Quick Start Guide

DATS LA runs under Windows (7 • 8 • 10 • 11)
DATS LA Hardware and Software are Designed and Engineered in the USA
Software downloads are at: **trueaudio.com/dats-la**

***** VERY IMPORTANT SAFETY NOTE *****

NEVER connect the DATS LA test leads to a speaker that is connected to any other equipment or to an equipment ground! Severe damage could occur to the DATS LA unit or to the other equipment! Only connect DATS LA to an unconnected loudspeaker.

Congratulations on your purchase of the Dayton Audio DATS LA Loudspeaker Analyzer! DATS LA is a unique loudspeaker analyzer that uses a new type of test signal that can measure loudspeaker parameters as the cone excursion is stepped in each direction. This new test method is exclusive to DATS LA and is protected by U.S. Patent 11.272,301. DATS LA is a high-powered outgrowth of the popular DATS V3 loudspeaker test system. While DATS V3 is a small-signal test system, DATS LA uses up to 100 Watts of power to measure speaker parameters from a whisper up to torturous drive levels over the full range of cone excursion (for most drivers).

Here are step-by-step instructions to get you going quickly. Later, as you wish to learn more about using DATS LA, you can **see the User's Guide under the Help menu**.

1) Download and install the DATS LA software.

Download and install the DATS LA software from:
https://trueaudio.com/DATS_LA/downloads/DATS_LA.zip
Double-click on the file and follow the on-screen instructions to complete the installation. **Don't launch the DATS LA application software just yet.**

2) Connect the DATS LA hardware unit to the PC and to AC power.

Using the supplied cables connect the unit to a PC with the USB cable and then connect to a 120VAC power outlet using the line cord. The blue "USB" LED at the DATS LA front panel lights up to indicate that a PC is connected. Switch on the power and look for the green "Power" LED at the front panel.

3) Launch the DATS LA application software.

From the Windows "Start" button select "All Programs" then select "DATS LA". The DATS LA software will launch. Accept the license agreement (first time only) and proceed.

4) Calibrate the System (in the following order).

Null Calibration (open lead calibration)

Perform this calibration one time when the software is first installed. Because the system uses a full power signal it is **VERY IMPORTANT** disconnect the test leads and make sure no speaker or other equipment are connected to the DATS LA unit when the Null Calibration is performed. When you are fully prepared, at the Impedance Analyzer menu select "Null Z Calibration" and follow the on-screen instructions.

Impedance Calibration at 100 Ohms.

Connect the test leads to the calibration terminals at the DATS LA front panel. Select "Impedance Calibration…" under the "Impedance Analyzer" menu and follow the instructions to calibrate the system at 100 Ohms using the built- in ±0.1% calibration resistor. A value between 99.5 and 100.5 Ohms is normally expected.

Shorted Leads Calibration

From the DATS LA "Impedance Analyzer" menu select "Test Leads Calibration…". Short the test leads by clipping them together and click OK to calibrate the software for the test lead resistance. The test lead resistance should be less than 1 Ohm as seen at the bottom right of the typical DATS screen shown in Figure 1. If the test leads fail to calibrate select "Impedance Calibration…" under the Impedance Analyzer menu click on "Restore Default Calibration" and repeat the Null Calibration and test leads calibration procedures.

5) Test a Speaker…connect the DATS LA alligator clips to the terminals of a speaker.

The speaker **MUST NOT BE CONNECTED** to anything else such as an amplifier, other electrical equipment or ground. For best results clamp the driver in place and allow adequate clearance for any rear pole piece vents.

6) Click on the "Measure Free Air Parameters" button at the left of the DATS window.

You should hear the sweep and then see the impedance response plotted on screen similar to Figure 1. The impedance magnitude is shown as a blue plot with the phase response shown in red. Several of the speaker's free air parameters

are displayed in the Parameters Bar at the right side of the screen. The bar at the left side on the window is where you set the impedance and frequency limits for the current display.

