

LabSat

GNSS Simulator

RECORDS Real world GNSS signals

REPLAYS GPS, Galileo, GLONASS, BDS, SBAS* RF data

SIMULATES User defined scenarios



LabSat by **RACELOGIC** is the most affordable **multi-constellation** Global Navigation Satellite System (GNSS) Simulator currently on the market.

If you are selling, testing or developing products incorporating GPS and or GLONASS/Galileo/BDS engines, then you'll find **LabSat** makes your job easier, quicker and more effective.

Why use a GNSS Simulator?

Connecting to a live sky antenna from your bench is not always easy and can result in attenuation problems and increased noise levels. During the day the satellite constellation, atmospheric conditions and multipath (from nearby structures) will change, so you can never have a repeatable environment with known signal levels. Using **LabSat** gives you a realistic signal to noise levels and repeatable conditions.

If you require specific trajectories and geographical locations, then you can run your choice of scenarios on the bench, anywhere in the world, saving hours in real world testing.

By using the digital input/output capability you can also have any number of event markers or even serial data embedded during the recording process which can then be replayed fully synchronized with the GNSS data stream.



How does it work?

LabSat streams data to and from a PC using a high speed USB link. When recording, **LabSat** down-converts the GNSS signals into a serial data stream which is then transferred in real time to the PC via the USB link, which is then saved as a binary file.

When replaying, the PC streams the previously recorded or generated file via USB back to **LabSat**, which then up-converts the data into a GPS L1/Galileo E1 signal (1575.42MHz). LabSat 2 operates on any two of the four constellations including GLONASS L1 signal (1602.00MHz), and BDS (Beidou Navigation Satellite System 1561.098MHz) reproducing the satellite signals from all of the satellites which were present during the recording. Any Satellite Based Augmentation Signals (SBAS) WAAS/EGNOS signals present are also reproduced.

How large are the files?

The data is streamed via high speed USB to a PC by **LabSat**, so a 10 minute recording will take up approximately 1.17 GB of data. There is no limitation to the size of the recorded file.

What scenarios come with the unit?

All units are shipped with a 500 GByte USB drive which contains 25 useful and varying scenarios, from artificial static scenarios to actual recorded drives in places such as London, Detroit and China etc.

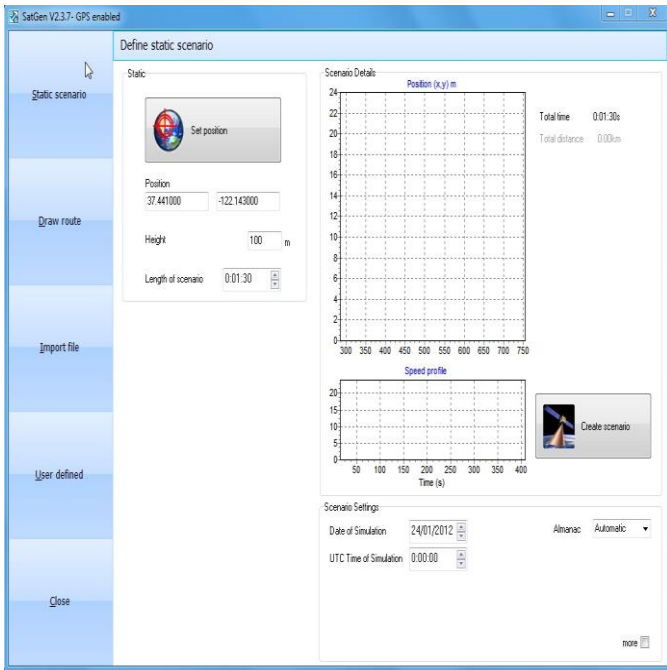
Choice of two models

LabSat – Single channel, GPS, Galileo & SBAS*. Record & Replay, Replay Only, Record Only variants.

LabSat 2 – Dual Channel, GPS, Galileo, GLONASS, BDS & SBAS* Record & Replay, Replay Only, Record Only variants.*Satellite-based Augmentation System (SBAS)

How can I generate my own tests?

With the optional **SatGen 2** software, defining the position, time and trajectory couldn't be easier; simply draw a route in Google Earth, and **SatGen** will convert this into a feasible route, basing the velocities and accelerations on a pre-defined profile. You can also create the scenario using a simple command file, controlling the position, velocity, height and acceleration. If you have NMEA data in the \$GGA format, you can use this directly to generate the binary file.



What else can I record at the same time?

Using the optional External Interface modules, you can log Serial (RS232, RS485/422) data or CAN data at the same time as the GPS RF data. When the GPS RF data is then replayed, the serial/CAN data is then replayed at the same time, synchronized to within 60nS.



Technical Specifications

| | LabSat | LabSat 2 |
|--------------------------------------|--|---|
| Constellation | GPS, Galileo, SBAS | GPS, Galileo, GLONASS, BDS, SBAS |
| Output Signal Level | Adjustable -83dBm to -115dBm | Adjustable -83dBm to -107dBm |
| RF Channels | 1 | 2 |
| RF Channel 1 Centre Frequency | 1575.42 MHz | Approx 1561.098 MHz, 1575.42 MHz, 1602.00 MHz |
| RF Channel 2 Centre Frequency | - | Approx 1561.098 MHz, 1575.42 MHz, 1602.00 MHz |
| Number of Satellites Observed | All in view | All in view |
| Sampling frequency | 16.368MHz | 16.368MHz |
| Bandwidth | 4.092MHz | 8.184MHz (SSB) |
| Quantisation | 1-bit | 1-bit / 2-bit per channel |
| Data Format | I | IQ |
| USB transfer rate | 2.046 Mbytes per second | 8.184Mbytes per second |
| Hard Disk Drive Included | 500Gb | 500Gb |
| Active Antenna Voltage Supply | 3.3v | 3.3v |
| Reference Oscillator | 16.368MHz Temperature controlled +/- 2.5 ppm | 16.368MHz Temperature controlled +/- 2.5 ppm |
| Operating voltage | 8v to 30VDC | 8v to 30VDC |
| Size | 170mm x 128mm x 38mm | 170mm x 128mm x 46mm |
| Weight | 750g | 750g |

LabSat is designed and manufactured by **RACELOGIC** Ltd., experts in the field of GPS Testing and Data Logging. Based in the UK with additional offices in Germany and the USA, **RACELOGIC** are an ISO 9001 company that supplies specialised GPS based test equipment to many well known corporations, in over 80 countries around the world.