



GPS10e2: 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 GPS Satellites
- Accuracy to parts in 10^{-12} (1 week)
- Never needs calibration
- 19" Rack Mount Case
- Low Price and High Quality Construction
- 5 or 10 sinewave outputs
- Locking to GPS, external 10 MHz or 1 pps
- Free windows software included
- RS232, USB and Ethernet ports as standard
- Many Options Available
- Supplied with GPS Antenna and 5m of cable.

General Description

The GPS10e2 is a low cost 10 MHz, GPS disciplined, frequency standard. It is supplied in a 19" rack mount case. The GPS10e2 uses the Global Positioning Service (GPS) set of satellites to discipline a TXCO or OXCO crystal oscillator. Long-term frequency accuracy of parts in 10^{-12} is achieved.

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 are five 10 MHz, sinewave outputs, a 10 MHz CMOS squarewave output, and a 1 pps (pulse per second) output. The 1 pps output is aligned to UTC time within ± 20 ns (typical). Options to increase the outputs to ten are available together with time code outputs (IRIG-B, NTP, SMPTE etc).

RS232, USB and Ethernet Interfaces

Three different types of interface allow interrogation of the GPS10e2. The GPS10e2 also have an embedded software page allowing the status of the unit to be monitored on a PC using a standard browser.

External Locking

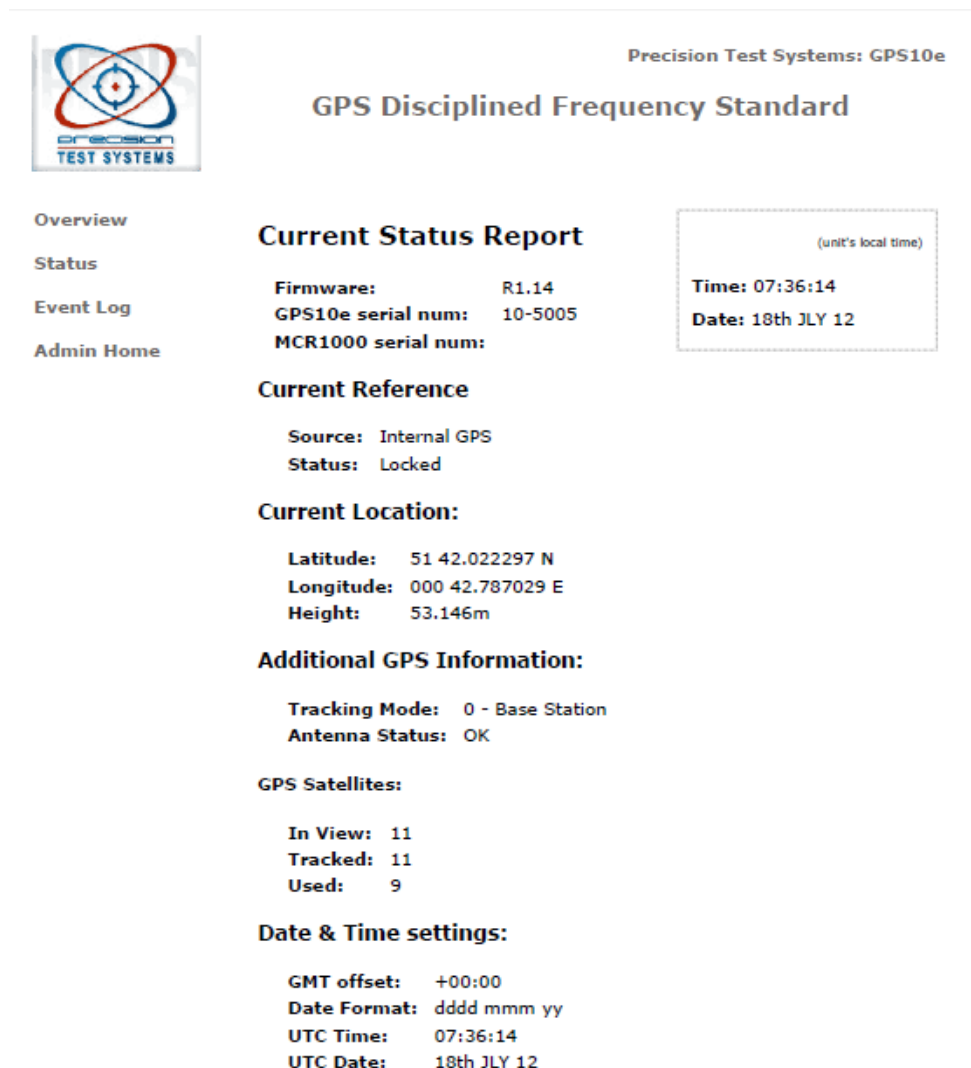
The GPS10e2 can either lock to the GPS satellite system, an external 10 MHz signal or an external 1 pps signal.

