PT-G510 Series
Quick Installation Guide

Version 1.1, September 2023

Technical Support Contact Information
www.moxa.com/support

MOXA®

Package Checklist

Moxa's PT-G510 industrial DIN-rail switch is shipped with the following items. If any of these items are missing or damaged, please contact your customer service representative for assistance.

• PT-G510 switch
• DIN-rail kit
• Protective caps on SFP ports and USB Storage ports
• RJ45 to DB9 Cable
• Quick installation guide (printed)
• Substance Disclosure Table
• Product Certificate of Quality Inspection (Simplified Chinese)
• Product Notices (Simplified Chinese)
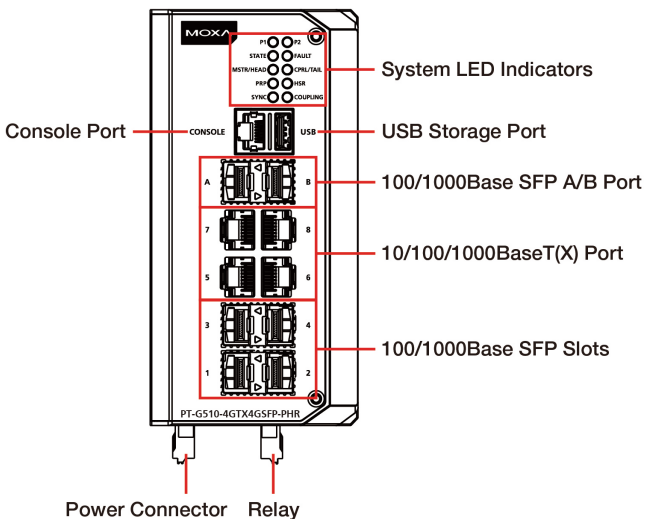• Warranty card

NOTE You can find information and software downloads on the relevant product pages located on Moxa's website: www.moxa.com/
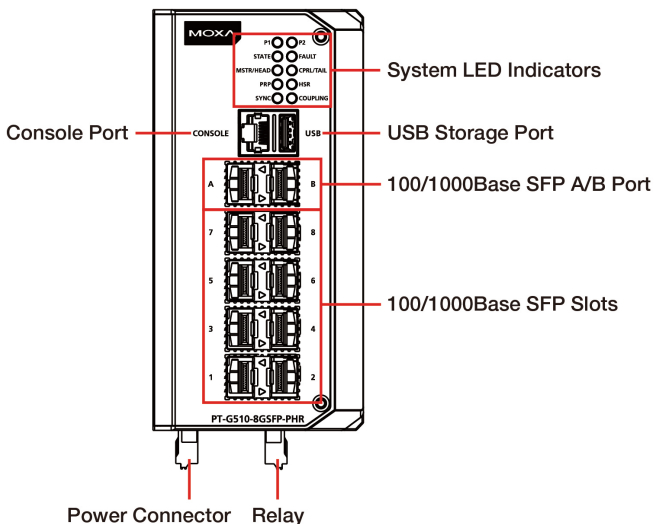
Default Settings

• Default IP address: 192.168.127.253
• Default Subnet Mask: 255.255.255.0
• Default Usernames: admin, user
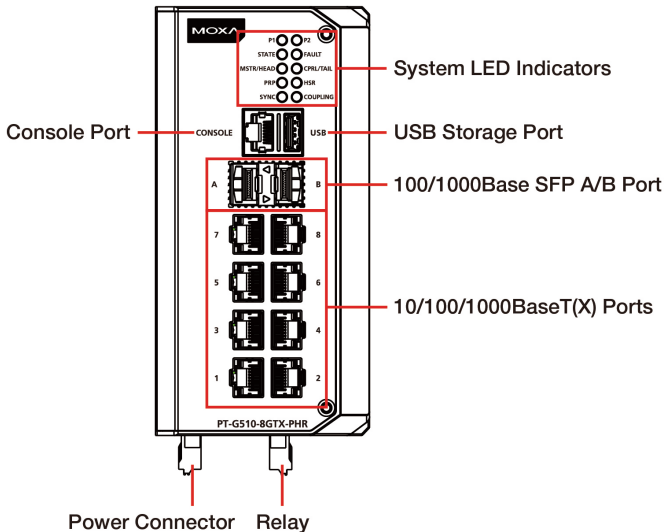• Default Password: moxa

