Affordable Software-Defined GNSS Simulator
For Advanced NAVWAR Signal Simulation

PROBLEM:
You want to evaluate the operation and performance of SAASM and M-Code receivers in clear and threat environments, including those that may be subjected to jamming and spoofing attacks.

SOLUTION:
BroadSim Defense (powered by Skydel). BroadSim Defense supports high dynamics, advanced jamming, spoofing, and encrypted military codes. Powered by Skydel's SDX Global Navigation Satellite System (GNSS) simulator engine, BroadSim Defense is able to simulate P-Code, P(Y)-Code, AES M-Code, and has a path to MNSA M-Code.

Why Choose BroadSim Defense?
BroadSim Defense is revolutionizing the GNSS industry because of its extraordinary flexibility, low cost and ability to achieve rapid development cycles. By leveraging Skydel's 1000Hz SDX navigation engine and COTS radios, it can simulate encrypted and unencrypted GNSS signals at the same time, at a fraction of the cost of comparable simulators. BroadSim Defense is unique in that it takes advantage of state-of-the-art RF commercial off-the-shelf (COTS) hardware during processing and generates signal data using COTS graphics-processing units (GPU). Its ability to generate multi-frequency encrypted codes on a COTS system maximizes scalability, value and reduces time to market.
**SPECIFICATIONS**

- 1000 Hz simulation iteration rate
- Live sky time synchronization
- High-end performance (precision, resolution, ultra-high dynamic motion)
- Simulate hundreds of satellites in real-time, using off-the-shelf graphics cards (GPU)
- Differential GNSS and multi-vehicle simulation (Real-Time Kinematics – RTK)
- Comprehensive and intuitive API (Python, C# and C++ open source client)
- Scalable and highly flexible architecture using software-defined radios
- On-the-fly scenario reconfiguration
- 6 DoF receiver trajectories

**Supported GPS Signal Types**

- GPS open codes: L1-C/A, L1-P, L2-P

**Signal Propagation and Errors Simulation**

- Multiple ionospheric models
- Multiple tropospheric models
- Transmitter/receiver antenna pattern models
- Relativistic effects
- Multi-paths
- Additive pseudorange ramps
- Satellite clock error modification
- Navigation message errors

**Signal Specifications**

**Signal Dynamics**

- Maximal relative velocity: 120,000 m/s
- Maximal relative acceleration: no limits
- Maximal relative jerk: no limits

**RF Signal Level**

- Max RF signal output: -10 dBm (no external attenuators)
- Min RF signal output: -170 dBm
- Range (per satellite) relative to reference level: -45 to +15 dB
- Additional range (applied to all satellites): 0 to +35 dB

**Advanced Jamming**

- Jamming signals generated within BroadSim
- Unlimited number of jamming signals generated on 1 RF output
- Each jamming signal can have different power levels, modulations, and locations
- Complete jamming control through the SDX GUI and/or API
- Option to specify the location and power of jamming transmitters - BroadSim calculates the jamming power at the receiver based on the location and jamming parameters
- Select various propagation loss models
- Ability to model Blue Force Electronic Attack (BFEA)

**Ordering Information**

*BroadSim Unencrypted Defense - BroadSim UD*

- GPS L1 C/A, L1-P, L2-P, L1-M-AES, L2-M-AES
- Advanced Jamming

*BroadSim Encrypted Defense – BroadSim ED*

- GPS L1 C/A, L1-P, L2-P, L1-M-AES, L2-M-AES
- GPS L1-Y, L2-Y
- Path to L1-M-MNSA, L2-M-MNSA (Future Paid Option)
- Advanced Jamming

**Service Plan**

Software updates, maintenance and support are included in the first year. UMS service plans are available for additional years.

This device and related technical data are controlled by the International Traffic in Arms Regulation (ITAR); restrictions apply to any non-United States entity.