

**Quartzlock** E8-X

# Breakthrough, Economy GPS Timing & Frequency Standards



... every lab should have one

## Description

The Quartzlock E8-X represents a breakthrough in exceptionally low cost, traceable, **calibration-free "off air" frequency & time standards**. These references maintain the high frequency & time accuracy required for demanding applications.

## Low distortion 10MHz Sine & 1PPS outputs. RS232 connection.

## Features & Benefits

- $1 \times 10^{-12}$  accuracy
- High Stability
- 1 Year Warranty
- Lowest Cost Available
- Very long product production life & support. The Quartzlock 2A series (E8-X predecessor) has been in production for > 30 years, 3 generations of design.
- Many versions of the E8 series are available. PCB, Mil spec, Low, Very Low & Ultra Low Noise etc. Please contact Quartzlock for details.
- No Calibration Required
- Traceable Reference, nationally & internationally

## Applications:

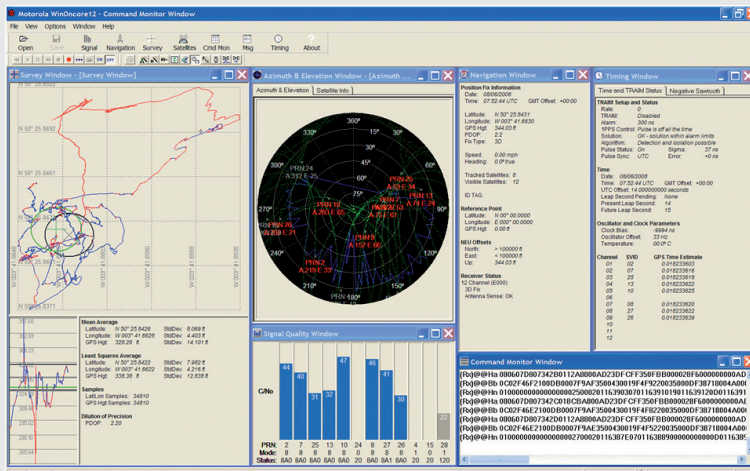
- **Calibration, Referencing & Servicing of:** Counters, Frequency Meters, Spectrum & Network Analysers, Synthesizers, & Communication Analysers, VHF, UHF & PMR TX, CDMA, Tetra, DTV & DAB
- Production Test Frequency Standard
- Network Time Protocol use in Financial, Utilities, Security & Communications Timing
- OEM
- **Frequency & Time Standard for:** Calibration Labs, Radio Workshops, Labs, Work Stations, RF Test Bench and in Higher Education.

## Quality:

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

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

These software packages will find educational survey and GNSS (Global Navigation Satellite Systems) applications. Demonstration of the location, timing and navigation functions are provided. As an educational tool, this monitor function demonstrates some of the elements of GNSS.



Quartzlock GPS instruments have been designed to work with various external software packages such as WinOncore. **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.

