

## LabSat GNSS Simulators LabSat 3 Wideband Web Server

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## 01 - Web Server Introduction

LabSat 3 Wideband has a complex array of settings for both GNSS signal and external data recording. To simplify the configuration and device control process, LabSat 3 Wideband has an internal webserver for configuration which can be easily accessed via a standard PC internet web browser.

*Note: The LabSat 3 Wideband system is not configured for bespoke user control by HTML code. Please see the [Remote Control and SDK](#) section at the end of this manual.*



## 02 - Web Server Hardware Configuration

Navigate to the 'LAN' section of the LabSat 3 Wideband menu, here a Static IP address can be defined if desired. If a Static IP is not required, simply ensure the option is unticked and connect a network cable. When the static IP option is unticked, the LabSat will work as **DHCP**. When the network cable is connected, the IP address will be displayed next to the 'LAN' menu and also in the 'About' menu.

When LabSat 3 Wideband has an IP address, the web server can be opened by entering the IP address into a web browser, Racelogic advise using Internet Explorer, Firefox or Google Chrome.

The screenshot displays the 'LabSat 3 Wideband Recording Setup' web interface. The browser address bar shows '192.168.1.158'. The interface is titled 'LabSat 3 Wideband Recording Setup' and shows a frequency spectrum plot with three bands highlighted: Band 1 (red), Band 2 (green), and Band 3 (blue). The left sidebar contains configuration options for signal display, bandwidth, channels, and quantization. The top right shows the current status as 'Idle'.

**Main Menu**

- FREQUENCY SETUP
- SELECT SIGNAL DISPLAY
  - GPS
  - Galileo
  - GLONASS
  - BeiDou
  - Other
- Show individual signals
- BANDWIDTH
  - 10 MHz
  - 30 MHz
  - 56 MHz
- NUMBER OF CHANNELS
  - 1 Band
  - 2 Bands
  - 3 Bands
- SIGNAL QUANTIZATION
  - Current quantization: 1
  - Maximum in this mode: 2 bits.
- DIGITAL IO
  - Resolution: 0.29 us (3.41 MHz)
  - Max baud rate: 426.25 kbit/s
- + RECORD AND REPLAY
- + GNSS MONITOR
- + DIGITAL IO SETUP
- + SYSTEM SETUP
- + ABOUT LABSAT 3 WIDEBAND

**Centre Frequency**

| Band   | Centre Frequency (MHz) | Bandwidth (MHz)     |
|--------|------------------------|---------------------|
| Band 1 | 1176.213               | 1161.213 - 1191.213 |
| Band 2 | 1227.340               | 1212.340 - 1242.340 |
| Band 3 | 1575.745               | 1560.745 - 1590.745 |

**SAVED RECORD PROFILES:**

- Read current profile
- Profile name: TELNET\_CONF
- Save and Apply
- Save only
- Delete selected profile



## 03 - Web Server WiFi Dongle

The LabSat 3 Wideband Web Server can be accessed on mobile devices such as smartphones or tablets to allow the user to configure and monitor the LabSat, connection is made possible using a WiFi dongle. The USB WiFi dongle must use a RT5370 chipset.

This feature will allow for remote control of the system and will be particularly useful in the field. For example, the LabSat 3 Wideband can be controlled from the front of a vehicle, monitoring the performance in real-time.

The WiFi Dongle should be connected to the Host USB port on the LabSat rear panel. Once connected a hotspot will be created using the LabSat host name, the host name will be '**labsatv3w\_XXXXXXX**', where XXXXXXXX is replaced with the LabSat serial number (the serial number must be entered in an 8 digit format, leading zeros should be used). Connection can also be made by entering '<http://10.0.0.3>' in the web browser address bar.

When selecting the hotspot on a mobile device, a password will be requested prior to connection, the password for all LabSat hotspots is '**secret1234**'. Please note that the password is case sensitive and should be entered all lowercase.

