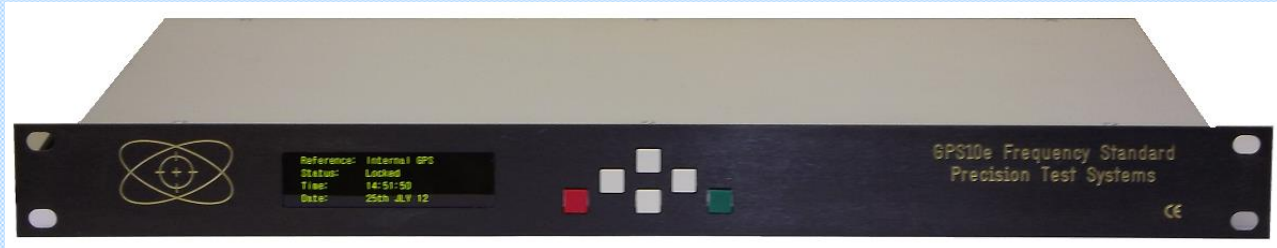




## GPS10e5: GPS Disciplined Frequency Standard



### Key Features

- LCD Display and Keyboard
- 10 MHz Sine & Square Outputs
- 1 pps Output aligned to UTC
- All outputs locked to GNSS / GPS Satellites
- Accuracy to parts in  $10^{-12}$  (1 week)
- Never needs calibration
- 19" Rack Mount Case
- Supplied with small GNSS antenna
- Low Price and High-Quality Construction
- 1, 5 or 10 sinewave outputs
- Locking to GPS, external 1 pps or 10 MHz
- GPS, GLONASS, Galileo or Beidou systems
- Free windows software included
- USB and Ethernet ports as standard
- Many Options Available

### General Description

The GPS10e5 is a low cost 10 MHz, GNSS disciplined, frequency standard. It is supplied in a 19" rack mount case. The GPS10e5 uses the Global Navigate Satellite System (GNSS) to discipline an OXCO crystal oscillator. Long-term frequency accuracy of parts in  $10^{-13}$  is achieved. The user can select what satellite service to use. 1, 2 or 3 systems can be simultaneously used from GPS (USA), GLONASS (Russian), Galileo (Europe) or Beidou (China) systems.

### Applications

- Calibration of Frequency Counters and other test equipment
- Frequency Reference for DTV, DAB, VHF, UHF, CDMA, Tetra etc
- Production frequency reference
- Network Time Protocol in Banks, Financial companies, utilities, 2-way radio workshops, TV studios.

### Outputs

There is a 10 MHz, sinewave output, a 10 MHz TTL programmable squarewave output, a 1 pps (pulse per second) output derived from the GNSS receiver and another 1 pps derived from the internal OXCO. The 1 pps from the GNSS receiver is aligned to UTC time within  $\pm 20$  ns (typical). Options to increase the number of outputs is available together with time code outputs (IRIG-B, NTP, SMPTE etc).

## USB and Ethernet Interfaces

There is a USB or Ethernet interface allow interrogation of the GPS10e5. The GPS10e5 also have an embedded software page allowing the status of the unit to be monitored on a PC using a standard browser. Alternatively, Telnet commands can be used to monitor and control the GPS10e5.

## External Locking

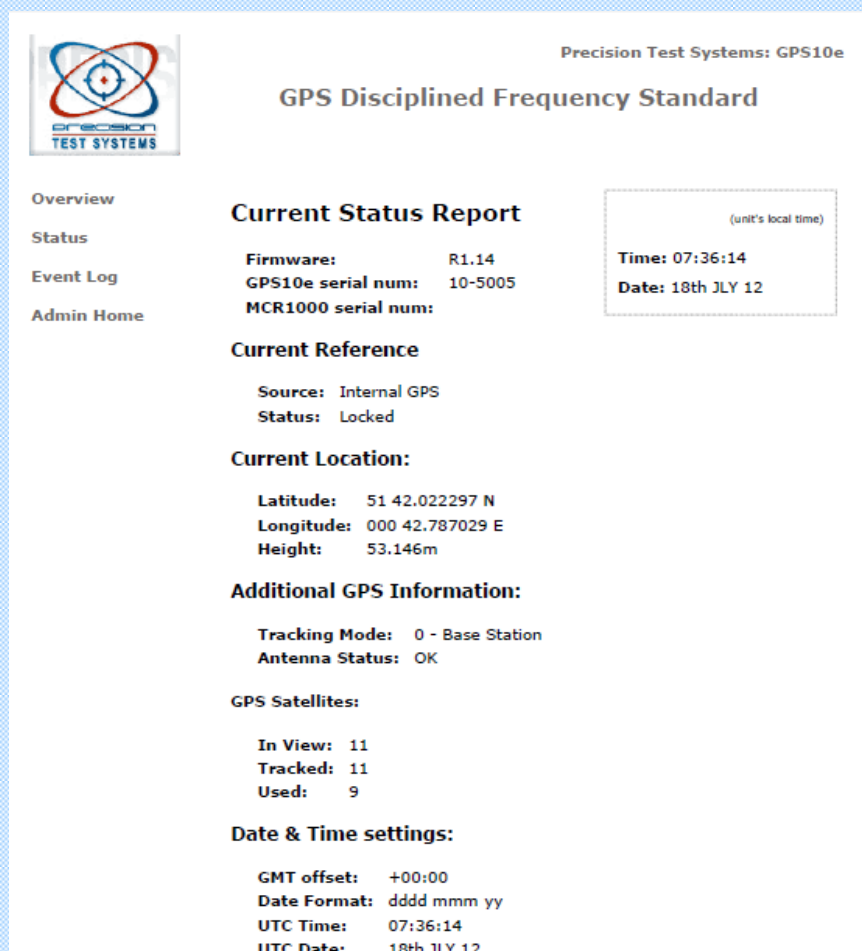
The GPS10e5 can either lock to the GNSS satellite system, or an external 1 pps signal. Options to lock to other frequencies, such a 1,5,10 MHz are available.

