LabSat 4

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

- Up to 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

12 Bit I & Q

Simultaneously record 1, 2 or 3 GNSS channels, each with up to 12-bit quantization

Wide Frequency Range

Record & Replay all GNSS signals in the Upper and Lower L-Band, including SBAS and Commercial differential services

Flexible 60 MHz Bandwidth

Allocate specific bandwidths to individual RF channels during recording to reduce file sizes

Multi-System Sync

Tightly synchronise the Record & Replay of two LabSat 4 systems, ideal for dual antenna testing

Additional Signals

Record a range of additional signals synchronised to the GNSS input, such as dual-CAN, CAN-FD, RS232, and digital signals*

High Speed Data Transfer

Efficient file management via high-speed data transfer to and from the 7.6 TB internal storage via Gigabit Ethernet and USB 3

* Not available with LabSat 4 Lite

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Which LabSat is Right For You?

LabSat 4 is available in three models: LabSat 4 Lite, LabSat 4 Core, and LabSat 4. As your testing needs evolve, so can LabSat 4. Upgrades are available from LabSat 4 Lite to LabSat 4 Core, and from LabSat 4 Core to LabSat 4, ensuring a seamless transition to more advanced capabilities.

LabSat 4 Lite

- ✓ 3 RF Channels
- ✓ 10-60 MHz Bandwidth
- ✓ Up to **2 bits of I&Q**
- ✗ **External Signals**

LabSat 4 Core

- ✓ 3 RF Channels
- ✓ 10-60 MHz Bandwidth
- ✓ Up to **4 bits of I&Q**
- ✓ **External Signals**

LabSat 4

- ✓ 3 RF Channels
- ✓ 10-60 MHz Bandwidth
- ✓ Up to **12 bits of I&Q**
- ✓ **External Signals**

LabSat 4 Options

Record & Replay

Capture live-sky GNSS signals and build a library of real-world scenarios for playback on any LabSat 4. A perfect all-in-one solution for comprehensive GNSS testing.

Replay Only

Ideal for bench testing and production lines, this model allows you to replay pre-recorded or simulated scenarios without the need for live-sky recording.

SatGen Compatibility

All models work with SatGen Simulation Software, enabling the creation of custom GNSS scenarios for precise and repeatable testing.

Advanced GNSS Signal Testing

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.

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Web Interface

LabSat 4 features a user-friendly web interface accessible via most browsers, allowing full device control and custom recording settings. Users can manage scenario libraries on the internal SSD, selecting and replaying files with adjustable attenuation.

Customisation extends to each RF channel, enabling adjustments to quantization, frequency, bandwidth, and sampling rate. This precise control makes **LabSat 4** ideal for diverse GNSS testing and simulation needs.

Why Use LabSat?

Budget-Friendly

Using recorded GNSS data for testing reduces the need for repetitive field-testing and saves both time and costs.

Lifetime Support

All LabSat owners benefit from exceptional customer support that is provided free of charge with no support contracts.

Compact Size

LabSat simulators are small, portable and battery powered allowing them to fit into the most compact of spaces.

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

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	-93dBm/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 bits I&Q (LabSat 4 Lite) 1, 2, 4 bits I&Q (LabSat 4 Core) 1, 2, 4, 8, 12 bits I&Q (LabSat 4)
Data Format	I&Q
Additional Logging	2x CAN channels, 4x Digital channels, 1x RS232 channel, 1x CAN-FD channel (Not available for LabSat 4 Lite)
User Defined Simulation Capability	Yes. Through Optional Simulation Software License.
Active Antenna Voltage Supply	4 - 4.5V

	TCXO	OXCO
Reference Oscillator	Temperature Stability +/- 0.05 ppm Frequency Stability +/- 1 ppm over first year	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.
Data Transfer	Gigabit Ethernet to and from SSD
Operating Voltage	8V to 30 VDC
Size	167 mm x 137 mm x 52 mm
Weight	1.45 kg with battery and SSD