*Note: If WiFi and Ethernet connection are used at the same time, there may be a 'disconnected' status displayed on the web server. This is due to limitations of handling data from two interfaces.*



## 04 - Web Server Frequency Setup

The Frequency setup page is designed to allow you to configure the device remotely. On this page, you can configure the bandwidth, quantisation and number of channels you wish to record.

The screenshot displays the 'LabSat 3 Wideband Recording Setup' web interface. At the top, it shows the connection to 'LabSat 3 Wideband SN:47150' and the current status as 'Idle'. The main area features a frequency chart with three bands highlighted: L5 (red), L2 (green), and L1 (blue). Below the chart, the 'CENTRE FREQUENCY' section shows three bands with their respective frequency ranges: Band 1 (1176.213 MHz), Band 2 (1227.340 MHz), and Band 3 (1575.745 MHz). The 'SAVED RECORD PROFILES' section includes a list of profiles and buttons for 'Read current profile', 'Save and Apply', 'Save only', and 'Delete selected profile'. A left-hand menu provides navigation options for various setup functions.

- **Unit Status** – This indicates the current state of the device. The available statuses are Idle, Playing – file, time & length, Recording – file & time.
- **Frequency Chart** – The frequency chart provides a visual representation of the GNSS signals available when using LabSat 3 Wideband. The frequency bands can be dragged across the chart to select desired frequencies. Click on the axis labels to snap the frequency band to a marked frequency. Right clicking will allow the image to be saved.
- **Frequency Display** – This will display the centre frequency highlighted by the bands on the frequency chart. The display will also accept manually entered frequencies, simply press enter at the end of an entry to update the frequency chart.
- **Read Current Profile** – Selecting this function will load LabSat 3 Wideband's current settings onto the web server page.
- **Settings Controls** – These controls allow you to save, apply and or delete frequency profiles.
- **Saved Profiles** – Any previously saved profiles will populate this area.



- **Digital Channel Rates** – Here the maximum rates for the digital channels is displayed. The rates will vary dependent on the signal setup in use.
- **Signal Setup Controls** – In this section you can select the Bandwidth, Number of Channels/Bands and Quantisation for the recording.
- **Chart Display Controls** – The settings here control what is displayed on the Frequency Chart. Individual constellations can be selected and deselected to tailor the chart display to your needs.



## 05 - Web Server Record and Playback

This page of the Web Server is designed to allow you to control record and replay functionality of your device remotely. On this page, it is also possible to navigate through the connected LabSat's SSD file structure and there is the ability to rename or delete any of the present files.

The screenshot shows the 'LabSat 3 Wideband file management' web interface. On the left is a navigation menu with sections like 'FREQUENCY SETUP', 'RECORD AND PLAYBACK', 'SYSTEM STATUS', 'REPLAY OPTIONS', and 'RECORD OPTIONS'. The main area displays the current directory as 'Internal SSD/ web1/'. Below this are 'SUBDIRECTORIES' (listing 'test2') and a 'RECORDINGS' table. The table has columns for Filename, Length, Bandwidth, Quantisation, Band 1, Band 2, Band 3, and actions (Play, Rename, Delete, Download). A 'CURRENT RECORDING SETTINGS' section at the bottom provides details about the active recording.

| Filename | Length | Bandwidth | Quantisation | Band 1       | Band 2       | Band 3       | Play | Rename | Delete | Download             |
|----------|--------|-----------|--------------|--------------|--------------|--------------|------|--------|--------|----------------------|
| File_001 | 2:00   | 10 MHz    | 3            | 1567.421 MHz | 1584.441 MHz | 1548.080 MHz | Play | Rename | Delete | Settings<br>Data CAN |
| File_002 | 09     | 10 MHz    | 3            | 1575.420 MHz | 1602.000 MHz | 1561.098 MHz | Play | Rename | Delete | Settings<br>Data     |
| File_003 | 1:17   | 56 MHz    | 2            | 1229.327 MHz | 1583.281 MHz | -            | Play | Rename | Delete | Settings<br>Data CAN |
| File_004 | 16     | 56 MHz    | 2            | 1229.327 MHz | 1583.281 MHz | -            | Play | Rename | Delete | Settings<br>Data CAN |
| File_005 | 3:37   | 56 MHz    | 2            | 1229.327 MHz | 1583.281 MHz | -            | Play | Rename | Delete | Settings<br>Data CAN |

