



GPS10X: GPS Disciplined Frequency Standard



Key Features

- 10 MHz Sine & Square Outputs
- Two line LCD display
- 1 pps Output aligned to UTC
- All outputs locked to GPS Satellites
- Accuracy to parts in 10^{-13} (1 week)
- Low Phase Noise
- Low Price and High Quality Construction
- Optional 5 or 10 extra outputs with built-in distribution amplifier
- Many Options Available

General Description

The GPS10X is a 10 MHz, GPS disciplined, frequency standard. The GPS10X uses the Global Positioning Service (GPS) set of satellites to discipline an oven controlled crystal oscillator. Long-term frequency accuracy of parts in 10^{-12} is achieved. Thus the GPS10X exceeds the requirements of a Stratum 2 level frequency standard (when disciplined by the GPS satellites). A two line LCD shows the current status of the GPS10X together with satellites received etc.

Outputs

There is a 10 MHz, sinewave outputs, a 10 MHz 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 allow complete control and interrogation of the GPS10X. An optional USB adapter allows the GPS10X to be controlled via the USB port of the PC.

Options

Options for the GPS10X include:

- Antenna Amplifier allowing the GPS antenna to be placed up to 350 m away from the GPS10X.
- Five or ten fully isolated sinewave outputs. Channel to channel isolation > 90 dB. Reverse isolation 130 dB.
- 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.
- Time Code Outputs, e.g. G703:10, IRIG-B, BCD (consult Precision Test Systems for further details).
- Higher stability oscillators including rubidium.

- External 12V input. Can be used as a backup supply.
- External 10 MHz Oscillator Input (replaces internal oscillator). Also 0 to +5V EFC Output.
- External 1 pps Locking Input Connector

GPS 10X 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
Phase Noise Response (typical for standard OXCO)		
At 1 Hz offset	-90 dBc /Hz (-92 dBc /Hz)	Typical specs are shown in brackets Better phase noise optionally available
At 10 Hz Offset	-120 dBc /Hz (-123 dBc /Hz)	
At 100 Hz Offset	-140 dBc /Hz (-143 dBc /Hz)	
At 1 kHz Offset	-150 dBc /Hz (-157 dBc /Hz)	
At 10 kHz Offset	-157 dBc /Hz (-162 dBc /Hz)	
At 100 kHz Offset	-157 dBc /Hz (-162 dBc /Hz)	
Allan Deviation when locked to GPS Satellites (typical)		
Observation Time 1 seconds	$< 1 \times 10^{-11}$	GPS10X in full lock for > 1 week. > 3 satellites in view. Ambient temperature 0°C to $+50^\circ\text{C}$. Temperature change less than 1°C per hour
Observation Time 10 seconds	$< 8 \times 10^{-12}$	
Observation Time 100 seconds	$< 3 \times 10^{-11}$	
Observation Time 1 week	$< 7 \times 10^{-13}$	
Output Drift when GPS10X NOT Locked to GPS Satellites (Holdover)		
Drift due to aging	$< 5 \times 10^{-9}$ per day	Optional to 5×10^{-10} /day available 0°C to $+50^\circ\text{C}$. Optional to 5×10^{-10}
Drift due to temperature	$< 5 \times 10^{-8}$	
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 GPS10X. 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 $+40^\circ\text{C}$	Battery backup optionally available 19" Rack Mount Case, 1U height
Storage Temperature	-20°C to $+60^\circ\text{C}$	
AC Power Inlet (fused)	IEC320 power cord	
AC Voltage Range	100 – 240 VAC @ 40 Watts Maximum.	
Dimensions	483 mm wide x 300 mm deep x 44 mm high	
Supplied Accessories	Antenna, Power Cord, Instruction Manual	
Options		
Option 01A: Five isolated Outputs	5 x sinewave outputs at 0 to +13 dBm level	Output level adjustable. Fully isolated Output level adjustable. Fully isolated Improves accuracy Also 0 to 5V EFC Output Connector TTL Voltage Level required
Option 01B: Ten isolated Outputs	10 x sinewave outputs at 0 to +13 dBm level	
Option 02:	High Stability oscillator	
Option 03:	10 MHz External Oscillator Input Connector	
Option 04:	1 pps disciplining input connector	
Option 05:	EFC Voltage Converter provides -5V to +5V	
Consult Precision Test Systems for further details of other options. Not all options can be fitted at the same time.		

Head Office - UK	South Africa	USA
Precision Test Systems LTD The Studio, Whitehouse Farm New Hall Lane, Mundon Maldon, Essex, CM9 6PJ, UK Tel: +44 (0) 870 368 9608 Fax: +44 (0) 1245 330030 Email: uksales@ptsyst.com Web: www.ptsyst.com	Precision Test Systems cc Randburg 2196 South Africa Fax: 08651 58198 Email: sasales@ptsyst.com Web: www.ptsyst.com	Precision Test Systems 304 S. Jones Blvd, Suite # 807 Las Vegas Nevada, 89107, USA Tel: 1 888 876 4804 Fax: 1 832 201 6564 Email: usasales@ptsyst.com Web: www.ptsyst.com

Specifications subject to change without notice (141016)