FEDERAL SYSTEMS

BROADSIM

Software-Defined NAVWAR Simulator

What is BroadSim?

Safran Federal System's BroadSim was developed to simplify the creation of advanced jamming and spoofing scenarios with Navigation Warfare (NAVWAR) testing in mind. BroadSim supports high dynamics, jamming, spoofing, alternative RF navigation, and encrypted military codes. Powered by Safran's Skydel GNSS simulator engine, BroadSim is able to simultaneously simulate multiple constellations including: GPS, GLONASS, Galileo, Beidou and SBAS. With high-performing hardware, a robust and innovative software engine, and an intuitive user interface; BroadSim outperforms and exceeds features offered by the competition.

Why Choose BroadSim?

BroadSim is revolutionizing the GNSS industry because of its extraordinary flexibility, low cost, upgradability, and rapid development cycles. Leveraging Safran's Skydel simulation engine and commercial-off-the-shelf (COTS) software-defined radios (SDRs), simulation of GNSS signals can be achieved at a fraction the cost of today's industry standards. The ability to generate military and multiconstellation signals on COTS hardware maximizes scalability, value, and time to market.

Advanced Jamming & Spoofing Simulation

- Unlimited number of in-band and out-of-band jamming signals with no additional hardware
- Spoofing for all licensed GNSS signals
- Configurable transmitters - set signals, location, antenna pattern, and trajectory for each transmitter
- Complete jamming and spoofing control through the Skydel GUI and/or API
- Automatic compensation for distance, power, and time-of-flight based on the scenario configuration
- Custom interference waveforms, incl. Blue Force Electronic Attack (BFEA) and replay of IQ data files

Safran Federal Systems is the trusted Resilient PNT mission partner to U.S. government and defense organizations, from the lab to the field.

SAFRAN
FEDERAL SYSTEMS

Software

- 1000 Hz simulation iteration rate
- Advanced jamming and spoofing simulation
- Live sky synchronization
- Low-latency, zero-effective latency HIL
- 6 DoF receiver trajectories
- Flexible licensing & upgradability
- High-end performance (precision, resolution, ultra-high dynamic motion)
- Simulate all-in-view satellites, more than 1000 signals, in real-time
- Differential GNSS and multi-vehicle simulation (Real-Time Kinematics - RTK)
- Comprehensive and intuitive API (Python, C#, and C++ open-source client)
- IQ file generation

Hardware

- Size: 4U
- Width: 19 in
- Depth: 15.5 in
- Height: 7in
- Weight: 33 lbs
- Power: 850 Watts
- Intel i7-7700 processor
- 64 GB DDR3 Memory
- 10 MHz and 1 PPS inputs/outputs for synchronization
- 2x NVIDIA GPUs
- 4 RF output (DekTec Radios)

Signal Propagation & Errors Simulation

- Multipath
- Additive pseudorange ramps
- Satellite clock error modification
- Navigation message errors
- Ionospheric and tropospheric models
- Antenna pattern models
- Relativistic effects
- Pseudorange / ephemeris errors
- Terrain modeling

Constellations & Sensors

GPS Open: L1C/A, L1C, L1P, L2P, L2C, L5

GPS Encrypted: L1P(Y), L2P(Y), L1-AES-M, L2-AES-M, L1-MNSA-M, L2-MNSA-M

GLONASS: G1, G2

BeiDou: B1I, B1C, B2I, B2a, B3I

Galileo: E1, E1B-OS-NMA, E5a, E5b, E5-AltBOC, E6HAS

QZSS: L1C/A, L1C, L1S, L2C, L5, L5S

SBAS: L1, L5 - WAAS, EGNOS, MSAS, GAGAN, SDCM

NavIC: L5

Alternative Navigation

LEO Navigation: Xona, Custom Constellations

Custom Signals: GNSS modulation types, custom NAV message, custom ranging code, configurable nav data and chipping rates

Simulation Capabilities

Signal Dynamics

- Max relative velocity: 1,500,000 m/s
- Max relative acceleration: no limits
- Max relative jerk: no limits

Receiver Trajectory Simulation

- Static
- Car trajectory with integrated maps
- Import arbitrary tracks/routes from NMEA, CSV, or KML files
- Spacecraft - orbital trajectories
- Hardware-in-the-loop (HIL)

Operating System

- Custom Linux for security and performance

Plug-In Architecture

- User-defined features leveraging Skydel API

POWERED BY TRUST

safranfederalsystems.com

SAFRAN FEDERAL SYSTEMS