

# PT-508/510 Series

## IEC 61850-3 8/10-port Layer 2 DIN-rail managed Ethernet switches



- > IEC 61850-3 and IEEE 1613 (power substations) compliant
- > Turbo Ring and Turbo Chain (recovery time < 20 ms @ 250 switches), RSTP/STP, and MSTP for network redundancy
- > Easy network management by web browser, CLI, Telnet/serial console, windows utility, and ABC-01
- > Isolated universal 24 VDC or 48 VDC redundant power inputs
- > Wide 110/220 VDC/VAC power supply range
- > Modbus/TCP, LLDP, SNMP Inform, QoS, IGMP snooping, VLAN, IEEE 802.1X, HTTPS, SNMPv3, and SSH supported
- > -40 to 85°C operating temperature range



### Introduction

The PowerTrans PT-508/510 is designed to meet the demands of power substation automation systems (IEC 61850-3, IEEE 1613). The PT-508/510's optical fiber Fast Ethernet backbone, redundant ring, redundant power inputs (24 VDC or 48 VDC), and isolated power inputs (24 VDC, 48 VDC, or 110/220 VDC/VAC) increase the reliability

of your communications and save on cabling/wiring costs. In addition, the DIN-rail and wall-mounting design of the PT-508/510 makes network planning easy, and allows greater flexibility by letting you install up to 8/10 Fast Ethernet ports for power distribution applications.

### General Features and Benefits

- Command Line Interface (CLI) for quickly configuring major managed functions
- IPv6 Ready logo awarded (IPv6 Logo Committee certified)
- Software-based IEEE 1588v2 PTP (Precision Time Protocol) for time synchronization of networks
- VLAN Unaware: Supports priority-tagged frames to be received by specific IEDs
- DHCP Option 82 for IP address assignment with different policies
- EtherNet/IP and Modbus/TCP industrial Ethernet protocols supported
- Turbo Ring and Turbo Chain (recovery time < 20 ms @ 250 switches), RSTP/STP, and MSTP for network redundancy
- IGMP snooping and GMRP for filtering multicast traffic from industrial Ethernet protocols
- IEEE 802.3ad, LACP for optimum bandwidth utilization
- Bandwidth management prevents unpredictable network status
- Multi-port mirroring for online debugging
- Automatic warning by exception through email, relay output
- RMON for efficient network monitoring and proactive capability
- Automatic recovery of connected device's IP addresses
- Line-swap fast recovery
- Configurable by Web browser, Telnet/Serial console, CLI, Windows utility, and ABC-01 automatic backup configurator

### Cybersecurity Features

- User passwords with multiple levels of security protect against unauthorized configuration
- SSH/HTTPS is used to encrypt passwords and data
- Lock switch ports with 802.1X port-based network access control so that only authorized clients can access the port
- Disable one or more ports to block network traffic
- 802.1Q VLAN allows you to logically partition traffic transmitted between selected switch ports
- Secure switch ports so that only specific devices and/or MAC addresses can access the ports
- RADIUS/TACACS+ allows you to manage passwords from a central location
- SNMPv3 provides encrypted authentication and access security

## Specifications

### Technology

#### Standards:

IEEE 802.3 for 10BaseT  
 IEEE 802.3u for 100BaseT(X) and 100BaseFX  
 IEEE 802.3x for Flow Control  
 IEEE 802.1D for Spanning Tree Protocol  
 IEEE 802.1w for Rapid Spanning Tree Protocol  
 IEEE 802.1D-2004 for Spanning Tree Protocol  
 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  
 IEEE 802.1s for Multiple Spanning Tree Protocol

### Software Features

**Management:** IPv4/IPv6, SNMPv1/v2c/v3, DHCP Server/Client, DHCP Option 66/67/82, BootP, TFTP, SMTP, RARP, HTTP, HTTPS, Telnet, SNMP Inform, LLDP, Flow Control, Back Pressure Flow Control, Port Mirror, Syslog, RMON