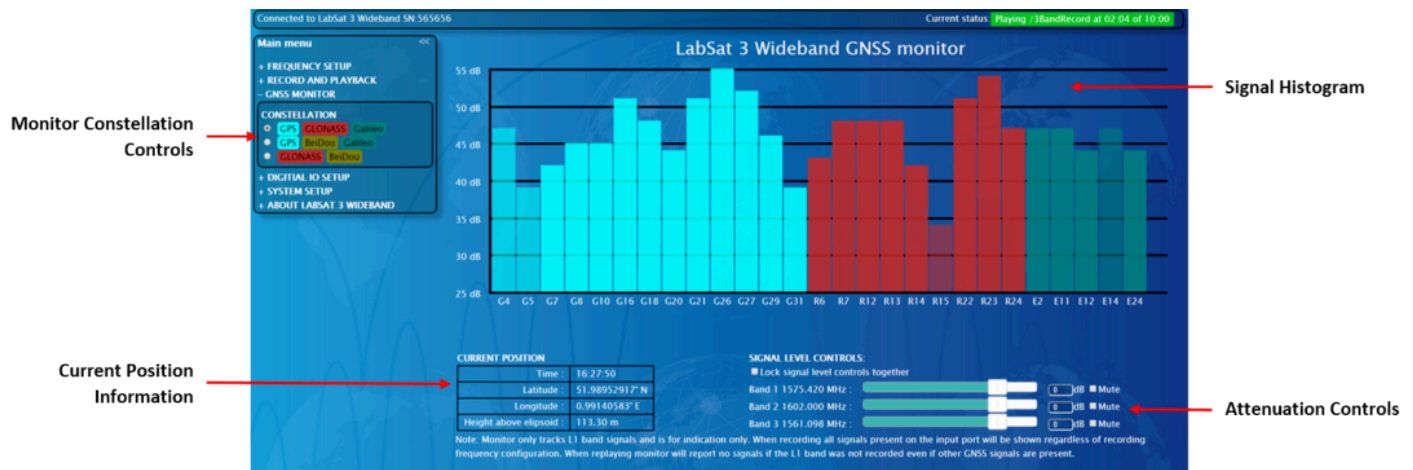
- **Replay options** – In this section, you can set Loop playback – selected file will replay continuously, Start playback at – Specify a time in the scenario to replay from, and Playback for - Specify how long the scenario will replay for.
- **Record options** – This section enables you to start a new recording, the desired file name can also be entered. Additionally a Record for time can be set - specify how long the LabSat will record for.
- **Current Directory** – A full file path will be displayed with the accessed directory being last in the list. To return to a specific directory on the SSD, simply click on the required directory in the file path.
- **Subdirectories** – All subdirectories contained within the open directory will be displayed here, to access them, click on the folder name.
- **Create Directory** - This allows the user to create a new directory within the LabSat 3 Wideband internal SSD.
- **File List** – Files within the current directory will be listed. Options to play, delete or rename files are also present in this list. Download links associated with each file allow you to view the setting used during the files recording, download the recording and view CAN data if applicable.  
*Note: Some file/browser combinations require you to right click and select 'Save as'.*



## 06 - Web Server GNSS Monitor

The GNSS monitor is a L1 only display and can display GPS L1, GLONASS G1, BeiDou B1 and Galileo E1. The user can enable and disable constellations from being displayed on the signal histogram to suit their needs.

The signal strengths shown on the Signal Histogram are for the LabSat 3 Wideband internal GNSS monitor, user equipment connected to the output may display different results depending upon the equipment and configuration used.



