

LabSat3



LabSat3 is a standalone, portable, two channel system for testing devices based on satellite navigation systems; it is capable of recording and replaying multiple raw satellite navigation RF signals including GPS, GLONASS, Galileo, BeiDou, QZSS and SBAS. The optional SatGen software package can be used to generate simulated satellite signals from a user defined trajectory, allowing tests to be carried out simulating any time, date or place around the world.

Why use a simulator?

LabSat3 records and replays real world data, allowing realistic and repeatable testing to be carried out under controlled conditions. All signal artefacts including multipath, ionospheric effects and signal dropouts are reproduced and there are no limits to the number of satellites. Conventional testing usually requires multiple test drives where conditions change and satellite constellations move between tests. This can make it very challenging to reproduce and fault find reception issues with the device under test. Using **LabSat3** saves engineers many hours of work, quickly pinpointing errors and verifying 'corner cases' without leaving their test bench.

How does it work?



LabSat3 receives the signal from a standard satellite antenna, but instead of processing each of the received signals to calculate a position fix, **LabSat3** digitises and stores the original satellite signals at very high bandwidth onto a removable SD card or USB disk.

By connecting the RF output of the **LabSat3** to the antenna input of the device under test, the receiver will start to track and use the satellites as though it was travelling along the same path taken by the **LabSat3** during the original recording.

How easy is it to use?

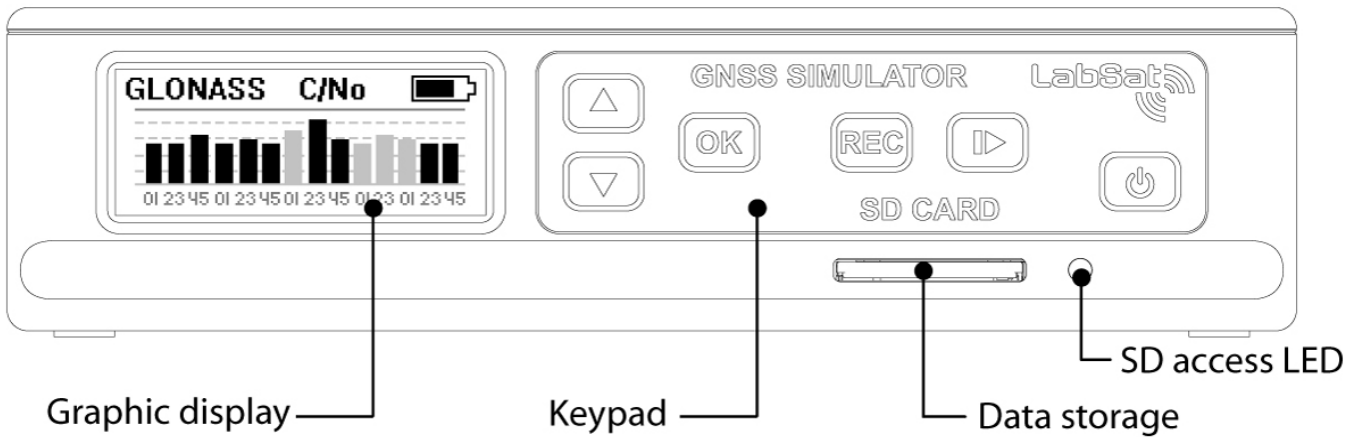
One touch record/replay makes **LabSat3** extremely simple to operate. With its rugged construction, built in battery and clear display, it is very easy to use in the same environments as your products will experience in everyday use. If you want to make up your own test scenario, the optional SatGen software allows you to simply draw a route on an interactive map, and then the software takes care of creating an RF file which can be replayed using **LabSat 3** containing the simulated signals from multiple satellites and constellations. 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.

Features

- Available for GPS L1, GLONASS L1, Galileo E1, BeiDou B1, QZSS and SBAS
- Compact, lightweight and portable
- Fully standalone
- Two channels (optional)
- Battery life up to 2 hours
- Simple to use one touch recording

The **LabSat3** product range supports a number of powerful features for use in industries such as automotive, aerospace and performance sports analysis. It includes dual RF channels for multiple constellation testing, Dual CAN Bus recording, digital event capture and inertial sensor logging.

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Model Range

Part Number	Description	Signal Band	GNSS Antenna
RLLS03-1P	LabSat3 Single Channel Replay Only Unit	Any one of GPS L1, GLONASS L1 or BDS B1 & SBAS	N/A
RLLS03-1RP	LabSat3 Single Channel Record & Replay Unit	Any one of GPS L1, GLONASS L1 or BDS B1 & SBAS	RLACS198 Quad Constellation Antenna
RLLS03-2P	LabSat3 Dual Channel Replay Only Unit	Any two of GPS L1, GLONASS L1 or BDS B1 & SBAS	N/A
RLLS03-2RP	LabSat3 Dual Channel Record & Replay Unit	Any two of GPS L1, GLONASS L1 or BDS B1 & SBAS	RLACS198 Quad Constellation Antenna

*Satellite-based Augmentation System (SBAS)

All units types can be factory upgraded to any other version.

