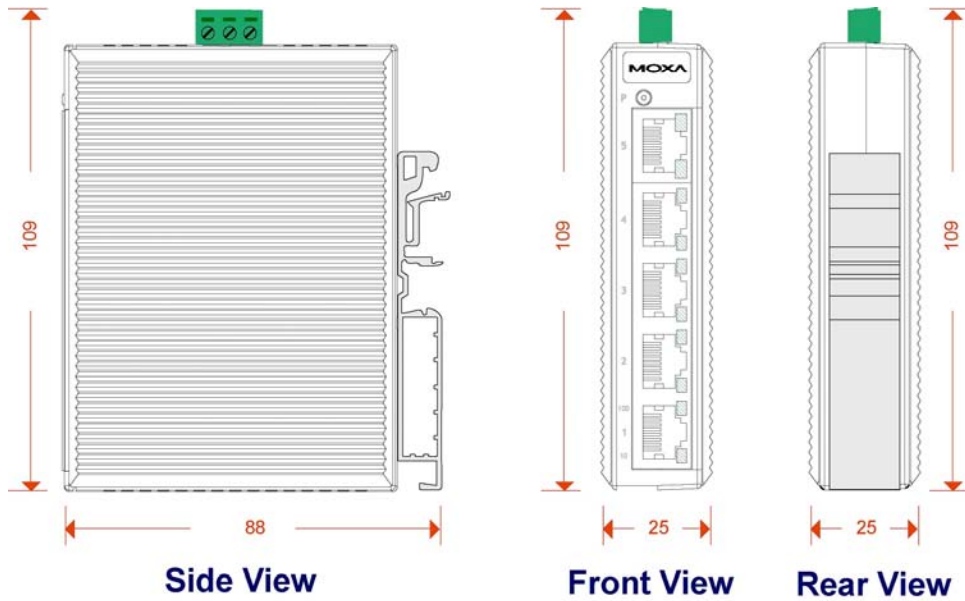
Industrial Design

- Operating temperature ranges from -10 to 60 °C
- Power inputs DC: 12 to 48 V, AC: 18 to 30 V 47~63 Hz
- IP 30, plastic case
- DIN-Rail mounting ability

Panel Layout of EDS-205 series



Mounting Dimensions



Unit: mm

DIN-Rail Mounting

The plastic DIN-Rail attachment plate should already be fixed to the rear panel of EDS when you take it out of the box. If you need to reattach the DIN-Rail attachment plate to EDS, make sure the DIN-Rail kit is situated towards the top, as shown in the figures below.

<p>STEP 1: Insert the top of the DIN-Rail into the slot.</p>	<p>STEP 2: The DIN-Rail attachment unit will snap into place as shown below.</p>
<p>DIN-Rail</p>	<p>DIN-Rail</p>

<p>DIN-Rail</p>	<p>To remove MOXA EDS-205 from the DIN-Rail, insert a flat-blade screw driver horizontally into the DIN-Rail kit under the EDS-205, and then pull it upwards and release EDS towards you away from the DIN-Rail.</p>
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Wiring Requirements

Safety First!

Be sure to disconnect the power cord before installing and/or wiring your MOXA EtherDevice Switch.

ATTENTION



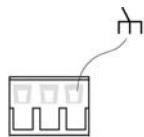
Calculate the maximum possible current in each power wire and common wire. Observe all electrical codes dictating the maximum current allowable for each wire size.

If the current goes above the maximum ratings, the wiring could overheat, causing serious damage to your equipment.

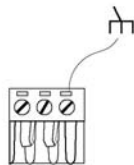
You should also pay attention to the following points:

- 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



Top View



Front View

Grounding and wire routing help limit the effects of noise due to electromagnetic interference (EMI). Run the ground connection from the right most of 3-contact terminal block to the grounding surface prior to connecting devices.

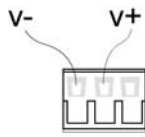
ATTENTION



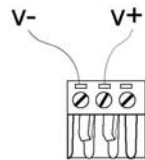
This product is intended to be mounted to a well-grounded mounting surface such as a metal panel.

