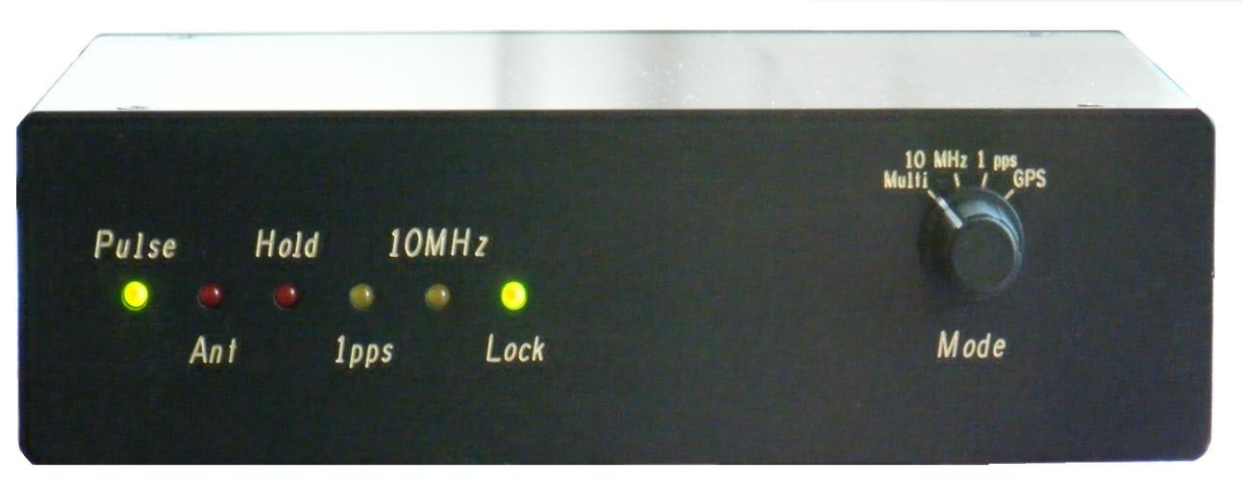
GPS10e: GPS Disciplined Frequency Standard



Key Features

- **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**
- **Supplied with AC Power Supply**
- **Low Price and High Quality Construction**
- **Optional rack mount case with 5 or 10 extra outputs with built-in distribution amplifier**
- **RS232 port with NMEA-0183 output**
- **Many Options Available**
- **Supplied with GPS Antenna and 5m of cable.**

General Description

The GPS10e is a low cost 10 MHz, GPS disciplined, frequency standard. The above picture shows the bench mount version, but a 19" rack mount case is also available. The GPS10e 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 is a 10 MHz, sinewave output, a 10 MHz CMOS squarewave output and a 1 pps (pulse per second) output. The 1 pps output is aligned to UTC time within ± 30 ns (typical). Options to increase the outputs to 10 are available.

RS232 and USB Interface

A RS232 interface allows interrogation of the GPS10e. Optional USB or Ethernet converters are available. Software is available to display the GPS receiver's status. The GPS10e outputs the NMEA-0183 protocol.

