

# LabSat

## GPS Recorder, Re-player and Simulator



**LabSat is the revolutionary new product from GPS experts RACELOGIC.**

As one of the first dedicated GPS Simulators with RF record and playback facilities, LabSat enables real world GPS testing to take place in the laboratory.

LabSat is small and rugged, allowing it to be used in the field to continuously record the RF GPS signal in a digital form that can then be replayed at a later date. As LabSat records real world GPS data, this means that all GPS artefacts are faithfully re-produced on the bench. Multipath, ionospheric effects and dropouts can now be recorded and then reproduced with ease. LabSat works with the L1 (1575.42MHz) signal and has no limit on the number of satellites that can be logged.

To cover all testing requirements, scenarios can also be generated from scratch using the *SatGen* software, which can provide simulated data to specific requirements. Playback with Racelogic prepared scenarios is also possible.

### How does it work?

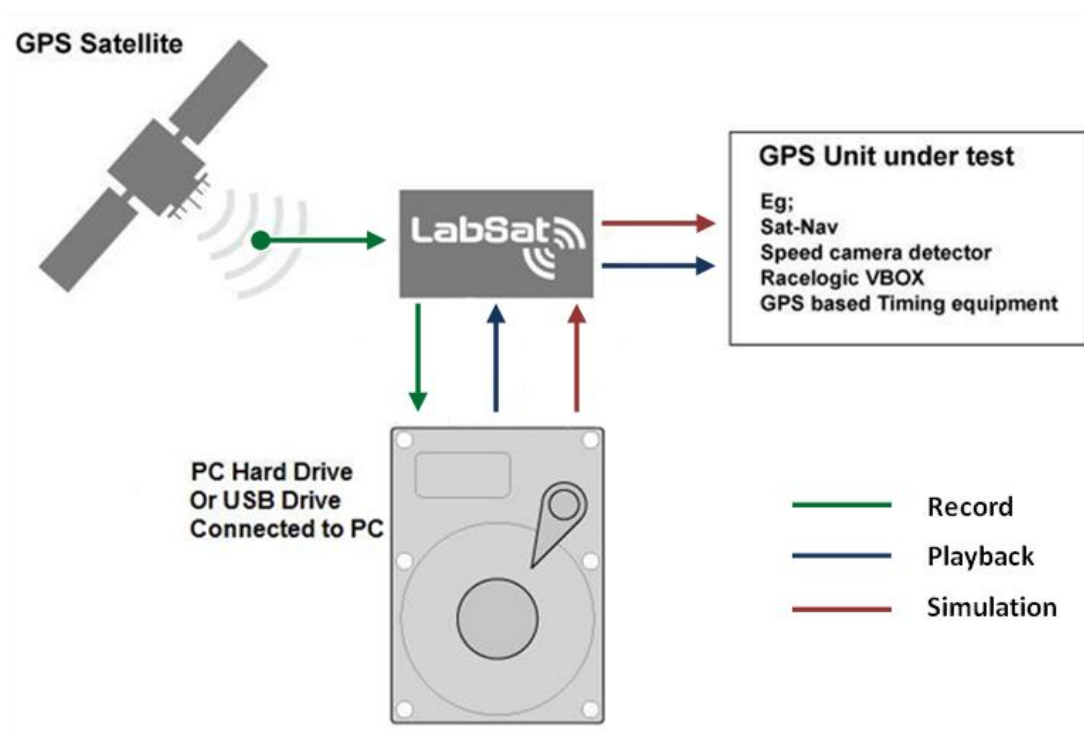
LabSat is controlled by a PC using a high speed USB 2.0 link. When recording RF GPS data, LabSat is connected to a laptop and data is continuously streamed to the hard disk. Approximately 1 GB of data is stored for every 10 minutes of use, with no limit on the length of the sample. When replaying, the same data is streamed from the laptop to LabSat at the same rate. A large internal buffer means that data is seamlessly replayed.

### How is it used?

LabSat is ideal for almost any kind of GPS development. It is used to test and develop GPS engines, GPS enabled smartphones, Portable Navigation Devices, GPS tracking systems and much more. It 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 can be used to calibrate GPS products, such as the Racelogic VBOX range.

## Features

- Real world GPS phenomena can be seen in test scenarios, such as multipath, drop-outs, tree coverage, and atmospheric effects.
- Low cost
- Simple to use but powerful LabSat software for record and replay
- SatGen software for simulation
- Small, rugged, anodised aluminium construction
- Portable – can be powered via Vehicle DC supply
- USB port for PC connectivity



## LabSat Models

### **LabSat Replay System (RLSP01)**

Ability to play pre-recorded GPS scenarios (illustrated by the blue line in the above diagram).

### **LabSat Record System (RLSC01)**

Ability to record GPS data (illustrated by the green line in the above diagram).

### **LabSat Record and Replay System (RLSR01)**

Ability to record GPS data, logging via USB, and replay GPS data (illustrated by the green and blue lines in the above diagram).

### **SatGen Software (RLSSGSW)**

Adds simulation capability to any of the above models, with the ability to simulate fully customisable GPS scenarios anywhere in the world (illustrated by the red line in the above diagram).

## Connections

Connector	Description	Comment
USB	High speed USB 2.0 link	--
PWR	12 volt DC	Power Supply
AD1	Analogue + digital input 1	Input 1 for the AD signal 1 output by a VBIII
AD2	Analogue + digital input 2	Input 2 for the AD signal 2 output by a VBIII
D Out	Digital output	--
CAN	NMEA output	RS 232 Serial output
SER	Serial input/output	RS-232 Serial connection for LabSat modules to log and replay CAN, RS232, RS422/485 data
RF OUT	GPS simulation RF level output	GPS L1 Transmission
ANTENNA	GPS antenna input to recorder	GPS L1 Reception



## Package Contents

RLSP01 / RLSC01 / RLRS01	LABSAT REPLAY / LABSAT RECORD / LABSAT RECORD & REPLAY
RLSSGSW	SATGEN SOFTWARE (OPTIONAL)
RLACS113	LABSAT CARRY CASE
LSHDD01	LABSAT SCENARIO 500GB HARD DISK DRIVE
RLVBACS020	VBOX MAINS CHARGER
RLCAB042	USB 'A' TO USB 'B' LEAD – 2M
RLCAB112	USB to 5W LEMO SERIAL
RLVCAB10	LEMO 2WAY TO 12V CIGAR LIGHTER LEAD
RLVBACS001	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
CDRLS	LABSAT SOFTWARE CD
LS01MAN	LABSAT MANUAL
RLSCAL	CALIBRATION CERTIFICATE
	Customer Support Form and User Guide

## Technical Specifications

<b>Output Signal Level</b>	Adjustable -85dBm to -115dBm
<b>Output Signal frequency</b>	1575.420 MHz
<b>Sampling frequency</b>	16.368MHz
<b>Bandwidth</b>	4.092Mhz
<b>Quantisation</b>	1 bit
<b>USB transfer rate</b>	2.046Mbytes per second
<b>Active Antenna Voltage Supply</b>	3.3v
<b>Reference Oscillator</b>	16.368MHz Temperature controlled +/-2.5 ppm Long term stability +/-1.0ppm
<b>Operating voltage</b>	8v to 30VDC
<b>Size</b>	170mm x 128mm x 38mm
<b>Weight</b>	750g