

# **GPS10eR-50 Frequency Reference**

			Precision Test Systems	Power Green = AC Supply	Amp-1 Green = OK Red = Fault	Amp-2 Green = OK Red = Fault	GPS10-eR-50 Frequency Extender C €	$\bigcirc$
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# **Key Features**

- 10 MHz Reference
- Industry leading ultra-low phase noise
- -115 dBc @ 1 Hz with < -175 dBc noise floor
- Oven Controlled Crystal Oscillator
- Low Aging of 2 x 10<sup>-10</sup> / day
- Can be locked to external 10 MHz Reference
- Low 1 second Allan Deviation
- 19" Rack mount Case, 1U

# **Optional Features**

- Optional 100 MHz output in addition to 10 MHz
- Optional built in distribution amplifier
- Example five outputs at 10 MHz and five outputs at 100 MHz. Or ten outputs at 10 or 100 MHz.
- Optional increase output level to +19 dBm
- Option 12 VDC back up power supply

### **General Description**

The GPS10eR-50 frequency reference was originally designed to be an option for our GPS10eR frequency standard.

After a year of research and development, it has now been introduced as a standalone unit.

The GPS10eR-50 is a 10 MHz and/or 100 MHz frequency reference which offers excellent performance for virtually any frequency or timing application. It can be externally locked to a reference 10 MHz signal (such as the output of our GPS10eR frequency standard). It has ultra-low phase noise. Refer to the typical plots on the next page. It is ideal for instrumentation and communication systems which require a precise frequency reference. The GPS10eR-50 is supplied in a 19" rack mount case and is powered from a 100 to 240 VAC supply (usable 90 - 260 VAC).

#### **Applications**

The CFS10B is being used by leading telecommunications companies to synchronize their automatic satellite communication system.

#### Phase Noise and Allan Deviation plots of Ultra Low Phase Noise Option

There are various oscillator options available for the GPS10eR-50, depending upon phase noise and Allan Deviation requirements.

Below are two plots from a GPS10eR-50 with option 01B1 (ultra-low phase noise 10 MHz and 100 MHz).



#### Typical Phase Noise at 10 MHz (Single output at + 10 dBm)



### Typical Phase Noise at 100 MHz (Single output at + 8 dBm)

#### **External Locking**

Both the 10 MHz outputs and 100 MHz outputs (if fitted) can be locked to an external 10 MHz reference. The frequency accuracy of all the outputs will then be similar to the reference. Note; to achieve the above phase noise plots, the external reference should also have good close in phase noise, typically < -105 dBc/Hz @ 1 Hz offset. The far out noise of the external reference is less important.

#### **Miscellaneous Information**

The GPS10eR-50 is a highly reliable unit. It is housed in a fully screened aluminum 19-inch case aluminum case and operates from a 100 - 240 VAC supply. The GPS10eR-50 is CE marked for sale within the EU.

## **Product Options and Part Numbers**

- GPS10eR-50: Basic Unit. Needs oscillator option.
- Option 01B1: 100 MHz ultra-low phase noise single output
- Option 01B: 100 MHz average phase noise single output
- Option 12: Additional five sinewave outputs (state frequency)
- Option 12C: Additional ten sinewave outputs (state frequency)
- Option 26C: 10 MHz ultra-low phase noise single output

#### **SPECIFICATIONS**

Specification Parameter	GPS10eR-50 Specification							
Frequency	10 MHz standard. Optional addition of a 100 MHz output							
Number of Outputs	One as standard. Can be increased to five.							
Output level (single output)	+10 dBm into 50 Ω @ 10 MHz and +8.5 dBm @ 100 MHz							
Output level (via distribution amps)	+ 10 dBm standard. But can be set to any level from 0 dBm to +13 dBm							
Output Level Option	Outputs can be increased to +19 dBm							
Output Waveform / 2 <sup>nd</sup> Harmonic	Sinewave. Harmonics -40 dBc @ 10 MHz and -28 dBc @ 100 MHz							
Other Harmonics / Spurious	-60 dBc / -80 dBc (typically < -100 dBc)							
Accuracy at shipment	$\pm 2.5 \text{ x } 10^{-8}$							
Frequency Stability (10 to 45 °C)	$\pm 5 \times 10^{-9}$							
Aging (per day after 30 days use)	$< 2 \times 10^{-10} / day$							
Allan Deviation (1 & 10 seconds) Allan Deviation (100 & 1k seconds) Allan Deviation (10k & 100k seconds) Allan Deviation (1 week)	$ < 1.5 \times 10^{-12}  < 1.2 \times 10^{-12}  < 3 \times 10^{-13}  < 2 \times 10^{-13} $							
Phase Noise (dBc/Hz) (Typical)	@ 1 Hz	@ 10 Hz	@ 100 Hz	@ 1 kHz	@ 10 kHz	@ 100 kHz		
10 MHz single output	-115	-145	-164	-170	-175	-175		
10 MHz via Distribution Amplifier	-115	-145	-162	-163	-165	-165		
Option 01B – 100 MHz – via Dist. Amp	-70	-100	-125	-150	-162	-166		
Option 01B1- 100 MHz – single output	-93	-120	-136	-163	-175	-180		
Option 01B1- 100 MHz via Dist. Amp	-93	-120	-136	-159	-165	-166		
Power (AC)	100 to 240 VAC (useable 90-260 VAC)							
Size / Weight	483 mm x 280 mm x 44 mm. Width x Depth x Height. Weight 3 kg (standard unit)			unit)				
Ambient Operating Temperature	10°C to +45 °C							

Head Office - UK	USA
Precision Test Systems LTD	Precision Test Systems L.L.C
Unit 4B Grange Farm	304 S. Jones Blvd
Abbots Ripton, Huntington	Suite #807
Cambridgeshire, PE28 2PH, UK	Las Vegas, NV, 89107
Tel: +44 (0) 333 444 9608	Tel: 1 888 876 4804
Email: uksales@ptsvst.com	Email: usasales@ptsyst.com
Web: www.ptsyst.com	Web: www.ptsyst.com

Full specifications available from www.ptsyst.com. Specifications and features subject to change without notice (101221)