



## **IEC 61850-9-2 Subscriber**

*HSR/PRP/PTP support*



## **RELY-SV-PCIe SV Subscriber PCIe NIC**

RELY-SV-PCIe card is a smart pluggable board that comprises in the same device hardware and software resources to implement intensive processing, specialized networking, synchronization and security oriented services for Smart Grids based on IEC 61850 standard.

The device uses dedicated hardware for **Layer 2 IEC 61850-9-2 Sampled Value frame processing** and converts any conventional computer in a powerful tool for IEC 61850 analysis, through a standard PCI Express interface.

It can be used as a multi-media PCIe DAN, operating as an **HSR/PRP node** of a high-availability network or connecting to a Conventional Ethernet network.

Additionally, RELY-SV-PCIe implements high accuracy clock synchronization based on **IEEE 1588** standard.

These key features make RELY-SV-PCIe platform the most reliable and multipurpose device for critical environments.

## Specifications



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### Sampled Value Processing

- Layer 2 IEC 61850-9-2 (SV) frame processing
- High performance implementation of DFT computation module for calculating magnitude and phase of the first harmonic (50 or 60 Hz)
- High performance RMS computation module
- Up to 40 simultaneous SV streams supported with a process window of 1 (full calculation with each new sample)
- Up to 64 streams with larger process window
- Deterministic latency for full computation of 6us
- Status, configuration and statistic counter registers

### Communications

- Autonomous management of Supervision Frames and IEEE 1588-2008 PTPv2 support
- 2x HSR/PRP ports or 1x Ethernet port
- Media options (SFP cages):
  - » 10/100/1000Base-T, 1000Base-X or 100Base-FX
- Zero-Packet-Loss redundancy modes:
  - » IEC 62439-3 v3 Clause 5 "High-availability Seamless Redundancy (HSR)"
    - Cut-through operation for the HSR ring to minimize the latency in the ring
    - Supported modes: H, N, T, U, X, HSR-SAN, PRP-HSR, HSR-HSR
  - » IEC 62439-3 v3 Clause 4 "Parallel Redundancy Protocol (PRP)"
    - Store & forward for PRP and Ethernet operation
    - Supported modes: Duplicate discard, duplicate accept, transparent reception, PRP-HSR
- 1 PPS output
- PCIe x1. Seamless integration on old Legacy PCI

Systems through optional adapter

### Processing performance

- On-board FPGA for SV processing, high-speed network switching and PTP timestamping
- Multi-core CPU unit to support autonomous software applications

### Configuration and Management

- Ethernet network drivers available for most OS (Linux, Windows, VxWorks, etc.)
- On-board integrated Web Server to provide HTML5-GUI configuration access for HSR/PRP/PTP
- Accessible through HTTP(S)
- Configuration profiles and Firmware updates
- Real-time network monitoring
- Websocket for seamless integration in customer's application

