PTS PRECISION TEST SYSTEMS

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^{-12} (1 week)**
- **Low Phase Noise**
- **Low Price and Quality Construction**
- **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 GPS10R 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. Options to increase the outputs to 10 is available.

RS232 and USB Interface

Two RS232 interfaces allow complete control and interrogation of the GPS10X and the internal GPS receiver. 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 fully isolated sinewave outputs. Channel to channel isolation > 90 dB.
- Ten fully isolated sinewave outputs. Channel to channel isolation > 90 dB.
- Fixed or variables frequency outputs, up to 10 GHz. E.g. 0 – 1640 MHz in 0.01 Hz steps.
- USB Interfaces
- 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
- Ethernet monitoring of unit
- Windows Software
- External 12V input

GPS10X SPECIFICATIONS

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
Phase Noise Response (Typical)		
At 1 Hz offset	-88 dBc /Hz	Better phase noise optionally available
At 10 Hz Offset	-125 dBc /Hz	
At 100 Hz Offset	-140 dBc /Hz	
At 1 kHz Offset	-150 dBc /Hz	
At 10 kHz Offset	-160 dBc /Hz	
At 100 kHz Offset	-160 dBc /Hz	
Allan Variance when locked to GPS Satellites (typical)		
Observation Time 1 seconds	$< 5 \times 10^{-12}$	GPS10X in full lock for > 1 week. > 3
Observation Time 10 seconds	$< 8 \times 10^{-12}$	satellites in view. Ambient temperature
Observation Time 100 seconds	$< 1.4 \times 10^{-11}$	0 °C to +50 °C. Temperature change less
Observation Time 1 week	$< 7 \times 10^{-13}$	than 1 °C per hour
Output Drift when GPS10X NOT Locked to GPS Satellites (Holdover)		
Drift due to aging	$< 1 \times 10^{-8}$ per day	Optional to 5×10^{-10}/day available
Drift due to temperature	$< 5 \times 10^{-8}$	0 °C to +50 °C. Optional to 5×10^{-10}
GPS Receiver		
Number of Channels	12 parallel	Simultaneous operation
Frequency	1575.42 MHz	L1 Frequency
Acquisition Time	< 50 s typical	With current position / time data. No SA
Positioning Accuracy	< 25 m	1 sigma, pos hold mode
Jamming Immunity	-79 dBm @ 1575.42 MHz	Measured at active antenna input
Antenna	Active micro strip patch	Powered by GPS10X
Datum	WGS-84	
Miscellaneous		
Operating Temperature	0 °C to +50 °C	
Storage Temperature	-20 °C to +60°C	
AC Power Inlet with switch	IEC320 power cord	
AC Voltage Range	90 – 260 VAC @ 40 Watts Maximum.	Battery backup optionally available
Dimensions	483 mm wide x 300 mm deep x 44 mm high	19" Rack Mount Case, 1U height
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
Option 01B: Ten isolated Outputs	10 x sinewave outputs at 0 to +13 dBm level	Output level adjustable. Fully isolated
Option 02:	High Stability oscillator	Improves accuracy
Consult Precision Test Systems for further details of other options. Not all options can be fitted at the same time.		

Precision Test Systems			
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Full specifications available from www.ptsyst.com. Specifications and features subject to change without notice (270906)