VCL-2156, NTP SERVER

Product Overview

The VCL-2156 NTP SERVER is designed to provide NTP and ITU-T G.811 Primary Reference Clock that is locked to a GPS / GNSS reference to provide time synchronization to private networks such as Railways and Metro (ticketing and platform) networks, Airports and Air-Traffic Control facilities, Electric Sub-Stations, Power Distribution and Transmission companies, Oil and Gas Utilities, ISPs and Cable TV networks as well as to Campus networks that are required to maintain a complete isolation from public networks for security reasons. It may be also used by 2G, 3G and LTE service providers which provide a time of day reference to their customers over their wireless networks.

VCL-2156 locks to a GPS / GNSS reference to provide an NTP time reference on up to 4+1, 10/100BaseT Ethernet Ports which can be segregated to serve separate classes of assets in the network.

Features and Highlights:

- GPS time reference for SCADA applications
- High bandwidth NTP performance
- Upto 5000 NTP requests per second
- Multiple NTP Ports - 4+1 x Independent 10/100 Mbit/s, RJ-45 Ethernet interfaces
- ITU-T G.811 / Stratum 1 compliant (PR) Primary Reference when locked to GPS
- ITU-T G.812 compliant holdover
- Synchronization of NTP and SNTP clients
- Leap Second correction Support
- MD5 authentication for NTP clients
- Supports 10000 NTP clients
- 1 x IRIG-B Un-Modulated (BNC)
- 1 x IRIG-B Modulated (RA45)
- Meets and comply with Power Contact and Lightening Protection as per Telcordia GR-1089-CORE and EN61000-4-5 Level 3 specifications.
- Alert notifications via SNMP Traps
- Concurrent IPv6 and IPv4 operation
- Supported networking protocols: IPv4, IPv6, SSH, TELNET, FTP, SYSLOG and SNMPv2
- Secure network management: enable or disable options
- Double Oven Quartz Oscillators (OCXO) hold-over
- Stratum 1 when synchronized to GPS/GNSS, or Stratum 2 hold-over
- DC, or AC, or 1+1 Redundant AC+DC Power Supply options.

The VCL-2156 is equipped with a highly accurate, low-noise OCXO to provide a high stability, ITU-T G.812, Type II, III compliant holdover clock with better than 12μs accuracy over a 24 hour (5 milliseconds per year) period in the event of unavailability of the GPS / GNSS signal, or GPS / GNSS antenna failure, or a temporary loss of reception in a totally isolated network without any external reference.

VCL-2156 establishes a highly accurate phase-synchronized frequency and time base by synchronizing to the GPS / GNSS satellites’ atomic clocks to distribute synchronized time over packet based networks including Ethernet, Carrier Ethernet, IP and IP/MPLS Networks.

The VCL-2156 provides a wide range of GPS / GNSS referenced frequency and time sources that include 2.048MHz, 10MHz, 1PPS frequency as well as an NMEA and NTPv4 time reference. Features such as maintaining a distinctly separate IP address for system management and control, password based access, SSH as well as MD5 authentication ensures operational reliability and security. Additional features include remote login and remote firmware upgrade (file transfer) capabilities. VCL-2156 includes complete SNMP monitoring as well as support for enterprise directory services for user authentication, internal and external logging and monitoring of alarm and error messages through Syslog ensures a high level of system manageability. Other features include DHCP for installation convenience and support concurrent IPv4/IPv6 support for future network upgrade.

Performance:

VCL-2156 is designed to be deployed in concurrent IPv4 networks to provide NTP time and frequency synchronization.

The VCL-2156 has 4+1, 10/100 BaseT Industrial Ethernet Ports that meet and comply with “Power Contact and Lightening Protection” as per Telcordia GR-1089-CORE and EN61000-4-5 Level 4 specifications making it suitable for the equipment to be installed in harsh industrial environments which include Electric Sub-Stations, Railway and Metro Networks.

VCL-2156 is powered by a high performance microprocessor and a highly precise GPS / GNSS receiver that provides a better than 30 nanosecond accuracy to assure high bandwidth NTP Performance of better than 5000 NTP requests per second.

Monitoring and Management:

The configuration of the system can be managed by Graphical User Management Interface. Alternatively, a text based and menu driven setup utility can be started from the shell prompt after logging into the unit via Telnet or SSH. An optional Graphical User Network Management Interface (NMS) allows multiple systems installed on a networks to be monitored and configured from a single or multiple management locations.

