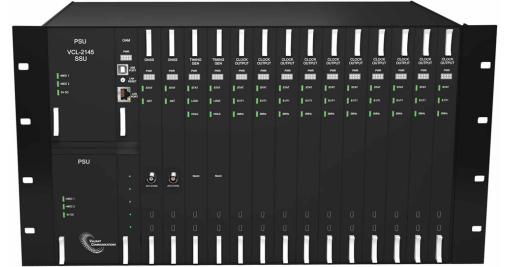


Product Overview

The VCL-2145-SSU is specifically designed to provide reliable and high precision synchronization in 2G, 3G, HetNet and LTE mobile telecommunications networks as well as backhaul wire-line SDH / SONET and Synchronous Ethernet networks. It may be also used by Railways, Airports (and Air-Traffic Control), Power Generation and Distribution companies and other Utility companies who require fail-safe, high-reliability and precise synchronized synchronization outputs that are concurrently locked to GNSS (GPS/GLONASS) References.

Fully Reliable / Redundant Equipment, High Performance Network

The VCL-2145-SSU accepts a wide range of input and outputs. Output capabilities allow it to support legacy frequency timing applications, including E1/ T1, 10 Mhz, 1 PPS (PPS) as well as Time-Of-Day (ToD) using redundant Input / Output Clock cards. Additionally, the SSU may also be used to provide IEEE-1588v2 PTP Grandmaster and NTP Outputs.



Features and Highlights:

- PTP Grandmaster is Modular and compact 6U, 19" or ETSI rack mountable equipment to provide network synchronization
- Fully integrated - IEEE 1588v2 (2008) PTP server and NTP (v4) Server
- High capacity (up to 16,384 PTP slaves / clients) per chassis.
- Compliant with ITU-T Telecom Profile G8265.1 and G8275.1
- High PTP message rate (up to 128 messages per second)
- Automatic Redundant configuration
- Single or Dual GNSS (GPS) inputs with Stratum 1
- Single platform for traditional TDM, PTP, NTP and SyncE
- Integrated with Next Generation Networks Synchronization
- Time-of-Day Server
- Timing sources for Sync-E, Ethernet Network Equipment
- OCXO and Rubidium (RbXO) Holdover Clock options
- Protection / Redundancy: Module protection for all critical functions (Inputs, Holdover Clock, Outputs, Power)
- Fully Manageable Local and Remote Graphical User Interface (Omni view).

Standards and 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.

Equipment Design:

VCL-2145-SSU hardware design is intended to integrate intelligent, functional modules into a flexible, fully protected / fully redundant system to seamlessly satisfy current and future customer requirements to provide Phase, Frequency Time Synchronization over Packet based networks.

VCL-2145-SSU integrated up to 6U high performance modules enabling a total capacity of more than 6,000 PTP slave clients. Each module integrated with PTP Engine with accurate time stamping and supports 1024 PTP Clients each card.

Fail-safe: Input signals from GNSS (GPS/GLONASS) are by-pass / switch / pass-through in case of any function / card level failure.

Reliability and Flexibility:

Each VCL-2145-SSU module/card is designed for high-reliability and flexible functionality. Modules/Cards can be removed or inserted while the unit is operating without any degradation of the output signals. Each Smart Card/Module supports the management of Critical, Major and Minor alarms.

Power Supply Options:

- Dual Redundant - maximum output / power supply card: 200W
- 1+1 AC power (100 to 240V AC, 50/60 Hz)
- 1+1 DC 24V power
- 1+1 DC -48V power
- AC or DC.

Technical Specifications:

GNSS (GPS and GLONASS):

- 50 Channel GPS Receiver / 72 Channel GNSS (GPS and GLONASS) Receiver
- Supports GPS/ L1, GLONASS Galileo, SBAS: GAGAN, WAAS, EGNOS, MSAS, QZSS
- 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.
- Antenna Connector: TNC
- Accuracy Of Time-Pulse Signal referenced to GPS: +/-30ns (raw)
- Accuracy Of Time-Pulse Signal referenced to GPS: +/-15ns (compensated)
(Note: with all satellites in view at -130db)

Synchronization Inputs:

- 1:1 Protected - E1 (2.048Mbits), 2.048 MHz inputs
- 4 x E1 (2.048Mbits), 4 x 2.048 MHz and SyncE input options
- Up to two GNSS Modules - GPS/GLONASS Inputs
- Up to two Input Modules E1 (2.048Mbits) / T1 (1.544Mbits), 2.048 MHz and 10 MHz.

Optional Synchronized Outputs:

- Up to 8 x E1/T1, 2048MHz cards - supports 24 outputs per card (E1 /T1 and 2048MHz)
- Optional 1:1 Protection
- Up to 8 x High capacity PTP cards - supports 1 PTP Output Ports per card
- Up to 8 x High Capacity NTP cards. Each NTP card supports 4 x 100/1000BaseT (electrical) / 1000BaseX (optical) NTP outputs
- SyncE
- 1 x 10 MHz
- 1 x NMEA0183
- 1 x 1 PPS.

