

VCL-2424-DIN-DC

PRC (G.811), NTP SERVER & PTP IEEE—1588v2 GRANDMASTER



ITU-T G.811 compliant
2.048MHz and 10MHz
frequency outputs

IEEE-1588v2 PTP
Grandmaster

<100ns Accuracy when
locked with GNSS (GPS/
Glonass)

Compact DIN RAIL
aluminum chassis

Standard PTP Profiles
supported : Default,
Telecom, Power, SMPTE,
Telecom2 and Power2

High bandwidth NTP
performance. Supports up
to 3000 NTP requests per
second

Synchronization of NTP and
SNTP clients

Leao Second Correction
Support

MD5 authentication for
NTP clients

Meets and comply with
Power Contact and
Lightening Protection as per
Teldcordia GR-1089-CORE
and EN6100-4-5 Level 4
specifications.

Description

The **VCL-2424-DIN-DC** is a compact, industrial grade DIN Rail mounted GPS / GNSS, ITU-T G.811 Primary Reference Master Clock (PRC), PTP IEEE-1588v2 Grandmaster and NTP Time Server synchronization solution that is designed to be installed in harsh environments to provide highly precise time and phase synchronized frequency and time of day references.

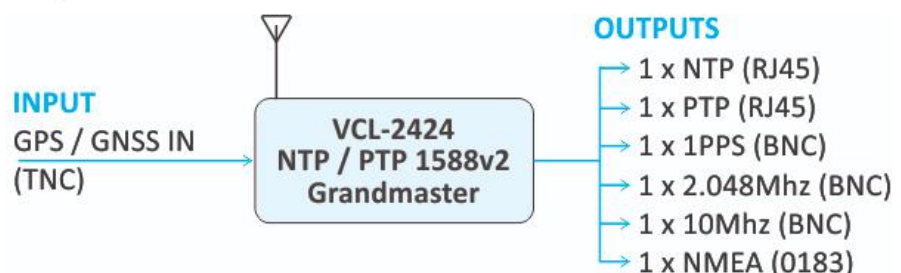
User applications include industrial application, electric sub-stations, power distribution infrastructure, solar farms, wind-farms, railways and metro signaling infrastructure, airports and air-traffic control facilities, 2G, 3G, 4G and LTE mobile cell towers, off-shore oil and gas rigs and naval vessels that are required to operate in complete isolation due to the very nature of their application, geographical location or due to security reasons.

The **VCL-2424-DIN-DC** 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 GNSS (GPS/GLONASS) signal, or GNSS (GPS/GLONASS) antenna failure, or a temporary loss of reception occurring due to stormy weather conditions or solar flares or without any external reference.

VCL-2424-DIN-DC establishes a highly accurate phase-synchronized frequency and time base by synchronizing to the GNSS (GPS/GLONASS) satellites' atomic clocks to distribute synchronized time over packet based networks including Ethernet, Carrier Ethernet, IP and IP/MPLS Networks.

The **VCL-2424-DIN-DC** provides a wide range of GNSS (GPS/GLONASS) referenced frequency and time sources (outputs) that include 2.048MHz, 10MHz, 1PPS as well as an NMEA, 1588v2 PTP and an 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-2424 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 includes support concurrent IPv4/IPv6 support for future network upgradation.

Applications Diagram



Alert notifications via SNMP
Traps

Concurrent IPv6 and IPv4
operation

Upto 3000 NTP requests
per second

Supported networking
protocols : IPv4, IPv6, SSH,
FTP, SYSLOG, SNMPv2 and
Telnet

Double Oven Quartz
Oscillators (OCXO) Hold-
over

Automatic and continuous
OCXO calibration from GPS
reference

Stratum 1 when
synchronized to GPS/GNSS
or Stratum 2 hold-over

24VDC, 48VDC, 110VDC,
220VDC and 220VAC power
supply options.

Performance

The **VCL-2424** is powered by a high-performance microprocessor and a highly precise GNSS (GPS/GLONASS) based time receiver that provides a better than 30 nanosecond accuracy.

VCL-2424 is designed to provide NTP and PTP time and frequency synchronization, with separate individual ports for each type of service.

The **VCL-2424** meets and complies with “Power Contact and Lightning Protection” as per Telcordia GR-1089-CORE and EN61000-4-5 Level4 specifications making it suitable for the equipment to be installed in harsh industrial environments.

