

# RPT-2011-3F-I-T-X1 | IEC61850-3 11Port Managed Fast Ethernet Switch



## Feature Highlights

- IEC61850-3 Certified
- 8 10/100 BASE-T(X) ports and 3 Gbps SFP ports
- 1 port RS232 console port (RJ45 connector)
- IEEE1588v2 Precision Time, Sync E (Optional model)
- Secure and trusted network: IEC62443, sFlow
- Compact and robust enclosure: -40 to 75 degree C
- Redundant Technology: ERPS Ring, MSTP/RSTP/STP support

## DESCRIPTION

### IEC 61850-3 & IEEE1613

Compliant with IEC 61850-3 & IEEE1613 standards for power substation automation systems .

### Self-Healing Network

Support various types of ring protocols. With ITU-T G.8032 ERPS Ring, self-recovery can be done within 25ms on full load. This helps administrators build a reliable network and improve network sustainability.

### sFlow Monitoring

By sampling packets, administrators are able to monitor network traffic and discover abnormal situations in time.

### Synchronous Ethernet

Stable frequency transport at MAC Layer to ensure services continuity from end to end.

### Nanosecond Time Sync with 1588v2 PTP

IEEE1588v2 PTP support helps achieve the strict time synchronization requirements in real-time applications. Can be used either as a hardware-assisted P2P/E2E transparent clock for packet update within nanoseconds or as a software-assisted boundary clock.

### RBAC

Besides multiple Admin accounts with read-&write or read-only access, ACL by MAC/IP is supported for LAN control, and 802.1x is supported to work with RADIUS/ TACACS+ for LAN hosts authorization and accounting.

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## SPECIFICATIONS

| <b>Interface</b>                          |  |
|---|--|
| RJ-45 Ports                               | 8 x 10/100BASE-T(X)  |
| Fiber Optics Ports                        | 3 x 100/1000FX SFP Slot  |
| Console Port                              | 1 x RS-232 (RJ-45 connector)   |
| LED Indicators                            | 1 x P1 & P2 & P3 (P3 for HV Model) 1 x Alarm   |
|   | 1 x Firmware Running   |
|   | 1 x Ring Master  |
|   | 1 x Ring   |
|   | 1 x SFP1 & SFP2 & SFP3   |
| Relay Output                              | 1 x Digital Input 1 x LAN Ports<br>1 x Relay Output (24V/1A) with current carrying capacity of 1A @ 24 VDC                               |
| DIP Switch                                | 4 x for Ring Control   |
| Button                                    | 1 x Factory Reset  |
| <b>Capacity</b>                           |  |
| Switching Capacity                        | 7.6 Gbps   |
| Switching Fabric                          | 5.7 Mpps   |
| Packet Buffer Size                        | 1.75 Mb  |
| MAC Table Size                            | 4K   |
| Jumbo Frame                               | 9216B  |
| <b>Networking Standards</b>               |  |
| IP Version                                | IPv4, IPv6   |
| Ethernet Standards                        | IEEE 802.3 for 10BaseT   |
|   | IEEE 802.3u for 100BaseT(X)  |
|   | IEEE 802.3z for 1000BaseX  |
|   | IEEE 802.3x for Flow Control, back pressure flow control   |
|   | IEEE 802.1d-2004 for Spanning Tree Protocol IEEE 802.1w for Rapid STP  |
|   | IEEE 802.1s for Multiple 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 802.1ad QinQ  |
| Redundancy                                | IEEE 802.1AB LLDP  |
|   | ITU-T G.8032 ERPS Ring IEEE 802.1d-2004 for STP IEEE 802.1w for RSTP   |
|   | IEEE 802.1s for MSTP MRP (Client)<br>Compatible Ring/Chain*  |
| <b>VLAN</b>                               |  |
| Max. Number of VLAN                       | 4KB  |
| VLAN ID                                   | 1 to 4094  |
| VLAN Type                                 | Management VLAN Port-Based VLAN 802.1q Tag-Based VLAN<br>MAC-Based VLAN (up to 512 VLANs) Protocol-Based VLAN 64 IP<br>Subnet-Based VLAN |
|   | Voice VLAN*  |
| GVRP<br>(GARP VLAN Registration Protocol) | Y  |