Panel Layouts

PT-G510-4GTX4GSFP-PHR Models

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PT-G510-8GSFP-PHR Models

Console Port

System LED Indicators

USB Storage Port

100/1000Base SFP A/B Port

100/1000Base SFP Slots

Power Connector   Relay

PT-G510-8GTX-PHR Models

Console Port

System LED Indicators

USB Storage Port

100/1000Base SFP A/B Port

10/100/1000BaseT(X) Ports

Power Connector   Relay
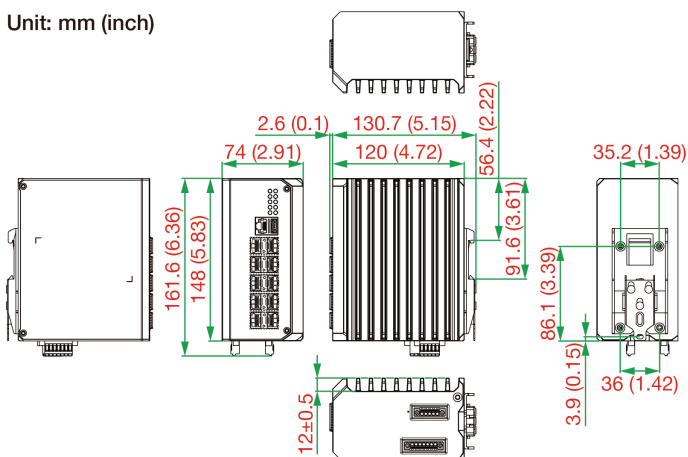
Dimensions

Unit: mm (inch)

DIN-rail Mounting Instructions

The DIN-rail mounting kit is fixed to the back panel of the PT-G510 by default. Mount the PT-G510 on a corrosion free mounting rail that meets the EN 60715 standard.
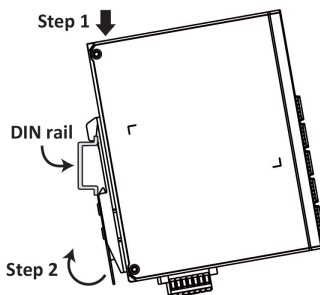
Installation

STEP 1:
Insert the upper lip of the DIN-rail into the DIN-rail mounting kit.

STEP 2:
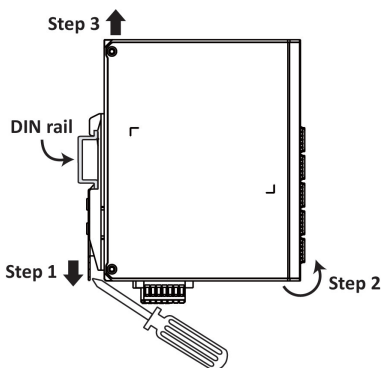Press the PT-G510 towards the DIN-rail until it snaps into place.

Removal

STEP 1:
Pull down the latch on the mounting kit with a screwdriver.

STEP 2 & 3:
Slightly pull the PT-G510 forward and lift to remove it from the DIN rail.

⚠️ **ATTENTION**

Safety First!

Be sure to disconnect the power cord before installing and/or wiring your Ethernet 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, which can cause serious damage to your equipment.
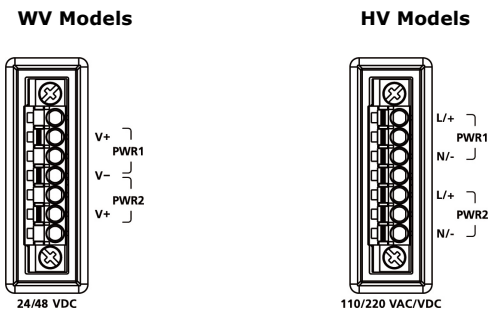

⚠️ **WARNING**

Use only a Laser Class 1 optical transceiver with this device.

