



# GSG-51

## GNSS Signal Generator

- Very accurate one-channel GNSS signal generator
- Ideal for GNSS receiver production test
- Wide RF output power range enables both conducted and over-the-air (OTA) testing
- Fully programmable with easy to use I/O protocol
- Communicates via USB, GPIB or Ethernet
- Affordable



The GSG-51 is a GNSS signal generator that emulates a single GNSS signal. The main application is a simple but very fast manufacturing test, to assure that the assembly is correct, that the antenna is properly connected, and that the receiver can receive and identify a satellite signal.

GSG-51 provides a fast and cost-effective solution for production test of GNSS-receivers in e.g. mobile phones with integrated GNSS-receivers. Thanks to the wide RF level range from  $-65$  to  $-160$  dBm, the sensitivity of all types of GNSS receivers can be verified with a minimum of delay. The 60 dB of extra power from normal test scenarios allows from splitting the signal many times.

### Easy to Use

GSG-51 users can configure scenarios on-the-fly without the need for an external PC and pre-compilation phase. Via the front panel,

the user can swiftly modify parameters such as user position, time and power output. The front panel can be locked out to prevent accidental power down or configuration changes. Once initiated the unit can simulate for 31 days continuously (or indefinitely if the unit is connected to the internet).

### Flexibility

As the base model of the popular Series 5 GNSS Simulator family, this affordable unit can be upgraded at any time after purchase to increase the channel count, add receiver trajectory control, and add advanced features such as SBAS (WAAS, EGNOS, MSAS, or GAGAN), white noise generation, or multipath simulation. Some restrictions apply. Your investment is protected as you can purchase now, and upgrade later, as needed, when your requirements change.

## Input and Output Specifications

### RF Signal GPS/GLONASS L1

**Connector:** Type N female

**DC Blocking:** internal, up to 7 VDC; 470  $\Omega$  nominal load

**Frequency:** 1575 - 1606 MHz (L1)

**Number of output channels:** 1

**Channel configuration:** 1 GPS or GLONASS satellite

**Data format:** 50 bits/s, GPS and GLONASS frame structure

**PRN codes:** 1 to 210

**Spurious transmission:** <-40 dBc

**Harmonics:** <-40 dBc

**Output signal level:** -65 to -160 dBm;

0.1 dB resolution down to -150 dBm;

0.3 dB down to -160 dBm.

**Power accuracy:**  $\pm 1.0$  dB

**Pseudorange accuracy:** 1mm

**Inter-channel bias:** Zero

**Inter-channel range:** >54 dB

### External Frequency Reference Input

**Connector:** BNC female

**Frequency:** 10 MHz nominal

**Input signal level:** 0.1 to 5Vrms

**Input impedance:** >1k $\Omega$

### Frequency Reference Output

**Connector:** BNC female

**Frequency:** 10 MHz sine

**Output signal level:** 1Vrms in to 50  $\Omega$  load

### External Trigger Input

**Connector:** BNC female

**Frequency:** TTL level, 1.4V nominal

### 1PPS Output

**Connector:** BNC female

**Output signal level:**

approx. 0V to +2.0V in 50  $\Omega$  load

**Accuracy:** Calibrated to  $\pm 10$  nSec of RF timing mark output

## Built-in Timebase

### Internal Timebase – High Stability OCXO

**Ageing per 24 h:** <5x10<sup>-10</sup>

**Ageing per year:** <5x10<sup>-8</sup>

**Temp. variation 0...50°C:** <5x10<sup>-9</sup>

**Short term stability (Adev @1s):** <5x10<sup>-12</sup>

## Auxiliary Functions

### Interface

GPIO (IEEE-488.2), USB 1.X or 2.X (USBTMC-488), Ethernet (100/10 Mbps)

## General Specifications

### Certifications

**Safety:** Designed and tested for Measurement Category I, Pollution Degree 2, in accordance with EN/IEC 61010-1:2001 and CAN/CSA-C22.2 No. 61010-1-04 (incl. approval)

**EMC:** EN 61326-1:2006, increased test levels per EN 61000-6-3:2001 and EN 61000-6-2:2005

### Dimensions

**WxHxD:** 210 x 90 x 395 mm

(8.25" x 3.6" x 15.6")

**Weight:** approx. 2.7 kg (approx. 5.8 lb)

### Optional Antenna

**Frequency:** 1000MHz to 2600MHz

**Impedance:** 50  $\Omega$

**VSWR:** <2:1 (typ)

**Connector:** SMA male

**Dimensions:** 15 mm diameter x 36 mm length

### Environmental

**Class:** MIL-PRF-28800F, Class 3

**Temperature:** 0°C to +50°C (operating);

-40°C to +70°C non-condensing @ <12,000 m (storage)

**Humidity:**

5-95 % @ 10 to 30°C

5-75 % @ 30 to 40°C

5-45 % @ 40 to 50°C

## Power

**Line Voltage:** 90-265 Vrms, 45-440 Hz

**Power Consumption:** <25 W

## Ordering information

### Basic Models

**GSG-51:** GNSS 1-channel simulator; with high stability OCXO timebase

#### Included with instrument

- User manual and GSG StudioView software (file management features does not require a license) on CD
- RF cable, 1.5 m
- SMA to Type N adapter
- USB cable
- Certificate of calibration
- 3-year warranty<sup>1</sup>

### Optional Accessories

**Option 01/71:** Passive GNSS Antenna

**Option 22/90:** Rack-mount kit

**Option 27H:** Heavy-duty hard transport case

**OM-54:** User Manual (printed)

### Optional Upgrades

**Option GLO:** Adds GLONASS Constellation

**Option GAL:** Adds Galileo Constellation

**Option 4:** Upgrade GSG-51 to Advanced 4 Channel GNSS Simulator

### Optional Services<sup>1</sup>

**Option 95/05:** Extended warranty to 5 years Calibration/GSG: GSG Calibration Service

**GSG-ASP:** GSG Annual Service Plan

**GSG-INST:** User Training and Installation

<sup>1</sup>The warranty period and available services may vary dependent on country.