Direct Digital Synthesis Signal Generator
SFG-1000 Series, an economic function generator with high accuracy and high stability output, is designed based on the DDS (Direct Digital Synthesis) technology embedded in a large scale FPGA. The frequency range of 3MHz and the output waveform selection as Sine, Square, Triangle and TTL of SFG-1000 Series adequately provide the fundamental features to ensure high confidence for the test results. The DDS technology at an affordable price gives a high-value solution to the users who need a signal source for accurate but unsophisticated measurement applications.

Stable Signal Source
The frequency drift and the amplitude instability of conventional signal sources are fatal uncertainties to the high-accuracy measurements. SFG-1000 Series employs PLL (Phase-Locked Loop) circuitry to generate a stable waveform at 20ppm accuracy & stability covering the frequency range from 0.1Hz up to 3MHz. When SFG-1000 Series is utilized to conduct experiments in the laboratory, it secures the signal source reliability, which is beyond the reach of any traditional signal generators.

Low Distortion
To most of the test engineers, it is always an annoyance trying to get rid of the ringing coming from the signal source being used to stimulate the DUT. The high precision measurements need to employ a signal source without the existence of harmonic components, which adhere to the oscillator of conventional signal generator circuit.

SFG-1000 Series, built over a DDS platform, generates the waveform through high-performance DAC and high-speed comparator to effectively avoid the generation of harmonic components. Utilizing direct digital synthesis technology, SFG-1000 Series provides an output waveform with 55dBc low distortion ranging from 2mVpp to 10Vpp output level. At the press of a button, you get a stable and high purity output signal from SFG-1000 Series right away.

User-Friendly Human Interface
The thoughtful human interface of SFG-1000 Series gives users a friendly operation environment. There is no need to go through a long and tedious learning curve to get used to the operations of the product. The key operation functions and the output on/off control are the advanced features that could only be seen on the high-end devices. You could enjoy all these conveniences at a very affordable cost.

All-Around Functionality
A signal output with selectable waveform among Sine, Square and Triangle, and an additional signal output at TTL level are included in SFG-1000 Series. The output control features include frequency adjustment, +/-5V DC offset and 40dB attenuation. All the fundamental features of a signal generator are well equipped on SFG-1000 Series with high accuracy and stability. Combining convenience, accuracy and economic cost, SFG-1000 Series 3 represents the beauty of GW Instek’s design.

SFG-1003/1013

FEATURES
- DDS Technology and FPGA Design
- Frequency Range: 0.1Hz – 3MHz
- High Frequency Accuracy: ±20ppm
- High Frequency Stability: ±20ppm
- Max. Frequency Resolution: 100 mHz
- Low Distortion Sine Wave: -55dBc, 0.1Hz-200 kHz
- Voltage Display (Only SFG-1013)

APPLICATIONS
- Automatic Controls Training Schools
- Vibration Testing
- Testing and Adjustment of Electronic Devices

www.gwinstek.com.tw

Made to Measure
**SPECIFICATIONS**

**MAIN**

<table>
<thead>
<tr>
<th>Output Function</th>
<th>Sine, Square, Triangle, TTL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency Range (For Sine, Square)</td>
<td>0.1Hz – 3MHz</td>
</tr>
<tr>
<td>Frequency Range (For Triangle)</td>
<td>0.1Hz – 1MHz</td>
</tr>
<tr>
<td>Resolution</td>
<td>0.1Hz maximum</td>
</tr>
<tr>
<td>Stability</td>
<td>±20ppm</td>
</tr>
<tr>
<td>Accuracy</td>
<td>±20ppm</td>
</tr>
<tr>
<td>Aging</td>
<td>±5ppm/year</td>
</tr>
<tr>
<td>Amplitude Range</td>
<td>10Vp-p (into 50Ω load)</td>
</tr>
<tr>
<td>Amplitude Accuracy</td>
<td>±2% at maximum position (only SFG-1013)</td>
</tr>
<tr>
<td>Impedance</td>
<td>50Ω±10%</td>
</tr>
<tr>
<td>Attenuator</td>
<td>-40dB±1dBxL</td>
</tr>
<tr>
<td>DC Offset</td>
<td>&lt;5V – &gt;5V (into 50Ω load)</td>
</tr>
<tr>
<td>Duty Control Range</td>
<td>25% – 75% below 1MHz (for square wave only)</td>
</tr>
<tr>
<td>Display</td>
<td>6-digit LED display</td>
</tr>
<tr>
<td>Output Control</td>
<td>ON/OFF selector</td>
</tr>
</tbody>
</table>

**SINE WAVE**

Harmonics Distortion: From Amplitude control at maximum position without any attenuation to its 1/10 of any combination setting, TTL OFF
- ≥-55dBc, 0.1Hz – 200kHz
- ≥-40dBc, 0.2MHz – 2MHz
- ≥-35dBc, 2MHz – 3MHz
- <≤-3dB, 0.1Hz – 1MHz
- <≤-0.5dB, 1MHz – 2MHz
- <≤-1dB, 2MHz – 3MHz

Flatness (at maximum amplitude relative to 1kHz)
- >-55dBc, 0.1Hz – 200kHz
- >-40dBc, 0.2MHz – 2MHz
- >-35dBc, 2MHz – 3MHz
- <≤-3dB, 0.1Hz – 1MHz
- <≤-0.5dB, 1MHz – 2MHz
- <≤-1dB, 2MHz – 3MHz

**SQUARE WAVE**

Symmetry
- ≥98%, 0.1Hz to 100kHz ; ≥95%, 100kHz to 1MHz

**TTL OUTPUT**

Rise or Fall Time
- ≤100ns at maximum output. (into 50Ω load)
- ≥3V-p

Fan Out
- 20 TTL load

Rise or Fall Time
- ≤25ns

**GENERAL**

Power Source
- AC 240V, 220V, 110V 10%, 50/60Hz

Operation Environment
- Indoor use, altitude up – 2000m
- Ambient Temperature: 0°C ~ 40°C
- Relative Humidity: Up to 80% at 0°C ~ 40°C
- Up to 70% at 35°C ~ 40°C
- Installation category II
- Pollution Degree 2

**STORAGE TEMPERATURE**

Humidity
- -10°C ~ 70°C, 70% (Maximum).

**ACCESSORIES**

GTL-101 x1, User manual x1, Power cord

**DIMENSION & WEIGHT**

251(W) x 91(H) x 291(D) m/m, Approx. 2.1kg

The Specifications are subject to change without notice. Refer to Goodwill Instrument Co., LTD. Specifications subject to change without notice. For latest specifications.

### SELECTION GUIDE

<table>
<thead>
<tr>
<th>MODEL</th>
<th>MAIN FUNCTION</th>
<th>Frequency</th>
<th>Offset</th>
<th>TTL Output</th>
<th>-40dB Attention</th>
<th>Voltage display</th>
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</thead>
<tbody>
<tr>
<td>SFG-1003</td>
<td>3 MHz DDS Function Generator</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
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<td></td>
</tr>
<tr>
<td>SFG-1013</td>
<td>3 MHz DDDS Function Generator with Voltage Display</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
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