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| Security                          |  |
|-----------------------------------|--|
| Port Security                     | Y  |
| AAA                               | RADIUS, TACACS+  |
| Port Authentication               | 802.1x EAP, MAC-Based  |
| IP Source Guard                   | Y  |
| ARP Spoof Prevention              | Y  |
| Dynamic ARP Inspection            | Y  |
| DHCP Snooping                     | Y  |
| Access Control List               | MAC, IPv4, IPv6  |
| Storm Control                     | Unicast, Multicast, Broadcast  |
| UDLD Loop Protection              | Y  |
| QoS                               |  |
| Number of Priority Queues         | 8  |
| Queue Selection                   | Strict Priority (SP), Weighted Round Robin (WRR), Deficit Round Robin (DRR)      |
| CoS (Class of Service)            | 802.1p CoS, DSCP, IP Precedence  |
| Rate Limit & Shaping              | Y  |
| Multicast                         |  |
| IGMP Snooping                     | v1/v2/v3   |
| MLD Snooping                      | v1   |
| Max. Number of Static IGMP Groups | 128  |
| GARP                              | Y  |
| GMRP                              | Y  |
| Link Aggregation                  |  |
| Max. Number of Trunk Groups       | 4  |
| Time Synchronization              |  |
| Network Time Sync.                | NTP Server/Client, SNTP  |
| Precision Network Time Sync.      | IEEE1588 PTP v1/v2 (hardware-based)  |
|                                   | IEEE1588 Hardware-based peer-to-peer / end-to-end transparent clock IEEE C37.238 |
|                                   | IEC 61850-9-3  |
| SyncE                             | Y (Optional)   |

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## SPECIFICATIONS

| Management                                  |  |
|---|--|
| Web Interface                               | HTTP, HTTPS  |
| Command Line Interface                      | Telnet, SSHv2  |
| User Authentication                         | Local Database, RADIUS, TACACS+  |
| Automation Profiles                         | RADIUS, TACACS+  |
| Port Authentication                         | Modbus/TCP status registers  |
| sFlow                                       | Y  |
| SNMP  | SNMPv1/v2c/v3, SNMP Inform   |
| RMON Group                                  | 1, 2, 3, 9   |
| LLDP  | Y  |
| ISDP (Industry Standard Discovery Protocol) | Y  |
| RARP  | Y  |
| Alarm                                       | Relay, E-mail (SMTP), LED  |
| Syslog                                      | Y  |
| DHCP Support                                | DHCP Server, DHCP Client, DHCP Relay   |
| DHCP Option                                 | 66, 67, 82   |
| BootP                                       | Y  |
| Backup/Restore                              | HTTP, TFTP   |
| NMU Managed                                 | Y  |
| Diagnostics Utilities                       | Port Mirror, Ping, Ping6, IPv4/v6 TraceRoute, Cable Diagnostics, Rmirror*, Flow Mirror   |
| Physical                                    |  |
| Housing                                     | IP30 SPCC, Black   |
| Dimension (W x H x D)                       | 77 x 163 x 138 mm  |
| Weight                                      | 1,500g (3.31lb)  |
| Installation                                | DIN-Rail mount / Wall mount (optional kit)   |
| Operating Temperature                       | -40°C to +75°C (-40°F to +167°F)   |
| Storage Temperature                         | -40°C to +85°C (-40°F to +185°F)   |
| Ambient Relative Humidity                   | 5% to 95% (Non-condensing test @ 55°C)   |
| Input Voltage                               | 24-48 VDC  |
|   | 110-240 VAC for AC series  |
|   | 110-300 VDC for HV Series  |
| Power Consumption                           | 13.1W@52VDC (with input current 0.25A)<br>910.6W@264VAC for AC series (with input current 0.04A)<br>10.2W@330VDC for HV Series (with input current 0.03A)                        |
| Connector                                   | 1 x 5-Pin 5.08mm Lockable Terminal Block for DC/HV Series<br>1 x 4-Pin 5.08mm Lockable Terminal Block for DC/HV Series<br>1 x 3-Pin 5.08mm Lockable Terminal Block for HV Series |
| Reverse Polarity Protection                 | Y  |

