

# VCL-2156. NTP SERVER



## Product Overview

The VCL-2156 NTP SERVER is designed to provide a highly precise time reference 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 by the creation of multiple VLANs. Each VCL-2156 NTP SERVER supports up to 16 VLANs.

### Features and Highlights:

- High bandwidth NTP performance
- < 3000 NTP requests per second
- Multiple NTP Ports - 4 x Independent 10/100 Mbit/s, RJ-45 Ethernet interfaces
- Support for up to 16 VLANs for segregated NTP networks to serve separate classes of assets
- Synchronization of NTP and SNTP clients
- <100ns Accuracy when locked with GNSS (GPS/GLONASS)
- 1 x IRIG-B Un-Modulated (BNC)
- 1 x IRIG-B Modulated (RJ45)
- Meets and comply with Power Contact and Lightning Protection as per Telcordia GR-1089-CORE and EN61000-4-5 Level 4 specifications.
- Alert notifications via SNMP Traps and e-mail alerts
- Concurrent IPv6 and IPv4 operation
- Supported networking protocols: IPv4, IPv6, SSH, TELNET, SCP, SFTP, FTP, SYSLOG, SNMPv2, SSL and TELNET
- 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, 1/5/10MHz, 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 and e-mail alert ensures a high level of system manageability. Other features include DHCP for installation convenience and support concurrent IP4/IP6 for future network up gradation.

### Performance:

VCL-2156 is designed to be deployed in concurrent IPv4 and IPv6 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 Lightning 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) based time receiver that provides a better than 30 nanosecond accuracy to assure high bandwidth NTP Performance of better than 3000 NTP requests per second / 128 packets per seconds with sub-microsecond accuracy.

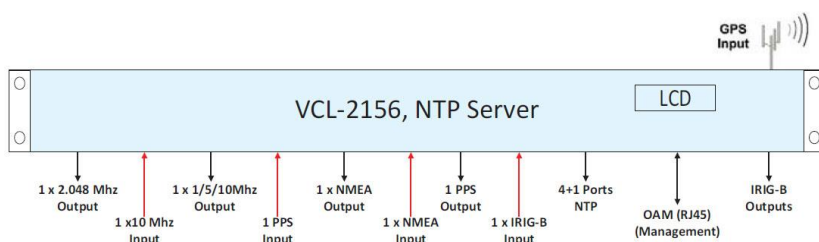
### Monitoring and Management:

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 for easy monitoring and configuration changes in a network that require multiple installations for be monitored and managed from a single or multiple management locations.

### Standards & Compliance:

- \*IEC - EMC – Certified to EN 55022: 2005 / CISPR 22, EN 55024:2005, IEC 61000-4-2
- \*CE – 2001/95/EC, 2006/95/EC, EN60950- 1, EN61000-6-2, EN61000-6-4
- \*FCC – FCC Part 15 B Class A: Conducted Emission test on Power Line
- \*FCC Part 15 B Class A: Radiated Emission >1 GHz FCC, 6 GHz, on Power Line

## Application Diagram:



**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: Less than 15 sec.
  - Acquisition time - Warm Start: Less than 45 sec.
  - Acquisition time - Cold Start: Less than 140 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)  
(Note: with all satellites in view at -130db)

**Holdover (G.812) Synchronization:**

- OCXO (Double Oven-Controlled Crystal Oscillator)

**External Synchronization Inputs:**

- 1 x GPS (TNC)
- 1 x 10 MHz, 50 Ohms (BNC)
- 1 x 1 PPS (Phase) (BNC)
- 1 x NMEA 0183 (TOD) (DB9)
- 1 x IRIG-B (BNC)

**NTP Outputs:**

- 4 x 10/100M NTP Interfaces

**Configuration and Monitoring Software:**

- Telnet, SSH, CLI
- NMS - GUI (Graphical User Interface) - Runs on any PC operating on Windows 7, Windows 8 or Windows 10 OS.

**Ordering Information:**

Part Number	Description	Power
VCL-2156-NTP-yy	NTP Server	yy: AC or ACR or DC or DCR or ACDC (1+0, 1+1, AC+DC)

**Frequency and Time Outputs:**

- 1 x 2.048 MHz, 75 Ohms, phase-locked to GPS (BNC)
- 1 x 1/5/10 MHz, 50 Ohms, phase-locked to GPS (BNC)
- 1 x 1 PPS, phase-locked to UTC\*\* (BNC)
- 1 x ToD (Time-Of-Day) output compliant to NMEA 0183 (DB9)
- 1 x IRIG-B Un-Modulated (BNC)
- 1 x IRIG-B Modulated (RJ45)

**Network Time Protocol:**

- NTP v2, (RFC 1119), NTP v3 (RFC 1305), NTP v4, (RFC 5905), SNTP v3 (RFC 1769), SNTP v4 (RFP 2030), MD5 Authentication
- Internet Protocol: IP v4, IP v6
- 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 and****Management Options:**

- Telnet / SSH (option to disable communication to comply with NERC requirements)
- CLI Control Interface (HyperTerminal or VT100)
- SNMP V2 Traps (MIB File provided).

**Security and Protection:**

- Password Protection with password strength monitor
- SSH
- SSL

**Environmental (Equipment):**

- Operational: -10C to +60C (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 90 mm  
 Width 480 mm (DIN 19-inch)  
 Depth 280 mm  
 Weight 4.5 Kg  
 Rack Mount Options 19", 21", 23" Rack mounting options

**Power Supply Options:**

- Dual Redundant
- 1+1 AC power (100 to 240V AC, 50/60 Hz)
- 1+1 DC 24V power 1+1 DC -48V power 1+1 DC 110/125V DC power
- AC or DC

**Antenna Specifications:****Antenna Type: Active**

- Amplifier Gain: Typically 27dB to 40dB (GPS L1 band)
- Operating temperature: -40C to +85C
- Reverse Polarity Protection
- Lightning Protection: According to EN61000-4-5 Level 4.
- Cable Type: LMR 400 or equivalent with N connector
- LMR400 (or equivalent) Cable Length - 30, 50, 60 and 90 meters

**MTBF:**

- MTBF for VCL-2156 with OCXO Option:
- Per MIL-HDBK-217F: ≥ 37 years @ 24C
  - Per Telcordia SSR 332, Issue 1: ≥ 42 years @ 24C

Technical specifications are subjects to changes without notice.

Revision 1.6