

# PT-G503 Series

## IEC 61850-3/62439-3 3-port full Gigabit managed redundancy boxes



### Features and Benefits

- IEC 61850-3, IEEE 1613 (power substations) compliant
- IEC 62439-3 Clause 4 (PRP) and Clause 5 (HSR) compliant
- PRP/HSR Coupling and QuadBox functions supported
- Ethernet console reserved for local access
- Built-in MMS server based on IEC 61850-90-4 switch data modeling for power SCADA
- Hardware-based IEEE 1588v2 PTP supported
- Design ready for NERC CIP compliant system development
- Isolated redundant power inputs with universal 24 VDC, 48 VDC, or 110/220 VDC/VAC power supply range
- -40 to 85°C operating temperature range

### Certifications



EN 50121-4



## Introduction

The PT-G503-PHR-PTP Series redundancy boxes (RedBoxes) are compliant with the latest standardized redundancy protocols for industrial automation networks, IEC 62439-3 Clause 4 (Parallel Redundancy Protocol, PRP) and IEC 62439-3 Clause 5 (High-availability Seamless Redundancy, HSR). PRP/HSR ensures the highest system availability and data integrity for mission-critical applications in electrical substation and/or process automation systems that require zero recovery time redundancy. The redundant protocols Coupling and QuadBox are also supported. With Coupling and QuadBox, HSR rings can be connected to make the redundant network more versatile. The PT-G503-PHR-PTP Series comes with three 10/100/1000BaseT(X) and 100/1000BaseSFP slot combo ports.

One slot (INTERLINK port) is for an internal link for connecting with a SAN (Singly Attached Node). The other two ports (LAN A and LAN B ports) are for PRP/HSR redundant protocol communications. With this full Gigabit Ethernet port design, the PT-G503-PHR-PTP Series provides high performance for PRP/HSR systems.

The PT-G503-PHR-PTP Series also provides IEEE 1588v2 PTP in end-to-end one-step transparent clock mode for timing-critical applications and isolated redundant power inputs with 24/48 VDC or 110/220 VDC/VAC power supply ranges to increase the reliability of the power supply.

### Additional Features and Benefits

- PRP (Parallel Redundancy Protocol): Transmit or receive two independent active paths to/from different LANs simultaneously on a zero recovery time network
- HSR (High-availability Seamless Redundancy): Every frame is duplicated and then transmitted in both directions of the HSR ring to deliver zero switchover time
- PRP/HSR coupling: Supports coupling from an HSR ring node to redundant PRP LANs (Up to 7 PRP LANs)
- QuadBox function: Supports peer coupling of rings via interconnecting two INTERLINK ports on two separate RedBoxes
- Fiber Check™ provides monitoring and diagnosis functionality on SFP fiber ports
- Hardware-based IEEE 1588v2 PTP (Precision Time Protocol) end-to-end one-step transparent clock for precise time synchronization of networks
- Automatic warning by exception through email and relay output
- Configurable via web browser, CLI, Windows utility, and ABC-02 automatic backup configurator

## Specifications

### Ethernet Interface

Combo Ports (10/100/1000BaseT(X) or 100/1000BaseSFP+)	3
Console Port	Ethernet console (10/100/1000Mbps RJ45)
Standards	IEEE 802.3 for 10BaseT IEEE 802.3ab for 1000BaseT(X) IEEE 802.3u for 100BaseT(X) and 100BaseFX IEEE 802.3z for 1000BaseSX/LX/LHX/ZX

### Ethernet Software Features

Filter	Static Multicast
Management	Back Pressure Flow Control, BOOTP, DHCP Client, Fiber check, Flow control, HTTP, IPv4/IPv6, LLDP, Port Mirror, RARP, RMON, SMTP, SNMP Inform, SNMPv1/v2c/v3, Syslog, Telnet
Power Substation	MMS
Redundancy Protocols	HSR, PRP, RSTP grouping
Security	HTTPS/SSL, TACACS+, RADIUS, SSH, Trust access control
Time Management	NTP Server/Client, SNTP, IEEE 1588v2 PTP (hardware-based)
MIB	IEC 62439-3 MIB

