

# PT-G510 系列

## IEC 61850-3 10 埠 Layer2 全 Gigabit PRP/HSR 託管型乙太網路交換器



### 特色與優點

- 符合 IEC 61850-3 Edition2 Class2
- 符合 IEC 62439-3 第4 條 (PRP) 和第5 條 (HSR) 協定
- 支援 IEEE 1588 (PTP) 硬體時間戳記
- 支援 IEEE C37.238 和 IEC 61850-9-3 電源設定檔
- GOOSE Check 輕鬆排除故障
- 內建 MMS Server，採用 IEC 61850-90-4 交換器資料模型，適用於 Power SCADA
- -40°C 至 75°C 操作溫度範圍

### 認證



EN 50121-4

IEC 61850-3 IEEE 1613



### 簡介

PT-G510 系列專為需要零復原時間冗餘的數位變電站的關鍵任務應用設計，提供最高階系統可用性和資料完整性。PT-G510 系列支援 PRP/HSR，滿足變電站和製程自動化系統的無縫冗餘。基於硬體的 IEEE 1588v2 PTP 同樣時序要求嚴格的應用。PT-G510 系列採高耐用設計，並符合 IEC 61850-3 Edition 2 Class 2 認證，可滿足變電站應用的嚴格要求。

PT-G510 系列配備 8 個 100/1000BaseT(X) 乙太網路連接埠或 100/1000BaseSFP 插槽，具兩個專用 100/1000BaseSFP PRP/HSR 連接埠，且支援完整的冗餘協定套件，包括 PRP、HSR、MRP、STP、MSTP 和 RSTP，以提供最可靠的網路。PT-G510 系列同時支援 GOOSE Check 以有效監控 GOOSE 封包，並具符合 IEC 61850-90-4 電力 SCADA 系統交換器資料建模的內建 MMS 伺服器。

### 規格

#### Ethernet Interface

|   |   |
|---|---|
| 100/1000BaseT(X) Ports (RJ45 connector) | PT-G510-8GTX-PHR models: 8<br>PT-G510-4GTX4GSFP-PHR models: 4   |
| 100/1000BaseSFP Ports                   | PT-G510-8GSFP-PHR models: 10<br>PT-G510-4GTX4GSFP-PHR models: 6   |
| Standards                               | IEEE 802.3u for 100BaseT(X) and 100BaseFX<br>IEEE 802.3ab for 1000BaseT(X)<br>IEEE 802.3z for 1000BaseX<br>IEEE 802.1D-2004 for Spanning Tree Protocol<br>IEEE 802.1w for Rapid Spanning Tree Protocol<br>IEEE 802.1p for Class of Service<br>IEEE 802.1Q for VLAN Tagging<br>IEEE 802.1X for authentication<br>IEEE 802.3ad for Port Trunk with LACP<br>IEEE 802.3x for flow control |

## Ethernet Software Features

|                      |  |
|----------------------|--|
| Management           | <p>HTTPS<br/>         Dying Gasp<br/>         Back Pressure Flow Control<br/>         DHCP Option 66/67/82<br/>         Fiber check<br/>         Flow control<br/>         LLDP<br/>         Port Mirror<br/>         SNMP Inform<br/>         BOOTP<br/>         DHCP Server/Client<br/>         HTTP<br/>         IPv4/IPv6<br/>         RARP<br/>         SMTP<br/>         SNMPv1/v2c/v3<br/>         Syslog<br/>         Telnet<br/>         TFTP</p> |
| MIB                  | <p>MIB-II<br/>         Ethernet-like MIB<br/>         Bridge MIB<br/>         P-BRIDGE MIB<br/>         Q-BRIDGE MIB<br/>         RSTP MIB<br/>         RMON MIB Groups 1, 2, 3, 9</p>   |
| Filter               | <p>IGMP v1/v2/v3<br/>         GMRP<br/>         GVRP<br/>         802.1Q<br/>         QinQ VLAN</p>  |
| Redundancy Protocols | <p>Link Aggregation<br/>         MSTP<br/>         RSTP<br/>         STP<br/>         Turbo Chain<br/>         Turbo Ring<br/>         MRP<br/>         HSR<br/>         PRP<br/>         Coupling<br/>         RSTP grouping</p>  |
| Security             | <p>RADIUS<br/>         TACACS+<br/>         SSH<br/>         Port Lock<br/>         Broadcast storm protection<br/>         MAB authentication<br/>         Sticky MAC<br/>         Access control list</p>  |
| Time Management      | <p>NTP Server/Client<br/>         SNTP<br/>         IEEE 1588v2 PTP (hardware-based)</p>   |
| Power Substation     | <p>GOOSE Check<br/>         IEC 61850 QoS<br/>         MMS</p>   |

