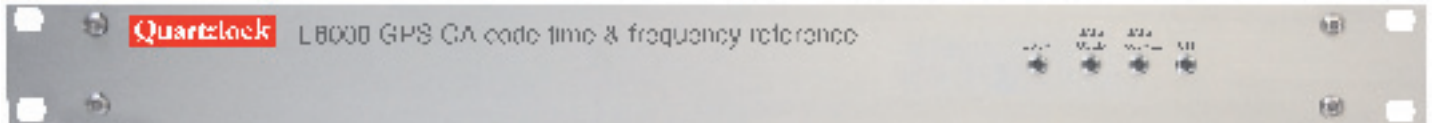


Quartzlock E8000

Very Low Noise GPS Timing & Frequency Standard

**Very Low Phase
Noise now standard**
Phase Noise is $-110\text{dBc}/\text{Hz}$ @ 1Hz offset
as standard
Stability (AVAR) is $8 \times 10^{-13}/\text{s}$ typically with
100us/day holdover



Description

The Quartzlock E8000 represent a breakthrough in exceptionally low cost, 1U rackmount, traceable, **calibration-free “off air” frequency & time standards**. These very low cost references maintain the high frequency & time accuracy required for demanding applications. Low distortion 10MHz Sine & 1PPS outputs. Ultra low noise options are available.

Considerably enhanced radio communications with E8000 much lower noise levels

Features & Benefits

- 1×10^{-12} accuracy
- No Drift
- High Stability
- 1 Year Warranty
- Lowest Cost Available
- Very long production life & support
- ULN Options: $-115\text{dBc}/\text{Hz}$ @ 1Hz offset & $-173\text{dBc}/\text{Hz}$ noise floor
- No Calibration Required
- Traceable Reference, nationally & internationally
- External & Internal BBU options
- **Lowest Cost Available**

Applications:

- **Calibration of:** Counters, Frequency Meters, Spectrum & Network Analysers, Synthesizers, & Communication Analysers
- **Reference for:** Satellite Communication Ground Stations, VHF, UHF & PMR TX, CDMA, Tetra, DTV & DAB
- Production Test Frequency Standard
- Network Time Protocol use in Financial, Utilities, Security & Communications Timing
- OEM
- **Frequency Standard for:** Calibration Labs, Radio Workshops, RF Labs

Quality:

- Quartzlock’s Hydrogen Maser based laboratory is used in production test & QA to ensure compliance with offset and stability specifications.



E8000

Very Low Noise GPS Timing & Frequency Standard

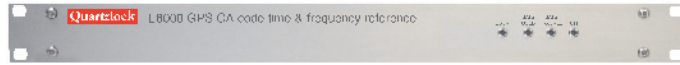
The Quartzlock E8000 represents a breakthrough in exceptionally low cost, very low noise, traceable, **calibration-free “off air” frequency & time standards**. These very low cost references maintain the high frequency & time accuracy required for demanding applications.

Very Low Phase Noise now standard
Phase Noise is -110dBc/Hz@1Hz offset as standard
Stability (AVAR) is 8×10^{-13} /s typically with 100us/day holdover

