# E10-GPS

## GPS Disciplined Rubidium Frequency & Time Reference

### Features

- Sine wave or CMOS/TTL output
- 10MHz & 100MHz output (Optional)
- Short term stability <2 x$10^{-12}$ at 1sec
- Accuracy to ±25ns UTC
- Ultra Low phase noise -110dBc at 1Hz
- National & International Traceable Reference

### Description

The E10-GPS 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 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

- 1x$10^{-12}$ frequency accuracy
- No Drift
- NTP Time Reference
- Alternative Cesium
- Optional internal battery backup
- No Calibration
- Excellent holdover performance
- National & International traceable reference
- Microwave Test Bench or Test solution

### 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
- **E8-Y**: 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

# E10-GPS Specification

| Outputs *See options* | |
|---|---|
| 10MHz | +8dBm (±2dBm) into 50 Ohms, 0.56$V_{rms}$ (Specify for 75Ω load) |
| Connector | BNC standard (SMA available) |
| No. outputs | 1-6 |

**Frequency Stability** *Allan Deviation*

| | Standard | Options B | Options C |
|---|---|---|---|
| Frequency | 10MHz | 10MHz | 10MHz |
| $\tau$ =1s | ≤$6x10^{-11}$ | ≤$2x10^{-12}$ | ≤$8x10^{-13}$ |
| $\tau$ =10s | ≤$3x10^{-11}$ | ≤$4x10^{-12}$ | ≤$2x10^{-12}$ |
| $\tau$ =100s | ≤$2x10^{-11}$ | ≤$6x10^{-12}$ | ≤$4x10^{-12}$ |

**Phase Noise (SSB)**

| | Standard | Options 2 | Options 3 |
|---|---|---|---|
| Frequency | 10MHz | 10MHz | 10MHz |
| 1Hz | -67 dBc | -100 dBc | -110 dBc |
| 10Hz | -95 dBc | -125 dBc | -136 dBc |
| 100Hz | -127 dBc | -145 dBc | -150 dBc |
| 1 kHz | -145 dBc | -150 dBc | -155 dBc |
| 10KHz | -144 dBc | -160 dBc | -160 dBc |

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

| 1PPS Output | |
|---|---|
| *Accuracy* | ±25ns RMS UTC |
| *Pulse Width* | 10 millisecond |
| *Output level* | CMOS 0-3.3V |

| Timing accuracy at Holdover | |
|---|---|
| *Per 24 hours* | 1µ sec. |

| Frequency aging at Holdover mode | | |
|---|---|---|
| *Per day* | $5x10^{-12}$ | No GPS lock[1] |
| *Per month* | $5x10^{-11}$ | |

**Warm-up time**

<15 minutes, time to lock at temperature between 20-25°C

*1. In the event of GPS signal loss the E10-GPS automatically switches to holdover mode.*

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

| Environmental | | | |
|---|---|---|---|
| *Temperature :* | | Operating | -40°C +60°C |
| | | Storage | -40°C +90°C |
| *Temp stability (no GPS lock):* | Standard | -20°C +60°C | <$0.3x10^{-9}$ |
| | Option E | -30°C +65°C | $0.3x10^{-9}$ |
| | Option F | -50°C +65°C | $0.5x10^{-9}$ |
| *Relative humidity :* | | 92% non-condensing | |
| *Magnetic Field sensitivity :* | | $2.6x10^{-11}$ Gauss | |
| *Atmospheric pressure :* | | $1x10^{-13}$ Per mbar | |
| *Approximate MTBF :* | | 100,000 Hrs, Stationary | |
| *Dimensions without cover* | | 127 x 94 x 38mm LWH (±0.5mm) | |
| *Weight:* | | <500gms | |

| Power supply | Standard | Option X |
|---|---|---|
| *External DC supply:* | +12 to +15VDC | +5.5V |
| *Power consumption:* | 22W Max at start (25°C)<br>6W at steady state | |

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

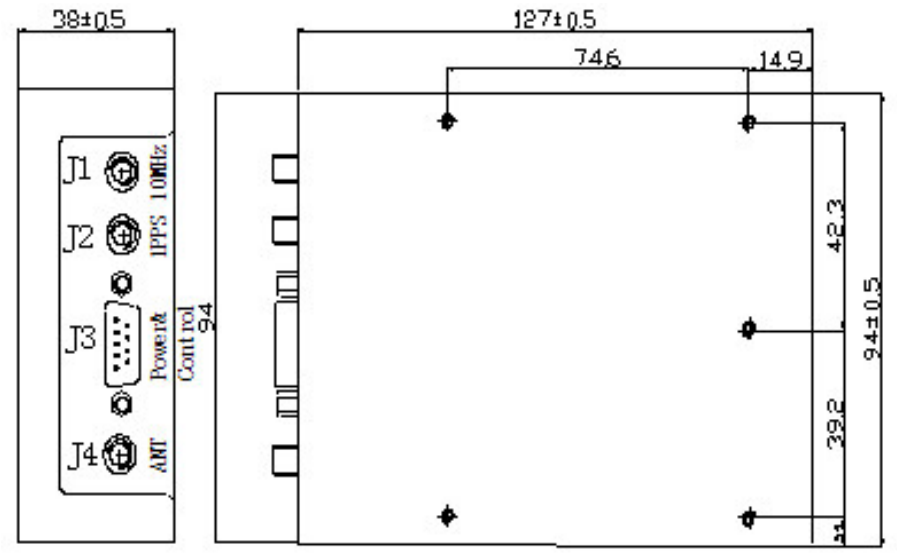
## Built-in options

***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 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 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 E10-GPS can be configured to frequency between 1 to 100MHz of your preferred signal format. Standard connectors are BNC and SMA, other connectors are available.*




| SMA Connectors | |
|---|---|
| J1 | 10MHz output |
| J2 | 1PPS output |
| J3 | GPS antenna |

J3: 9 PIN D-SUB

| Pin | Description |
|---|---|
| 1 | - |
| 2 | RX Data |
| 3 | TX Data |
| 4 | Power +12V |
| 5 | GND |
| 6 | GPS RX |
| 7 | GPS TX |
| 8 | - |
| 9 | Lock status |

## Standard accessories supplied with E10-GPS

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

Power supply

Standard GPS antenna with 5 meters of 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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ISO 9001 Registered

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