Connecting the Power Inputs

The PT-G510 Series switches support various types of power supplies.

- WV models come with two 24 to 48 VDC power inputs.
- HV models come with two 110 to 220 VDC/VAC power inputs.

Refer to the table below for an overview of the power input connectors on HV and WV models:

WV Models

V+ ⌐ PWR1
V− ⌐
PWR2
V+ ⌐

24/48 VDC

HV Models

L/+ ⌐ PWR1
N/- ⌐
L/+ ⌐
PWR2
N/- ⌐

110/220 VAC/VDC

⚠ **WARNING**

This equipment is intended to be supplied by an external power source (UL listed/ IEC 60950-1/ IEC 62368-1) with output rating 24 to 48 VDC, 1.1 A (minimum) or 110 to 220 VDC, 0.3 A (minimum), and an ambient temperature of 75°C (minimum).

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 device may only be connected to the supply voltage shown on the type plate. The device is designed for operation with a Safety Extra-Low Voltage (SELV) or an isolated power supply, which means that the device may only be connected to the supply voltage connections and to the signal contact with a SELV or an isolated power supply in compliance with IEC 62368-1/EN 62368-1/UL 62368-1 or UL 61010.

Wiring the Redundant Power Inputs

The PT-G510 Series provides high-voltage (HV) and low-voltage (WV) models with two power inputs for redundancy. Refer to the instructions below on how to wire to the terminal block connectors.

> ⚠ **ATTENTION**
>
> Before connecting the PT-G510 Series to the AC or DC power inputs, make sure the power source voltage is stable.

> **NOTE** If you intend to only use one power input, be sure to disconnect the other power input (unplug the power cord or disconnect the power input from the L and N contacts). Only one power input LED will be on.

> **NOTE** When wiring the relay contact, we suggest using the cable type – AWG (American Wire Gauge) 19-24.

For HV Models:

> **NOTE** For HV models with 220 VAC wires:
>
> 1. The AC voltages between each of the two wires from the power supply source must be less than 264 VAC RMS. To measure and ensure the AC voltage for the PWR1 and PWR2 is within the correct range, please use a qualified digital multi-meter (e.g., a Fluke 85V or equivalent) before connecting and applying the power source to the PT-G510 PWR1 and PWR2 input terminals. If the difference in AC voltage exceeds 264 VAC RMS, an isolation transformer (220 V to 110 V; minimum 50 VA) must be used between the PT-G510 Series and the AC power source to avoid damage from power surges.
>
> 2. Please use an isolation transformer (220 V to 110 V; minimum 50 VA) between the PT-G510 Series and the Uninterruptible Power Supply (UPS) source to avoid damage from power surges. Please use a qualified digital multi-meter to measure the AC power difference between each pair of the four power cable wires to ensure that the voltage difference between each pair of wires is less than 264 VAC RMS. You will need to measure the voltage difference between 4 pairs of wires, as listed below: [L1-N1], [L1-N2], [L1-L2] [N1-N2], [N1-L2], [N2-L2].

> **NOTE** If you intend to only use one power input, be sure to disconnect the other power input (unplug the power cord or disconnect the power input from the L and N contacts). Only one power input LED will be on.

STEP 1: Insert the positive/negative DC or line/neutral AC wires into the V+/V- or L/N terminals, respectively.

STEP 2: Use a flat-blade screwdriver to tighten the wire-clamps on the front of the terminal block connector to fasten the wires.

STEP 3: Insert the plastic terminal block connector prongs into the terminal block receptor.
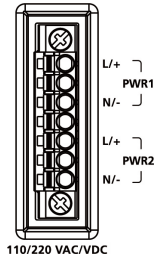
For WV Models:

STEP 1: Insert the positive/negative DC wires into the V+/V- terminals, respectively.