- **Monitor Constellation Controls** – These controls determine which constellations are displayed on the Signal Histogram.
- **Current Position Information** – This section allows the current GPS time, latitude, longitude and height above ellipsoid to be displayed throughout the scenarios replay.
- **Signal Histogram** – Bars on the histogram represent each individual satellite, these bars will display the SV number and SNR for each satellite captured in the scenario. The more transparent bars represent the satellites that are being tracked but not used in the current position calculation.
- **Attenuation Controls** – There is an attenuation control for each band in the current replay (attenuation is not functional during recording), to adjust the attenuation slide or click to move bars. When using the number enter boxes to set the attenuation, press tab, enter or click away to apply. The bars can be 'locked' together, when locked together all bars will move the same amount and maintain their relative separation (entry boxes ignore the lock option).





## 07 - Web Server Digital IO Setup

On the Digital IO Setup page, it is possible to configure the LabSat 3 Wideband's four external data channels. These channels can be set up to record/replay CAN, RS232, and/or Digital signals. It is also possible to set up arbitrated CAN recording/replay.

Connected to LabSat 3 Wideband SN:565656 Current status: Idle

### LabSat 3 Wideband Digital IO Setup

**SAMPLE RATE:**  
 Time accuracy: 0.29 us (3.41 MHz)  
 Max baud rate: 426.25 kbit/s

**DIGITIZED CHANNEL SELECT**

Channel 1: [Signal source] [Record input] [Replay output]

| Channel   | Signal source | Record input | Replay output |
|-----------|---------------|--------------|---------------|
| Channel 1 | Disabled      |              |               |
| Channel 2 | Disabled      |              |               |
| Channel 3 | Disabled      |              |               |
| Channel 4 | Disabled      |              |               |

Ground connectors are available on pins 4, 5, 7, 9, 19, 20, 21, 33 and 34.

**CAN RECORDED OPTIONS:**  
 Record arbitrated CAN to text log file  
 Silent record (No Ack from LabSat)  
 Arbitrated CAN 1 baud rate: 500 kHz  
 Arbitrated CAN 2 baud rate: 500 kHz

**CAN PLAYBACK OPTIONS:**  
 Use log file for CAN replay if available

Apply changes

- **Digital Channel Rates** – This shows the maximum rates for the digital channels. The rates will vary dependent on the signal setup in use.
- **Digital Channel Setup** – Use the dropdowns to select the signal you wish to record on each digital channel. Once a signal is selected, the table will be populated with the input and output pins for the selected signal.
- **Arbitrated CAN Setup** – Here you can enable the LabSat to log arbitrated CAN and define if the recording needs to be silent or not. Silent recording enabled will mean no acknowledgement is sent by the LabSat during recording. The baud rate of each CAN channel can be defined individually.



## 08 - Web Server System Setup

Connected to LabSat 3 Wideband SN:565656 Current status: Idle

**Main menu**

- + FREQUENCY SETUP
- + RECORD AND PLAYBACK
- + GNSS MONITOR
- + DIGITAL IO SETUP
- SYSTEM SETUP
- Setup options
- + ABOUT LABSAT 3 WIDEBAND

### LabSat 3 Wideband System Setup

**NETWORK OPTIONS:**

- Enable DHCP
- IP address: 192.168.1.239
- Subnet mask: 255.255.255.0
- Default gateway: 192.168.1.255
- Refresh

**CLOCK OPTIONS:**

Clock source:  TCXO  OXCXO  External 10.0 MHz clock input

- Enable 10.0 MHz clock output

Apply changes

**Network Settings**

**Clock Source Options**

- **Network Settings** – Change the current network/LAN configuration of the LabSat currently in use.  
*Note: Changing these settings will require you to reconnect the device after changes.*
- **Clock Source Options** – Define whether the LabSat uses its internal TCXO, OXCXO or an external 10 MHz reference clock input. When using TCXO or OXCXO, it is also possible to enable a 10 MHz clock output from the REF port of LabSat 3 Wideband.



## 09 - Web Server Remote Control and SDK

For automation of LabSat 3 Wideband remote control, please see the online [telnet manual](#), and for the SDK, please contact your local distributor or [Racelogic support](#).

