

Multiband (L₁, L₂, L₅) Multichannel GPS, Dual Platform Signal Generators (GPSS-MBD-206-08; GPSS-MBD-207-08)



The GPS Signal Generator from CRS, Inc. provides live RF signals at navigational frequencies (L₁ and L₂) at two independent platforms suitable for precise, rover, and base station simulation.

This self-contained unit simulates high-fidelity waveform for up to 12 satellites at any time. The Dual Antenna Units provide two independent platforms and maintains precise code and relationships between them. The phase accuracies are better than 1 mm and these units provide the most accurate and capable base station and rover combinations available. It also allows incorporation of additional range errors and ionospheric model gradients by the users. The ionospheric model considers the code and phase divergences enabling accuracies not possible with other simulators.

Almost unlimited user motions can be specified. A user friendly GUI allows various complex motions with high dynamics up to 20,000 g to be specified. It allows a variety of environmental and receiver antenna models. All of these are done with a minimal latency (< 5 ms).

The signal generator utilizes software-based architecture providing unprecedented accuracy and flexibility, and unlimited vertical and horizontal upgrade.

The flexibility is reflected in the supplied software that allows an operative interactive mode or fully integrated mode using the supplied 'C' programming libraries. It supports synchronization to other systems. All the signals and internal signal structure can be monitored in real-time.

- Performance
 - ⊕ Flexible Software-based Design
 - ↳ 12 to 24 independent channels
 - ↳ GPS – L₁, L₂, and L₅: all C/A, P(Y), M, and L₂C signals
 - ↳ SBAS – support at L₁, WAAS, EGNOS
- High Accuracy
 - ⊕ Code: < 1 cm
 - ⊕ Differential Phase: < 1 mm
- Complex Scenarios
 - ⊕ High Dynamics – suitable for EKV, satellite, projectiles, aircrafts (200 km/s; 20,000 g)
 - ⊕ Arbitrary motion (6 DOF)
 - ⊕ Wavefront Simulation
 - ⊕ Independent controls over all aspects of antennas and platforms

Multiband GPS Generator

- Independent Base and Rover signals
- Arbitrary range error in pseudorange and phase
- Arbitrary ionospheric gradients
- Comprehensive Models
 - ⊕ Constellation
 - ↳ Full Control; definition and modeling
 - ↳ Navigation message bits, HOW, TLM, and sub-frame error data.
 - ⊕ Waveforms
 - ↳ Full controls (independent) over waveform errors, nav bits
 - ↳ Clock errors
 - ⊕ Environment
 - ↳ Ionosphere/Troposphere/Scintillation
 - ⊕ Antenna
 - ↳ Gain and Phase (3-D), Real-time, Lever Arms
 - ⊕ Multipath
 - ↳ Dynamic
 - ⊕ Terrain Obscuration
 - ↳ Dynamic
- Operation and Control
 - ⊕ Manual
 - ↳ Menu-based
 - ↳ Script file based
 - ↳ Interactive (Real-time)
 - ⊕ HWIL
 - ↳ Real-time execution (2 ms latency)
 - ⊕ Remote Control
 - ↳ External control via Ethernet
- Real-time Display
 - ⊕ Satellite Constellation
 - ⊕ Ground Trajectory
 - ⊕ User motion parameters (6 DOF)
 - ⊕ Individual Antennas
- Other Facilities
 - ⊕ Comprehensive Logging
 - ⊕ Remote Control via Ethernet
 - ⊕ Digital Output
 - ⊕ 1 PPS in/out
 - ⊕ 10 MHz / 10.23 MHz operation
 - ⊕ Large Dynamic Range ~ 120 dB

SIGNAL DYNAMICS

- **Velocity:** ± 600 km/s
- **Acceleration:** $\pm 2 \times 10^5$ m/s²
- **Jerk:** $\pm 2 \times 10^5$ km/s³

RF OUTPUT

- -130 dBm at 50 ohms
- **Dynamic Range:** 80 dB
- **Level Resolution:** 0.1 dB
- **Level Accuracy:** ± 0.1 dB RSS
- **Spurious (max):** < -50 dBc
- **Harmonics (max):** < -60 dBc
- **Phase Noise (max):** < 0.02 Rad RMS
- **VSWR:** 1.5:1

CLOCK

- **Internal:** 1×10^{-10} /day
- **External Input:** 10 MHz

WAVEFORM

- GPS C/A code with data at 50 bps
- GPS P, P(Y) optional *
- GPS L2C, L5 code
- GPS M (optional) *

* Requires DoD authorization for P(Y) and M codes (GPSS-MBD-207-08).
[Civilian applications using C/A and P code and M-noise (GPSS-MBD-206-08)]

THE MOST ADVANCED NAVIGATION SIMULATION

- *Comprehensive*
- *Accurate*
- *Flexible*
- *Versatile*
- *User Friendly*
- *Modular*