STEP 2: Use a flat-blade screwdriver to tighten the wire-clamps on the front of the terminal block connector to fasten the wires.

STEP 3: Insert the plastic terminal block connector prongs into the terminal block receptor.
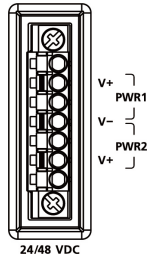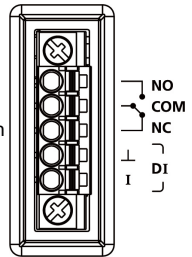
Wiring the Relay Contact

Each power module has one relay output that can provide two types of relay output. Refer to the table below for detailed information.

The relay contact is used to detect user-configured events. Two wires are attached to the relay pins with normally close and normally open options.

FAULT:

The relay contact of the 3-pin terminal block connector is used to detect user-configured events. The module provides normally open (NO) and normally closed (NC) circuits depending on what the user chooses. For pin definitions, refer to the table below.

Relay connection	Power on state	Event trigger
NO and COM	Closed circuit	Open circuit
NC and COM	Open circuit	Closed circuit

> **NOTE** When wiring the relay contact, we suggest using the cable type
> - AWG (American Wire Gauge) 16-24 (1.31-0.205 mm²) and
> the corresponding pin type cable terminals. The connector
> must be able to withstand torque at maximum 5 pound-inches.
> The rated temperature of wiring should be at least 105°C.

Grounding the Moxa Industrial DIN-rail 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.
Refer to table below for the location of the grounding screw.

HV Models

WV Models
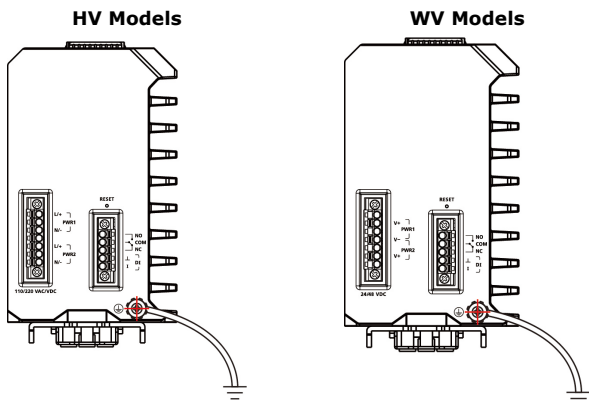
> **NOTE** Using a shielded cable achieves better electromagnetic
> resistance. Use a green-yellow grounding cable with a wire size
> AWG 18 or higher to ground this product to earth.

RJ45 Console Connection

The PT-G510 has one RJ45 console port (RS-232) located on the front
panel. Use an RJ45-based cable to connect the PT-G510's console port
to your PC's COM port. You may then use a console terminal program,
such as Moxa PComm Lite - Serial Communication Tool for Windows, to
access the PT-G510 with a baudrate of 115200. Refer to the following
for the pin definition of the console port.

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
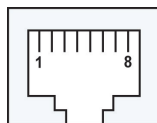
USB Storage Connection

The USB storage port is on the front panel of the PT-G510 switch and
comes with a type A connector (see the diagram below for pinout
assignments). Use Moxa's ABC-02-USB automatic backup configurator

to connect to the PT-G510 USB storage port in order to perform configuration backup, firmware upgrade, or system log file backup.

Pin	Description
1	VCC (+5V)
2	D- (Data-)
3	D+ (Data+)
4	GND (Ground)

The Reset Button

The reset button can perform two functions. One is to reset the PT-G510 switch back to factory default settings and the other is to perform a quick backup of configuration and log files to the ABC-02-USB automatic backup configurator.

Reset to Factory Default Settings

Use a pointed object, such as a straightened paper clip or toothpick, to depress the Reset button. When you do so, the STATE LED will start to blink about once per second. Continue until the STATE LED begins blinking more rapidly; this indicates that the button has been depressed for five seconds and you can release the Reset button to load factory default settings.

NOTE   DO NOT power off the switch when loading default settings.