External Locking

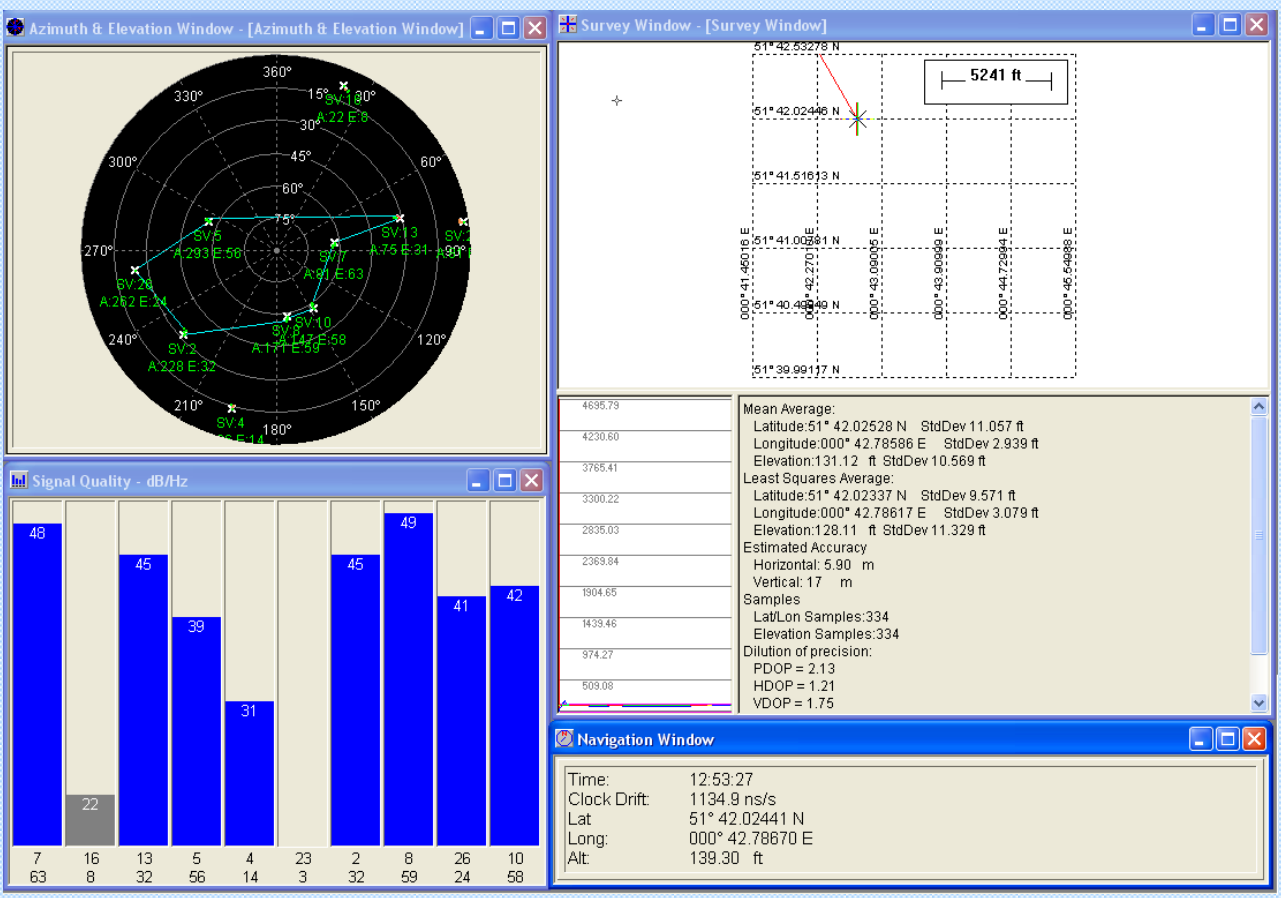
The GPS10e can either lock to the GPS satellite system, an external 10 MHz signal or an external 1 pps signal. A mode switch selects what locking method to use. A "Multi" mode allows the GPS10e to automatically lock to any of the external references signals, selecting the GPS signal first, then if that's not available the external 10 MHz, then if that's not available, the external 1 pps signal.

Options

- Antenna Amplifier allowing the GPS antenna to be placed up to 350 m away from the GPS10e.
- 19" Rack mount case with five or ten fully isolated sinewave or squarewave outputs.
- 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.

Software

Free window software is available to continuously monitor the GPS10e. A screen print-out of the software is shown below



GPS 10e 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 ± 30 ns
Allan Deviation when locked to GPS Satellites (typical TXCO / OXCO)		
Observation Time 1 seconds	$< 2.5 \times 10^{-10}$ / $< 5 \times 10^{-11}$	GPS10E in full lock for > 1 week. > 3
Observation Time 10 seconds	$< 6 \times 10^{-11}$ / $< 3 \times 10^{-11}$	satellites in view. Ambient temperature
Observation Time 100 seconds	$< 2 \times 10^{-11}$ / $< 1 \times 10^{-11}$	0 °C to +40 °C. Temperature change less
Observation Time 1 week	$< 1 \times 10^{-12}$ / $< 1 \times 10^{-12}$	than 1 °C per hour
Output Drift when GPS10E 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
Acquisition Time / Positioning Accuracy	< 50 s typical / < 25 m	With current position / time data. No SA
Jamming Immunity	-79 dBm @ 1575.42 MHz	Measured at active antenna input
Antenna	Active micro strip patch	Powered by GPS10e. Waterproof
Datum	WGS-84	
Miscellaneous		
Operating Temperature	0 °C to +50 °C	
Storage Temperature	-20 °C to +60°C	
Power Inlet	9 - 12 VDC	
Interface	RS232 @ 38400 baud	NMEA-0183 output message
Dimension (bench case)	162 mm wide x 162 mm deep x 44 mm high	AC Power Adapter also supplied
Dimensions (rack mount version)	483 mm wide x 300 mm deep x 44 mm high	Battery backup optionally available
Supplied Accessories	Antenna, AC Power Adapter, Manual	
Options		
Option 01 / 01B / 01C	19” Rack Mount Case with 5 or 10 outputs	
Option 03:	Redundancy	Needs 19” Rack Mount Case
Option 04:	Upgrade oscillator from TXCO to OXCO	
Option 05:	LCD Display and switchboard.	Needs 19” Rack Mount Case
Option 09A/ Option 09B	IRIG-B Output / IRIG-B Input	Needs 19” Rack Mount Case
Option 38:	NTP Server	Needs 19” Rack Mount Case
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. Specifications and features subject to change without notice (131016)