ELECTRONICS & DEFENSE

GSG-8 GEN2

Expert GNSS Simulator

Safran's GSG-8 Gen2 is an evolution of the popular GSG-8. An expert-level positioning, navigation, and timing test solution offered through Safran's family of Skydel-based simulators.

The GPU-based GSG-8 Gen2 simulator delivers the highest standard of GNSS signal testing in an easy-to-use, turnkey form factor supporting the growing need for location-aware applications and systems that require navigation or timing. With 6 front-facing high-quality RF outputs and a combined one, the GSG-8 Gen2 GNSS simulator covers the entire GNSS bandwidth and features high-end performance with a 1000 Hz simulation iteration rate, high dynamics, real-time synchronization, and simulation of all-in-view satellite signals.

The GSG-8 Gen2 is ideal for development, NavWar testing, and integration projects that require very high performance and an increased number of constellations and satellites in view, and multi vehicle / multi antenna scenarios..

Key Features:

- **2000+ signals**
- **All MF/MC Signals via Individual or Composite Port**
- **Up to 6 vehicle or antennas in a simulation**
- **Simulate jamming, spoofing, meaconing, interference of all kind**
- **Unlimited number of jammers**
- **1000 Hz simulation iteration rate**
- **Available in three configurations with up to 6 SDRs**
- **Sub-nanosecond-level synchronization between RF bands**
- **High-end RF quality**

Safran Electronics & Defense is with you every step of the way, building in the intelligence that gives you a critical advantage in observation, decision-making and guidance.

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PERFECT FOR EXPERT TESTING

The GSG-8 Gen 2 is a perfect fit for expert civilian and defense users and organizations that need to simulate multi-antenna or very complex scenarios, or test their resilience to jamming or spoofing attacks.

This evolution of the GSG-8 takes a step forward by adding power and flexibility that will benefit those conducting expert testing. Users will benefit from improved operability through front-facing N-Type connectors, a front-facing combined RF output, oscillator, and clock calibration. A small form factor and simple user interface also help improve the user experience.

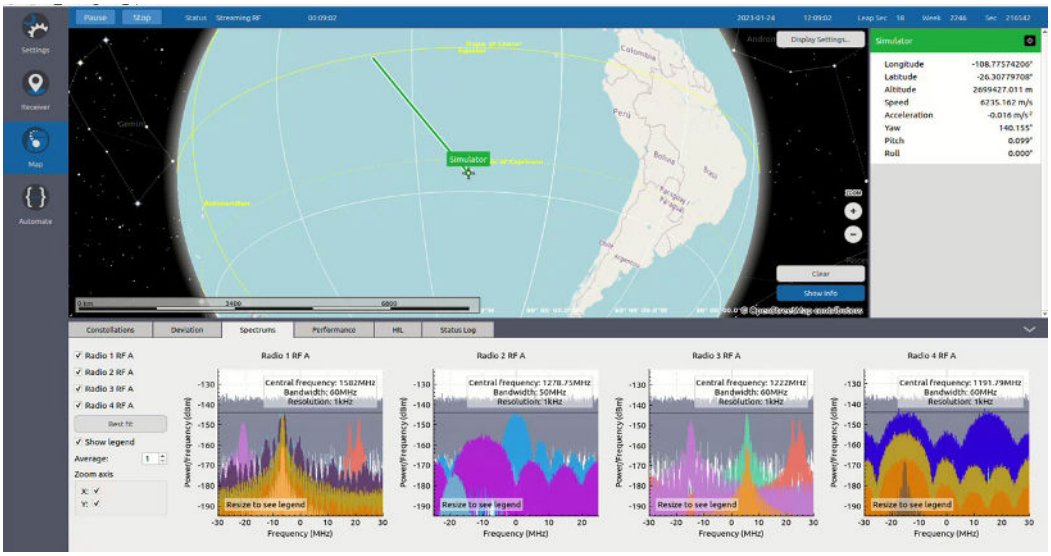
The result is a GSG-8 Gen2 that is capable of delivering the performance and quality that is expected from expert civilian and defense customers, all the while keeping costs low and productivity high.

