LabSat

GNSS Simulator

RECORDS Real world GNSS signals
REPLAYS GPS, Galileo, GLONASS, BeiDou, SBAS & QZSS RF data
SIMULATES User defined scenarios anywhere

The most affordable, portable, and versatile multi-constellation Global Navigation Satellite Simulator on the market.

If you are selling, testing or developing products incorporating satellite navigation chipsets, then you'll find LabSat 3 makes your job easier, quicker and more cost effective.

Why use a Simulator?

LabSat 3 records and replays real world data, allowing realistic and repeatable testing to be carried out under controlled conditions. Signal artefacts including multipath, ionospheric effects and signal dropouts are reproduced and there are no limits to the number of satellites used in the test.

Conventional testing usually requires driving the same route multiple times, where conditions vary and satellite constellations change between tests. This can make it very challenging to reproduce and fault find software errors or reception issues with the device under test. Using LabSat 3 saves many hours of work, allowing you to quickly pinpoint errors and verify 'corner cases' without leaving the test bench.

A very useful feature is the ability to record and replay additional streams of data using the high speed digital port(s) on LabSat 3. In this way, CAN bus data, RS232 signals or digital event triggers can be fully synchronised during playback, bringing a whole new level of realism to your bench simulations.

How does it work?

LabSat 3 receives the signal from a standard satellite antenna, but instead of processing each of the received signals to calculate a position fix, LabSat 3 digitises and stores the original satellite signals at a very high bandwidth onto a removable SD card or USB disk.

The RF output of the LabSat 3 is then connected to the antenna input of the device under test and the recorded data is replayed back as an RF signal. The device under test will then start to track the satellites as though it was travelling along the same path taken by the LabSat 3 during the original recording.

How easy is it to use?

One touch record/replay makes LabSat 3 extremely simple to operate. With its rugged construction, built in battery and clear display, it is very easy to use the LabSat 3 in the same environment as your product will experience in everyday use, with little or no training.

A free library of pre-recorded and simulated files from around the world is included to get you up and running as quickly as possible.

What constellations can I record?

Each LabSat channel can be tuned to one of 3 user selectable frequencies:

1. 1575.420 MHz - GPS+Galileo+SBAS+QZSS
2. 1602.000 MHz - Glonass
3. 1561.098 MHz - BeiDou

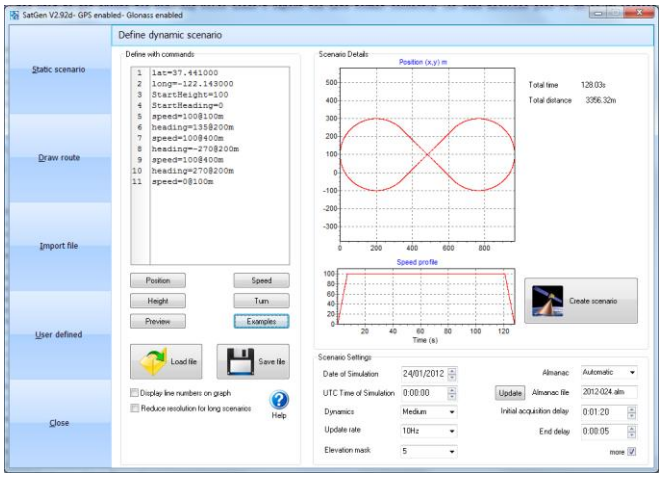
RLLS03-1P – Single channel Replay only
RLLS03-1RP – Single channel Record/Replay

RLLS03-2P – Dual channel Replay only
RLLS03-2RP – Dual channel Record/Replay

Can I generate my own test scenarios?

If you want to create your own custom test scenario using artificial signals, SatGen software allows you to quickly draw a route using Google maps, and then automatically creates an RF file which can then be transferred to an SD card and replayed on a **LabSat 3**.

Multiple satellites and multiple constellations can be simulated, and the user can also have precise control over velocity, heading and height profiles.



A suitable almanac can be automatically downloaded, or defined by the user. SatGen can also import KML files and NMEA files, and the time, date and dynamics are fully user definable.

A 30 day demo version of SatGen, limited to 2 minutes scenarios, is included with every model.

What else can I record at the same time?

You can log a variety of other information such as CAN, serial or digital data alongside the satellite signals. When the file is replayed, the embedded data is reproduced at the same time, synchronized to within 60nS. You can also embed a 1PPS signal using the internal GPS receiver.

Additional features

- Ethernet, USB and RS232 port for remote control
- External 10 MHz reference input
- Digital inputs/outputs for synchronisation
- USB Host port for USB sticks/hard drives*
- 1PPS digital output

How much data can I store on an SD card?

Each channel uses ~14GBytes per hour, and the largest SD card which can be used is 128Gb*. Therefore you can record just over 9 hours with a single channel and 4.5 hours with two channels.

*Storage devices >32Gb in size need to be formatted in FAT32 using the PC utility provided.

Technical Specifications

	LabSat 3 Single Channel	LabSat 3 Dual Channel
Constellation	1 of GPS, Galileo, SBAS, QZSS, GLONASS, or BeiDou	2 of GPS, Galileo, SBAS, QZSS, GLONASS, or BeiDou
Output Signal Level	Adjustable -83dBm to -115dBm	
RF Channels	1	2
RF Channel 1 Centre Frequency	1561.098/ 1575.4/1602.00 MHz	
RF Channel 2 Centre Frequency	-	1561.098/ 1575.4/1602.00 MHz
Number of Satellites Observed	All in view	
Sampling Frequency	16.368 MHz	
Bandwidth	9.66 MHz	
Quantisation	1 or 2-bit	2xchannels at 1-bit or 1xchannel at 2-bit
Data Format	I & Q	
Additional logging	-	2 channels of CAN, RS232 or Digital
Removable Battery Pack	Record & Replay version only	Both versions
Media Storage Included	32Gb SD card & 500Gb USB HDD	
Active Antenna Voltage Supply	2.85 v	
Reference Oscillator	16.368 MHz Temperature controlled +/- 2.5 ppm or OCXO option	
Operating voltage	8v to 30VDC	
Size	167mm x 128mm x 43mm	
Weight	960g with Battery (910g without Battery)	

LabSat is designed and manufactured by **RACELOGIC** Ltd., experts in the field of GPS Testing and Data Logging, based in the UK with offices in Germany and the USA. **RACELOGIC is** an ISO 9001 company that supplies specialised GPS based test equipment to major OEMs in over 90 countries around the world. Racelogic has recently won three Queen's Awards for Enterprise and was founded in 1992.