Technical Specifications:**Holdover Oscillator Options [Internal (G.812) Synchronization Options]:**

- The VCL-2145-SSU accepts single or dual clocks (1+0 or 1:1 / 1+1 protected clocks). The input reference jitter and wander are filtered by a high quality oscillator.
- Oscillator options include:
- Oven-Controlled Crystal Oscillators (OCXO)
- Rubidium (RbXO)
- In case of loss of GNSS and input references, the VCL-2145-SSU uses intelligent software algorithms to provide better output performance which exceed the holdover stability requirements of ITU-T G.821.

Synchronization Performance:

- G.811 PRC referenced to GNSS (GPS/GLONASS). ITU-T G.811 quality when locked to GPS, or GPS+GLONASS (ITU-T G.811)
- G.812 Type II SSU on Rubidium Holdover (ITU-T G.812)
- G.812 Type I & III SSU on OCXO Holdover (ITU-T G.812)

NTP - 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)
- Upto 8000 NTP requests per second
 - 64,000 NTP Slaves supported
 - 400,000 SNTP Slaves supported

PTP IEEE 1588-2008 V2 Grandmaster:

- <100ns Accuracy when locked with GNSS (GPS/GLONASS)
- PTP Slave/Client capacity: 8, 16, 32, 64 or 128
- User Configurable
- 1-step and 2-step Clock
- Configuration message rate 8 pkts/sec, 16 pkts/sec, 32 pkts/sec and 64 pkts/sec
- Up to 128 message per second
- 1 x 10/100/1000Base-T (RJ45) Electrical Ports

PTP Profiles:

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

Local / Remote Management and Monitoring Ports:

- RS-232C
- USB
- 10/100BaseT Ethernet Rj45
- 2 x External Alarm Relay Contacts for Critical and Minor Alarms
- User defined alarm status for all Alarms

Local / Remote Communication and Management Options:

- LED's on front panel
- Telnet, CLI, HTTP Web Interface
- Password Protection
- Firmware upgrade
- CLI Control Interface (HyperTerminal or VT100)
- SNMP V2 Traps (MIB File provided)
- GUI (Graphical User Interface) - Runs on any PC operating on Windows 7, Windows 8 or Windows 10 OS.

Security and Protection:

- Password Protection
- SSH
- RADIUS

Management:

- OMNIVIEW management software provides locally and remotely, powerful fault, configuration, accounting/inventory, performance, security, and other optional management functions.
- Third party equipment can easily be managed through a set of electrical alarm collection inputs. The VCL-2145-SSU is also manageable by SNMP through OMNIVIEW.

MTBF:

MTBF for VCL-2145 with RbXO Option:

- Per MIL-HDBK-217F: ≥ 32 years @ 24C
- Per Telcordia SSR 332, Issue 1: ≥ 36 years @ 24C

MTBF for VCL-2145 with OCXO Option:

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

Environmental Characteristics (Equipment):

Operational	-10C to +60C (Typical: +24C)
Cold start	-0C to +50C
Storage	-20C to +70C
Humidity	-95% non-condensing
Cooling	Convention Cooled.
	No cooling fans are required.

Mechanical Specifications:

Height	266 mm (6U)
Width	480 mm (DIN 19-inch)
Depth	280 mm
Weight	9.5 Kg
Rack Mount Options	19", 21", 23" Rack Mounting options

Antenna Specifications:

- Protected 1:1 / 1+1 Antenna (Redundant)
- Antenna Type: Active
- N-Type (F) Connector
- Frequency: GPS L1 and L2 Bands (1.575 MHz); GLONASS: 1602-1615MHz
- Amplifier Gain: Typically +/-40dB (GPS L1 band); +/-34 (GLONASS band)
- Reverse Polarity Protection
- Lightning Protection: According to EN61000-4-5 Level 4.
- Operating temperature: -40C to +85C

Environmental characteristics (Antenna):

Operational	-40C to +85C
Storage	-40C to +85C
Humidity	95 % non-condensing
Salt and Fog	Mil. Std. 202F, Method 101D Cond. B
Lightning Protection	According to EN610004 -5 Level 4
	Suitable for outdoor and rooftop installations.

Antenna Cable Options:

(Note: cables and connectors are not included and must be ordered separately as optional extras).

- Cable Type: LMR 400 or equivalent with N connector
- Total Cable Length: 30, 50, 60, 90 meters LMR 400
- 91 to 120 meters (LMR400 with one active in-line amplifier).
- 121 to 240 meters (LMR 600 with two active in-line amplifiers).

U.K.

Valiant Communications (UK) Ltd
Central House Rear Office,
124 High Street, Hampton Hill,
Middlesex TW12 1NS, United Kingdom

E-mail: gb@valiantcom.com

U.S.A.

Valcomm Technologies Inc.
4000 Ponce de Leon Blvd.,
Suite 470 Coral Gables,
FL 33146

E-mail: us@valiantcom.com

INDIA

Valiant Communications Limited
71/1, Shivaji Marg,
New Delhi - 110015,
India

E-mail: mail@valiantcom.com