### USB Interface

Storage Port	USB Type A
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### Serial Interface

Console Port	USB-serial console (Type B connector)
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### Input/Output Interface

Alarm Contact Channels	Resistive load: 1 A @ 24 VDC
Digital Inputs	+13 to +30 V for state 1 -30 to +3 V for state 0 Max. input current: 8 mA

### Power Parameters

Input Voltage	PT-G503-PHR-PTP-HV: Redundant dual inputs 110/220 VAC/VDC (85 to 264 VAC, 88 to 300 VDC)  PT-G503-PHR-PTP-WV: Redundant dual inputs 24/48 VDC (18 to 72 VDC)
Overload Current Protection	Supported
Reverse Polarity Protection	Supported
Input Current	PT-G503-PHR-PTP-HV: 0.260/0.170 A @ 110/220 VAC PT-G503-PHR-PTP-HV: 0.150/0.080 A @ 110/220 VDC PT-G503-PHR-PTP-WV: 0.660/0.360 A @ 24/48 VDC
Power Connector	1 removable 5-contact terminal block(s)

## Physical Characteristics

Housing	Aluminum
IP Rating	IP40
Dimensions (without ears)	80 x 160 x 110 mm (3.15 x 6.30 x 4.33 in)
Weight	1210 g (2.69 lb)
Installation	DIN-rail mounting

## Environmental Limits

Operating Temperature	-40 to 85°C (-40 to 185°F)
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 508
EMI	EN 55032 Class A, CISPR 32, FCC Part 15B Class A
EMS	IEC 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 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 PFMF IEC 61000-4-11 DIPs
Power Substation	IEC 61850-3, IEEE 1613
Railway	EN 50121-4

## MTBF

Time	PT-G503-PHR-PTP-HV: 566,844 hrs PT-G503-PHR-PTP-WV: 440,857 hrs
Standards	Telcordia (Bellcore) Standard TR/SR

## Warranty

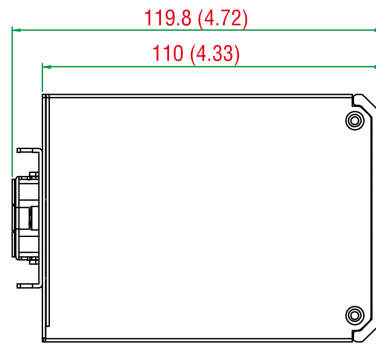
Warranty Period	5 years
Details	See <a href="http://www.moxa.com/warranty">www.moxa.com/warranty</a>

## Package Contents

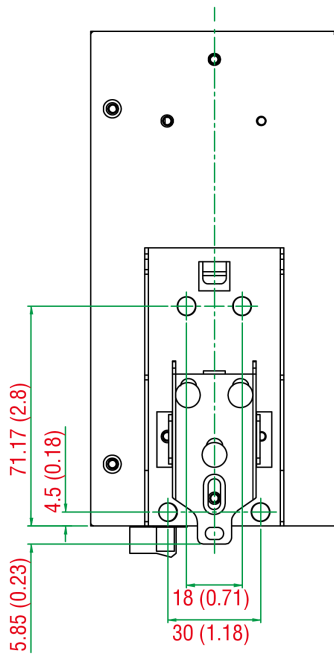
Device	1 x PT-G503 Series switch
Cable	1 x USB type A male to USB type B male
Installation Kit	1 x DIN-rail kit 1 x cap, for type A USB port 4 x cap, plastic, for RJ45 port 1 x cap, plastic, for console port 3 x cap, plastic, for SFP slot
Documentation	1 x document and software CD 1 x quick installation guide 1 x warranty card 1 x product certificates of quality inspection, Simplified Chinese 1 x product notice, Simplified Chinese
Note	SFP modules need to be purchased separately for use with this product.

