

Moxa EtherDevice™ Switch

EDS-P510 Series Hardware Installation Guide

Second Edition, June 2010



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P/N: 1802005101011

Overview

We describe two products in this manual:

The Moxa EtherDevice™ EDS-P510 Series Ethernet switches are Gigabit managed redundant Ethernet switches that come standard with 4 10/100BaseT(X) 802.3af (PoE) compliant Ethernet ports and 3 combo Gigabit Ethernet ports. The EDS-P510 Ethernet switches provide up to 15.4 watts of power per PoE port, and allow power to be supplied to connected devices (such as surveillance cameras, wireless access points, and IP phones) when AC power is not readily available or cost-prohibitive to provide locally. The EDS-P510 Ethernet switches are highly versatile, and their SFP fiber port can transmit data up to 80 km from the device to the control center with high EMI immunity. The Ethernet switches support a variety of management functions, including Turbo Chain, IEEE 1588 PTP, Turbo Ring, RSTP/STP, IGMP, VLAN, QoS, RMON, bandwidth management, and port mirroring. The EDS-P510 series is designed especially for security automation applications such as IP surveillance and gate of entry systems, which can benefit from a scalable backbone construction and Power-over-Ethernet support.

The SPL-24 plays the role of PD, and splits the data signal and power signal that are transmitted from the PSE. The SPL-24 plays a dual role of providing power to industrial devices, and enabling Ethernet connections.

The EDS-P510 and SPL-24 can operate from 0 to 60°C or -40 to 75°C for T model and are designed to withstand a high degree of vibration and shock. The rugged hardware design makes the EDS-P510 Series and SPL-24 perfect for ensuring that your Ethernet equipment can operate in critical industrial environments, such as in hazardous locations, and complies with FCC and CE standards.

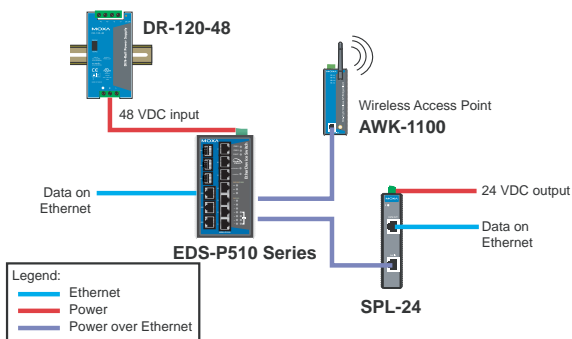
The installation of the EDS-P510 Series is presented on pages 8 to 14. The installation of the SPL-24 is presented on pages 14 to 18.

NOTE Throughout this Hardware Installation Guide, we use EDS as an abbreviation for Moxa EtherDevice Switch, and we use SPL as an abbreviation for Moxa PoE Splitter:

EDS = Moxa EtherDevice Switch

SPL = Moxa PoE Splitter

Moxa's PoE Solution



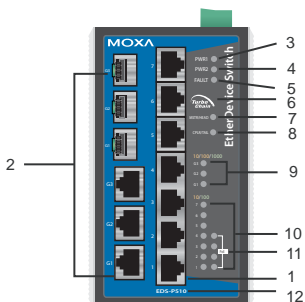
Package Checklist

The EDS-P510 is shipped with the following items. If any of these items are missing or damaged, please contact your customer service representative for assistance.

- 1 EDS-P510 EtherDevice Switch
- Hardware Installation Guide (this guide)
- CD-ROM with user's manual and Windows utility
- Moxa product warranty statement
- RJ45 to DB9 console port cable
- Protective caps for unused ports
- DIN-Rail mounting kit (attached to the EDS-P510's rear panel by default)