## Switch Properties

|                   |           |
|-------------------|-----------|
| Priority Queues   | 8         |
| Max. No. of VLANs | 256       |
| VLAN ID Range     | 1 to 4094 |

|                        |           |
|------------------------|-----------|
| RSTP Grouping ID Range | 1 to 4094 |
| IGMP Groups            | 4096      |
| MAC Table Size         | 16 K      |
| Packet Buffer Size     | 12 Mbits  |

### Serial Interface

|              |               |
|--------------|---------------|
| Console Port | RS-232 (RJ45) |
|--------------|---------------|

### USB Interface

|              |            |
|--------------|------------|
| Storage Port | USB Type A |
|--------------|------------|

### Power Parameters

|                             |   |
|-----------------------------|---|
| Input Voltage               | <p>-HV models:<br/>110-220 VAC, 110-220 VDC (88 to 300 VDC, 85 to 264 VAC)</p> <p>-WV models:<br/>24-48 VDC (18 to 72 VDC)</p> <p>Note: Both -HV and -WV models support dual power inputs with a single power module.</p> |
| Input Current               | <p>-HV models:<br/>0.5 A @ 110-220 VAC<br/>0.3 A @ 110-220 VDC</p> <p>-WV models:<br/>1.1 A @ 24-48 VDC</p>   |
| Alarm Contact Channels      | Resistive load: 1 A @ 24 VDC  |
| Overload Current Protection | Supported   |
| Reverse Polarity Protection | Supported   |

### Physical Characteristics

|                           |   |
|---------------------------|---|
| IP Rating                 | IP30                                      |
| Dimensions (without ears) | 74 x 148 x 120 mm (2.91 x 5.83 x 4.72 in) |
| Weight                    | 1476 g (3.25 lb)                          |
| Installation              | DIN-rail mounting                         |

### Environmental Limits

|  |  |
|--|--|
| Operating Temperature                  | <p>-40 to 75°C (-40 to 167°F)</p> <p>-40 to 85°C (-40 to 185°F) for 16 hrs (tested in accordance with IEC 60068-2-2)</p> |
| Storage Temperature (package included) | -40 to 85°C (-40 to 185°F)   |
| Ambient Relative Humidity              | 5 to 95% (non-condensing)  |

### Standards and Certifications

|     |   |
|-----|---|
| EMC | EN 55032/35   |
| EMI | CISPR 32, FCC Part 15B Class A  |
| EMS | <p>IEC 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV</p> <p>IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m</p> <p>IEC 61000-4-4 EFT: Power: 4 kV; Signal: 4 kV</p> <p>IEC 61000-4-5 Surge: Power: 4 kV; Signal: 4 kV</p> <p>IEC 61000-4-6 CS: 10 V</p> <p>IEC 61000-4-8 PFMF</p> <p>EN 61000-4-11</p> |

|                  |  |
|------------------|--|
| Power Substation | IEC 61850-3 Edition 2.0 Class 2<br>IEEE 1613 |
| Railway          | EN 50121-4                                   |
| Maritime         | -WV models:<br>DNV<br>IEC 60945              |
| Safety           | IEC 62368-1<br>UL 62368-1                    |

#### MTBF

|           |                                     |
|-----------|-------------------------------------|
| Time      | 688,584 hrs                         |
| Standards | Telcordia (Bellcore) Standard TR/SR |