Configuration and Log Files Backup

When the ABC-02-USB is connected to the PT-G510 switch, the reset button allows for a quick back up of configuration and event logs to the ABC-02-USB. Press the reset button to start backing up the current system configuration files and event logs to the ABC-02-USB.

NOTE   When the ABC-02 is plugged in, you cannot reset to factory default by pressing the reset button.

LED Indicators

The front panel of the PT-G510 switch contains several LED indicators. The function of each LED is described in the table below:

LED	Color	State	Description
System LEDs			
State (S)	Green	On	When system has passed power-on self-test (POST) and is ready to run.
		Blinking	• When the reset button is pressed for 5 seconds to reset to factory default. • When a USB drive is detected. • Web locator is on.
		Off	N/A
	Red	On	• Switch initialization failure. • When the power-on self-test (POST) fails.
FAULT (F)	Red	On	• USB detected/operation failed. • Network loop detected when loop protection is enabled. • Relay NC is on. • The ring port connection is not valid.
		Blinking	• EEPROM information error. • Web locator is on.
		Off	The system is operating normally, and no user-configured event is triggered.
Power1 (P1)	Amber	On	Power is being supplied to power input P1.
		Off	Power is not being supplied to power input P1.
Power2 (P2)	Amber	On	Power is being supplied to power input P2.
		Off	Power is not being supplied to power input P2.
MSTR/HEAD (M/H)	Green	On	• EEPROM information error. • When the switch is Master/Head/Root of Turbo Ring/Turbo Chain/Fast RSTP. • When the switch is MRM of MRP and the MRP ring is closed.
		Blinking	• When the switch is Ring Master/Head of Turbo Ring/Turbo Chain, and the Turbo Ring/Turbo Chain is broken. • When the switch is MRM of MRP and the MRP ring is broken. • Web locator is on.
		Off	When the switch is not the Master/Head/Root of this Turbo Ring/Turbo Chain/Fast RSTP.

LED	Color	State	Description
CPRL/TAIL (C/T)	Green	On	• When the switch enables the coupling function to form a back-up path. • When the switch is tail of Turbo Chain.
		Blinking	• When the switch is enabled Turbo Chain and Turbo Chain is broken. • Web locator on.
		Off	When the switch disables the coupling or tail role of Turbo Chain.
SYNC	Amber	On	The PTP function is enabled and is in the free-run state.
		Blinking	The PTP function is enabled, and switch is in syncing state.
	Green	On	The PTP function has successfully converged
		Off	The PTP function is off.
Redundancy			
PRP	Green	On	PRP mode is enabled.
		Off	PRP mode is disabled.
HSR	Green	On	HSR mode is enabled.
		Off	HSR mode is disabled.
Coupling	Green	On	PRP/HSR Coupling mode is enabled.
		Off	PRP/HSR Coupling mode is disabled.
Port LEDs			
10M/100M/1000M Copper	Green	On	When the port is active, and link is on 1000 Mbps.
		Blinking	When the port's data is being transmitted at 1000 Mbps.
		Off	When the port is inactive, or link is down.
	Amber	On	When the port is active, and link is on 100/10 Mbps.
		Blinking	When the port's data is being transmitted at 100/10 Mbps.
		Off	When the port is inactive or the link is down.
100M/1000M SPF	Green	On	When the port is active, and the link is on 1000 Mbps.
		Blinking	When data is being transmitted at 1000 Mbps.
		Off	When the port is inactive or the link is down.
	Amber	On	When the port is active and the link is on 100 Mbps.
		Blinking	When data is being transmitted at 100 Mbps.
		Off	When the port is inactive, or link is down.

