POWERED BY skydel

The Global Leader in Resilient **PNT**

GSG-8 Advanced GNSS Simulator

Ultra-High Performance with Unmatched Flexibility

Advanced GNSS Simulation, Made Easy.

GSG-8 is the newest positioning, navigation, and timing test solution offered through Orolia's GSG family of simulators, It was developed to deliver the highest standard of Global Navigation Satellite System (GNSS) signal testing and sensor simulation performance in an easy to use, upgradable and scalable platform.

GSG-8 Advanced GNSS Simulator

GSG-8 Benefits

- Flexible software defined platform
- Truly future proof
- Ultra-high dynamics
- Advanced jamming and spoofing options
- All GNSS constellations
- Powerful Automation
- Aerospace Simulation
- User-defined waveforms

GSG-8 features high-end performance with a 1000 Hz simulation iteration rate, high dynamics, real-time synchronization, and simulation of all-in-view satellite signals. Advanced GNSS jamming and spoofing options allow the creation of benign and threat scenarios required to meet the needs of mission-critical applications. GSG-8 is ideal for any development or integration project that requires sophisticated simulation capabilities in any simulated environment from any point on earth, and beyond.

GSG-8 supports multi-constellation, multi-frequency GNSS simulation and advanced threat scenarios, including jamming, spoofing and repeater simulation. Powered by our industry-leading Skydel simulation engine, GSG-8 can be programmed to simulate operations with all current and future GNSS signals. The ability to simulate multiple synchronized trajectories through multiple instances of the Skydel simulation engine allows testing of complex GNSS systems, such as:

- Differential GNSS, such as Real-time Kinematics (RTK)
- Receiver spoofing mitigation evaluation
- Multi-antenna vehicles
- Attitude measurements
- Simple or complex arrays of GNSS receivers

GSG-8 can also incorporate encrypted or proprietary signals with a comprehensive SDK, which allows signal generation of even the most sensitive signals.

GSG-8: Scientific Precision. Software Defined.

GSG-8 is revolutionizing the GNSS simulation industry with its easy to use, advanced simulation capabilities, extraordinary flexibility and rapid development cycles. With a robust and innovative 1000Hz software engine and commercial-off-the-shelf (COTS) software-defined radios (SDRs), GSG-8 easily outperforms the competition. It can accommodate unlimited configurations to conduct system testing and simulation, and its SDR format makes maintenance and customization much easier and more affordable than other options. Trust GSG-8 to deliver precise results for your critical programs. Orolia can help ensure reliable performance and accelerate your system's time to market or deployment.

Powerful Automation

The unique and modern architecture of its Skydel simulation engine provides an extensive application program interface (API) to configure and control all aspects of the simulator. The API is available in various programming languages such as Python, C#, C++ and LabVIEW. Moreover, all human and machine interactions with the simulator can be recorded and exported as executable python script, which greatly simplifies the work of test engineers who want to automate or expand the simulator capabilities.

Scalable Platform

The Skydel simulator engine provides a flexible and scalable architecture to cover larger and more complex applications to test controlled reception pattern antennas (CRPA). Ask Orolia about Wavefront and Anechoic test solutions using the Skydel simulator engine.

GSG-8 Key Features

- 1000Hz simulation iteration rate
- Low-latency HIL
- Live sky time synchronization
- On-the-fly scenario reconfiguration
- 6 Degrees of Freedom (DoF) receiver trajectories
- Flexible licensing
- In-field upgradability
- High-end performance (precision, resolution, ultra-high dynamic motion)
- Simulate hundreds of satellites in real time, using off-the-shelf graphics cards (GPU)
- Multi-vehicle simulation
- Comprehensive and intuitive API (Python, C# and C++ open source client)
- Scalable and highly flexible architecture using software-defined radios

Signal Propagation and Errors Simulation

- Multipath
- Additive pseudorange ramps
- Satellite clock error modification
- Navigation message errors
- Multiple ionospheric models
- Multiple tropospheric models
- Antenna pattern models
- Relativistic effects
- Pseudorange/ephemeris errors
- Custom signals injection

Signals

- *GPS:* L1C, L1-C/A, L1-P, L2-P, L2C, L5
- *GLONASS:* G1, G2
- *Galileo:* E1, E5a, E5b, E5AltBOC
- *BeiDou-2:* B1, B2
- *Beidou-3:* B1C, B2a
- *SBAS:* WAAS, EGNOS, MSAS, GAGAN, SDCM

Advanced Jamming

- In-band and out-of-band jamming signals, with no additional hardware needed
- Unlimited number of jamming signals generated on 1 RF output
- Set power level, modulation and location for each transmitter
- Complete jamming control through the SDX GUI and/or API
- Option to specify the location and power of jamming transmitters: GSG-8 calculates the jamming power at the receiver based on the location and jamming parameters

Signal Specifications

- Pseudorange Accuracy - ±0.001m
- Pseudorange Rate - ±0.001m/s
- Inter-channel bias - zero
- Spurious transmission ≤ -45 dBc
- Harmonics ≤ -45 dBc
- Signal Dynamics
  - Maximum relative velocity: 1,500,000 m/s
  - Maximum relative acceleration: No limits
  - Maximum relative jerk: No limits
- 1000 Hz iteration rate
- RF Signal Level (GNSS)
  - Power Accuracy: +/- 0.5dB
  - Output reference power: -80 to -50 dBm, 0.1dB resolution
  - Dynamic range (relative to reference power): -45 to +30 dB
  - Total range: -125 to -20 dBm
- RF Signal Level (Jamming)
  - +0 to +110 J/S (with signal (S) reference power at -130dBm)

General Specifications

Certifications

Safety:

- EN/IEC 61010-1:2010

Emissions:

- EN 61326-1:2013
- EN 55011:2009/A1:2010
- FCC Part 15 Subpart B Class A, ICES-003 Issue 6
- AS/NZ CISPR 32:2015
- EN61000-3-2:2014, EN61000-3-3:2013

Dimensions

- Size: 4U
- Weight: 39.6 lbs. (18 kg)
- Width: 19 in (48cm)
- Depth: 16 in (40.6cm)
- Height: 7 in (18cm)

Environmental

- Temperature – +0C to +30C (operating), -15C to +50C non-condensing @ 12,000m (storage)
- Humidity 10% to 70% (non-condensing)

Power

- Line Voltage – 100-240VAC, 50-60Hz
- Power Consumption – 400W

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