Panel Views of EDS-P510

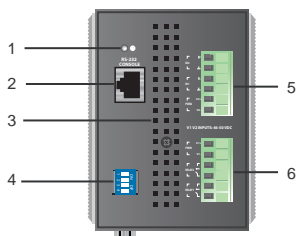
Front Panel View



Front Panel

1. 1 to 7: 10/100BaseT(X) port
2. G1 to G3: Combo (10/100/1000BaseT(X) or 100/1000BaseSFP slot Gigabit port.)
3. PWR1: LED for power input 1
4. PWR2: LED for power input 2
5. Fault LED
6. Turbo Chain logo
7. MSTR/HEAD LED
8. CPLR/TAIL LED
9. G1, G2, G3 LED for 10/100/1000Mbps speed
10. Port 1 to Port 7 LED for 10/100Mbps speed
11. PoE port LED (Port 1 to Port 4)
12. Model name

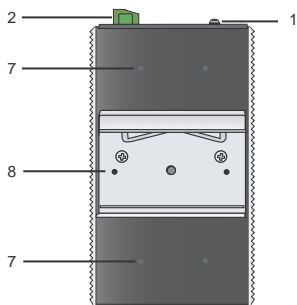
Top Panel View



Top Panel

1. Ground screw
2. RS-232 console port
3. Heat dissipation orifices
4. DIP switches for Ring Master, Ring Coupler, and Turbo Ring
5. 6-pin terminal block for DI 1, DI 2, and PWR 2
6. 6-pin terminal block for PWR1, Relay 1 and Relay 2

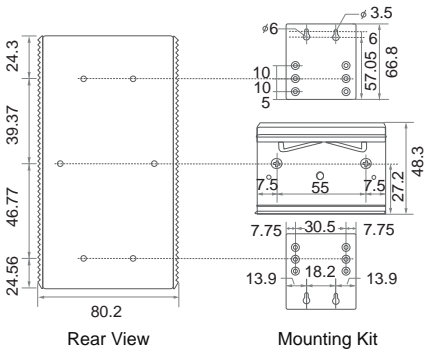
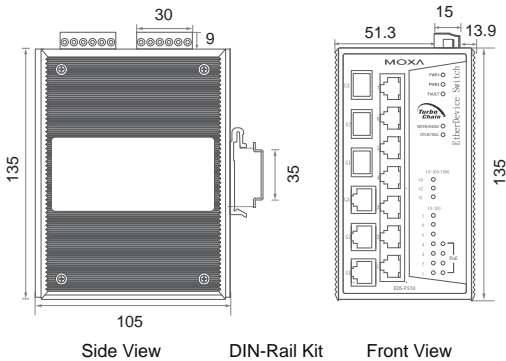
Rear Panel View



Rear Panel:

7. Screw holes for Wall Mounting Kit
8. DIN-Rail Kit

Mounting Dimensions (unit = mm)

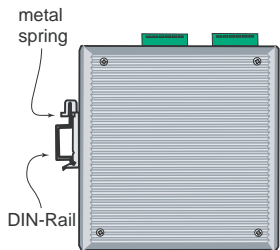
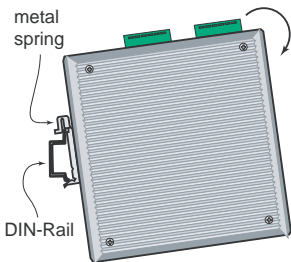


DIN-Rail Mounting

The aluminum DIN-Rail attachment plate should already be fixed to the back panel of the EDS-P510 when you take it out of the box. If you need to reattach the DIN-Rail attachment plate to the EDS-P510, make sure the stiff metal spring is situated towards the top, as shown by the following figures.

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 in the following illustration.

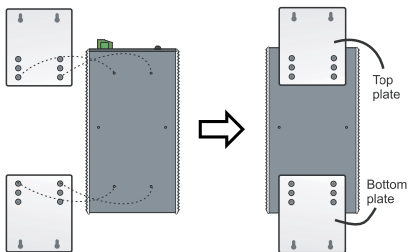


To remove the EDS-P510 from the DIN-Rail, simply reverse Steps 1 and 2 above.

