CAST-SIMCOM

GPS Satellite Simulator

CAST NAVIGATION

Simulator Features

- **Up to 12 C/A and M-noise signal on L1**
- **Selectable Host Vehicle Parameters**
- **Complete SV Constellation Generation**
- **Satellite RAIM Events**
- **Ionosphere Modeling**
- **Troposphere Modeling**
- **Satellite Clock Errors**
- **Waypoint Navigation**
- **Multipath Modeling**
- **Time-Tagged Satellite Events**
- **Selective Availability Modeling**
- **Antenna Pattern Modeling**

Portable C/A Code GPS Simulation

The SIMCOM GPS simulation system from CAST produces GPS RF signals that provide dynamic, repeatable testing in the laboratory for a wide range of GPS applications. The simulator produces a constellation of GPS RF signals that are fully programmable and controlled by the simulator software in real time.

The SIMCOM simulator generates a full constellation of GPS with up to 12 satellites in view selected from the defined 32 Pseudo Random Noise codes. It generates signals for up to 12 channels of C/A code and the M-noise signal on L1.

Three user-defined test scenarios are delivered with the simulator. Software is included for remotely controlling the simulator from a Windows PC via Ethernet. A single PC may control multiple SIMCOM units simultaneously. Each simulator can output GPS signals for testing up to 64 receivers simultaneously.

With the scenario generation option, the user has the ability to select from a variety of vehicle types and simulate dynamic motion for land, sea, air and space based vehicles. They may also generate a trajectory by defining a total mission profile or by using six degree of freedom dynamic profile data collected in the field.

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System Specifications

Output Frequency

- GPS L1 — 1575.42 MHz

Maximum Dynamics

- Velocity — > 60,000 m/s
- Acceleration — ± 150,000 m/s^2
- Jerk — ± 150,000 m/s^3

Signal Level

- GPS L1 C/A Code — -160 dBW
- GPS L1 P Code — -163 dBW

Signal Level Control

- Range — ± 30 dB
- Resolution — 0.1 dB

L1/L2 Differential Delay

- Range — ± 0.3 m
- Resolution — < 1 mm

Signal Accuracy

- Pseudorange — 1 mm
- Pseudorange Rate — 1 mm/s
- Delta Pseudorange — 1 mm
- Interchannel Bias — < 1 mm
- Uncontrolled Bias — < 1 mm
- Bias Repeatability (initial) — < 1 mm
- Bias Stability (operational) — < 1 mm

Signal Quality

- Spurious — < -160 dBc
- Harmonics — < -50 dBc
- Reference Oscillator — 100 MHz OCXO
- Frequency Stability — $3x10^{-8}$ per day

System Configuration

- GPS Channels Generated — 1 to 12
- Size (H x W x D) — 17” x 14” x 10”
- Weight (approximate) — 50 lbs
- Power Required — 110/220 VAC 50/60 Hz, 600 W
- Operating System — Windows, Lynx

System Options

- Scenario Generation
- 6-DOF Real Time Interface

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