Guideform Specification

Reason RT430/434 GNSS Precision-Time clock

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RT430/434 is a GNSS clock referenced to GPS and GLONASS satellites, whose main application is to be a source of temporal synchronization signals in different formats and protocols to synchronize internal clocks of equipment and systems based on digital processing.

Functional Specifications

Satellite Systems as Time Input

The device shall track and receive signals from GPS and GLONASS Satellites concurrently to choose the best available source of synchronization.

When installed in a fixed position, the clock shall be capable of been in "locked" state even when receiving signals from a single satellite.

Interfaces Outputs for Time Synchronization

The device shall have at least four TTL electrical outputs, which can be configured to IRIG-B004, DCF77 PPS or PPM, with a mean accuracy of ±50 ns.

The device shall have at least two ST optical outputs, which can be configured to IRIG-B004, DCF77 PPS or PPM, with a mean accuracy of ±50 ns.

The device shall comprise at least one AM (amplitude modulated) output for IRIG-B signal.

One serial port RS232 or RS422/485 shall be available for time synchronization using both frequency variable pulses (such as IRIG-B, PPS or PPM) and datagrams.

The device shall have at least two transistorized (open-collector) outputs to provide a voltage-free signal for time synchronization. Signal may be configurable as PPS, IRIG-B004 or PPM.

Ethernet Protocols for Time Synchronization

The device shall support the IEEE 1588v2 PTP protocol, with better than 100 ns accuracy, including the following PTP profiles:

- PTP Power Profile, in accordance with IEEE C37.238:2017 standard;

- PTP Profile for Power Utility Automation, in accordance with IEC 61850-9-:2016 standard;

- PTP Power Profile, in accordance with IEEE C37.238:2011 standard;

The device shall act as NTP/SNTP Time Server (v2, v3 and v4)

PTP and NTP/SNTP must be available simultaneously through each Ethernet port

Communication Specifications

The device shall comprise at least two Ethernet ports 10/100BASE-T for communication **(RT430 only)**

The device shall comprise at least four Ethernet ports 10/100BASE-T for communication **(RT434 only)**

The Parallel Redundancy Protocol (PRP) in accordance with IEC 62439-3:2016 shall be available for both NTP and IEEE 1588v2 PTP, to ensure Ethernet redundancy with zero-time recovery. **(RT430 only)**

Simple Network Management Protocol (SNMP) v1, v2c and v3 shall be provided to manage the device in an IP network.

Internal Oscillator (holdover) Requirements

In cases where the clock loses the satellites signals, the device shall have a TCXO internal oscillator to ensure a time drift no more than ±800 μs after one day.

A dry contact relay shall be available to alarm the supervisory if the satellite signal is lost, and the clock is using the internal oscillator as time reference.

General Requirements

Design

The device shall be designed to be mounted in a standard 19-inch rack.

Local HMI
The clock shall comprise a LCD display to show date and time. Besides, the equipment shall have one indicator to show if the clock is accurately synchronized with satellites.

Remote Access

The equipment shall be accessible remotely, via a Web Interface, for monitoring and configuration of the clock.

Locked Status

The equipment shall have a dry contact relay signaling if the clock is accurately synchronized to satellites or not.

Power Supply Specification

Apart from the main power supply, the device shall have a redundant power supply. The power supplies must be independent from each other, and each of them may have either one of the the nominal voltages ranges as listed:

- 100-240Vac, 110-250Vdc;

- 24-48 Vdc.

Environmental Conditions

Ambient Temperature Range

Operating temperature range: -40°C to +55°C   (or -40°F to +131°F)

Tested as per IEC 60068-2-1: -40°C operation (16 hours)

Tested as per IEC 60068-2-2: +85°C operation (16 hours)

Relative Humidity

From to 5 to 95%, non-condensing.

Standards Compliance / Type Tests

EMC Compliance

As minimum, the equipment shall use the IEC 60255-26 standard to establish EMC conformity.

Product Safety

As minimum, the equipment shall use the IEC 61010-1 standard to ensure product safety.

The device shall meet the IEC 60255-5, ensuring insulation resistance greater than 100MΩ when applying 500 Vdc.

Mechanical Robustness

The device shall comply with vibration, shock and seismic tests as described in IEC 60255-21 standard.

EU Directives

A declaration of conformity shall evidence compliance with EU directives, and the device shall display a

CE mark.