PT-G503-PHR-PTP Series

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

> 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 modeling for power SCADA
> Hardware-based IEEE 1588v2 PTP supported
> Design ready for NERC CIP compliance system development
> Isolated redundant power inputs with universal 24/48 VDC or 110/220 VDC/VAC power supply range
> -40 to 85°C operating temperature range

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: 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 hardware-based IEEE 1588v2 PTP when 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.

General 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.
- Built-in MMS server for integration with power SCADA systems.
- Switch data modeling based on the IEC 61850-90-4 standard.
- Automatic warning by exception through email, relay output.
- Configurable via web browser, CLI, Windows utility, and ABC-02 automatic backup configurator.

: Specifications

Technology
Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X) and 100BaseFX
IEEE 802.3ab for 1000BaseT(X)
IEEE 802.3z for 1000BaseX

Protocols: PRP/HSR, SNMPv1/v2c/v3, DHCP Client, BootP, SNTP, SMTP, RARP, RMON, HTTP, Telnet, Syslog, LLDP, IPv6, SNMP Inform, NTP Client/Server
MIB: IEC 62439-3 MIB

MOXA®

Interface

Gigabit Ethernet: 3 x 10/100/1000BaseT(X) ports or 100/1000BaseSFP combo ports
Console Port: Ethernet console (10/100/1000 Mbps RJ45), USB-serial console (Type B connector)
Storage Port: USB storage (Type A connector for ABC-02-USB)
System LED Indicators: PWR1, PWR2, STATE, FAULT, PRP, HSR, QUADBOX, COUPLING
Port LED Indicators: A, B, ETHERNET CONSOLE, INTERLINK
Alarm Contact: 1 relay output with current carrying capacity of 1 A @ 24 VDC
Digital Inputs: 1 input with the same ground, but electrically isolated from the electronics
• +13 to +30V for state "1"
• -30 to +3V for state "0"
• Max. input current: 8 mA
Button: Reset button

Power Requirements

Input Voltage:
• WV: 24/48 VDC (18 to 72 VDC)
• HV: 110/220 VDC/VAC (88 to 300 VDC, 85 to 264 VAC)

Input Current:
• Max. 0.660/0.360 A @ 24/48 VDC
• Max. 0.150/0.080 A @ 110/220 VDC
• Max. 0.260/0.170 A @ 110/220 VAC
Overload Current Protection: Present
Connection: 5-pin terminal block
Reverse Polarity Protection: Present

Physical Characteristics

Housing: IP40 protection
Dimensions: 80 x 160 x 110 mm (3.15 x 6.30 x 4.33 in)
Weight: 1210 g
Installation: DIN rail mounting

Environmental Limits

Operating Temperature: -40 to 85°C (-40 to 185°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
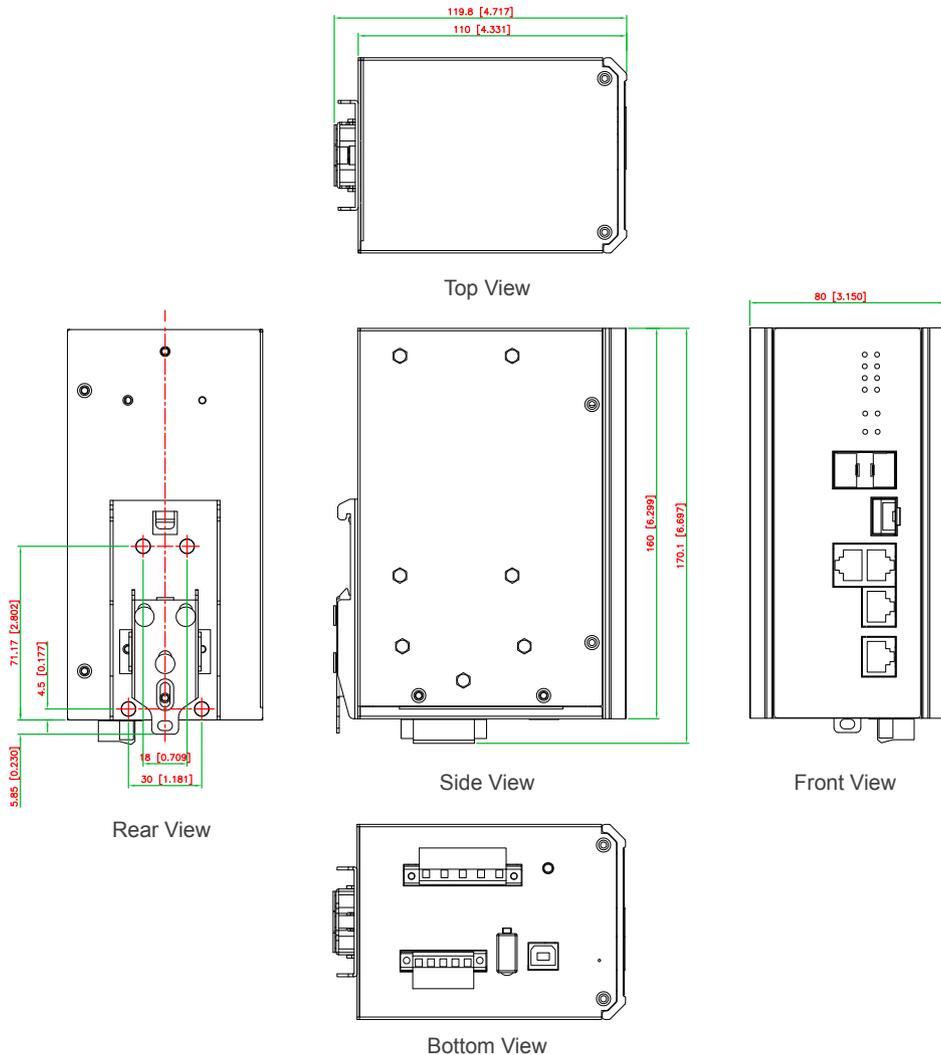
Standards and Certifications

High Availability Automation Networks: IEC 62439-3
Safety: UL 508
EMI: FCC Part 15 Subpart B Class A, EN 55022 Class A
Power Automation: IEC 61850-3, IEEE 1613
Rail Traffic: EN 50121-4

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)

Top View

Rear View

Side View

Front View

Bottom View

: Ordering Information

	Available Models	
DIN Rail, Front Cabling, Front Display	**Power Supply**	
	WV: 24/48 VDC (18 to 72 VDC), isolated (dual power inputs)	**HV: 110/220 VDC/VAC (88 to 300 VDC, 85 to 264 VAC), isolated (dual power inputs)**
PT-G503-PHR-PTP-WV	1	–
PT-G503-PHR-PTP-HV	–	1

Optional Accessories (can be purchased separately)

EDS-SNMP OPC Server Pro: OPC server software that works with all SNMP devices
ABC-02 Series: Configuration backup and restoration tool for managed Ethernet switches, 0 to 60°C operating temperature

Package Checklist

- PT-G503-PHR-PTP redundancy box
- USB-IF certified cable
- DIN-rail kit or wall mount ears (optional)
- Protective caps for unused ports
- Documentation and software CD
- Hardware installation guide
- Warranty card