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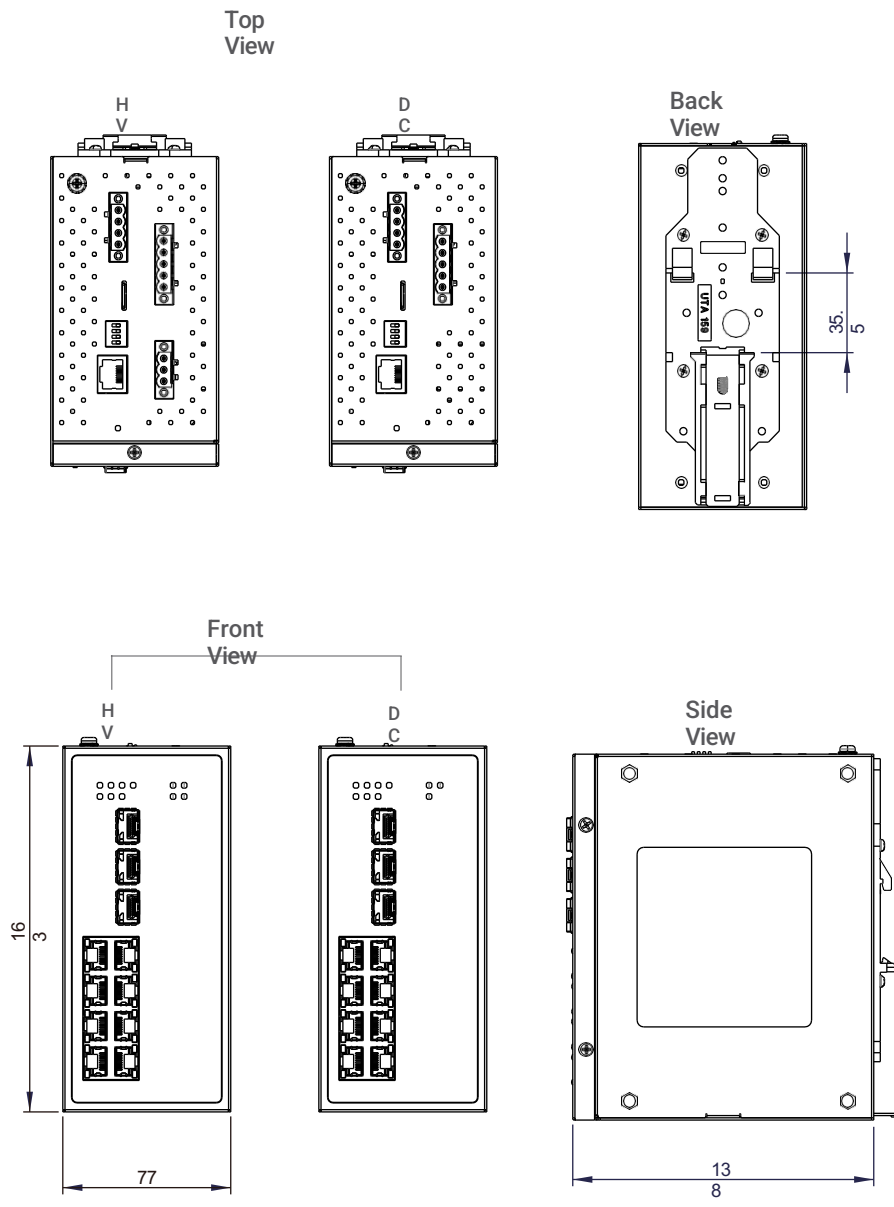
### Regulatory Approvals

|                  |                         |   |
|------------------|-------------------------|---|
| Safety           | UL/IEC(CB) 62368        |   |
| EMI              | FCC                     | FCC Part 15, Subpart B, Class A<br>EN 55032: 2015/AC:2016 Class A |
|                  | CE                      | EN 61000-6-4: 2007 + A1: 2011                                     |
|                  |                         | EN 61000-3-2: 2014, Class A                                       |
|                  |                         | EN 61000-3-3: 2013  |
| EMS              | CE                      | EN 55024: 2010 + A1: 2011   |
|                  |                         | EN 61000-6-2 2005   |
|                  |                         | EN 61000-4-2/3/4/5/6/8/10/11/12                                   |
| Power Automation | IEC 61850-3 & IEEE 1613 |   |
| RoHS             | Y                       |   |