E8000 SPECIFICATION		E8000 ULTRA LOW NOISE 5MHz OPTION SPECIFICATION	
Outputs	a) Sinewave, 10MHz, 12dBm +/- 2dBm into 50 Ohms Harmonics < -50dBc Spurii < -75dBc b) TTL, 3.3VCMOS, 1pulse per second (4ns std dev)	Outputs	a) Sinewave, 5MHz, 12dBm +/- 2dBm into 50 Ohms Harmonics < -50dBc Spurii < -75dBc b) TTL, 3.3VCMOS, 1pulse per second (4ns std dev)
Frequency Accuracy	1x10 ⁻¹² Long Term	Frequency Accuracy	1x10 ⁻¹² Long Term
Hold-over	100 us - ask Quartzlock	Hold-over	100 us - ask Quartzlock
Short Term Stability	tau Allan Variance 1s <8x10 ⁻¹³ 10s <4x10 ⁻¹³ 100s <5x10 ⁻¹² 1000s <2x10 ⁻¹² 10000s x10 ⁻¹³	Short Term Stability	tau Allan Variance 1s <5x10 ⁻¹³ 10s <4x10 ⁻¹³ 100s <5x10 ⁻¹³ 1000s <2x10 ⁻¹² 10000s x10 ⁻¹³
Phase Noise (typ)	1Hz -110 dBc/Hz 10Hz -136 dBc/Hz 100Hz -145 dBc/Hz 1kHz -155 dBc/Hz 10kHz -157 dBc/Hz	Phase Noise (typ)	1Hz -120 dBc/Hz (-123 typ) 10Hz -140 dBc/Hz 100Hz -150 dBc/Hz 1kHz -155 dBc/Hz 10kHz -158 dBc/Hz
Lock Indicator	On - Not Locked Off - Locked, Low Phase Error Short flash every second - Locked, High Phase Error	Lock Indicator	On - Not Locked Off - Locked, Low Phase Error Short flash every second - Locked, High Phase Error
GPS Indicator	Green - Indicates number of satellites used in time solution Amber - Indicates number of satellites tracked but not used in time solution	GPS Indicator	Green - Indicates number of satellites used in time solution Amber - Indicates number of satellites tracked but not used in time solution
Warm Time	<20 minutes to specified accuracy	Warm Time	<20 minutes to specified accuracy
Power Supply	85 ... 240V ac (External 12Vdc Battery Back Up seamless switching option) (Internal 12Vdc Lithium Ion battery with charger > 1 hour holdover option)	Power Supply	85 ... 240V ac (External 12Vdc Battery Back Up seamless switching option) (Internal 12Vdc Lithium Ion battery with charger > 1 hour holdover option)
GPS Antenna	Supplied with cable and connectors	GPS Antenna	Supplied with cable and connectors
Current Consumption	250mA typical	Current Consumption	250mA typical
Size	E8000 19" x 44mm 1U Rack Mount	Size	E8000 19" x 44mm 1U Rack Mount

Interface	Shared between DPLL and GPS receiver
DPLL	9.6kbaud, RS232, PC compatible (8bits no parity, no handshake)
GPS	9.6kbaud, Motorola binary format (8bits no parity, no handshake)
DPLL Tracking	5mHz to 500mHz typical in 8 binary Bandwidths increments default 20mHz

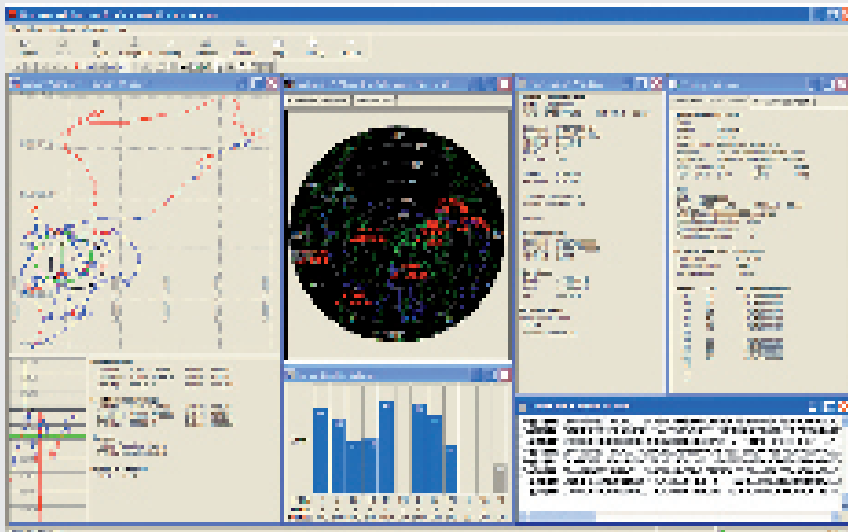
OPTION 42 **See A5000 Spec**
 Outputs 6 x10MHz low distortion, sinewave, isolated, +13dBm 1V rms 50 Ohms



The special E8000 OCXO and filter circuitry are used to achieve the Very Low Noise 10MHz or Ultra Low Noise 5MHz optional output.

Survey, Satellite Azimuth & Elevation, Navigation, Timing & Signal Quality Monitoring

These software packages will find educational survey and GNSS applications. Demonstration of the location, timing and navigation functions are provided.