#### Warranty

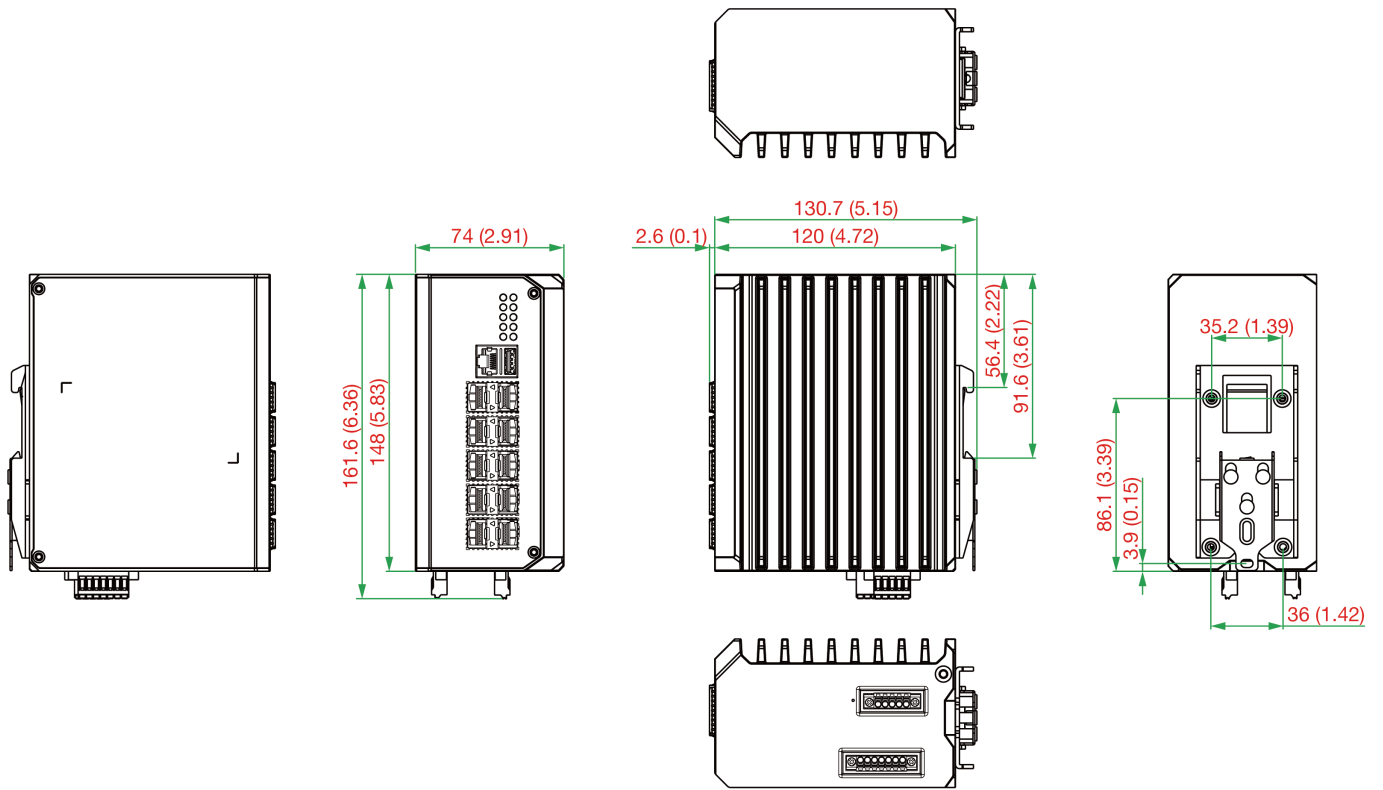
|                 |  |
|-----------------|--|
| Warranty Period | 5 years  |
| Details         | See <a href="http://www.moxa.com/tw/warranty">www.moxa.com/tw/warranty</a> |

#### Package Contents

|                  |   |
|------------------|---|
| Device           | 1 x PT-G510 Series switch   |
| Cable            | 1 x RJ45-to-DB9 console cable   |
| Installation Kit | 1 x DIN-rail kit<br>1 x cap, for type A USB port<br>6 or 10 x cap, plastic, for SFP port  |
| Documentation    | 1 x quick installation guide<br>1 x warranty card<br>1 x substance disclosure table<br>1 x product certificates of quality inspection, Simplified Chinese<br>1 x product notice, Simplified Chinese |
| Note             | SFP modules need to be purchased separately for use with this product.  |