**Quartzlock accept no responsibility for accuracy or performance of these external programs.**

# Timing & Frequency Standards



| <b>E8-X SPECIFICATION</b>  |   |     |                |      |                      |       |                      |      |                      |       |                      |
|--|---|-----|----------------|------|----------------------|-------|----------------------|------|----------------------|-------|----------------------|
| <b>Outputs</b>   |   |     |                |      |                      |       |                      |      |                      |       |                      |
| a) 10MHz, Sinewave, 12dBm +/- 2dBm into 50 Ohms<br>Harmonics < -50dBc<br>Spurii < -75dBc |   |     |                |      |                      |       |                      |      |                      |       |                      |
| b) 1PPS, TTL, 3.3VCMOS, Jitter 7ns RMS std dev   |   |     |                |      |                      |       |                      |      |                      |       |                      |
| <b>Frequency Accuracy</b>  | 1x10 <sup>-12</sup> Long Term   |     |                |      |                      |       |                      |      |                      |       |                      |
| <b>Short Term Stability</b>  | <table border="1"> <thead> <tr> <th>tau</th> <th>Allan Variance</th> </tr> </thead> <tbody> <tr> <td>1s</td> <td>&lt;2x10<sup>-10</sup></td> </tr> <tr> <td>10s</td> <td>&lt;4x10<sup>-10</sup></td> </tr> <tr> <td>100s</td> <td>&lt;5x10<sup>-11</sup></td> </tr> <tr> <td>1000s</td> <td>&lt;2x10<sup>-11</sup></td> </tr> </tbody> </table> | tau | Allan Variance | 1s   | <2x10 <sup>-10</sup> | 10s   | <4x10 <sup>-10</sup> | 100s | <5x10 <sup>-11</sup> | 1000s | <2x10 <sup>-11</sup> |
| tau  | Allan Variance  |     |                |      |                      |       |                      |      |                      |       |                      |
| 1s   | <2x10 <sup>-10</sup>  |     |                |      |                      |       |                      |      |                      |       |                      |
| 10s  | <4x10 <sup>-10</sup>  |     |                |      |                      |       |                      |      |                      |       |                      |
| 100s   | <5x10 <sup>-11</sup>  |     |                |      |                      |       |                      |      |                      |       |                      |
| 1000s  | <2x10 <sup>-11</sup>  |     |                |      |                      |       |                      |      |                      |       |                      |
| <b>Phase Noise (typ)</b>   | <table border="1"> <tbody> <tr> <td>1Hz</td> <td>-60 dBc</td> </tr> <tr> <td>10Hz</td> <td>-90 dBc</td> </tr> <tr> <td>100Hz</td> <td>-115 dBc</td> </tr> <tr> <td>1kHz</td> <td>-130 dBc</td> </tr> <tr> <td>10kHz</td> <td>-140 dBc</td> </tr> </tbody> </table>  | 1Hz | -60 dBc        | 10Hz | -90 dBc              | 100Hz | -115 dBc             | 1kHz | -130 dBc             | 10kHz | -140 dBc             |
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| 10Hz   | -90 dBc   |     |                |      |                      |       |                      |      |                      |       |                      |
| 100Hz  | -115 dBc  |     |                |      |                      |       |                      |      |                      |       |                      |
| 1kHz   | -130 dBc  |     |                |      |                      |       |                      |      |                      |       |                      |
| 10kHz  | -140 dBc  |     |                |      |                      |       |                      |      |                      |       |                      |
| <b>Lock Indicator</b>  | On - Not Locked<br>Off - Locked, Low Phase Error<br>Short flash every second - Locked, High Phase Error   |     |                |      |                      |       |                      |      |                      |       |                      |
| <b>GPS Indicator</b>   | Green - Indicates number of satellites used in time solution<br>Amber - Indicates number of satellites tracked but not used in time solution  |     |                |      |                      |       |                      |      |                      |       |                      |
| <b>Warm Time</b>   | <15 minutes to specified accuracy   |     |                |      |                      |       |                      |      |                      |       |                      |
| <b>Power Supply &amp; Antenna</b>  | 6 to 12V dc (ac psu provided)<br>Active GPS antenna supplied  |     |                |      |                      |       |                      |      |                      |       |                      |
| <b>Current Consumption</b>   | 250mA typical   |     |                |      |                      |       |                      |      |                      |       |                      |
| <b>Size</b>  | E8-X105 x 30 x 125mm desktop module<br>E8-X PCB OEM 100 x 120mm<br>E8-X MIL CNC machined microwave housing  |     |                |      |                      |       |                      |      |                      |       |                      |

See E8-Y Datasheet for higher performance version

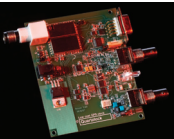
- Lower Phase Noise
- Higher Short-term Stability

E5-X6



6 output distribution amplifier

E8-X - OEM



100 x 120mm

E8000



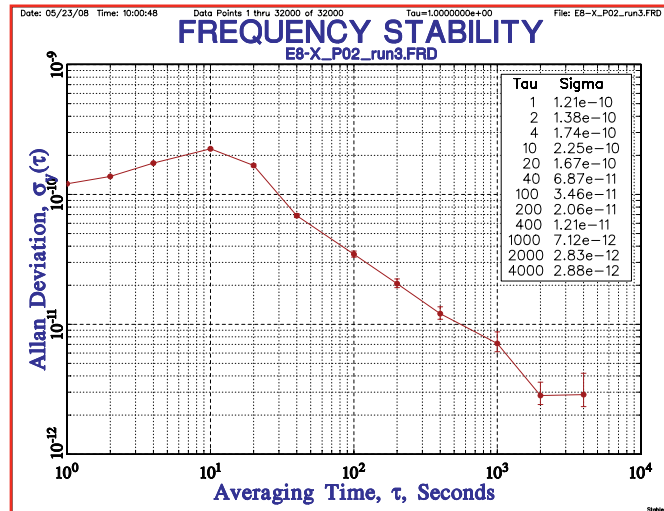
1U rack mount version of E8-Y

E8-Y



Very low noise/higher stability E8-Y

# E8-X Short Term Stability



Phase Noise Plots available – please contact Quartzlock

The E8010 is a GPS disciplined Rubidium in 1U rack format, ask Quartzlock for details.



**E8-X Rear Panel**

**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 43**

**PCB version (OEM use)**

**Option 47**

**High gain antenna & PSU**

**E5-X6**

**6 output self contained distribution amplifier in matching case**

The E8-X is supplied with GPS antenna and wall plug power supply with international connector fittings.



**Contact us:**

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