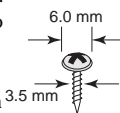
Wall Mounting (Optional)

For some applications, you will find it convenient to mount Moxa EDS-P510 on the wall, as shown in the following illustrations:

STEP 1—Remove the aluminum DIN-Rail attachment plate from the rear panel of the EDS-P510, and then attach the wall mount plates with M3 screws, as shown in the figure at the right.



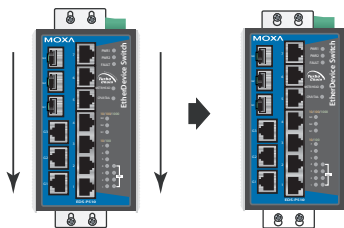
STEP 2—Mounting the EDS-P510 on the wall requires 4 screws. Use the EDS-P510, with wall mount plates attached, as a guide to mark the correct locations of the 4 screws. The heads of the screws should be less than 6.0 mm in diameter, and the shafts should be less than 3.5 mm in diameter, as shown in the figure on the right.



NOTE Before tightening the screws into the wall, make sure the screw head and shank size are suitable by inserting the screw through 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 to the wall, insert the four screw heads through the wide parts of the keyhole-shaped apertures, and then slide the EDS-P510 downwards, as indicated in the figure at the right. Tighten the four screws for more stability.



Wiring Requirements



WARNING

Do not disconnect modules or wires unless power has been switched off or the area is known to be non-hazardous. The devices may only be connected to the supply voltage shown on the type plate. The devices are designed for operation with a Safety Extra-Low Voltage. Thus, they may only be connected to the supply voltage connections and to the signal contact with the Safety Extra-Low Voltages (SELV) in compliance with IEC60950-1/EN60950-1.



ATTENTION

This unit is a built-in type. When the unit is installed in another piece of equipment, the equipment enclosing the unit must comply with fire enclosure regulation IEC60950-1/EN60950-1 (or similar regulation).



ATTENTION

Safety First!

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

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.

Please read and follow these 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 through 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.
- You should separate input wiring from output wiring.
- We advise that you label the wiring to all devices in the system.

Grounding the Moxa EDS-P510

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.



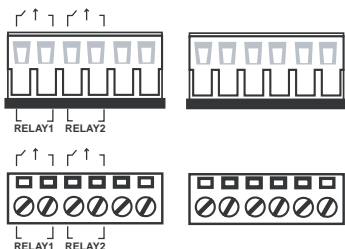
ATTENTION

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

Wiring the Relay Contact

The EDS-P510 has two sets of relay outputs—relay 1 and relay 2. Each relay contact uses two contacts of the terminal block on the EDS-P510'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.

In this section, we illustrate the meaning of the two contacts used to connect the relay contact.

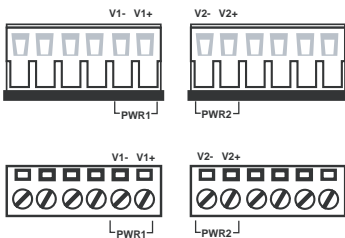


FAULT:

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 remains closed.

Wiring the Redundant Power Inputs

The EDS-P510 has two sets of power inputs—power input 1 and power input 2. The top two contacts and the bottom two contacts of the 6-pin terminal block connector on the EDS-P510's top panel are used for the two digital inputs. The top and front views of one of the terminal block connectors are shown here.



STEP 1: Insert the

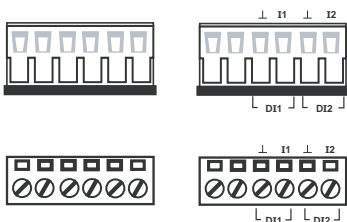
negative/positive DC wires into the V-/V+ terminals, respectively.

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 the EDS-P510's top panel.

Wiring the Digital Inputs

The EDS-P510 has two sets of digital inputs, DI 1 and DI 2. Each DI consists of two contacts of the 6-pin terminal block connector on the EDS-P510's top panel, which are used for the two DC inputs. The top and front views of one of the terminal block connectors are shown here.



STEP 1: Insert the negative (ground)/positive DI wires into the \perp /I1 terminals, respectively.