**Filter:** IGMPv1/v2, GMRP, GVRP, 802.1Q VLAN, VLAN Unaware, Port-Based VLAN, GVRP

**Redundancy Protocols:** STP/RSTP, MSTP, Turbo Ring v1/v2, Turbo Chain, Link Aggregation

**Security:** RADIUS, TACACS+, SSL, SSH, Port Lock

**Time Management:** SNTP, NTP Server/Client, IEEE 1588v2 PTP (software-based)

**Industrial Protocols:** EtherNet/IP, Modbus/TCP

**MIB:** MIB-II, Ethernet-like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Group 1, 2, 3, 9

### Switch Properties

**Priority Queues:** 4

**Max. Number of VLANs:** 64

**VLAN ID Range:** VID 1 to 4094

**IGMP Groups:** 256

**MAC Table Size:** 8 K

**Packet Buffer Size:** 1 Mbit

### Interface

**RJ45 Ports:** 10/100BaseT(X) auto negotiation speed, F/H duplex mode, and auto MDI/MDI-X connection

**Fiber Ports:** 100BaseFX ports (SC/ST/LC/MTRJ connector)

**Console Port:** RS-232 (RJ45)

**Alarm Contact:** 1 relay output with current carrying capacity of 1 A @ 24 VDC

### Optical Fiber

		100BaseFX		
		Multi-Mode		Single-Mode
Fiber Cable Type		OM1	50/125 μm	G.652
			800 MHz*km	
Typical Distance		4 km	5 km	40 km
Wave-length	Typical (nm)	1300		1310
	TX Range (nm)	1260 to 1360		1280 to 1340
	RX Range (nm)	1100 to 1600		1100 to 1600
Optical Power	TX Range (dBm)	-10 to -20		0 to -5
	RX Range (dBm)	-3 to -32		-3 to -34
	Link Budget (dB)	12		29
	Dispersion Penalty (dB)	3		1

Note: When connecting a single-mode fiber transceiver, we recommend using an attenuator to prevent damage caused by excessive optical power.

Note: Compute the "typical distance" of a specific fiber transceiver as follows: Link budget (dB) > dispersion penalty (dB) + total link loss (dB).

### Power Requirements

#### Input Voltage:

- 24 VDC
- 48 VDC
- 110/220 VDC/VAC

#### Operating Voltage:

- 18 to 36 V (24 VDC)
- 36 to 72 V (48 VDC)
- 88 to 300 VDC, 85 to 264 VAC (110/220 VDC/VAC)

#### Input Current: (all ports are equipped with fiber)

- PT-508:
- Max. 0.27 A @ 24 VDC
  - Max. 0.12 A @ 48 VDC
  - Max. 0.084/0.043 A @ 110/220 VDC
  - Max. 0.18/0.11 A @ 110/220 VAC

#### PT-510:

- Max. 0.39 A @ 24 VDC
- Max. 0.18 A @ 48 VDC
- Max. 0.10/0.052 A @ 110/220 VDC
- Max. 0.234/0.148 A @ 110/220 VAC

**Overload Current Protection:** Present

**Connection:** 5-pin terminal blocks

**Reverse Polarity Protection:** Present

### Physical Characteristics

**Housing:** Aluminum alloy

**IP Rating:** IP40 protection

#### Dimensions:

PT-508: 60 x 160 x 110 mm (2.36 x 6.30 x 4.33 in)

PT-510: 80 x 160 x 110 mm (3.15 x 6.30 x 4.33 in)

#### Weight:

PT-508: 995 g (2.21 lb)

PT-510: 1210 g (2.69 lb)

**Installation:** DIN-rail mounting, wall mounting (with optional kit)

### Environmental Limits

**Operating Temperature:** -40 to 85°C (-40 to 185°F), cold start requires min. of 100 VAC at -40°C

**Storage Temperature:** -40 to 85°C (-40 to 185°F)

**Ambient Relative Humidity:** 5 to 95% (non-condensing)

### Standards and Certifications

**Safety:** UL 508

**EMI:** FCC Part 15 Subpart B Class A, EN 55022 Class A

**EMS:** IEC 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV

IEC 61000-4-3 RS: 80 MHz to 1 GHz:

PT-508: 20 V/m

PT-510: 35 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

IEC 61000-4-11

**Electrical Substation:** IEC 61850-3, IEEE 1613

Note: Please check Moxa's website for the most up-to-date certification status.

