OHB
DIGITAL

GNSS Simulation

GIPSIE

REALTIME GNSS SIMULATOR

Supported GNSS signals	GPS: Galileo: GLONASS: BeiDou: SBAS:	L1 C/A, L2C, L5 E1 B/C, E5a-I/Q, E5b-I/Q G1 C/A, G2 C/A B1, B2 L1 C/A
Bandwidth	Up to 120 MHz per RF output	
Constellation Update Rate	Up to 250 Hz	
Resolution:	Up to 2x16 bit (complex I/Q)	
Operating system	Linux	
Number of channels	Up to 128 (depending on selected signal components)	
Simulation	- Satellite orbits based on ephemeris or orbit integration - Satellite clock model - Atmospheric delays - Ionospheric delay models: Klobuchar, Nequick-Gal, IONEX Tec Maps - Tropospheric delay models: Saastamoinen, Hopfield, GPT2w - Multipath models (statistical and deterministic) - Noise models for all delays customizable and highly (bit-true) reproducible - Antenna gain pattern and obstruction mask - IF signal parameters including RFFE simulation - User-configurable navigation message - Receiver movement simulation (input through GUI, user file or API) - Simulation of multiple receivers within one simulation	
Frequency Range	2x RF Tuner, 9kHz – 3 GHz (0.001 Hz resolution)	
Accuracy between RF1, RF2	Lower than 100us	
Reference accuracy	OCXO ±5 x 10-8 ageing per year <±1 x 10-8 temperature stability 10 min warm-up time	
Power level	Maximum power output: Resolution: Uncertainty: Range: Dynamic range:	+20 dBm typical 0.1 dB ±0.5 dB: +10 dBm – -50 dBm ±1.0 dB: below -50 dBm -134 dBm – +20 dBm (peak); <75 dB typical
Spectral purity	Harmonics f >30 MHz: Harmonics f <30 MHz: Non harmonics >30 MHz: Non harmonics <30 MHz:	<-30 dBc at +10 dBm <-40 dBc at +10 dBm <-75 dBc typical <-80 dBc typical
Output IP3	<30 MHz @ 10 dBm dualtone, 2 MHz spacing: 100 MHz @ 10 dBm dualtone, 2 MHz spacing: 1575 MHz @ 10 dBm dualtone, 2 MHz spacing: 2332.5 MHz @ 10 dBm dualtone, 2 MHz spacing:	35 dBm typical 40 dBm typical 34 dBm typical 32 dBm typical
Continuous operation	Supported	
Simulation iteration rate	250Hz, 100Hz, 50Hz, 10Hz	
Simulation update rate of trajectory	250Hz, 100Hz, 50Hz, 10Hz, 1Hz	
Simulation of hardware in the loop HIL	250Hz, 100Hz, 50Hz, 10Hz, Latency to RF output < 2ms	
Simulation of receiver Antenna	Gain	
Simulation of transmit Antenna	Gain, Phase	
Logging capabilities	- Time related parameters - Simulated vehicle trajectory parameters - Receiver antenna parameters - Satellite trajectory parameters - Satellite transmit antenna parameters - Received signal parameters	

GNSS Simulation for Novices and Experts alike

A GNSS simulator for all your needs – testing and validating GNSS hardware, research or satellite constellation simulation.

Benefit from quickly created simulations and parameters that can be adjusted down to the smallest detail for more complex test scenarios.
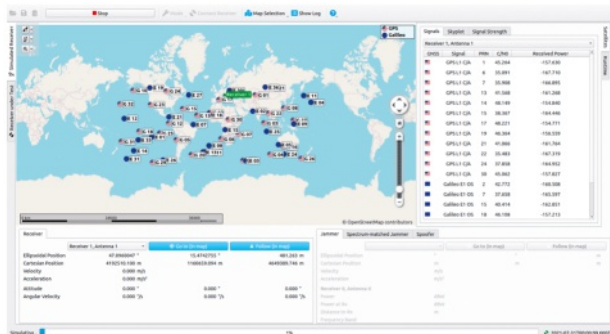
Configure satellite orbits, navigation-messages and change simulation parameters on-the-fly or in a hardware-in-the loop setup.