| Test           | Type               | Description             | Value                             | Level | Criterion |
|----------------|--------------------|-------------------------|-----------------------------------|-------|-----------|
| IEC 61000-4-2  | ESD                | Contact Discharge       | ±8KV                              | 4     | B         |
|                |                    | Air Discharge           | ±15KV                             | 4     | B         |
|                |                    | Air Discharge           | ±15KV                             | 4     | B         |
| IEC 61000-4-3  | RS                 | 80-1000MHz              | IEC61850-3                        | 3     | A         |
|                |                    |                         | 10(V/m), 80-3000 MHz              |       |           |
|                |                    |                         | IEEE1613                          |       |           |
|                |                    |                         | 20(V/m), 80-1000 MHz              | -     | -         |
| IEC 61000-4-4  | EFT                | AC Power Port           | ±4.0KV @ 5.0KHz                   | 4     | B         |
|                |                    | DC Power Port           | ±4.0KV @ 5.0KHz                   | 4     | B         |
|                |                    | Signal Port             | ±4.0KV @ 5.0KHz                   | 4     | B         |
| IEC 61000-4-5  | Surge              | AC Power Port           | Line-to-Line ±2.0KV               | 4     | B         |
|                |                    |                         | Line-to-Earth ±4.0KV              | 4     | B         |
|                |                    | DC Power Port           | Line-to-Line ±1.0KV               | 3     | B         |
|                |                    |                         | Line-to-Earth ±2.0KV              | 3     | B         |
|                |                    | Signal Port             | Line-to-Line ±2.0KV               | 4     | B         |
|                |                    |                         | Line-to-Earth ±4.0KV              | 4     | B         |
| IEC 61000-4-6  | CS                 | AC Power Port           | 10V, 150KHz to 80MHz, 80%AM       | 3     | A         |
|                |                    | DC Power Port           | 10V, 150KHz to 80MHz, 80%AM       | 3     | A         |
|                |                    | Signal Port             | 10V, 150KHz to 80MHz, 80%AM       | 3     | A         |
| IEC 61000-4-8  | PFMF               | Enclosure               | 100A/m continuous, 1000A/m for 3S | 5     | A         |
| IEC 61000-4-11 | AC Power Port      | Voltage DIPS            | 30% Reduction, 1 Cycle            | N/A   | B         |
|                |                    |                         | 60% Reduction, 50 Cycle           | N/A   | B         |
|                |                    |                         | 100% Reduction, 5 Cycle           | N/A   | B         |
|                |                    | Voltage Interruptions   | 100% Reduction, 50Cycle           | N/A   | B         |
| Test           | Type               | Description             | Value                             | Level | Criterion |
| IEC 61000-4-16 | Main               | DC Input / Output       | 30V continuous, / 300V 1S         | 4     | A         |
|                | Frequency          | Signal Port             | 30V continuous, / 300V 1S         | 4     | A         |
| IEC 61000-4-17 | Ripple             | DC Input / Output       | 10% of unit (10% Level3)          | 3     | A         |
| IEC 61000-4-18 | Damped Oscillatory | AC Power Port           | Line-to-Line ±2.5KV               | 3     | B         |
|                |                    |                         | Line-to-Earth ±2.5KV              | 3     | B         |
|                |                    | DC Power Port           | Line-to-Line ±2.5KV               | 3     | B         |
|                |                    |                         | Line-to-Earth ±2.5KV              | 3     | B         |
|                |                    | Signal Port             | Line-to-Earth ±2.5KV              | 3     | B         |
| IEC 61000-4-29 | DC Input Port      | DC Voltage DIPS         | 30% Reduction: 0.1 sec            | N/A   | B         |
|                |                    |                         | 60% Reduction: 0.1 sec            | N/A   | B         |
|                |                    | DC Voltage              | 10V, 150KHz to 80MHz, 80%AM       | N/A   | B         |
| IEC 61000-4-8  | PFMF               | Enclosure Interruptions | 100% Reduction: 0.05 sec          | N/A   | B         |

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## DIMENSIONS



| Ordering information  |               |                 |                                   |
|-----------------------|---------------|-----------------|-----------------------------------|
| Model name            | 10/100TX RJ45 | 1000Base(X) SFP | Power                             |
| RPT-2011-3F-I-DC-T-X1 | 8             | 3               | 24-48VDC                          |
| RPT-2011-3F-I-HV-T-X1 | 8             | 3               | 24-48VDC<br>110-300VDC/110-240VAC |