Connections


Name	Connection	Description
Power	2 pin LEMO	8 to 30VDC Power Supply input
HOST USB	USB	For connection of USB Storage devices
ETHERNET	RJ45	Remote access and control (Available in future updates)
USB	USB	For future updates
RF Out	SMA	Output for RF signal replay for connection to receiver under test
RF IN	SMA	RF signal input from antenna (RP models only)
REF IN	SMA	10 MHz Reference Clock Input
Expansion	36 Way MDR	1-PPS, Digital I/O, CAN Bus, RS232 *

*Model dependent



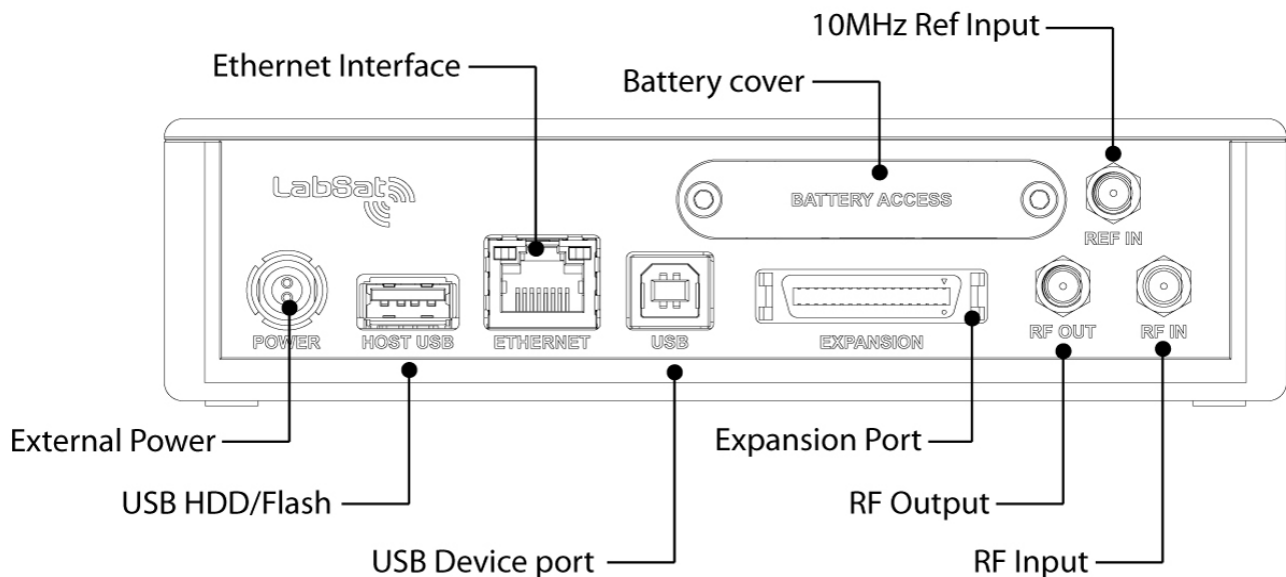


Technical Specifications

	LabSat3 Single Channel	LabSat3 Dual Channel
Constellation	Any one of GPS, GLONASS, BDS plus SBAS	Any two of GPS, GLONASS, BDS plus SBAS
Output Signal Level	Adjustable -83dBm to -115dBm	
RF Channels	1	2
RF Channel 1 Centre Frequency	Selectable Approx 1561.098 MHz, 1575.42 MHz, 1602.00 MHz	
RF Channel 2 Centre Frequency	-	Selectable Approx 1561.098 MHz, 1575.42 MHz, 1602.00 MHz
Number of Satellites Observed	All in view	
Sampling frequency	16.368MHz	
Bandwidth	9.66MHz	
Quantisation	1-bit	2-bits per channel
Data Format	IQ	
User Control	6 Button Membrane Keypad	
Display	Backlit LCD Dotmatrix	
Battery Included	Record & Replay version only	Both versions
Battery Type	Varta Easypack Li_Polymer 2260mAh	
SD Card Included	32 GB SD card	32 GB SD Card & 500GB HDD
SD Card Media	Class 10 UHS-I  max size 128Gbyte (FAT32 only)	
Active Antenna Voltage Supply	2.85V	
Reference Oscillator*	16.368MHz Temperature controlled +/- 2.5 ppm	
Operating voltage	8V to 30VDC	
Size	167mm x 128mm x 43mm	
Weight	960g with battery (910g without battery)	
Operating Temperature	-20°C to +60°C Note: Battery will not charge below 0°C or above +45°C (Charger shuts down outside this range) Unit will shut down outside operating temperature range.	
Storage Temperature	-20°C to +60°C Note: Battery will discharge whilst in storage and discharge rate will increase at higher storage temperatures	

*OCXO Optional (Available in future updates)

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System Package Contents

Unit	Part Number
LabSat3 UNIT	RLLS03
LabSat3 CARRY CASE (RLLS03-1RP & RLLS03-2RP only)	RLACS197
LabSat3 SCENARIO 500 GB HARD DISK DRIVE (RLLS03 -2P & RLLS03-2RP only)	LS02HDD
VBOX MAINS ADAPTER	RLVBACS020
32GB SDHC Card	RLACS199
LEMO 2 WAY TO 12V CIGAR LIGHTER LEAD – 2M	RLCAB010L
GNSS QUAD CONSTELLATION MAGNETIC MOUNT ANTENNA (RLLS03-1RP & RLLS03-2RP only)	RLACS198
SMA-SMA CABLE – 1M	RLACS071-1
SMA PLUG TO MCX PLUG CABLE – 1M	RLCAB082-1
SMA PLUG TO MMCX PLUG CABLE – 1M	RLCAB083-1
SMA PLUG TO TNC PLUG CABLE – 1M	RLCAB084-1
LabSat3 BATTERY (Not supplied with RLLS03-1P)	RLACS201
LabSat3 EXPANSION CONNECTOR ADAPTER (RLLS03 -2P & RLLS03-2RP only)	RLACS202
LabSat3 MANUAL	LS03MAN
LabSat3 CABLE IDENTIFICATION SHEET	LS03-CABIDEN
LabSat3 QUICK START GUIDE	LS03GUIDE