# 尺寸

單位：公釐（英吋）



## 訂購資訊

| Model Name                  | 100/1000BaseT(X)<br>Ports (RJ45 Connector) | 100/<br>1000BaseSFP<br>Slots | Operating Voltage | Conformal Coating | Operating Temp. |
|-----------------------------|--|------------------------------|-------------------|-------------------|-----------------|
| PT-G510-8GSFP-PHR-HV        | -  | 10                           | 110-220 VDC/VAC   | -                 | -40 to 75°C     |
| PT-G510-8GSFP-PHR-WV        | -  | 10                           | 24-48 VDC         | -                 | -40 to 75°C     |
| PT-G510-8GTX-PHR-HV         | 8  | 2                            | 110-220 VDC/VAC   | -                 | -40 to 75°C     |
| PT-G510-8GTX-PHR-WV         | 8  | 2                            | 24-48 VDC         | -                 | -40 to 75°C     |
| PT-G510-4GTX4GSFP-PHR-HV    | 4  | 6                            | 110-220 VDC/VAC   | -                 | -40 to 75°C     |
| PT-G510-4GTX4GSFP-PHR-WV    | 4  | 6                            | 24-48 VDC         | -                 | -40 to 75°C     |
| PT-G510-8GSFP-PHR-HV-CT     | -  | 10                           | 110-220 VDC/VAC   | P                 | -40 to 75°C     |
| PT-G510-8GSFP-PHR-WV-CT     | -  | 10                           | 24-48 VDC         | P                 | -40 to 75°C     |
| PT-G510-8GTX-PHR-HV-CT      | 8  | 2                            | 110-220 VDC/VAC   | P                 | -40 to 75°C     |
| PT-G510-8GTX-PHR-WV-CT      | 8  | 2                            | 24-48 VDC         | P                 | -40 to 75°C     |
| PT-G510-4GTX4GSFP-PHR-HV-CT | 4  | 6                            | 110-220 VDC/VAC   | P                 | -40 to 75°C     |
| PT-G510-4GTX4GSFP-PHR-WV-CT | 4  | 6                            | 24-48 VDC         | P                 | -40 to 75°C     |

## 配件（選購）

### Software

|            |                              |
|------------|------------------------------|
| MXview-50  | MXview license for 50 nodes  |
| MXview-100 | MXview license for 100 nodes |

|                   |                                       |
|-------------------|---------------------------------------|
| MXview-250        | MXview license for 250 nodes          |
| MXview-500        | MXview license for 500 nodes          |
| MXview-1000       | MXview license for 1000 nodes         |
| MXview-2000       | MXview license for 2000 nodes         |
| MXview Upgrade-50 | MXview license expansion for 50 nodes |

### 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-1GTXRJ45-T  | SFP module with 1 1000BaseT port with RJ45 connector for 100 m transmission, -40 to 75°C operating temperature   |
| 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, LC connector for 2/4 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-1GEZXLC     | SFP module with 1 1000BaseEZ port with LC connector for 110 km transmission, 0 to 60°C operating temperature   |
| SFP-1GEZXLC-120 | SFP module with 1 1000BaseEZ 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-1GLHLC      | SFP module with 1 1000BaseLH port with LC connector for 40 km transmission, 0 to 60°C operating temperature  |

|               |   |
|---------------|---|
| SFP-1GLHXLC-T | SFP module with 1 1000BaseLHX port with LC connector for 40 km transmission, -40 to 85°C operating temperature    |
| SFP-1GLSXLC   | SFP module with 1 1000BaseLSX port with LC connector for 1km/2km transmission, 0 to 60°C operating temperature    |
| SFP-1GLSXLC-T | SFP module with 1 1000BaseLSX port with LC connector for 1km/2km transmission, -40 to 85°C operating temperature  |
| SFP-1GLXLC    | SFP module with 1 1000BaseLX port with LC connector for 10 km transmission, 0 to 60°C operating temperature       |
| SFP-1GLXLC-T  | SFP module with 1 1000BaseLX port with LC connector for 10 km transmission, -40 to 85°C operating temperature     |
| SFP-1GSXLC    | SFP module with 1 1000BaseSX port with LC connector for 300m/550m transmission, 0 to 60°C operating temperature   |
| SFP-1GSXLC-T  | SFP module with 1 1000BaseSX port with LC connector for 300m/550m transmission, -40 to 85°C operating temperature |
| SFP-1GZXLC    | SFP module with 1 1000BaseZX port with LC connector for 80 km transmission, 0 to 60°C operating temperature       |
| SFP-1GZXLC-T  | SFP module with 1 1000BaseZX port with LC connector for 80 km transmission, -40 to 85°C operating temperature     |

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