LabSat 2
Dual Constellation GPS + GLONASS Recorder and Re-player

What is LabSat 2?

LabSat 2 builds on the highly successful **LabSat** system. It is capable of recording and replaying two channels of GPS and GLONASS data, with 2 bit sampling when recording both constellations and 4 bit sampling when recording a single constellation. This enables real-world, repeatable testing of GNSS devices to take place in the laboratory.

How does it work?

LabSat 2 is controlled by a PC using a high-speed USB 2.0 connection. GPS-L1 and GLONASS-L1 channels can be recorded simultaneously to a Laptop PC hard drive where they are stored for future replay. Approximately 4 GB of data is stored for every 10 minutes of use, with no limit on the length of the sample.

When replaying, the same data is streamed from the laptop to **LabSat 2** at the same rate. A large internal buffer means that data is seamlessly replayed.

LabSat 2 is small and rugged, allowing it to be used in the field to continuously record GPS + GLONASS signals in a digital form that can then be replayed at a later date. As **LabSat 2** records real world data, this means that all GNSS artefacts are faithfully re-produced on the bench. Multipath, ionospheric effects and dropouts can now be recorded and then reproduced with ease. There is no limit on the number of satellites that can be logged.

In addition to replaying recorded RF data, **LabSat 2** is able to play user defined simulated GPS L1 files generated using the optional **SatGen** software.

How is it used?

LabSat 2 is ideal for almost any kind of GNSS development. It is used to test and develop GPS / GLONASS engines, GNSS enabled smart phones, Portable Navigation Devices, tracking systems and much more. **LabSat 2** is very well suited to end of line testing as it can represent a real world test as well as a carefully simulated scenario. In addition, **LabSat 2** can be used to calibrate GPS products, such as the Racelogic VBOX range.

Features

- Real-world GPS phenomena can be seen in test scenarios (e.g. multipath, drop-outs, tree coverage, atmospheric effects)

- Low cost

- Simple yet powerful **LabSat** software for record and replay

- **SatGen** software for GPS simulation

- Small, rugged, anodised aluminium body

- Portable – can be powered via Vehicle DC supply
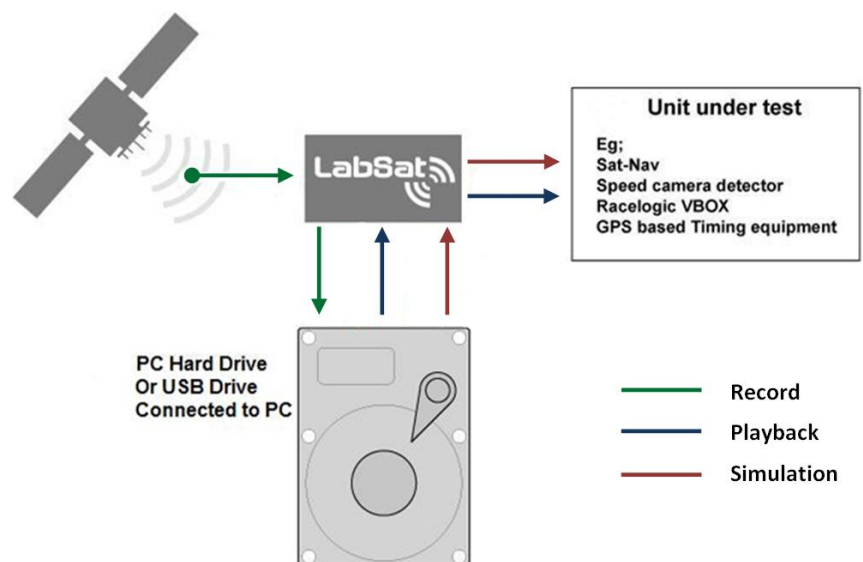
- USB port for PC connectivity

LabSat 2 Models

Part Number	Description	Signal Band	GPS + GLONASS Antenna Supplied?
RLLSP02-GNL1	**LabSat 2 Replay Only**	GPS L1 + GLONASS L1	No
RLLSR02-GNL1	**LabSat 2 – Replay & Record**	GPS L1 + GLONASS L1	Yes
RLLSC02-GNL1	**LabSat 2 Record Only**	GPS L1 + GLONASS L1	Yes
RLLSSGSW	**SatGen Software** - Adds customisable GPS simulation capability to any of the above models	GPS L1	No

Name	Connector	Description
Data	USB 'B'	High speed USB 2.0 Data Link
Monitor	USB 'mini B'	GPS Monitor - NMEA
PWR	LEMO	12 volt DC Power Supply
AUX	5 pin LEMO	Digital In / Out
RF Out	SMA	Output antenna for RF signal replay
RF IN	SMA	Input antenna for RF signal record
REF IN	SMA	10 MHz Reference
Digital I/O	26-D type	1-PPS

Connections

Package Contents

Part Number	Unit
RLLSXXX-XXXX	LABSAT 2 UNIT
RLLSSGSW	SATGEN GPS SIMULATION SOFTWARE (OPTIONAL)
RLACS113	LABSAT CARRY CASE
LSHDD01	LABSAT SCENARIO 250GB HARD DISK DRIVE
RLVBACS020	VBOX MAINS CHARGER
RLCAB042	USB 'A' TO USB 'B' LEAD – 2M
RLVBCAB01	VBOX SERIAL CABLE (5 WAY LEMO TO 9 WAY 'D' CONNECTOR) – 2M
RLVBCAB10	LEMO 2 WAY TO 12V CIGAR LIGHTER LEAD
RLACSXXX	GPS MAGNETIC AERIAL
RLACS071	SMA-SMA CABLE - 1M
RLCAB082	1M SMA PLUG TO MCX PLUG CABLE
RLCAB083	1M SMA PLUG TO MMCX PLUG CABLE
RLCAB084	1M SMA PLUG TO TNC PLUG CABLE
CDRLLS	LABSAT SOFTWARE CD
LS01MAN	LABSAT 2 MANUAL
RLLSCAL	CALIBRATION CERTIFICATE
	Customer Support Form and User Guide

Technical Specifications

PC	Interface to PC	USB 2.0 Hi-speed 480mbit/s
	PC Requirements	Minimum Core i5 with XP/Vista/Win7
	STD Reference Oscillator	16.368MHz Temperature controlled +/-2.5 ppm options
RF Record	Input Connector	Single SMA
	Channels	2
	Channel 1 Centre Frequency	1575.42 MHz
	Channel 2 Centre Frequency	1602.00 MHz
	Sample Frequency	16.368MHz
	Data format	IQ
	Sampling	2-bit (dual constellation) or 4-bit (single constellation)
	Channel bandwidth	16MHz
	Input LNA Gain	13dB
	Input LNA Noise	1.14dB
RF Replay	Output Connector	Single SMA
	Channels	2
	Channel 1 Centre Frequency	1575.42 MHz
	Channel 2 Centre Frequency	1602.00 MHz
	RF Power Range	Approx -83dBm to -107dBm
Digital Input Capture	Resolution	Approx 62 ns
	1 PPS Output	Yes – When Internal GPS Locked to Input / Output
	External Reference Clock Input	10 MHz
Options	OCXO	Frequency Stability <+/-1x10-9
	Record Only	Record GPS + GLONASS
	Replay Only	Replay GPS + GLONASS
Future Options	*Multi - LabSat Synchronisation*	
	Dual Input / Output RF ports	*For dual antenna operation*
	Multi bit*	*Single channel 2-bit operation*
Power	Operating Voltage	8V to 30V DC
	Power	7W
Weight & Dimensions	Weight	Approx 750g
	Size	170mm x 128mm x 46mm