Skydel Key Features

- All-in-view satellites simulation
- 1000Hz simulation iteration rate
- Low-latency HIL
- Live sky time synchronization
- RTK
- On-the-fly scenario reconfiguration
- Flexible licensing
- In-field software upgradability
- High-end performance (precision, resolution, ultra-high dynamic motion)
- 6 degrees of freedom (DoF) receiver trajectories
- Simulate hundreds of satellites in real-time
- Comprehensive and intuitive API (Python, C# and C++ open-source client)
- IQ file generation
- Scalable and highly flexible architecture using software-defined radios
- Advanced Jamming and Spoofing capabilities

Signal Propagation and Errors Simulation

- Multipath and propagation models
- Additive pseudorange ramps
- Satellite clock error modification
- Navigation message errors
- Multiple ionospheric/tropospheric models
- Antenna pattern models
- Relativistic effects
- Pseudorange/ephemeris errors
- Advanced interference



POWERED BY skydel

TECHNICAL SPECIFICATIONS

Constellations & Signals	GSG-8 Gen2 Interfaces

• GPS: L1 C/A, L1C, L1 P(Y), L2 P(Y), L2C, L5
• Galileo: E1, E5a, E5b, E5 AltBOC, E6 HAS, PRS (Restricted Signals), OSNMA
• GLONASS: G1, G2
• BeiDou:
  • BeiDou-2 (BDS-2): B1, B2
  • BeiDou-3 (BDS-3): B1C, B2a, B3I
• QZSS: L1 C/A, L1 C/B, L1S, L2C, L5, L5S, L6
• NavIC (IRNSS): L1, L5, S
• SBAS (Satellite-Based Augmentation Systems): L1, L5
• Xona: PULSAR XL, X1, X5
• Custom Signals: User-defined signals
• Custom Constellation
	• RF output: N-Type (Combined) x1
	• RF single outputs: N-Type
	GSG-82: 2
	GSG-84: 4
	GSG-86: 6
	• HDMI, USB, Ethernet and serial ports
	• 10 MHz clock input (BNC)
	• 10 MHz clock output (BNC)
	• 1 PPS input (BNC)
	• 1 PPS output (BNC)
	• GNSS antenna input (SMA)

RF/GNSS Signal	Specifications	
Power	Single Output • Maximum carrier level : -20 dBm * • Minimum carrier level : -125dBm ** • Carrier level resolution : 0.1dB • Linearity < 0.5dB (calibrated from -90dBm to -20dBm) • Absolute Accuracy : ±0.5 dB • Run to run repeatability: ±0.1dB	Combined Output • Maximum carrier level : -50 dBm * • Minimum carrier level : -170dBm ** • Carrier level resolution : 0.1dB • Run to run repeatability: ±0.1dB
GNSS Bands	Simultaneous bands 100MHz bands: • 2 (GSG-822) • 4 (GSG-842) • 6 (GSG-862)	
Compatible Bands	L1, L2, L5, E6, S-band	
Signal Purity	• Spurious transmission < -65 dBc • Harmonics < -45 dBc • Phase noise: < 0.003 rad RMS***	
Signal Pseudorange Accuracy in RMS	±1mm RMS	
Pseudorange Bias	0mm RMS	

Time Alignment (internal operating mode)	• 1PPS output to RF output alignment bias <±1ns • Typical 1PPS output to RF output alignment deviation < 100ps • Inter Frequency signal Alignment (as inter-SDR alignment) < 1 ns • Inter-signal alignment bias in the same band : 0s
Sampling Rate	Configurable, up to 125 Msps

** The indicated power refers to the power measured at the output of the unit (via the output RF connector). You can increase or decrease this power level using attenuators (included in the ancillary kit) or an LNA (not included). Please note that active electronics, such as amplifiers, may affect signal purity, power linearity, and accuracy.*

*** As a result of the simulated signal from Skydel, which ranges from -175 to -100 dBm in IQ data, and RF output power amplification of +50 to +80 dB, and internal attenuation (30 dB loss in the combined path).*

**** Nominal Value, which can vary based on several factors such as temperature fluctuations and power supply stability. Based on single output.*

Scenarios	Type of Data
Number of Signals	2000+ signals
Iteration Rate	1000 Hz
Dynamics*	• Relative Velocity : 1 500 000 m/s • Relative acceleration : no limits • Relative jerk : no limits * This velocity requires the SKY-EXLI license in order to exceed 600 m/s • Angular rate (in rad/s) : • 15pi (at lever arm of 1.5m) • 60pi (at lever arm of 0.05m)
HIL Latency	• 10 ms • Zero effective latency
Scenario Duration	No limits

Available Plugins

- SKY-PLG-IMU – Inertial sensors emulation.
- SKY-ADVIMU – Advanced IMU simulation with a complete error model.
- SKY-PLG-RTK – RTCM message generation via virtual basestation.
- SKY-PLG-SDK – Plugin SDK allows the creation and integration of custom plugins for Skydel.

Optional Features

- SKY-HIL – Hardware-in-the-loop mode allows input of vehicle trajectory information in real-time.
- SKY-IQFILE – IQ File, allows saving of generated IQ data to file
- SKY-IQPLAY – Allows the re-playing of an existing IQ file.
- SKY-CSI – Custom signal injections, allows real-time simulation of user-defined GNSS signals (custom modulation and navigation message).

Ext Warranty – Extends Hardware warranty over 3-years

SKY-SSUP – Extends Software support

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