## Dimensions

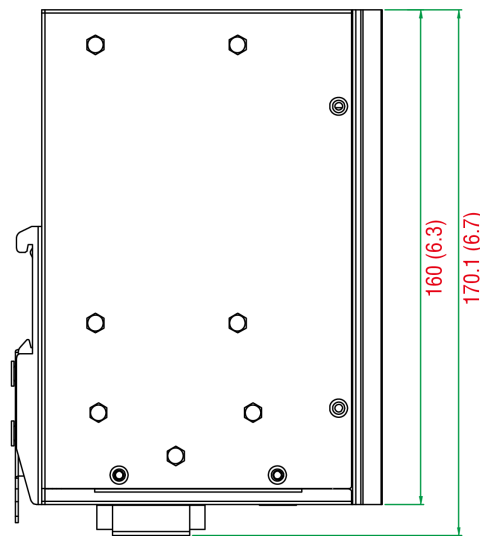
Unit: mm (inch)



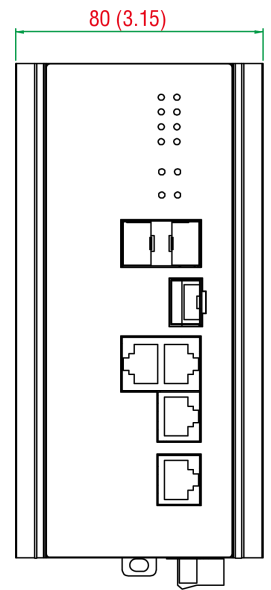
Top View



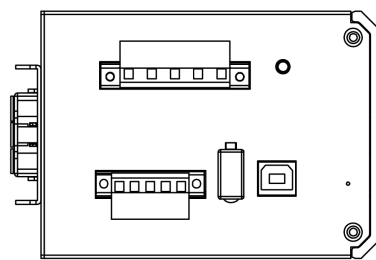
Rear View



Side View



Front View



Bottom View

## Ordering Information

Model Name	Max. No. of Ports	Max. No. of Gigabit Ports	Combo Ports 10/100/1000BaseT(X) or 100/1000BaseSFP	Input Voltage	Operating Temp.
PT-G503-PHR-PTP-WW	3	3	3	24/48 VDC	-45 to 85°C
PT-G503-PHR-PTP-HV	3	3	3	110/220 VDC/VAC	-45 to 85°C

## Accessories (sold separately)

### Software

MXview-50	Industrial network management software with a license for 50 nodes (by IP address)
MXview-100	Industrial network management software with a license for 100 nodes (by IP address)
MXview-250	Industrial network management software with a license for 250 nodes (by IP address)
MXview-500	Industrial network management software with a license for 500 nodes (by IP address)
MXview-1000	Industrial network management software with a license for 1000 nodes (by IP address)
MXview-2000	Industrial network management software with a license for 2000 nodes (by IP address)
MXview Upgrade-50	License expansion of MXview industrial network management software by 50 nodes (by IP address)

### Storage Kits

ABC-02-USB	Configuration backup and restoration tool, firmware upgrade, and log file storage tool for managed Ethernet switches and routers, 0 to 60°C operating temperature
ABC-02-USB-T	Configuration backup and restoration tool, firmware upgrade, and log file storage tool for managed Ethernet switches and routers, -40 to 75°C operating temperature

