LabSat 4

It has never been this easy to record, replay and simulate advanced GNSS test scenarios.

- 12-bit I&Q quantization
- Flexible 10-60 MHz bandwidth
- Wide frequency range
- High-speed data transfer
- Over 7 TB internal storage
- Customisable simulations with SatGen

Advanced GNSS Signal Testing with Precise Customisation

Introducing **LabSat 4**, an advanced GNSS record, replay, and simulation system engineered to capture and simulate GNSS signals within the upper and lower L-Band, as well as the S-Band.

Individual customisation of each of its three RF channels allows for precise adjustments in quantization (selectable up to 12 bits per signal), and variable bandwidth (10-60 MHz).

It features external data integration (including CAN, CAN-FD, RS232, and Digital event capture), saveable custom record settings, and easy configuration and operation via a user-friendly web interface.

LabSat 4 can record and replay the following signals:

- GPS: L1 / L2 / L5
- Galileo E1, E5a/b, E6
- GLONASS G1, G2, G3
- BeiDou B1, B2a/b, B3
- QZSS L1, L2, L5, L6
- NavIC L1, L5, S-Band
- SBAS L1, L5

Further signals in the upper and lower L-Band as well as the S-Band can be configured with the web interface. Bespoke requirements like Iridium & Sirius XM radio frequencies are available on request.

labsat.co.uk/four

Product Features

12 Bit I & Q
Record I & Q signals data with 12-bit quantization

Flexible 60 MHz Bandwidth
Allocate specific bandwidths to individual RF channels during recording to reduce file sizes

Wide Frequency Range
Record GNSS and other signals including L1, L2, L5, B3, E6 and S-Band with no restrictions

High Speed Data Transfer
Move data to and from internal storage with USB 3 and Gigabit Ethernet

Multi-System Sync
Allows precise synchronisation for Record & Replay using multiple LabSat 4 systems

Backwards Compatible
Scenarios recorded on LabSat 3 Wideband can be replayed on LabSat 4

Web Interface

LabSat 4 offers a user-friendly, web interface that is fully accessible through most web browsers. This interface allows complete access and control over the device, enabling users to predefine recording settings to their specific needs.

With the ability to organize and manage the scenario library stored on the internal SSD, users have the flexibility to select and replay files with full command over the attenuation levels for each scenario.

The interface's customisation extends to each RF channel, both in the pre-record phase and during replay, providing users the ability to adjust critical settings such as quantization, centre frequency, bandwidth, and sampling rate.

This level of control ensures that users can precisely configure the record profile for each available channel, making **LabSat 4** an ideal solution for a wide range of GNSS testing and simulation requirements.

labsat.co.uk/four

Test and Develop for a Wide Range of Applications

LabSat 4 is used across the world by companies and organisations that span a wide variety of industry sectors. Specialist features for industry specific applications include:

- Synchronisation with a **VBOX VIDEO** to record and replay a video of the test route to monitor performance against exact external conditions
- Use of an RF splitter to allow multiple devices to receive the same scenario from a single **LabSat**
- Space simulation scenarios with automated elevation mask to follow the true horizon
- Addition of timed stops to scenarios to simulate multi-stop routes

New SatGen Software

SatGen GNSS Simulation Software creates custom scenarios to simulate a test anywhere in the world, with position, route, speed, date, and time all defined by the user. This powerful tool allows users to generate a GNSS RF I&Q scenario file based on the unique trajectories which can then be transferred to the internal **LabSat 4** SSD for replay.

SatGen supports all signals in the upper and lower L-Band, including GPS L1C and BeiDou 3rd-generation signals for comprehensive testing.
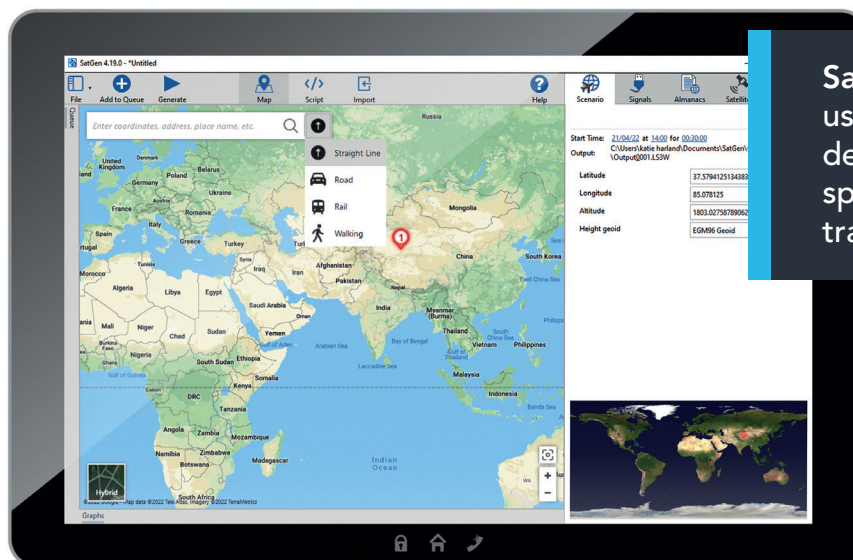
SatGen software offers users the flexibility to create detailed scenarios based on specific time, location, and trajectories.

Learn more about SatGen simulation software: labsat.co.uk/satgen

Product Specifications

Constellations	GPS L1, L2, L5; Galileo E1, E5a/b, E6; GLONASS G1, G2, G3; BeiDou B1, B2a/b, B3; QZSS L1, L2, L5, L6; NavIC L1, L5, S-Band; SBAS L1, L5 Further signals in the upper and lower L band as well as the S-Band can be configured with the web interface. Bespoke requirements like Iridium and Sirius XM radio frequencies are available on request.
Nominal Output Signal Level	-73dBm/MHz @ 0dB Variable attenuator provides between +20 dB & –69 dB of adjustment during replay
RF Channels	3
RF Centre Frequency	Selectable
Number of Satellites Recorded & Replayed	All in view
Bandwidth	Variable 10 - 60 MHz per channel
Sampling Frequency	Automatically adjusted to suit Bandwidth 10 – 61 MHz
Quantization	1, 2, 4, 8, 12 bits I&Q
Data Format	I&Q
Additional Logging	2x CAN channels, 4x Digital channels, 1x RS232 channel, 1x CAN-FD channel
User Defined Simulation Capability	Yes. Through Optional Simulation Software License.
Active Antenna Voltage Supply	4 - 4.5V
Reference Oscillator	**TCXO** Temperature Stability +/- 0.05 ppm Frequency Stability +/- 1 ppm over first year — **OXCO** Temperature Stability +/- 0.05 ppm Frequency Stability +/- 0.3ppm over first year
Storage	7.68 TB Solid State Drive (SSD), 8 GB SD Card (SD card for firmware upgrades only) and removable battery pack.
Operating Voltage	8V to 30 VDC
Size	167 mm x 137 mm x 52 mm
Weight	1.45 kg with battery and SSD