Standards & Compliance:

- CE – 2001/95/EC, 2006/95/EC, EN60950-1, EN61000-6-2, EN61000-6-4
- FCC Part 15 B Class B: Radiated Emission >1 GHz FCC, 6 GHz, on Power Line
Technical Specifications:

GPS/GNSS Receiver Specifications:
- 50 Channel GPS Receiver
- 72 Channel GNSS Receiver
- GPS L1 frequency, C/A Code Receiver
- Tracks up to 12 satellites simultaneously
- Synchronizing Time:
  - Acquisition time - Hot Start: 1 sec.
  - Acquisition time - Warm Start: 28 sec.
  - Acquisition time - Cold Start: 28 sec.
- GPS Signal
  - Tracking and Navigation: -162 dBm
  - Reacquisition: -160 dBm
  - Cold Start: -148 dBm
- Antenna Connector: TNC
- Accuracy Of Time-Pulse Signal referenced to GPS: +/-30ns (raw)
- Accuracy Of Time-Pulse Signal referenced to GNSS: +/-20ns (raw)
- Accuracy Of Time-Pulse Signal referenced to GPS/GNSS: +/-15ns (compensated)

Holdover (G.812) Synchronization:
- OCXO (Double Oven-Controlled Crystal Oscillator)
  - Accuracy: 0.5ppb per day
  - Accuracy: 50ppb per year

Synchronization Inputs:
- 1 x GPS (TNC)

NTP Outputs:
- 4 x 10/100Mbps NTP Interfaces
- 4 x 10/100Mbps user configurable NTP interface

Configuration and Monitoring Software:
- Telnet, SSH, CLII
- NMS - GUI (Graphical User Interface) - Runs on any PC operating on Windows 7, Windows 8 or Windows 10 OS.

Network Time Protocol:
- NTP v2, (RFC 1119), NTP v3 (RFC 1305), NTP v4, (RFC 1769), NTP v4 (RFP 2030), MDS Authentication
- Internet Protocol: IP v4
- Time Protocol: TIME (RFC 868)
- Daytime Protocol: DAYTIME (RFC 867)

Display:
- LCD-display with back-light

Local / Remote Management and Monitoring Ports:
- RS-232C
- USB
- 10/100BaseT Ethernet RJ45
- 2 x External Alarm Relay Contacts.

Local / Remote Communication Options:
- Telnet / SSH (option to disable clear text communication to comply with NERC security requirements)
- CLI Control Interface (HyperTerminal or VT100)
- SNMP V2 Traps (MIB File provided).

Security and Protection:
- Password Protection with password strength monitor
- SSH

Ordering Information:

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
<th>Power</th>
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<tbody>
<tr>
<td>VCL-2156-NTP-yy</td>
<td>NTP Server</td>
<td>yy: AC or ACR or DC or DCR or ACDC (1+0, 1+1, AC+DC)</td>
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Environmental (Equipment):
- Operational: -10C to +65C (Typical: +25C)
- Cold start: 0C to +50C
- Storage: -20C to +70C
- Humidity: 95% non-condensing
- Cooling: Convention Cooled.
- No cooling fans are required.

Mechanical Specifications:
- Height: 44 mm
- Width: 480 mm (DIN 19-inch)
- Depth: 225 mm
- Weight: 2.3 Kg
- Rack Mount Options: 19", 21", 23" mounting options

Power Supply Options:
- Dual Redundant
- 1+1 AC power (100 to 240V AC, 50/60 Hz)
- 1+1 DC 24V
- 1+1 DC -48V
- 1+1 DC 110~220V
- AC or DC

Power Consumption:
- < 15W at ambient (steady state 24°C)

Antenna Specifications:
- Antenna Type: Active
- Polarization: Right hand circular
- Frequency Band: 1575.42 MHz ± 10 MHz
- Amplifier Gain: 40dB ± 4dB
- VSWR: < 0.5 Max, 1.0 Typical
- Operating temperature: -40°C to +85°C
- Reverse Polarity Protection
- Out of Band Rejection: -60dB @ 50MHz off center (1575.42 MHz) frequency
- Lightning Protection: According to EN61000-4-5 Level 4.
- LMR400 (or equivalent) Cable Length - 30, 50, 60 and 90 meters

MTBF:
- Per MIL-HDBK-217F: ≥ 37 years @ 24C
- Per Telcordia SSR 332, Issue 1: ≥ 42 years @ 24C

Technical specifications are subjects to changes without notice.

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