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 to be monitored and configured from single or multiple management locations.

Standards & Compliance

- IEC—EMC Certified to EN55022 : 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 Part 15 B Class A : Conducted Emission test on PowerLine
- FCC Part 15 B Class A : Radiated Emission >1GHz, FCC, 6 GHz on Power Line



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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 for GPS
- Tracks up to 24 satellites simultaneously for GNSS (GPS+GLONASS)
- 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
- Integrated GPS Antenna
- Accuracy of Time-Pulse Signal referenced to GPS: +/-30ns (raw), in Stationary Mode
- Accuracy of Time-Pulse Signal referenced to GNSS: +/-20ns (raw) in Stationary Mode
- Accuracy of Time-Pulse Signal referenced to GPS/GNSS: +/-15ns (compensated) (Note: with all satellites in view at -130db)
- User configurable for "Stationary" or "Moving" Applications. May be configured for use in Portable, Automobile, Maritime Application Modes.

NTP Output:

- 1 x 10/100 Mbps user configurable NTP interface

Local / Remote Management and Monitoring Ports:

- 10/100BaseT Ethernet RJ45

Local / Remote Communication Options:

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

Holdover (G.812) Synchronization:

- OCXO (Double Oven-Controlled Crystal Oscillator)

Synchronization Inputs:

- 1 x GPS

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: Ipv4
- Time Protocol: TIME (RFC 868)
- Daytime Protocol: DAYTIME (RFC 867)

Frequency Outputs:

- 1 x 2.048 MHz, 75 Ohms, phase-locked
- 1 x 10 MHz, 50 Ohms, phase-locked
- 1 x 1 PPS, phase-locked to UTC (BNC)

PTP IEEE 1588-2008 V2 Grandmaster:

- <100ns Accuracy when locked with GNSS (GPS/GLONASS) in Stationary Mode.
- PTP Slave/Client capacity: 8, 16, 32
- User Configurable: 1-step and 2-step Clock

PTP Outputs:

- 1 x 10/100/1000Base-T (RJ45) Electrical Port.

PTP Profiles:

- Default IEEE-1588v2, 2008 PTP Profile
- Default Power Profile.
- Power Profile: IEEE C37.238-2011
- Ethernet Default Profile (Layer 2 multicast)
- Telecom-2008 Profile (Layer 3 unicast, pre-standard ITU-T G.8265.1, Ipv4)
- ITU-T G.8265.1 (Layer 3 unicast, Ipv4)
- Communication: Unicast, Multicast or Mixed
- Best Master Clock Algorithm (BMCA)



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Specifications

Security and Protection:

- Password Protection with password strength monitor
- SSH

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.

Antenna Specifications:

- Integrated Antenna
- Antenna Type: Active
- Amplifier Gain: Typical 27dB (GPS L1 band)
- Operating temperature: -40C to +75C
- Reverse Polarity Protection
- Lightning Protection: According to EN61000-4-5 Level 4.

Regulatory Compliance

- RoHS
- CE Marking
- Complies to applicable IEEE and IEC standards
- Transportation ETS 300 019 Class 2.3

MTBF:

- Per MIL-HDBK-217F: ≥ 17 years @ 24C
- Per Telcordia SSR 332, Issue 1: ≥ 23 years @ 24C

Environmental (Equipment):

Operational: -40C to +75C (Typical: +25C)
 Cold start -20C to +50C
 Storage -40C to +85C (Typical: +25C)
 Humidity 95% non-condensing
 Enclosure Ip65, suitable for outdoor, unprotected installation.

Mechanical Specifications:

Height 73 mm
 Width 190 mm
 Depth 210 mm
 Weight 1.0 Kg

Power Supply Options:

- DC 24V and DC 48V
- DC 110V, 220V with external adapter
- AC 220V with external adapter

Power Consumption:

- < 10W at ambient (steady state 24°C)

Product References

Reference	Industrial Managed PRC (G.811), NTP Server & IEEE-1588v2 PTP Grandmaster
VCL-2424-DIN-DC	PTP / NTP time server VCL-2424-D. PRC with GPS input and OCXO oscillator. Outputs: 1xNTP, 1xPTP, 1x 1PPS, 1x 2.048MHz, 1x 10MHz, 1x NMEA. Industrial design with DIN rail mounting, 12/24 Vdc power input. 30dB GPS antenna and 10 meter cable.



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