Wiring the Power Inputs

The two left-most contacts of the 3-contact terminal block connector on EDS's top panel are used for EDS's DC or AC inputs. Top and front views of one of the terminal block connectors are shown here.



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's top panel.

Communication Connections

EDS-205 has five 10/100BaseT(X) Ethernet ports.

10/100BaseT(X) Ethernet Port Connection

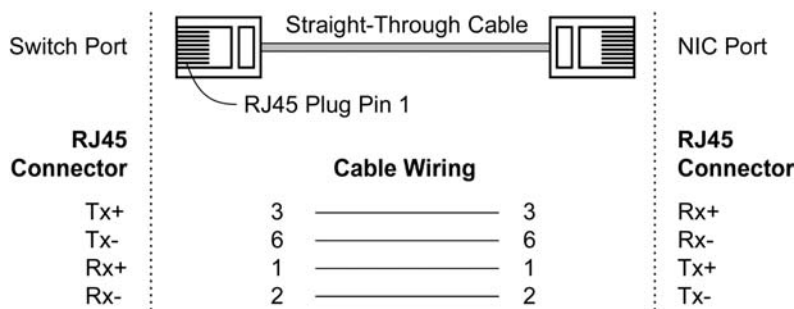
The 10/100BaseT(X) ports located on EDS's front panel are used to connect to Ethernet-enabled devices.

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

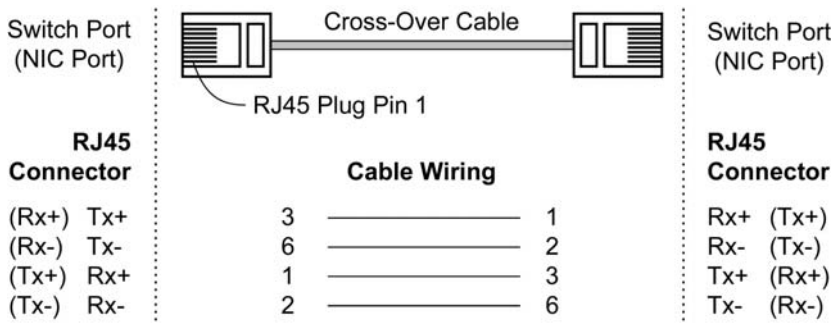
RJ45 (8-pin, MDI) Port Pinouts RJ45 (8-pin, MDI-X) Port Pinouts

<table border="0"> <thead> <tr> <th>8-Pin</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Tx+</td> </tr> <tr> <td>2</td> <td>Tx-</td> </tr> <tr> <td>3</td> <td>Rx+</td> </tr> <tr> <td>6</td> <td>Rx-</td> </tr> </tbody> </table>	8-Pin	Description	1	Tx+	2	Tx-	3	Rx+	6	Rx-		<table border="0"> <thead> <tr> <th>8-Pin</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Rx+</td> </tr> <tr> <td>2</td> <td>Rx-</td> </tr> <tr> <td>3</td> <td>Tx+</td> </tr> <tr> <td>6</td> <td>Tx-</td> </tr> </tbody> </table>	8-Pin	Description	1	Rx+	2	Rx-	3	Tx+	6	Tx-	
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RJ45 (8-pin) to RJ45 (8-pin) Straight-Through Cable Wiring



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



LED Indicators

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

LED	Color	State	Description
P	AMBER	On	Power is being supplied to power input
		Off	Power is not being supplied to power input
10M (TP)	GREEN	On	TP port's 10 Mbps link is active
		Blinking	Data is being transmitted at 10 Mbps
		Off	TP Port's 10 Mbps link is inactive
100M (TP)	GREEN	On	TP port's 100 Mbps link is active
		Blinking	Data is being transmitted at 100 Mbps
		Off	100BaseTX Port's link is inactive

Auto MDI/MDI-X Connection

The Auto MDI/MDI-X function allows users to connect MOXA EtherDevice Switch's 10/100BaseTX 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 EDS to Ethernet devices.

