



# SG1640 1640 MHz Signal Generator



## Key Features

- 10  $\mu$ Hz to 1640 MHz continuous coverage
- Frequency Steps: 10  $\mu$ Hz
- Internal GPS Synchronized Frequency Standard with UTC aligned 1 pps output
- Frequency Accuracy better than  $1 \times 10^{-10}$
- -40 dBm to +10 dBm 50  $\Omega$  RF Output (2-1640 MHz)
- DC to 398 MHz, 3.3 / 5V CMOS Outputs
- 10 MHz to 1.6 GHz LVDS Output
- Low Phase Noise and low spurious outputs
- RS232 Interface
- Frequency either CW or frequency sweep
- Broadband Mixer Included

## General Description

The SG1640 is a 10  $\mu$ Hz to 1640 MHz signal generator with outstanding frequency accuracy. The SG1640 has a built in GPS Disciplined frequency standard as its main frequency reference. Frequency coverage is in three bands; DC to 400 MHz, 400 to 800 MHz and 800 to 1640 MHz. The frequency can be set with 10  $\mu$ Hz frequency resolution. Frequency accuracy, when locked to a GPS satellite signal, is typically  $1 \times 10E^{-10}$  short term and better than  $1 \times 10^{-12}$  long term. Thus the SG1640 never requires calibration as it is locked to the GPS satellite service.

## Outputs

There are multiple outputs. The RF output is a 50  $\Omega$ , 2 MHz to 1640 MHz output. This output can be adjusted in amplitude from +10 dBm to -40 dBm. Logic outputs include a DC – 398 MHz CMOS output that can be set to either 3V3 or 5V output levels. Dual LVDS/PECL outputs give > 300 mV p-p output level from 10 MHz to 1640 MHz.

## Frequency Standard for Free!

The SG1640 has its own GPS synchronized standard (requires GPS antenna – supplied). This GPS Synchronized timebase is available as a 10 MHz output on the rear panel. This output can act as a laboratory’s frequency reference since it is locked to the global positioning service’s set of satellites. Accuracy is  $1 \times 10^{-10}$  in the short time (< 1 sec) and as good as  $1 \times 10^{-12}$  in the long term (> 1 week). This 10 MHz output can be connected to the PTS50 or DA series of distribution amplifiers to synchronize a complete workshop or factory. Thus all the instruments in an entire factory can be synchronized by the SG1640.

## Other Features

The SG1640 also has a general purpose, non-dedicated mixer available via BNC front-panel connectors. RF and LO inputs are from 4.5 MHz to 2 GHz. Filtered IF output bandwidth is 4.5 MHz to >350 MHz, with -20dBm RF input and -10 to 5dBm LO input sensitivity. The conversion gain is 0 to -3.5 dBm conversion gain with +14 dBm damage level.

## Front Panel Control and Serial Communication

The unit can be controlled via front panel keys with readout on a 20 x 4 character LCD display. The unit can also be controlled by a RS232 interface (USB optional). The internal GPS receiver also has its own RS232 interface allowing monitoring of all its settings and functions, such as the number of satellites tracked, etc.

### SG1640 SPECIFICATIONS

Specification Parameter	Specification	Comments
<b>Outputs</b>		
Frequency	10 $\mu$ Hz to 1640 MHz	10 $\mu$ Hz Frequency setting resolution.
Output Level (50 $\Omega$ )	+10 dBm to -40 dBm	2 - 1640 MHz
Output Level Accuracy	$\pm 2$ dB	
Phase Noise	-130 dBc @ 100 Hz, -145 dBc floor	10 MHz carrier, typical
Spurious / Harmonic Outputs	-67 dBc typical / -35 dBc typical	
CMOS Output	3V3 or 5V switchable	DC to 398 MHz
LVDS/PECL Output	> 300 mV p-p from 10 to 1640 MHz	Dual SMA connectors
UTC synchronized 1 pps	Synchronized to UTC time $\pm 20$ ns	Requires GPS Antenna (supplied)
<b>Main Timebase</b>		
Frequency	10 MHz	Available on rear panel
Frequency Accuracy	$1 \times 10^{-10}$ ( 1 sec), $1 \times 10^{-12}$ (> one week)	When locked to GPS satellites
Output	10 MHz, 3V3 CMOS output	Multiple outputs optionally available
Phase Noise @ Hz offset	-120 dBc at 10 Hz, -145 dBc @ 100 kHz	Sinewave Output @ 10 MHz
Set-up and monitoring of timebase	Separate RS232 interface for GPS receiver	Allows set up and monitoring
<b>General</b>		
Keyboard	5 button keyboard	
Display	20 character x 4 line LCD display	
Communication Interface	RS232 (USB optional)	
Size and weight	276 x 212 x 102 mm and 2.5 kg	Width x Depth x Height
Environmental	0°C to +40 °C	<1°C/24 hr for optimum performance
Power Supply	100 - 240 VAC	Usable 90 - 260 VAC
<b>Options</b>		
Option 01	19” Rack Mount case	
Option 02	Extra 10 sinewave outputs of freq. ref	Includes separate distribution amp
Option 03	Higher Stability OXCO	Improves Allan Deviation

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