

## Portable Dual Frequency GPS Simulator

The CAST-1000 GPS simulation system produces GPS RF signals that provide repeatable testing in the laboratory environment or in the field for a wide range of GPS applications. The simulator includes dual frequency GPS RF signal generation technology that is fully programmable and controlled by the simulator software in real time.

The CAST-1000 is capable of generating a full constellation of GPS with 8 to 12 satellites in view selected from the defined 32 Pseudo Random Noise codes. It generates signals for 8 to 12 satellites of C/A Code on L1 and P Code on L1 and L2.

The user has the ability to select from a variety of vehicle types and simulate dynamic motion for terrestrial, aquatic, airborne and space based vehicles. The user may generate a trajectory by defining a total mission profile or by using six degree of freedom dynamic profile data collected in the field.

The system's performance evaluation module provides the capability to compare raw measurements and filtered data received from the GPS navigation system with true vehicle position for completing post-test analysis.



### Simulator Features

- 8 to 12 C/A and P Code SVs on L1 and L2
- 6-DOF Motion Generation Capability
- Selectable Host Vehicle Parameters
- Complete SV Constellation Editing
- External Ephemeris and Almanac
- Spoofer Simulation
- Satellite RAIM Events
- Ionosphere and Troposphere Modeling
- Satellite Clock Errors
- Waypoint Navigation
- Multipath Modeling
- Time-tagged Satellite Events
- Models Selective Availability
- Antenna Pattern Modeling
- External Trajectory Input
- Post Mission Processing

TMB Record		201		TIME MARK BLOCK			
GPS Time	21578.033					Delta T from GPS Time	0
UTC Time	21565.033					Time Mark Counter	2
		Pos			Vel		
Lat	33.00000 (deg)	X	2513773.25 (m)	E	0.00 (m/s)		
Lon	-117.99999 (deg)	Y	-4727722.00 (m)	N	-0.03 (m/s)		
Alt(MSL)	37.77 (m)	Z	3453959.75 (m)	U	-0.09 (m/s)		
(ABS)	1.48 (m)				Acc		
		Pitch	0.00 (deg)	E	0.01 (m/s^2)		
Ch	SV	Cd	Fq	St	Hd	Fl	CN
1	29	P	L1	5	1	0	45
2	21	P	L1	5	2	0	45
3	05	P	L1	5	3	0	45
4	26	P	L1	5	4	0	45
5	16	P	L1	5	5	0	45
6	14	P	L1	5	6	0	45
7	07	P	L1	5	7	0	45
8	31	P	L1	5	8	0	45
9	17	P	L1	5	9	0	45
10	24	P	L1	5	10	0	45
11	02	P	L1	5	11	0	45
12	20	P	L1	5	12	0	45
						J5	
						Roll	
						Hdg	
						MGVar	
						EHE	
						EVE	
						Yr	
						DOY	
						TFOM	
						INS	
						Baro	
						Speed	
						UTC	
						Mag Var	
						MSL	
						Compass	
						Attitude	
						1 PPS	

Receiver data is captured and played back for analysis

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## System Specifications

### Output Frequency

- GPS L1 1575.42 MHz
- GPS L2 1227.60 MHz

### Maximum Dynamics

- Velocity > 60,000 m/s
- Acceleration  $\pm 150,000 \text{ m/s}^2$
- Jerk  $\pm 150,000 \text{ m/s}^3$

### Signal Level

- GPS L1 C/A Code -160 dBW
- GPS L1 P Code -163 dBW
- GPS L2 P Code -166 dBW

### Signal Level Control

- Range  $\pm 30 \text{ dB}$
- Resolution 0.1 dB

### L1/L2 Differential Delay

- Range  $\pm 0.3 \text{ m}$
- Resolution < 1 mm

### 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 < -30 dBc
- Harmonics < -35 dBc
- Reference Oscillator 100 MHz OCXO
- Frequency Stability  $3 \times 10^{-8}$  per day

## System Configuration

- GPS Satellites Generated 8 to 12 L1 and L2
- 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

- 6-DOF Real Time Interface
- Y-Code
- SAASM
- M-Code
- SBAS

## Typical Configuration