## Options

- Antenna Amplifier allowing the GPS antenna to be placed up to 350 m away from the GPS10e5.
- Fixed or variables frequency outputs, up to 10 GHz. E.g. 0 – 1640 MHz in 0.01 Hz steps.
- Alarm Relay Output.
- Redundancy. Two units operate together with automatic switchover if one unit fails.
- Low phase noise version

## Software

Free window software is included to continuously monitor the GPS10e5. A screen print-out of the software is shown below



The screenshot displays the web interface for the Precision Test Systems GPS10e5. The interface is titled "Precision Test Systems: GPS10e" and "GPS Disciplined Frequency Standard". On the left, there is a navigation menu with links: Overview, Status, Event Log, and Admin Home. The main content area is titled "Current Status Report" and includes the following information:

- Firmware:** R1.14
- GPS10e serial num:** 10-5005
- MCR1000 serial num:**

On the right, a box displays the unit's local time and date:

- Time:** 07:36:14
- Date:** 18th JUL 12

The "Current Reference" section shows:

- Source:** Internal GPS
- Status:** Locked

The "Current Location:" section shows:

- Latitude:** 51 42.022297 N
- Longitude:** 000 42.787029 E
- Height:** 53.146m

The "Additional GPS Information:" section shows:

- Tracking Mode:** 0 - Base Station
- Antenna Status:** OK

The "GPS Satellites:" section shows:

- In View:** 11
- Tracked:** 11
- Used:** 9

The "Date & Time settings:" section shows:

- GMT offset:** +00:00
- Date Format:** dddd mmm yy
- UTC Time:** 07:36:14
- UTC Date:** 18th JUL 12

GPS10e5 Specifications		
Description	Specification	Remarks
Outputs		
Sinewave Output Frequency Squarewave Output Frequency 1 Squarewave Output Frequency 2 Squarewave Output Frequency 3	10 MHz Programmable frequencies. 1 pps derived from GNSS receiver 1 pps derived from OXCO	Other frequencies optionally available Other frequencies optionally available Aligned to UTC time ± 20 ns.
Allan Deviation when locked to GPS Satellites (standard unit / optionally available)		
Observation Time 1 seconds Observation Time 10 seconds Observation Time 100 seconds Observation Time 1 week	< 5 x 10 <sup>-12</sup> / < 1.5 x 10 <sup>-12</sup> < 5 x 10 <sup>-12</sup> / < 1.5 x 10 <sup>-12</sup> << 5 x 10 <sup>-12</sup> / < 1.5 x 10 <sup>-12</sup> < 1 x 10 <sup>-12</sup> / < 1 x 10 <sup>-13</sup>	GPS10e5 in full lock for > 1 week. > 3 satellites in view. Ambient temperature 0 °C to +40 °C. Temperature change less than 1 °C per hour
Phase Noise (standard unit / optionally available)		
1 Hz offset (dBc/Hz) 10 Hz offset (dBc/Hz) 100 Hz offset (dBc/Hz) 1 kHz offset (dBc/Hz) 10 kHz offset (dBc/Hz) 100 kHz offset (dBc/Hz)	-100 dBc / -118 dBc -135 dBc / -145 dBc -145 dBc / -159 dBc -155 dBc / -165 dBc -158 dBc / -163 dBc -158 dBc / -165 dBc	
Output Drift when GPS10e5 NOT Locked to GPS Satellites (Holdover TXCO / OXCO)		
Drift due to aging Drift due to temperature (when unlocked)	< 5 x 10 <sup>-10</sup> per day, < 2 x 10 <sup>-6</sup> per year < 5 x 10 <sup>-7</sup> / < 2 x 10 <sup>-8</sup>	Optional to 2 x 10 <sup>-10</sup> per day available Relative to 25 °C
GNSS / GPS Receiver		
Number of Channels GNSS systems available Acquisition Time / Sensitivity (cold start) Antenna (GPS/GLOSNASS/Galileo – L1) Antenna Frequency / Gain / Noise Figure Antenna Out Of Band Filtering Antenna Power Supply / Current Antenna Lightning Protection	50 channels GPS, Galileo, GLONASS, BeiDou (option) < 32 s. / -143 dBm. Pole mount with lightening protection 1560 – 1620 MHz / 38 dB / 2.5 dB -60 dB @ f < 1530 MHz or < 1660 MHz 3.3 – 9.0 VDC @ < 40 mA 90 V, 20 kA, 8/20 S	
Miscellaneous		
Operating Temperature Storage Temperature Power Inlet Interface Dimensions (rack mount version) Supplied Accessories	0 °C to +50 °C -20 °C to +60°C 9 - 12 VDC USB or Ethernet 483 mm wide x 300 mm deep x 44 mm high Antenna, AC Power Adapter, Manual	Battery backup optionally available 19” Rack Mount Case, 1U height
Options		
Option 01B Option 03: Option 04: Option 05: Option 09A/ Option 09B Option 26 and 26B Option 38:	Additional five sinewave outputs Redundancy Upgrade oscillator from TXCO to OXCO LCD Display and switchboard. IRIG-B Output / IRIG-B Input Ultra-low and low phase noise options NTP Server	Many other options available. Please just ask if you need an option not listed here.
Consult Precision Test Systems for further details of other options. Not all options can be fitted at the same time.		

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Full specifications available from [www.ptsyst.com](http://www.ptsyst.com). Specifications and features subject to change without notice (101221)