Quartzlock GPS instruments have been designed to work with various external software packages such as WinOncore. We accept no responsibility for accuracy or performance of these external programs.

These programmes enable the main parameters of the GPS signals to be easily verified, particularly input signal level and satellites in view.

WinOncore12 has been designed for use as an evaluation and testing tool in conjunction with Motorola's GT, UT and M12 Oncore GPS receivers. This utility will aid the user in initializing and operating the Oncore receiver, displaying, plotting and printing data from the receiver, and recording and replaying data files.

Other Oncore receivers such as the VP, Basic or XT Oncore may also be used with WinOncore12; however, not all of the input and output (I/O) messages are defined. If you are using a receiver which supports I/O messages not defined in WinOncore12, you may customize support for each desired message in the Command Manager.

WinOncore12 supports both NMEA and Motorola Binary protocol, and thus may be used to record live data or playback previously recorded data from a NMEA (*.GPS) file or Motorola Binary (*.bin) file.

WinOncore12 will run under Windows 95/98/2000 and NT.

Fully Specified, Low Cost Distribution Amplifier Outputs

SPECIFICATION

No of outputs: 6 to 12

Input characteristics

- a) impedance 50 ohm nominal
- b) level +10dBm nominal
+7 dBm to +15 dBm adjustable
- c) input SWR <1.2 :1 at 10 MHz

Output characteristics

- a) impedance: 50 ohm nominal
- b) rated output: 12dBm into 50 ohms
at 10MHz
- c) output SWR: <1.2:1
- d) maximum output: 13dBm into 50 ohms
at 10MHz typical

Frequency response 1MHz to 20MHz +/-1.0dB

Harmonics

- (at rated output,10MHz) (source harmonics less than -60dBc)
- second harmonic < -50dBc
 - third harmonic < -50dBc

Isolation

- a) output to output (adjacent outputs) >50dB at 10 MHz
typically >60dB
- b) output to output (non adjacent) Ask Quartzlock
- c) output to input >90db at 10MHz

Short term stability (at 10MHz) 2×10^{-13} tau=1sec
 2×10^{-14} tau=10sec
 5×10^{-15} tau=100sec

Phase noise (10MHz)

- offset typical phase noise,dBc/Hz
- 1Hz -115
 - 10Hz -145
 - 100Hz -146
 - 1kHz & 10kHz -147

Noise Floor -155

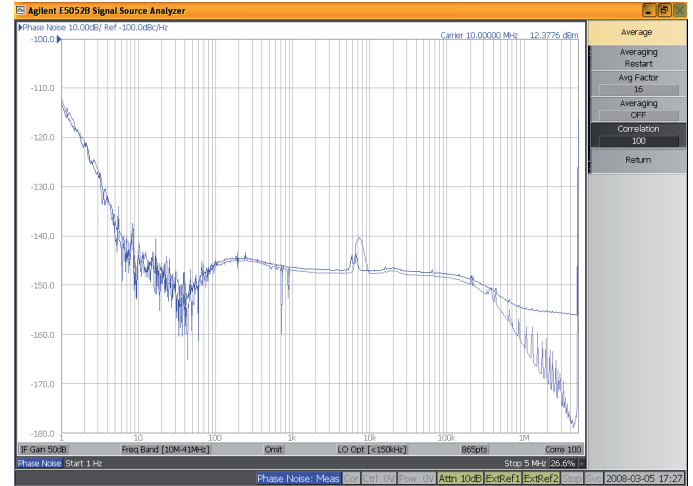
Spurious outputs < -100dBc

Broadband noise < -155 dBc/Hz

Delay match between outputs < 1 ns

Delay input to output < 6ns

Phase Noise



Typical Output to Output Stability

Measured in 200Hz bandwidth

Tau	Allan Variance
1ms	5×10^{-11}
10ms	8×10^{-12}
100ms	8×10^{-13}
1s	2×10^{-13}
5s	2×10^{-14}
10s	1.5×10^{-14}
100s	3×10^{-15}
1,000s	1×10^{-15}
10,000s	$x 10^{-16}$

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