### MTBF (mean time between failures)

#### Time:

PT-508: 394,238 hrs

PT-510: 372,276 hrs

**Standard:** Telcordia SR332

### Warranty

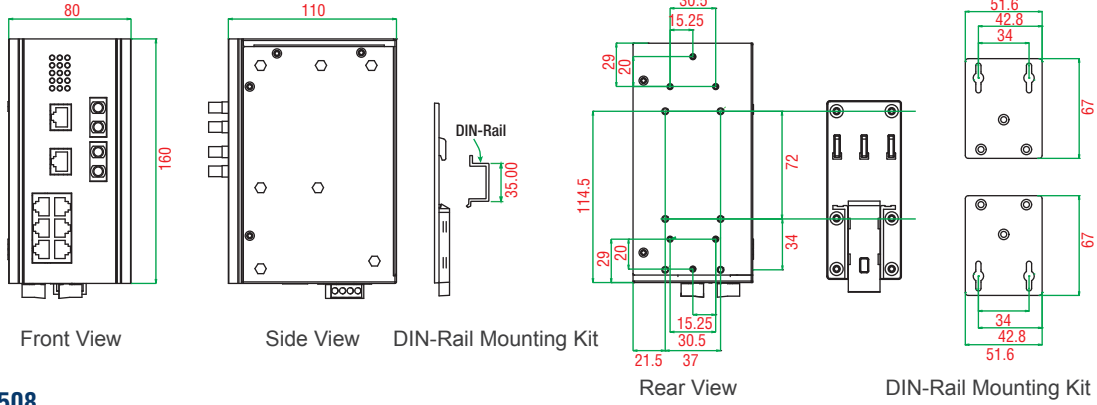
**Warranty Period:** 5 years

**Details:** See [www.moxa.com/warranty](http://www.moxa.com/warranty)

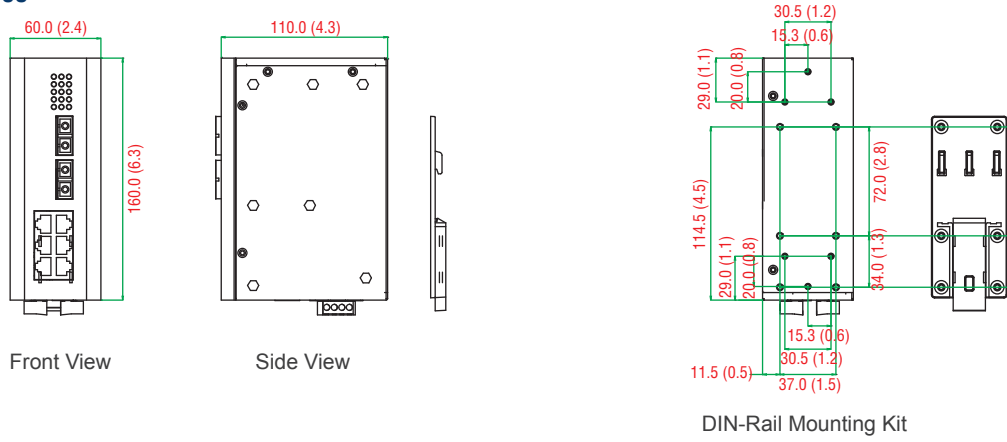
**Dimensions**

Unit: mm (inch)