Specifications

Technology	
Standards	IEEE 802.3u for 100BaseT(X) and 100BaseFX
	IEEE 802.3ab for 1000BaseT(X)
	IEEE 802.3z for 1000BaseX
	IEEE 802.1D-2004 for Spanning Tree Protocol
	IEEE 802.1w for Rapid Spanning Tree Protocol
	IEEE 802.1p for Class of Service
	IEEE 802.1Qfor VLAN Tagging
	IEEE 802.1X for authentication
	IEEE 802.3ad for Port Trunk with LACP
	IEEE 802.3x for flow control
Input Output Interface	
Alarm Contact Channels	Resistive load: 1 A @ 24 VDC
Ethernet Interface	
10/100/1000BaseT(X) ports (RJ45 connector)	PT-G510-8GTX-PHR Models: 8
	PT-G510-4GTX4GSFP-PHR Models: 4
100/1000Base SFP slots	PT-G510-8GSFP-PHR Models: 10
	PT-G510-4GTX4GSFP-PHR Models: 6
Power Parameters	
Input Voltage	PT-G510-PHR-HV Models: 110 to 220 VAC, 50/60 Hz, 110 to 220 VDC
	PT-G510-PRP-WV Models: 24 to 48 VDC
	Note: Both -HV and -WV models support dual power inputs with a single power module.
Overload Current Protection	Yes
Reverse Polarity Protection	Yes
Input Current	PT-G510-PHR-HV Models: 0.5 A @ 110 to 220 VAC
	PT-G510-PHR-HV Models: 0.3 A @ 110 to 220 VDC
	PT-G510-PHR-WV Models: 1.1 A @ 24 to 48 VDC
Power Consumption (Max.)	PT-G510-8GSFP-PHR-HV Models:
	• 110 VAC: 23.54 W
	• 220 VAC: 24.57 W
	• 110 VDC: 23.485 W
	• 220 VDC: 23.88 W
	PT-G510-8GSFP-PHR-WV Models:
	• 24 VDC: 21.868 W
	• 48 VDC: 22.646 W
Physical Characteristics	
IP Rating	IP30
Dimensions	74 x 148 x 120 mm (2.91 x 5.83 x 4.72 in)
Weight	1,476 g (3.3 lb)
Installation	DIN-rail mounting
Environmental Limits	
Operating Temperature	-40 to 75°C (-40 to 167°F)
	-40 to 85°C (-40 to 185°F) for 16 hrs based on 85°C test in accordance with IEC 60068-2-2.

Storage Temperature (Package Included)	-40 to 85°C (-40 to 185°F)
Ambient Relative Humidity	5 to 95% (non-condensing)
Standards and Certifications	
Safety	UL 62368-1, IEC 62368-1
EMI	CISPR 32, FCC Part 15B Class A
EMC	EN 55032/35
EMS	IEC 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 20 V/m IEC 61000-4-4 EFT: Power: 4 kV; Signal: 4 kV IEC 61000-4-5 Surge: Power: 4 kV; Signal: 4 kV IEC 61000-4-6 CS: 10 V IEC 61000-4-8 PFMF EN61000-4-11
Power Substation	IEC 61850-3 Edition 2.0 Class2, IEEE 1613
Railway	EN 50121-4
Marine	DNV, IEC 60945 (-WV models only)
Warranty	
Warranty Period	5 years
Details	See www.moxa.com/warranty

Restricted Access Locations

⚠️ **WARNING**

This equipment is intended to be used in Restricted Access Locations, such as a computer room, with access limited to service personnel or users who have been instructed on how to handle the metal chassis of equipment that is very hot. The location should only be accessible with a key or through a security system.

⚠️ **WARNING**

External metal parts of this equipment are extremely hot. Before touching the equipment, you must take special precautions to protect your hands and body from serious injury.

> ⚠️ **ATTENTION**
>
> 1. To protect against the risk of fire, only replace the fuse with one that has the same type and rating.
> 2. It is recommended to incorporate a readily accessible disconnect device into the building installation wiring. Importantly, ensure the power supply is disconnected before performing any maintenance.
> 3. This equipment is designed to connect the earthed conductor of the D.C supply circuit to the equipment's earthing conductor.

Patent Marking

This product is protected by a patent. For details, see
https://www.moxa.com/doc/operations/Moxa_Patent_Marking.pdf