### SFP Modules

SFP-1FELLC-T	SFP module with 1 100Base single-mode with LC connector for 80 km transmission, -40 to 85°C operating temperature
SFP-1FEMLC-T	SFP module with 1 100Base multi-mode with LC connector for 4 km transmission, -40 to 85°C operating temperature
SFP-1FESLC-T	SFP module with 1 100Base single-mode with LC connector for 40 km transmission, -40 to 85°C operating temperature
SFP-1G10ALC	WDM-type (BiDi) SFP module with 1 1000BaseSFP port with LC connector for 10 km transmission; TX 1310 nm, RX 1550 nm, 0 to 60°C operating temperature
SFP-1G10ALC-T	WDM-type (BiDi) SFP module with 1 1000BaseSFP port with LC connector for 10 km transmission; TX 1310 nm, RX 1550 nm, -40 to 85°C operating temperature
SFP-1G10BLC	WDM-type (BiDi) SFP module with 1 1000BaseSFP port with LC connector for 10 km transmission; TX 1550 nm, RX 1310 nm, 0 to 60°C operating temperature
SFP-1G10BLC-T	WDM-type (BiDi) SFP module with 1 1000BaseSFP port with LC connector for 10 km transmission; TX 1550 nm, RX 1310 nm, -40 to 85°C operating temperature
SFP-1G20ALC	WDM-type (BiDi) SFP module with 1 1000BaseSFP port with LC connector for 20 km transmission; TX 1310 nm, RX 1550 nm, 0 to 60°C operating temperature
SFP-1G20ALC-T	WDM-type (BiDi) SFP module with 1 1000BaseSFP port with LC connector for 20 km transmission; TX 1310 nm, RX 1550 nm, -40 to 85°C operating temperature
SFP-1G20BLC	WDM-type (BiDi) SFP module with 1 1000BaseSFP port with LC connector for 20 km transmission; TX 1550 nm, RX 1310 nm, 0 to 60°C operating temperature
SFP-1G20BLC-T	WDM-type (BiDi) SFP module with 1 1000BaseSFP port with LC connector for 20 km transmission; TX 1550 nm, RX 1310 nm, -40 to 85°C operating temperature
SFP-1G40ALC	WDM-type (BiDi) SFP module with 1 1000BaseSFP port with LC connector for 40 km transmission; TX 1310 nm, RX 1550 nm, 0 to 60°C operating temperature
SFP-1G40ALC-T	WDM-type (BiDi) SFP module with 1 1000BaseSFP port with LC connector for 40 km transmission; TX 1310 nm, RX 1550 nm, -40 to 85°C operating temperature
SFP-1G40BLC	WDM-type (BiDi) SFP module with 1 1000BaseSFP port with LC connector for 40 km transmission; TX 1550 nm, RX 1310 nm, 0 to 60°C operating temperature
SFP-1G40BLC-T	WDM-type (BiDi) SFP module with 1 1000BaseSFP port with LC connector for 40 km transmission; TX 1550 nm, RX 1310 nm, -40 to 85°C operating temperature
SFP-1GEZXC	SFP module with 1 1000BaseEZXC port with LC connector for 110 km transmission, 0 to 60°C operating temperature
SFP-1GEZXC-120	SFP module with 1 1000BaseEZXC port with LC connector for 120 km transmission, 0 to 60°C operating temperature
SFP-1GLHLC	SFP module with 1 1000BaseLH port with LC connector for 30 km transmission, 0 to 60°C operating temperature

SFP-1GLHLC-T	SFP module with 1 1000BaseLH port with LC connector for 30 km transmission, -40 to 85°C operating temperature
SFP-1GLHXC	SFP module with 1 1000BaseLHX port with LC connector for 40 km transmission, 0 to 60°C operating temperature
SFP-1GLHXC-T	SFP module with 1 1000BaseLHX port with LC connector for 40 km transmission, -40 to 85°C operating temperature
SFP-1GLSXC	SFP module with 1 1000BaseLSX port with LC connector for 500 m transmission, 0 to 60°C operating temperature
SFP-1GLSXC-T	SFP module with 1 1000BaseLSX port with LC connector for 500 m transmission, -40 to 85°C operating temperature
SFP-1GLXC	SFP module with 1 1000BaseLX port with LC connector for 10 km transmission, 0 to 60°C operating temperature
SFP-1GLXC-T	SFP module with 1 1000BaseLX port with LC connector for 10 km transmission, -40 to 85°C operating temperature
SFP-1GSXC	SFP module with 1 1000BaseSX port with LC connector for 300/550 m transmission, 0 to 60°C operating temperature
SFP-1GSXC-T	SFP module with 1 1000BaseSX port with LC connector for 300/550 m transmission, -40 to 85°C operating temperature
SFP-1GZXC	SFP module with 1 1000BaseZX port with LC connector for 80 km transmission, 0 to 60°C operating temperature
SFP-1GZXC-T	SFP module with 1 1000BaseZX port with LC connector for 80 km transmission, -40 to 85°C operating temperature

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