The VCL-2156, PTP IEEE-1588v2 Grandmaster with NTP SERVER is designed to provide PTP, 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:
- IEEE 1588 v2 Precision Time Protocol Grandmaster
- PTP Profiles supported: Telecom profile, Power profile
- Support up to 128 PTP Clients
- Gigabit Ethernet Interfaces
- 2048MHz, 10MHz, PPS and TOD Output
- 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
- <100ns Accuracy when locked with GNSS (GPS/GLONASS)
- Leap Second Correction Support
- MDS authentication for NTP clients
- 1 x IRIG-B Un-Modulated (BNC)
- 1 x IRIG-B Modulated (RI45)
- 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, SNMPrv2, SNMPrv3
- Concurrent IPv6 and IPv4 operation
- Supported networking protocols: IPv4, IPv6, SSH, TELNET, FTP, SYSLOG
- Secure network management: enable or disable options
- Double Oven Quartz Oscillators (OCXO) hold-over
- DC, or AC, or 1+1 Redundant AC+DC Power Supply options.

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

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 A: 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 in GPS only mode (GPS only version)
- Tracks up to 24 satellites in GNSS mode (GNSS version)

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
  - Tracking and Navigation: -162 dBm

PTP, Frequency and Time Outputs:
- Sync inputs (1 x IRIG-B Modulated (B000, B002, B003, B004, B005, B006, B007))
- 1 x 2.048 MHz, 75 Ohms, phase-locked to Telecom Profile G.8265.1
- 1 x 10/100/1000Base-T (RJ45)
- 1 x GPS (TNC)
- 1 x GPS (IEE-1588 v2 Grandmaster)
- 1 x 10/100Mbps user configurable NTP Interface
- 4 x 10/100 Mbps NTP Interfaces

PTP Profiles:
- Default Profile
- Power Profile C37.238-2011
- Power Profile C37.238-2017
- Power Profile IEC/IEEE 61850-9-3
- Telecom Profile G.8265.1
- Telecom Profile G.8275.1-2008
- Ethernet Default Profile (Layer 2 multicast)
- Configuration message rate 8 pkts/sec, 16 pkts/sec, 32 pkts/sec, 64 pkts/sec, 128 pkts/sec
- Up to 128 message per second
- 1 x 10/100/1000Base-T (RJ45)

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

Synchronization Inputs:
- 1 x GPS (TNC)

NTP Outputs:
- 4 x 10/100 Mbps NTP Interfaces

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

Power Supply:
- 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
- Reverse Polarity Protection

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: < 2.0 Max, 1.0 Typical
- Operating temperature: -40°C to +85°C
- Lightning Protection: According to EN61000-4-6 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

Ordering Information:

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
<th>Power</th>
</tr>
</thead>
<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>
</tr>
<tr>
<td>VCL-2156-NTP-PTP-yy</td>
<td>NTP Server and IEEE-1588v2 PTP Grandmaster</td>
<td>yy: AC or ACR or DC or DCR or ACDC (1+0, 1+1, AC+DC)</td>
</tr>
</tbody>
</table>

Technical specifications are subject to changes without notice.