GPS Disciplined Rubidium Frequency & Time Reference

Features

- Sine wave or CMOS/TTL output
- Short term stability 4 x10^{-12} at 100sec
- Accuracy to 25ns RMS UTC
- Ultra Low phase noise -115dBc at 1Hz
- National & International Traceable Reference consumption

Description

The E8010 provides a stable and accurate calibration free GPS time & frequency with multiple outputs signal formats in an easy to install 1U rack mountable chassis. This reference maintains high time and frequency accuracy required for demanding applications.
The added advantage of the internal rubidium module is that there is no measurable difference between the stability when locked to GPS or in Holdover mode with measurement times up to 1000s.

Applications

- RS232, USB & Ethernet interface
- Remote access & software interface
- 50ns 1PPS accuracy to UTC
- Optional upgrade to NTP server
- Alternative Cesium
- Built-in self calibration
- UKAS calibration certificate available
- Excellent holdover performance
- Battery back up and redundancy switchover
- Time and frequency standard for calibration & RF laboratories

Related products

- **E8000**: 1U 19” rack mount up to 12 output, frequencies 1 to 100MHz
- **E80-GPS**: Low Noise Desktop & Bench top Frequency reference 1 to 4 outputs
- **E8-Y**: Low cost and Low Noise Desktop Frequency reference 1 to 4 outputs
- **E8-X**: Low cost Desktop Frequency reference 1 to 4 outputs

E8010 Specification

Outputs *See options*	
10MHz	+8dBm (±2dBm) into 50 Ohms, 0.7V_{rms} (Specify for 75Ω load)
Connector	BNC standard (SMA available)

Frequency Stability *Allan Deviation*	Options A	Options B	Options C
Frequency	10MHz	10MHz	10MHz
τ =1s	≤2x10^{-11}	≤2x10^{-12}	≤8x10^{-13}
τ =10s	≤5x10^{-11}	≤4x10^{-12}	≤2x10^{-12}
τ =100s	≤2x10^{-11}	≤1x10^{-12}	≤1x10^{-12}

Phase Noise (SSB)	Options 1	Options 2	Options 3	Options 4
Frequency	10MHz	10MHz	10MHz	10MHz
1Hz	-67 dBc	-100 dBc	-110 dBc	-115 dBc
10Hz	-95 dBc	-125 dBc	-136 dBc	-140 dBc
100Hz	-127 dBc	-145 dBc	-150 dBc	-154 dBc
1 kHz	-145 dBc	-150 dBc	-155 dBc	-155 dBc
10KHz	-144 dBc	-155 dBc	-157 dBc	-160 dBc

Harmonics	Standard	Options C
	<-30dBc	<-45dBc
Spurious		
100 KHz BW	<-100dBc	<-100dBc

1PPS Output	
Accuracy	<+12ns
Pulse Width	10 millisecond
Output level	CMOS 0-3.3V

Timing accuracy at Holdover mode	
Per 24 hours	1.5µ sec.

Frequency aging at Holdover mode		
Per 24 hours	5x10^{-12}	No GPS lock[1]
Per month	5x10^{-11}	

Warm-up time

<30 minutes, time to lock at room temperature 25°C

1. In the event of GPS signal loss the E8000 automatically switch to holdover mode.

Included with shipment: *Calibration certificate, Certificate of Conformance, product test sheet and 24 month warranty.*

Environmental			
Temperature :		Operating	-40°C +60°C
		Storage	-40°C +90°C
Temp stability :	No GPS Lock	-20°C +60°C	0.1x10^{-9}
	Locked to GPS	-20°C +60°C	<1x10^{-10}
Relative humidity :		92% non-condensing	
Magnetic Field sensitivity :		2x10^{-11} Gauss	
Atmospheric pressure :		1x10^{-13} Per mbar	
Approximate MTBF :		100,000 Hrs, Stationary	
Dimensions without cover		44 x 250 x 444mm LWH	

Power supply	
AC power:	90 – 240V
Power consumption:	22W Max at start (25°C) 6W at steady state

Data output & monitoring	Options D	
RS232, 9600 baud rate	USB	Ethernet

NMEA output sentences: GPGLL, GPGGA, GPGSA, GPGSV & GPRMC

GPS receiver data output in TSIP forma.

Processor data include unit status.

Built-in options

Option 01: Redundant switchover for external power back-up
Option 02: Output 2.048MHz (2048kHz)
Option 03: Output 1544kHz
Option 04: 13MHz Output
Option 05: TTL Output
Option 07: 10.24MHz Output
Option 08: 10.23MHz Output
Option 09: Add 6 Output Distribution Card
Option 10: 26MHz Output
Option 11: 1MHz Output
Option 12: 5MHz Output
Option 18: Extended warranty to 3 years
Option 20: Discipline to external GPS 1PPS or 10MHz input
Option 42: Low noise floor -170dBc at 10KHz
Option 47: High gain GPS antenna, up to 50 meters of cable
Option 52: Rack Mount 19" 2U
Option 62: AC Input 110V
Option 64: DC input: Specify +12V, +24V, +48V or +60V
Option 75: Add internal battery, up to 4 hours of battery life.

Contact us to configure this product to meet your requirement.
Designed and manufactured in the U.K.

Typical configuration

The E8010 can be configured to any frequencies from 1 to 100MHz of your preferred signal format. Standard connectors are BNC and SMA but E8010 can be configured with any output connector to suit your application.

Included with the shipment

All Quartzlock GPS frequency references are supplied with our standard GPS Antenna, Manual, Test sheet, Calibration certificate and Certificate of conformance.

Standard GPS antenna with 5 meters of cable

Optional upgrade

The High Gain GPS Antenna is designed for stationary application and all weather and harsh environment to provide a strong signal. This antenna is also a high-quality solution for adding GPS RF signals to marine GPS navigation systems. The high gain GPS antenna can be setup with up to 50 meters of cable. The high gain GPS antenna is supplied with stainless steel antenna mount.

High Gain GPS antenna

High Gain GPS Antenna specifications:
Waterproof, weatherproof
Operating Temp -40°C to +85°C
Gain: 35dB ±3dB
Voltage: +5V
Connector: TNC
L1 GPS, 1575.42MHz ±1.023MHz
ROHS compliant

Antenna mount & coaxial cable