# BROADSIM SOLO

## Single Output Software-Defined GNSS Simulator

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skydel

## What is BroadSim Solo?

Safran Federal System's BroadSim Solo was developed to simplify the creation of advanced jamming scenarios. BroadSim Solo supports high dynamics and jamming. Powered by Safran's Skydel GNSS simulation engine, BroadSim Solo is able to simultaneously simulate multiple constellations including: GPS, GLONASS, Galileo, Beidou, QZSS, NavIC, SBAS. With high-performing hardware, a robust and innovative software engine, and an intuitive user interface; BroadSim Solo outperforms and exceeds features offered by the competition.

## Why Choose BroadSim Solo?

BroadSim Solo is revolutionizing the GNSS industry because of its extraordinary flexibility, low cost, upgradability, and rapid development cycles. Leveraging the Skydel navigation 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 and Spoofing

Advanced jamming needs its own RF output, so multiple units are needed to jam and spoof simultaneously

- 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

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## Software

- 1000 Hz simulation iteration rate
- Advanced jamming
- Live sky synchronization
- Low-latency HIL
- 6 DoF receiver trajectories
- Flexible licensing & upgradability
- High-end performance (precision, resolution, ultra-high dynamic motion)
- Differential GNSS via the RTCM plug-in
- Comprehensive and intuitive API (Python, C#, and C++ open-source client)
- IQ file generation

## Hardware

- Width: 3.8 in
- Depth: 9.4 in
- Height: 8.5 in
- Weight: 8 lbs
- Power: 500 Watts
- Intel i5-9300 processor
- 64 GB DDR4 Memory
- 10 MHz and 1 PPS inputs for synchronization
- 1x NVIDIA GPU
- 1 RF output (DekTec Radio)

## Signal Propagation & Errors Simulation

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

## Constellations

Thanks to the Skydel engine, BroadSim Solo can simulate all constellations and frequency bands. The BroadSim Solo is equipped with one RF output, meaning that only one frequency band can be simulated at a time. Precise synchronization of multiple BroadSim Solo units is supported to expand the number of simultaneously generated frequency bands, jammers, and/or spoofers.

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

## 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
- Circle
- Car trajectory with integrated maps
- Import arbitrary tracks/routes from NMEA, CSV, or KML files
- Spacecraft (LEO/GEO orbits)
- Hardware-in-the-loop (HIL)

Operating System
- Custom Linux for security and performance

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