Improve your interference and spoofing countermeasures and mitigation strategies by using highly detailed signal simulations.


Main User Interface
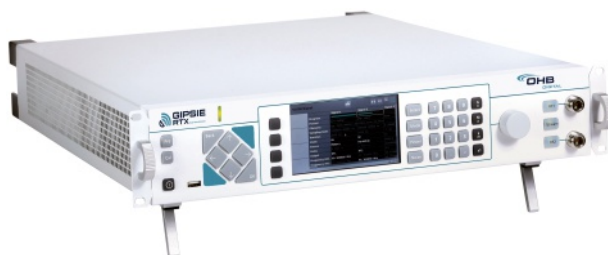
GIPSIE Signal Generation Hardware

Modular, Functional and Intuitive

GIPSIE is a GNSS simulator that is capable of generating all public GNSS signals and frequencies available today. It offers direct RF signal playback in real-time or alternatively digital IF baseband signal generation. Additionally, simulation of GNSS receiver observables is available.

The simulator capabilities can be adjusted in terms of features to meet the user requirements exactly by offering optional signals, frequency bands and simulation of interference and multiple receivers.

Rich Set of Core Features

- Orbit simulation for all GNSS freely customizable
- Accurate models for atmospheric delays – Ionosphere and Troposphere
- Receiver movement by defining position, velocity, acceleration and receiver attitude
- Unlimited number of simulated receivers and antennas
- Modelling of user-defined antenna characteristics and antenna arrays
- Multipath modelling

- In-depth interference and spoofing simulation
- Navigation message simulation based on GNSS ICDs or customized user-defined message formats
- GNSS interference simulation in the form of jamming and spoofing
- Real-time modification of scenario parameters during simulation runtime via API or GUI
- Graphical user interface or command line interface
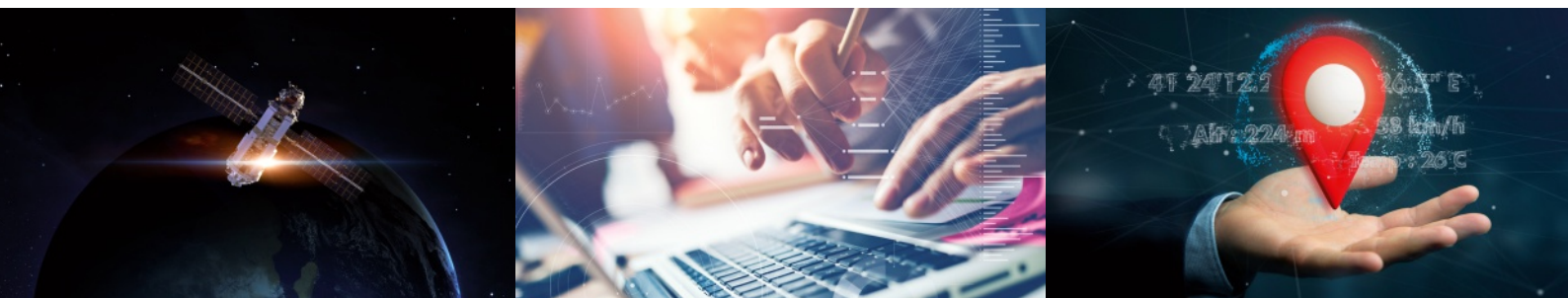
Enjoy GIPSIE'S Simulation Capabilities

The **GIPSIE** GNSS simulator is suitable for system integrators, GNSS equipment manufacturers and users, research institutions, governmental authorities and armed forces in a navigation warfare scenario.

- Control all parameters for a realistic and authentic GNSS signal environment
- Precisely repeat all tests
- Simulate new satellite constellations and signals in advance
- Test under laboratory environment and simulate GNSS denied environments realistically

Get in touch with us to learn how to optimize your resources and time in development, qualification and certification of GNSS equipment and GNSS applications!