

GPS Disciplined Oscillator (OCXO) & Time Reference

Features

- Sine wave or CMOS/TTL output
- Short term stability $<2 \times 10^{-12}$ at 1sec
- Accuracy to 25ns RMS UTC
- Ultra Low phase noise -115dBc at 1Hz
- National & International Traceable Reference consumption



Description

The E8-Y provides a stable and accurate calibration free GPS time & frequency with multiple outputs signal formats is a cost effective solution for applications require frequency reference. This reference maintains high time and frequency accuracy required for demanding applications.

The E8-Y provides low noise, traceable, calibration free time & frequency reference. These time & frequency standards maintain high time & frequency accuracy required for demanding applications. The E8-Y may be considered as a primary reference clock.

Applications

- $<1 \times 10^{-12}$ frequency accuracy
- No Drift
- 50ns 1PPS accuracy to UTC
- RS232 NMEA NTP Time Reference
- Excellent holdover performance
- No Calibration
- Excellent holdover performance up to measurement time up to 1000s
- National & International traceable reference
- Time and frequency standard for calibration & RF laboratories

Related frequency reference products

- **E8000**: Low Noise 1U 19" rack mount GPS disciplined OCXO up to 12 output, 1 to 100MHz
- **E8010**: Low Noise 1U 19" rack mount GPS disciplined rubidium up to 12 output, 1 to 100MHz
- **E80-GPS**: Low cost and Low Noise Desktop GPS disciplined OCXO 1 to 4 outputs
- **E8-X**: Low cost Desktop GPS disciplined TCXO 1 to 4 outputs

E8-Y Specification

| Outputs <i>See options</i> | |
|----------------------------|---|
| 10MHz | +9dBm (± 2 dBm) into 50 Ohms, 0.56V _{rms} (Specify for 75Ω load) |
| Connector | BNC standard (SMA available) |
| No. outputs | 1-8 |
| Standard outputs | 1 x 10MHz, 1 x 1PPS |

| Frequency Stability <i>Allan Deviation</i> | | | |
|--|--------------------------|--------------------------|--------------------------|
| | Options A | Options B | Options C |
| Frequency | 10MHz | 10MHz | 10MHz |
| $\tau = 1s$ | $\leq 1 \times 10^{-11}$ | $\leq 2 \times 10^{-12}$ | $\leq 8 \times 10^{-13}$ |
| $\tau = 10s$ | $\leq 5 \times 10^{-11}$ | $\leq 4 \times 10^{-12}$ | $\leq 3 \times 10^{-12}$ |
| $\tau = 100s$ | $\leq 2 \times 10^{-11}$ | $\leq 6 \times 10^{-12}$ | $\leq 5 \times 10^{-12}$ |

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

Frequency accuracy

| | |
|-------|-----------------------|
| 10MHz | $< 1 \times 10^{-12}$ |
|-------|-----------------------|

Harmonics

| Standard | Options C |
|-------------|-------------|
| < -30 dBc | < -45 dBc |

Spurious

| | | |
|------------|--------------|--------------|
| 100 KHz BW | < -100 dBc | < -100 dBc |
|------------|--------------|--------------|

1PPS Output

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

Timing accuracy at Holdover

| | |
|--------------|---------|
| Per 24 hours | 6μ sec. |
|--------------|---------|

Frequency aging at Holdover mode

| | | |
|-----------|----------------------|--------------------------|
| Per day | 2×10^{-10} | No GPS lock ¹ |
| Per month | 20×10^{-10} | |

Warm-up time

< 15 minutes, time to lock at room temperature 25°C

1. In the event of GPS signal loss the E8-Y will 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 +70°C |
| | Storage | -40°C +90°C |
| Temp stability : | -20°C +70°C | 0.1×10^{-9} |
| Relative humidity : | 92% non-condensing | |
| Magnetic Field sensitivity : | 2×10^{-11} Gauss | |
| Atmospheric pressure : | 1×10^{-13} Per mbar | |
| Approximate MTBF : | 100,000 Hrs, Stationary | |
| Dimensions without cover | 122 x 105 x 60mm LWH | |
| Weight: | Without battery | 400gms |
| | With internal battery | 650gms |

Power supply

| | |
|---------------------|------------------------|
| External DC supply: | +12 to 15 |
| Power consumption: | 8W Max at start (25°C) |
| | 3W at steady state |

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

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

GPS data output in TSIP forma.

Processor data output, unit status.

Built-in options

- Option 02:** Output 2048kHz
- Option 03:** Output 1544kHz
- Option 04:** 13MHz Output
- Option 05:** CMOS/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 51:** Rack Mount 19" 1U
- Option 62:** AC Input 110V
- 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 E8-Y can be configured to frequencies 1 to 100MHz of your preferred signal format. Standard connectors are BNC and SMA, other connectors are available.



Examples of rear panel configuration.

Standard accessories supplied with E8-Y

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



Power supply



Standard GPS antenna with 5 meters of RG-174 cable.

Optional upgrade

The High Gain GPS Antenna is designed for stationary application, 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 70 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

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