Smart solutions for smart networks

Version 5.5

VCL-2145-D

PRIMARY REFERENCE CLOCK
PTP GRANDMASTER AND NTP SERVER

TIMING
PTP NTP
IRIG-B

SYNCHRO
1PPS 1PPM
1/5/10 MHz
2.048 Mbps / MHz
10MHZ
E1 / T1

GPS PRC
G.811

OCXO RUBIDIUM
G.812 holdover

2U COMPACT
Cost effective

Introduction

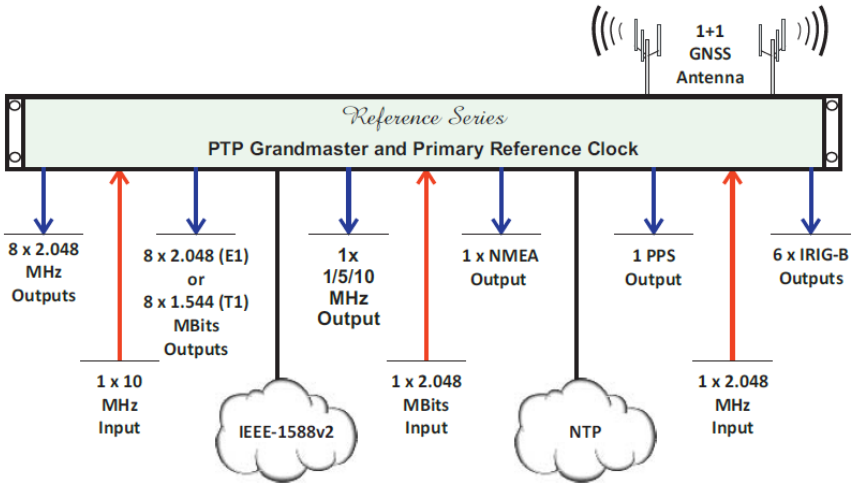
VCL-2145-D is a high-performance, GPS/GNSS (Global Navigation Satellite System) Primary Reference Clock that provides ITU-T G.811 Primary/Reference Clock, PTP (IEE 1588 v2), NTP and IRIG-B outputs which are locked with GPS/GNSS or user-selected input reference source. (i.e., 2.048Mbit/s (E1), 2.048MHz and 10MHz).

The VCL-2145-D Satellite Receiver also has an integrated, high bandwidth NTP Server engine that is capable of handling up to 10.000 NTP requests par second. Multiple IRIG-B Outputs are also provided to synchronize local clock (time-of-day) display units to a central timing source with nanosecond accuracy.

VCL-2145-D, Primary Reference Clock is specifically designed for frequency synchronization of mobile telecommunications SONET and Synchronous Ethernet networks. It may be also used by Railways, Airports (and Air Traffic Control), Power generation and distribution companies who not only require highly precise G.811 frequency synchronization locked to a GPS Reference but who also need to provide an accurate time-of-day reference clock in their network.

VCL-2145-D incorporates dual (1+1 redundant) GPS receiver engines and dual (1+1 redundant) power supply for added reliability which are always locked t a user selected satellite (GPS) reference to provide multiple G.811/Stratum1 quality frequency and tile-of-day (PTP, NTP and IRIG-B) outputs. The VCL-2145-D is also equipped highly accurate, low-noise OCXO/Rubidium oscillator which provides a high stability holdover clock that is typical of a Network SSU in the event of loss of GPS signal, or its antenna failure.

Application Diagramm



GPS Receiver as a Primary Reference (PRC) Clock with IEEE-1588v2 Grandmaster and NTP Server

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Specifications

SYNCHRONIZATION INPUTS	
GPS/GNSS receiver	50 channel GPS receiver 72 channel GNSS receiver Tracks up to 12 GPS satellites -150/-160 dBm sensibility Accuracy +/-15nS
2.048 MHz	75 Ohms, BNC
2.048 Mbps	75 Ohms, BNC
10 MHz	50 Ohms, BNC
OCXO	0.5ppb (10^{-9})per day accuracy 50 ppb per year accuracy
Rubidium	$5x10^{-11}$ per month accuracy < $1x10^{-10}$ frequency stability
Clock accuracy	PRC G.811 when locked on GPS G.812 on holdover
TIMING OUTPUTS	
PTP IEE 1588	IEEE 1588 v2 Gand Master (2008) Up to 128 PTP Clients 1-step or 2-step L2 Ethernet or L3 UDP Telecom Profile G.8265.1 / G.8275.1 Power Profile IEC.61850-9-3, C37.328
NTP	4x NTP ports NTP v2 / v3 / v4, SNTP v4 MD5 authentication Unicast, Multicast, broadcast Support of 5K requests per second
IRIG-B	6x BNC
NMEA Time Of Day	1x RS232, DB9, NMEA.0183
SYNCHRONIZATION OUTPUTS	
2.048 / 1.544 Mbps	8x RJ45, 120 Ohms, E1 / T1
2.048 MHz	8x BNC, 75 Ohms
1 / 5 / 10 MHz	1x BNC, 50 Ohms
1PPS	1x BNC
1PPM	3 pin connector

Management	
Protocols	Telnet, ftp, SSH, sftp, scp HTTP/HTTPS, Syslog SNMP v2/v3 Radius CLI, GUI
Power supply	
Redundancy	2x AC or DC power inputs and converters
110-230 Vac	100 to 240 Vac, IEC connector 2x redundant AC converters
48 Vdc	40 to 60 Vdc, screw bloc 2x redundant DC converters
Power consumption (with OCXO osc.)	< 25 W max during startup < 18 W at steady state 23°C
Power consumption (with Rubbidium osc.)	< 40W max during startup < 32 W at steady state 23°C
GPS Antenna	
Format	Active, wall mounting
Frequency band	1575.42 MHz, +/- 10MHz
Amplifier gain	40 dB +/-4dB
Operating temperature	-40 to + 85 °C
Lightning protection	EN61000-4-5, Level 4
Environmental	
Size (WxDxH)	435 x 305 x 89 mm
Weight	4.5 Kg
Operating temperature	-10 to +60 °C (Typical: +25°C)
Storage temperature	-20 to +70 °C
Cold start	-0°C
Humidity	95%, non condensing
Compliance	CE, ROHS, EN55022, EN55024
MTBF	210,000 Hours, Telcordia SSR332, 40°C

Ordering information

Reference	Description
VCL-2145-D	GPS G.811 PRC and SSU with PTP Grand Master and NTP server, no power supply
VCL-2145	GPS G.811 PRC and SSU with NTP server, no power supply
VCL-2145-LC	GPS G.811 PRC and synchronization Supply Unit, no power supply
-OCXO	OCXO oscillator option for VCL-2145 clock system
-RBXO	Rubidium oscillator option for VCL-2145 clock system
VCL-PS-AC220	110-230 Vac power supply module
VCL-PS-DC048	48 Vdc power supply module (other power supply on demand)
VCL-GPS-ANT	GPS antenna, 30dB, N-Type (F) connector
VCL-GPS-COAX-03M	N-Type (M) to TNC (M) cable, 3 meters
VCL-GPS-COAX-30M	N-Type (M) to N-Type (F) cable, 30 meters
VCL-GPS-COAX-60M	N-Type (M) to N-Type (F) cable, 60 meters (other length on demand)
VCL-GPS-PROTEC	GPS lightning protection kit, 50 Ohms, N-Type (M) to N-Type (F)

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