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.

STEP 3: Insert the plastic terminal block connector prongs into the terminal block receptor, which is located on the EDS-P510's top panel.

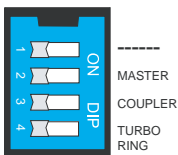
Turbo Ring DIP Switch Settings

EDS-P510 series are plug-and-play managed redundant Ethernet switches. The proprietary Turbo Ring protocol was developed by Moxa to provide better network reliability and faster recovery time. Moxa Turbo Ring's recovery time is less than 300 ms (**Turbo Ring**) or 20 ms (**Turbo Ring V2**)—compared to a 3- to 5-minute recovery time for commercial switches—decreasing the possible loss caused by network failures in an industrial setting.

There are 4 Hardware DIP Switches for Turbo Ring on the top panel of EDS-P510 that can help setup the Turbo Ring easily within seconds. If you do not want to use a hardware DIP switch to setup the Turbo Ring, you can use a web browser, telnet, or console to disable this function.

NOTE Please refer to the *Turbo Ring DIP Switch* section and *Using Communication Redundancy* section in User's Manual for more detail information about the settings and usage of *Turbo Ring* and *Turbo Ring V2*.

EDS-P510 Series DIP Switches



The default setting for each DIP Switch is OFF. The following table explains the effect of setting the DIP Switch to the ON position.

“Turbo Ring” DIP Switch Settings

DIP 1	DIP 2	DIP 3	DIP 4
Reserved for future use.	<u>ON</u> : Enables this EDS as the Ring Master.	<u>ON</u> : Enables the default “Ring Coupling” ports.	<u>ON</u> : Activates DIP switches 1, 2, 3 to configure “Turbo Ring” settings.
	<u>OFF</u> : This EDS will not be the Ring Master.	<u>OFF</u> : Do not use this EDS as the ring coupler.	<u>OFF</u> : DIP switches 1, 2, 3 will be disabled.

“Turbo Ring V2” DIP Switch Settings

DIP 1	DIP 2	DIP 3	DIP 4
<u>ON</u> : Enables the default “Ring Coupling (backup)” port.	<u>ON</u> : Enables this EDS as the Ring Master.	<u>ON</u> : Enables the default “Ring Coupling” port.	<u>ON</u> : Activates DIP switches 1, 2, 3 to configure “Turbo Ring V2” settings.
<u>OFF</u> : Enables the default “Ring Coupling (primary)” port.	<u>OFF</u> : This EDS will not be the Ring Master.	<u>OFF</u> : Do not use this EDS as a ring coupler.	<u>OFF</u> : DIP switches 1, 2, 3 will be disabled.

NOTE You must enable the Turbo Ring function first before using the DIP switch to activate the Master and Coupler functions.

NOTE If you do not enable any of the EDS-P510 switches to be the Ring Master, the Turbo Ring protocol will automatically choose the EDS-P510 with the smallest MAC address range to be the Ring Master. If you accidentally enable more than one EDS-P510 to be the Ring Master, these EDS-P510 switches will auto-negotiate to determine which one will be the Ring Master.

LED Indicators

The front panel of the Moxa EDS-P510 contains several LED indicators. The function of each LED is described in the following table:

LED	Color	State	Description
PWR1	AMBER	On	Power is being supplied to power input P1.
		Off	Power is not being supplied to power input P1.
PWR2	AMBER	On	Power is being supplied to power input P2.
		Off	Power is not being supplied to power input P2.
FAULT	RED	On	When a user-configured event is triggered.
		Off	When a user-configured event is not triggered.
MSTR/HEAD	GREEN	On	When the EDS-P510 is set as the Master of the Turbo Ring, or as the Head of the Turbo Chain.
		Blinking	The EDS-P510 has become the Ring Master of the Turbo Ring, or the Head of the Turbo Chain, after the Turbo Ring or the Turbo Chain is down.
		Off	When the EDS-P510 is not the Master of this Turbo Ring or is set as the Member of the Turbo Chain.
CPLR/TAIL	GREEN	On	When the EDS-P510 coupling function is enabled to form a back-up path, or when it's set as the Tail of the Turbo Chain.
		Blinking	When the Turbo Chain is down.
		Off	When the EDS-P510 disables the coupling function.
Port1 to Port7 (10M)	AMBER	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.
Port1 to Port7 (100M)	GREEN	On	TP port's 100 Mbps link is active.
		Blinking	Data is being transmitted at 100 Mbps.
		Off	TP port's 100 Mbps link is inactive.
G1 to G3 (10/100M)	AMBER	On	G1 to G3 port's 10/100Mbps link is active.
		Blinking	Data is being transmitted at 10/100Mbps.
		Off	G1 to G3 port's 10/100Mbps link is inactive.