Options

- Antenna Amplifier allowing the GPS antenna to be placed up to 350 m away from the GPS10e2.
- Fixed or variables frequency outputs, up to 10 GHz. E.g. 0 – 1640 MHz in 0.01 Hz steps.
- USB Interfaces, Ethernet Interface and Alarm Relay Output.
- Redundancy. Two units operate together with automatic switchover if one unit fails.
- Higher stability oscillators. TXCO is standard. OXCO or rubidium is optional.
- Low phase noise version

Software

Free window software is included to continuously monitor the GPS10e2. A screen print-out of the software is shown below



The screenshot displays the web interface for the Precision Test Systems GPS10e2. The page title is "Precision Test Systems: GPS10e" and the main heading is "GPS Disciplined Frequency Standard". On the left, there is a navigation menu with links for "Overview", "Status", "Event Log", and "Admin Home". The "Status" link is selected. The main content area is titled "Current Status Report" and includes a "Current Reference" section with "Source: Internal GPS" and "Status: Locked". Below that is the "Current Location" section with "Latitude: 51 42.022297 N", "Longitude: 000 42.787029 E", and "Height: 53.146m". The "Additional GPS Information" section shows "Tracking Mode: 0 - Base Station" and "Antenna Status: OK". The "GPS Satellites" section lists "In View: 11", "Tracked: 11", and "Used: 9". The "Date & Time settings" section shows "GMT offset: +00:00", "Date Format: dddd mmm yy", "UTC Time: 07:36:14", and "UTC Date: 18th JULY 12". A dashed box on the right side of the page contains the text "(unit's local time)", "Time: 07:36:14", and "Date: 18th JULY 12".

Precision Test Systems: GPS10e

GPS Disciplined Frequency Standard

Overview
Status
Event Log
Admin Home

Current Status Report

(unit's local time)
Time: 07:36:14
Date: 18th JULY 12

Current Reference

Source: Internal GPS
Status: Locked

Current Location:

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

Additional GPS Information:

Tracking Mode: 0 - Base Station
Antenna Status: OK

GPS Satellites:

In View: 11
Tracked: 11
Used: 9

Date & Time settings:

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

GPS10e2 Specifications

Description	Specification	Remarks
Outputs		
Sinewave Output Frequency	10 MHz	Other frequencies optionally available
Squarewave Output Frequency 1	10 MHz	Other frequencies optionally available
Squarewave Output Frequency 2	1 pps	Aligned to UTC time \pm 30 ns.
Allan Deviation when locked to GPS Satellites (typical TXCO / OXCO)		
Observation Time 1 seconds	$< 2.5 \times 10^{-10}$ / $< 5 \times 10^{-11}$	GPS10E2 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
Observation Time 10 seconds	$< 6 \times 10^{-11}$ / $< 3 \times 10^{-11}$	
Observation Time 100 seconds	$< 2 \times 10^{-11}$ / $< 1 \times 10^{-11}$	
Observation Time 1 week	$< 1 \times 10^{-12}$ / $< 1 \times 10^{-12}$	
Output Drift when GPS10E2 NOT Locked to GPS Satellites (Holdover TXCO / OXCO)		
Drift due to aging	$< 5 \times 10^{-7}$ per day / $< 2 \times 10^{-9}$ per day $< 2 \times 10^{-6}$ per year / $< 8 \times 10^{-8}$ per year	Optional to 2×10^{-10} per day available
Drift due to temperature	$< 5 \times 10^{-7}$ / $< 2 \times 10^{-8}$	Relative to 25 °C
GPS Receiver		
Number of Channels / Frequency	12 parallel @ 1575.42 MHz	Simultaneous operation. L1 Frequency With current position / time data. No SA Measured at active antenna input Powered by GPS10e2. Waterproof
Acquisition Time / Positioning Accuracy	< 50 s typical / < 25 m	
Jamming Immunity	-79 dBm @ 1575.42 MHz	
Antenna	Active micro strip patch	
Datum	WGS-84	
Miscellaneous		
Operating Temperature	0 °C to +50 °C	Battery backup optionally available 19" Rack Mount Case, 1U height
Storage Temperature	-20 °C to +60°C	
Power Inlet	9 - 12 VDC	
Interface	RS232, ISB or triple Ethernet	
Dimensions (rack mount version)	483 mm wide x 300 mm deep x 44 mm high	
Supplied Accessories	Antenna, AC Power Adapter, Manual	
Options		
Option 01B	Additional five sinewave outputs	Consult Precision Test Systems for further details of other options. Not all options can be fitted at the same time.
Option 03:	Redundancy	
Option 04:	Upgrade oscillator from TXCO to OXCO	
Option 05:	LCD Display and switchboard.	
Option 09A/ Option 09B	IRIG-B Output / IRIG-B Input	
Option 26 and 26B	Ultra-low and low phase noise options	
Option 38:	NTP Server	

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Full specifications available from www.ptsyst.com. Specifications and features subject to change without notice (100812)