Dual Speed Functionality and Switching

MOXA EtherDevice Switch's 10/100 Mbps switched RJ45 port auto negotiates with the connected device for the fastest data transmission rate supported by both devices. All models of MOXA EtherDevice Switch are plug-and-play devices, so that software configuration is not required at installation, or during maintenance. The half/full duplex mode for the switched RJ45 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.

Switching, Filtering, and Forwarding

Each time a packet arrives at one of the switched ports, a decision is made to either filter or forward the packet. Packets with source and destination addresses belonging to the same port segment will be filtered, constraining those packets to one port, and relieving the rest of the network from the need to process them. A packet with destination address on another port segment will be forwarded to the appropriate port, and will not be sent to the other ports where it is not needed. Packets that are used in maintaining the operation of the network (such as the occasional multi-cast packet) are forwarded to all ports.

MOXA EtherDevice Switch operates in the store-and-forward switching mode, which eliminates bad packets and enables peak performance to be achieved when there is heavy traffic on the network.

Switching and Address Learning

MOXA EtherDevice Switch has an address table that can hold up to 1K node addresses, which makes it suitable for use with large networks. The address tables are self-learning, so that as nodes are added or removed, or moved from one segment to another, MOXA EtherDevice Switch automatically keeps up with new node locations. An address-aging algorithm causes the least-used addresses to be deleted in favor of newer, more frequently used addresses. To reset the address buffer, power down the unit and then power it back up.

Auto-Negotiation and Speed Sensing

All of MOXA EtherDevice Switch's RJ45 Ethernet ports independently support auto-negotiation for speeds in the 10BaseT and 100BaseTX modes, with operation according to the IEEE 802.3u standard. This means that some nodes could be operating at 10 Mbps, while at the same time, other nodes are operating at 100 Mbps.

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

If a MOXA EtherDevice Switch 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 802.3u standard.

Specifications

Technology

Standards	IEEE802.3, 802.3u, 802.3x
Processing Type	Store and Forward, with IEEE802.3x full duplex, non-blocking flow control
Address Table Size	1K uni-cast addresses

Interface

RJ45 Ports	10/100BaseT(X) auto negotiation speed, F/H duplex mode, and auto MDI/MDI-X connection
LED Indicators	Power, 10/100 M

Power

Input Voltage	DC: 12 to 48 V, AC: 18 to 30 V, 47 ~63 Hz
Input Current	12 to 48 VDC, 5 W 18 to 30 VAC, 5 VA, 47 ~63 Hz
Connection	Removable 3-contact Terminal Block
Overload Current Protection	1.1 A
Reverse Polarity Protection	Present

Mechanical

Casing	IP30 protection, plastic case
Dimensions	25 x 109 x 88 mm (W x H x D)
Weight	135 g
Installation	DIN-Rail

Environment

Operating Temperature	-10 to 60°C (14 to 140°F)
Storage Temperature	-40 to 70°C (-40 to 158°F)
Ambient Relative Humidity	5 to 95% (non-condensing)

Regulatory Approvals

Safety	UL 508 (Pending)
EMI	FCC Part 15, CISPR (EN55022) class A
EMS	EN61000-4-2 (ESD), EN61000-4-3 (RS), EN61000-4-4 (EFT), EN61000-4-5 (Surge), EN61000-4-6 (CS),
Shock	IEC 60068-2-27
Free Fall	IEC 60068-2-32
Vibration	IEC 60068-2-6
WARRANTY	5 years

MOXA Internet Services

Customer satisfaction is our number one concern, and to ensure that customers receive the full benefit of our products, Moxa Internet Services has been set up to provide technical support, driver updates, product information, and user's manual updates.

The following services are provided

E-mail for technical support support@moxanet.com

World Wide Web (WWW) Site for product information:

<http://www.moxa.com> or
<http://www.moxa.com.tw>