RELY-REC Time-aware Network Recorder

In critical systems, it is essential being able to analyze the network communications at frame level for testing and forensic purposes.

Furthermore, the validity of this analysis will be constrained by the capability of the infrastructure to correlate the frames with a common time reference.

For that purpose, Relyum has developed RELY-REC, a device that is able to inspect, timestamp and record regular Ethernet and high-availability Ethernet traffic, using the same PTP timing reference than the network under analysis.

As an example, due to the critical nature of communications in Electric sector, RELY-REC is an all-in-one solution specifically designed to analyze the traffic in the modern IEC 61850 Digital Substations where the use of combined HSR, PRP and PTP has generated a new challenge for the operators.

This device is synchronized with a IEEE 1588-2008 PTPv2 infrastructure, that may be the same shared by the other equipment of the substation.

Specifications
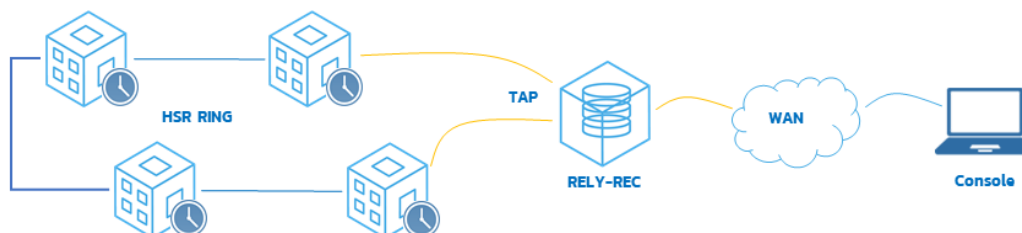
Communications

- 2 x SFP cages for 10/100/1000Base-TX Ethernet copper or 100Base-FX/1000Base-X fiber for TAP or Port Mirroring connection.

- 1 x SFP cages for 10/100/1000Base-TX Ethernet copper or 100Base-FX/1000Base-X fiber for expansion connection (alternative PTP Source, Modbus/S7/MQTT connections, etc.).

- 1 x 10/100/1000Base-TX Ethernet copper port for Console management and non-stop remote access to recorded data.

- IEC 62439-3 v3 Clause 5 "High-availability Seamless Redundancy (HSR)".

- IEC 62439-3 v3 Clause 4 "Parallel Redundancy Protocol (PRP)".

- 1 x Pulse-Per-Second (PPS) SMA output.

- 1 x Sensor expansion module (optional).

Processing capabilities

- Simultaneous read/write data operation supported.

- Industrial temperature grade high-capacity SSD disk.

- Remote access to Log Data Files configurable and standard format (PCAP).

- Triggering based on:
  - » Direct I/O Signals and Modbus/S7/MQTT variables.
  - » Packet inspection.
  - » IEC 61850:
    - • SMV events, PTP events.
    - • GOOSE messages events based on an SCL file configuration.

- Filtering:
  - » Based on the standard filtering format used in the sector.

Synchronization

- IEEE 1588-2008 PTPv2.

- Operation modes: Transparent Clock, Ordinary Clock.

- Profiles: Default, Power, IEC 61850-9-3.

- Optional time reference source for timestamping:
  - » Dedicated port for external PTP Master.
  - » NTP (configurable).
  - » Internal reference.

Configuration and Management

- On-board integrated Web Server to provide HTML5-GUI configuration access:
  - » Accessible through HTTP(S).

- Configuration profiles.

- Digitally signed and encrypted firmware upgrades.

- Real-time HSR/PRP network node monitoring.

- SNMPv1/v2c/v3.

Rugged devices

- Fan-less design and full metal enclosure.

- Redundant Power Input: 9VDC to 26 VDC.

- Optional input: 48VDC / 125VDC.

- Operating temperature: -40°C to +55°C.

- Storage temperature: -40°C to +85°C.

- Optional mounting: DIN rail.

- IEC 61850-3 compliant.