

SPECIFICATIONS

The Naval Research Laboratory has a requirement for a GNSS Satellite Signal Simulator with the following Salient Features.

Frequencies/Codes

GPS/SBAS L1 1575.42 MHz (C/A, P, Y Codes)

GPS L2 1227.60 MHz (C/A, L2C)

Number of simultaneous signals

12 GPS (L1, L2)

Signal Dynamics

Max Velocity +/- 120,000 m/s

Max Acceleration +/- 3,600 m/s/s

Max Jerk +/- 5,000 m/s/s/s

Signal Accuracy (RMS max over 1 minute)

Pseudorange +/- 0.01m

Pseudorange rate +/- 1mm/s

Delta Pseudorange +/- 5mm

Inter-channel bias +/- 0.05m (code)

Less than +/- 1mm (carrier)

Signal Quality

Spurious (Max) -30 dBc

Harmonics -40 dBc

Phase Noise (Max) 0.02 radians RMS (1Hz-10kHz offset)

Frequency Stability +/- 5x10⁻¹⁰ per day (after 24 hour warm-up)

Signal Level (Nominal, as appropriate)

GPS L1 C/A -130 dBm

GPS L1 P(Y) -133 dBm

GPS L2 -136 dBm

GPS L2(c) -130 dBm

M-noise L1 -128.5 dBm

M-noise L2 -134.5 dBm

Calibration port at nominal +50 dB for all signals

Signal Level Control

Range +/- 20 dB

Resolution 0.1 dB

Calibration Accuracy +/- 0.7 dB RSS

Signal Generator Unit

- Mount in Standard 19" rack
- May use desktop or rackmount PC controller
- Weight less than 75 lb
- Power 100-250V, 600W, 48-62 Hz
- Built-in Self Test

Connections

- Main RF and Calibration port 50 Ohms, Type N connector, VSWR less than 1.2:1
 - (AC coupled to withstand +/- 50 VDC bias)
- External 10 MHz Clock, 50 Ohms, -5 to +10 dBm level, BNC connector
- External synchronization and trigger ports, 50 Ohms, TTL level, BNC connector
- Internal Standard output, 10.23 MHz, 50 Ohms, +10 dBm, BNC connector

PPS Compatibility

- SA/AS capable
- SAASM (via test vectors)
- M-Code (pseudo-M) per ICD-GPS-700 and MNSA test vectors
- Keying via standard crypto fill port
 - KYK-13, AN/CYZ-10, and KOI-18 compatible

User Interface

- PC for control to be supplied by vendor
- Windows (XP SP2 or later) compatible
- Graphic interface
 - Real Time Display
 - Visible GPS satellites
 - User position and velocity
 - GPS sat range, range rate, signal levels

Scenario Control

- Real time scenario operation
 - Continuous operation (Within cryptographic key limits)
 - Dynamic parameter adjustment
 - Power
 - Disable/enable GPS sats
- Preprocess scenario operation
- User generated motion file (time, position, velocity)

Remote Control

- Capable of external command line control via TCPIP or IEEE-488
 - Select scenario

Start scenario
Stop Scenario
Adjust power

Scenario Capability

Vehicle Type

Fixed (earth surface)
Mobile (land, sea, air to 100 km)
Space (earth orbiting 100 km to 4x GEO)

Special Requirements. Unit to be configured for as required integration with NRL's existing GSS7712-4 GPS Simulator, s/n 7246(16 channel). The purpose of the integration is the capability to produce a dual antenna signal with 12 satellites on one antenna and 16 on the other (1 or 2 independent platforms simulated). In this configuration the unit will be controlled by the SIMGEN software on the computer that runs the existing GSS7712-4 simulator as an integral component. The unit shall be operable either as a standalone device or in the integrated configuration.

Documentation

Standard commercial user manuals