**PT-510**



**PT-508**



## Ordering Information

Available Models				Port Interface						
DIN-Rail, Front Cabling, Front Display	Power Supply			10/100 BaseT(X)	100BaseFX					
	24 VDC	48 VDC	HV: 110/220 VDC/VAC		Multi-mode, SC Connector	Multi-mode, ST Connector	Multi-mode, LC Connector	Multi-mode, MTRJ Connector	Single- mode, SC Connector	Single- mode, LC Connector
PT-508-MM-SC-24	1	–	–	6	2	–	–	–	–	–
PT-508-MM-SC-48	–	1	–	6	2	–	–	–	–	–
PT-508-MM-SC-HV	–	–	1	6	2	–	–	–	–	–
PT-508-MM-ST-24	1	–	–	6	–	2	–	–	–	–
PT-508-MM-ST-48	–	1	–	6	–	2	–	–	–	–
PT-508-MM-ST-HV	–	–	1	6	–	2	–	–	–	–
PT-508-MM-LC-24	1	–	–	6	–	–	2	–	–	–
PT-508-MM-LC-48	–	1	–	6	–	–	2	–	–	–
PT-508-MM-LC-HV	–	–	1	6	–	–	2	–	–	–
PT-508-SS-SC-24	1	–	–	6	–	–	–	–	2	–
PT-508-SS-SC-48	–	1	–	6	–	–	–	–	2	–
PT-508-SS-SC-HV	–	–	1	6	–	–	–	–	2	–
PT-508-SS-LC-24	1	–	–	6	–	–	–	–	–	2
PT-508-SS-LC-48	–	1	–	6	–	–	–	–	–	2
PT-508-SS-LC-HV	–	–	1	6	–	–	–	–	–	2
PT-510-4M-ST-24	1	–	–	6	–	4	–	–	–	–
PT-510-4M-ST-48	–	1	–	6	–	4	–	–	–	–
PT-510-4M-ST-HV	–	–	1	6	–	4	–	–	–	–
PT-510-MM-SC-24	1	–	–	8	2	–	–	–	–	–
PT-510-MM-SC-48	–	1	–	8	2	–	–	–	–	–
PT-510-MM-SC-HV	–	–	1	8	2	–	–	–	–	–
PT-510-MM-ST-24	1	–	–	8	–	2	–	–	–	–
PT-510-MM-ST-48	–	1	–	8	–	2	–	–	–	–
PT-510-MM-ST-HV	–	–	1	8	–	2	–	–	–	–
PT-510-MM-LC-24	1	–	–	8	–	–	2	–	–	–
PT-510-MM-LC-48	–	1	–	8	–	–	2	–	–	–
PT-510-MM-LC-HV	–	–	1	8	–	–	2	–	–	–
PT-510-SS-SC-24	1	–	–	8	–	–	–	–	2	–
PT-510-SS-SC-48	–	1	–	8	–	–	–	–	2	–
PT-510-SS-SC-HV	–	–	1	8	–	–	–	–	2	–
PT-510-3S-SC-HV	–	–	1	7	–	–	–	–	3	–
PT-510-3S-SC-24	1	–	–	7	–	–	–	–	3	–
PT-510-3S-SC-48	–	1	–	7	–	–	–	–	3	–
PT-510-SS-LC-24	1	–	–	8	–	–	–	–	–	2
PT-510-SS-LC-48	–	1	–	8	–	–	–	–	–	2
PT-510-SS-LC-HV	–	–	1	8	–	–	–	–	–	2

**Note:**

Additional switch configurations with 2 Gigabit ports or 3 or 4 fiber ports are available by special request.  
24 VDC, 48 VDC, and HV models support isolated power; only 24 VDC and 48 VDC models support redundant power inputs.

### Optional Accessories (can be purchased separately)

**MXview:** Moxa industrial network management software with 50, 100, 250, 500, 1000, or 2000 nodes

**EDS-SNMP OPC Server Pro:** OPC server software that works with all SNMP devices

**ABC-01:** Configuration backup and restoration tool for managed Ethernet switches, 0 to 60°C operating temperature

**WK-46:** DIN-rail/wall-mounting kit, 2 plates with 4 screws

### Package Checklist

- PT-508/510 switch
- Serial Cable: CN20070
- DIN-rail kit
- 1 grounding cable
- Protective caps for unused ports
- Documentation and software CD
- Hardware installation guide
- Warranty card