G1 to G3 (1000M)	GREEN	On	G1 to G3 port's 1000 Mbps link is active.
		Blinking	Data is being transmitted at 1000 Mbps.
		Off	G1 to G3 port's 1000 Mbps link is inactive.
PoE	AMBER	On	Power is being supplied to Powered Device (PD)
		Blinking	PoE port is in Power-Fail status
		Off	Power is not being supplied to Powered Device (PD)

Specifications of EDS-P510 Series

Technology	
Standards	IEEE 802.3af for Power-over-Ethernet, IEEE 802.3 for 10BaseT, IEEE 802.3u for 100BaseT(X) and 100Base FX, IEEE 802.3ab for 1000BaseT(X), IEEE 802.3z for 1000BaseSX/LX/LHX/ZX, IEEE 802.3x for Flow Control, IEEE 802.1D for Spanning Tree Protocol, IEEE 802.1w for Rapid STP, 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, DHCP Option 66/67/82, BootP, TFTP, SNTP, SMTP, RARP, RMON, HTTP, HTTPS, Telnet, SSH, Syslog, IPv6, LLDP, IEEE 1588 PTP, Modbus/TCP, SNMP Inform
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
Interface	
RJ45 Ports	10/100BaseT(X) or 10/100/1000BaseT(X) auto negotiation speed
Fiber Ports	100/1000BaseSFP slot
Console Port	RS-232 (RJ45)
LED Indicators	PWR1, PWR2, FAULT, 10/100M (TP port), 1000M (Gigabit port), MSTR/HEAD, CPLR/TAIL, PoE
DIP Switch	Turbo Ring, Master, Coupler, Reserve

Alarm Contact	Two relay outputs with current carrying capacity of 0.5A @ 48 VDC
Digital Input	Two inputs with the same ground, but electrically isolated from the electronics <ul style="list-style-type: none"> • For state “1”: +13 to +30V • For state “0”: -30 to +3V • Max. input current: 8 mA
PoE (per port)	
Max. Output Power	15.4W
Output Voltage	44 to 48.5 VDC
Max. Output Current	350 mA
Max. Overload Protection	400 mA
Power	
Input Voltage	48 VDC (46 to 50 VDC), redundant dual inputs
Connection	Two removable 6-pin terminal blocks
Overload Current Protection	Present
Reverse Polarity Protection	Present
Physical Characteristics	
Casing	IP30 protection, metal case
Dimensions	80.2 × 135 × 105 mm (3.16 × 5.31 × 4.13 in)
Weight	1170g
Installation	DIN-Rail, Wall Mounting Kit (optional kit)
Environment	
Operating Temperature	0 to 60°C (32 to 140°F), standard models -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)
Regulatory Approvals	
Safety	UL508, EN60950-1 (Pending)
Hazardous Location	UL/cUL Class I, Division 2, Groups A, B, C, and D (Pending); ATEX Class I, Zone 2, Ex nC IIC (Pending)
Maritime:	DNV, GL
Traffic Control:	NEMA TS2 (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
Shock	IEC60068-2-27
Freefall	IEC60068-2-32
Vibration	IEC60068-2-6
Warranty	
Time Period	5 years
Details	www.moxa.com/warranty

Technical Support Contact Information

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