



CAST-SGX

GPS Satellite Simulator



Lightweight, Handheld Satellite Signal Simulator

The CAST-SGX GPS satellite signal simulator from CAST Navigation provides the user with dynamic, repeatable GPS RF signals for use in the laboratory or in the field for a wide range of GPS applications. The SGX simulator is housed in a portable lightweight handheld enclosure.

The simulator is capable of generating up to 16 satellites of GPS CA code on L1. The P code capability can be added as an option. The SGX is based on CAST's state of the art technology that has been developed for use in our larger military products.

The CAST-SGX is controlled via an intuitive touch screen interface that allows the user to select, start and stop scenarios, change screen views and change satellite RF power levels while a scenario is running. Four test scenarios are delivered with the simulator.

The SGX is delivered with CAST-XGen Basic software which can be installed on a separate Windows® PC and allows scenarios based on four maneuver sets. The maneuver trajectory sets include a figure eight, a circle, stationary and racetrack. The CAST-XGen Basic software also allows the user to specify start time, date, position and the almanac used for these simulations. After the scenarios have been created on a PC, they can be transferred to the SGX via an SD card or USB interface.

The optional CAST-XGen Plus software will generate advanced customized scenario's for use with the SGX. The software allows for complete control over atmospheric effects, GPS almanac, ephemeris and all satellite error sources. Select from a variety of vehicle types and simulate static or dynamic motion for land and air, and employ antenna gain patterns and vehicle silhouettes if desired. Generate a trajectory by defining a total mission profile based on native maneuvers, waypoint navigation or importing data generated by Google Maps® or other compatible route planning software. New scenarios can be downloaded to the system via USB port or SD card interfaces.

Simulator Features

- **Lightweight, Portable, Handheld**
- **Touch Screen**
- **Easy to Operate, Intuitive Interface**
- **Operates on Battery or 110/220 VAC 50/60 Hz**
- **Rechargeable Internal Battery**
- **8 Hours Battery Life**
- **Up to 16 C/A, P Code Signals on L1**
- **Complete SV Constellation Generation**
- **GPS L1 RF Output**
- **External Oscillator Input**
- **Oscillator Output**
- **1PPS Output**
- **18 Month Warranty**

System Specifications

Output Frequency

- GPS L1 1575.42 MHz

Maximum Dynamics

- Velocity > 60,000 m/s
- Acceleration $\pm 150,000$ m/s²
- Jerk $\pm 150,000$ m/s³

Signal Level

- GPS L1 C/A Code -160 dBW
- GPS L1 P Code (optional) -163 dBW

Signal Level Control

- Range ± 30 dB
- Resolution 0.1 dB

Signal Accuracy

- Pseudorange 1 mm
- Pseudorange Rate 1.5 mm/s
- Delta Pseudorange 1.5 mm
- Interchannel Bias < 1 mm
- Uncontrolled Bias < 1 mm
- Bias Repeatability (initial) < 1 mm
- Bias Stability (operational) < 1 mm

Signal Quality

- Spurious < -45 dBc
- Harmonics < -50 dBc
- Reference Oscillator 10 MHz OCXO
- Frequency Stability 1×10^{-9} per day

System Configuration

- GPS Channels Generated 1 to 16
- Size (H x W x D) 7" x 11" x 3"
- Weight < 4 lbs
- Power Required 110/220 VAC
50/60 Hz to Charge Battery
- Operating System Proprietary

System Options

- P Code
- XGen Plus Scenario Generation Software
- Additional Scenarios