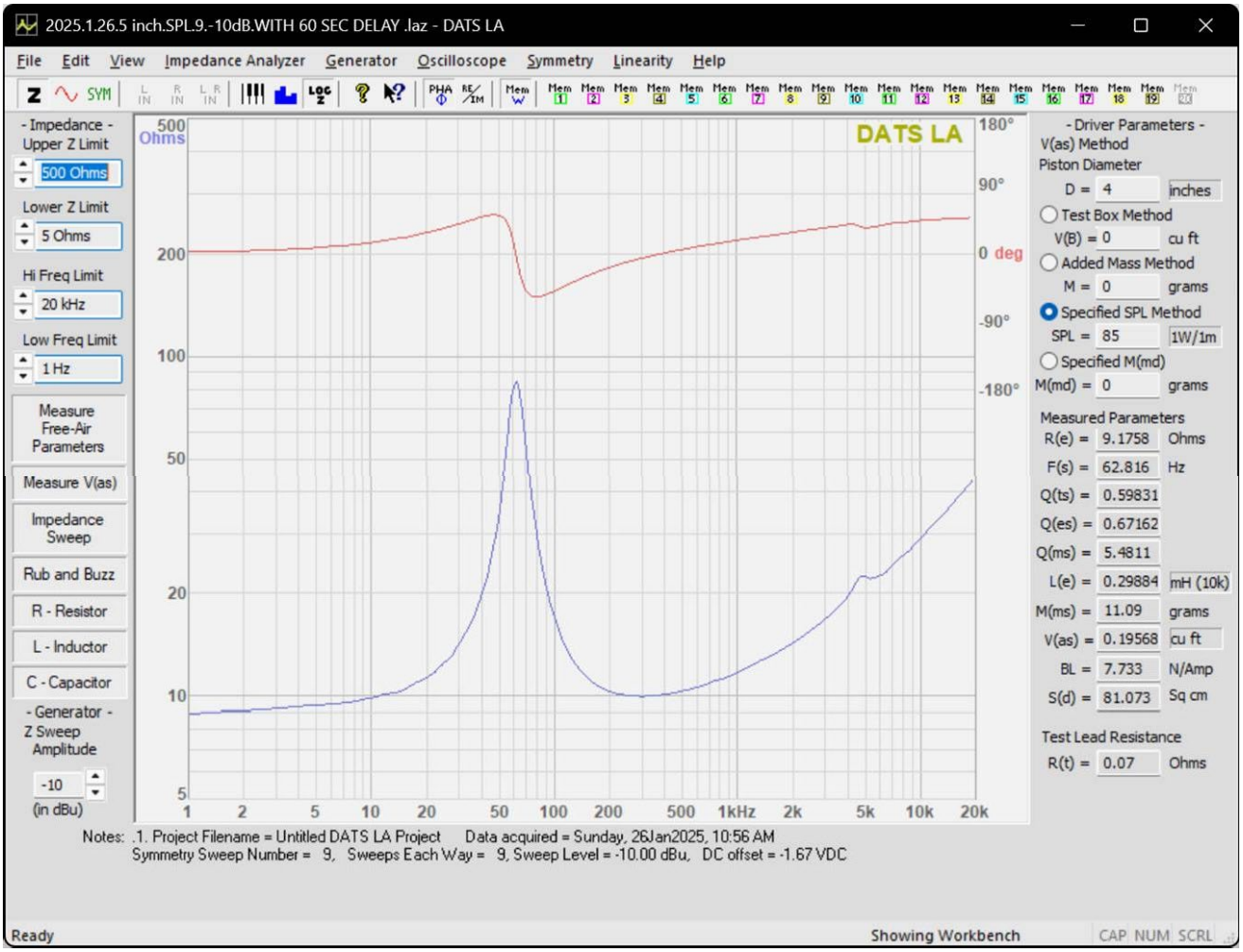


Figure 1: A Typical DATS LA screen

7) Measure the driver's V_{AS}.

Once you have measured the speaker's free air parameters the "Measure V(as)" button becomes enabled. Select one of the four methods to measure the V_{AS} at the upper right side of the DATS screen. The four V_{AS} measurement methods are:

1.) Test Box Method	**- requires a suitable test box**
2.) Added Mass Method	**- requires you to add a known mass**
3.) Specified SPL Method	**- requires the SPL be known**
4.) Specified M_{MD} Method	**- requires the M_{MD} be known**

Enter the required data and then press the "Measure V(as)" button to start the measurement procedure.

8) After measuring the speaker you can:

- Conduct symmetry & linearity testing
- Save the data to one of 20 project memories (Alt+1 saves to Memory 1 for example)
- Save a DATS LA project file (file extension ".lsz") which includes your test setup and all 20 memories
- Export the parameters and impedance data in either ".txt" or ".zma" formats
- Overlay plots of various measured impedances from the 20 memories for detailed comparison
- Print a report showing the impedance and parameters of the displayed memories

9) Symmetry testing - This test biases the driver under test with very low frequency then applies a small level sine sweep.

- Click on "Symmetry" then "Symmetry Test Mode"
- Enter the "Maximum DCV" on the left-hand side Note that too much DC voltage can certainly cause a driver to fail so I suggest on smaller drivers (2"- 4") to start low and work your way up.
- Then click "Test" – you will hear a total of 19 sweeps, nine sweeps with negative DC biasing, one sweep at X=0, and nine sweeps with positive DC biasing for. This will take some time so be patient and don't disturb the DUT.

You can look at all the symmetry graphs in the "Plot Selection" drop down box lower left-hand side.
To view the impedance sweeps and the parameters for each sweep just return to the "Impedance Analyzer" then "Impedance Analyzer Mode" Note that all sweeps should follow the same pattern and be smooth. You can view any sweep and parameters by clicking any of the memory tabs on top to look at a single sweep and its parameters.

10) Quit DATS LA.

Quit the DATS application software by using "Ctrl+Q" from the keyboard or by selecting "Exit" under the "File" menu

Future sessions with DATS LA.

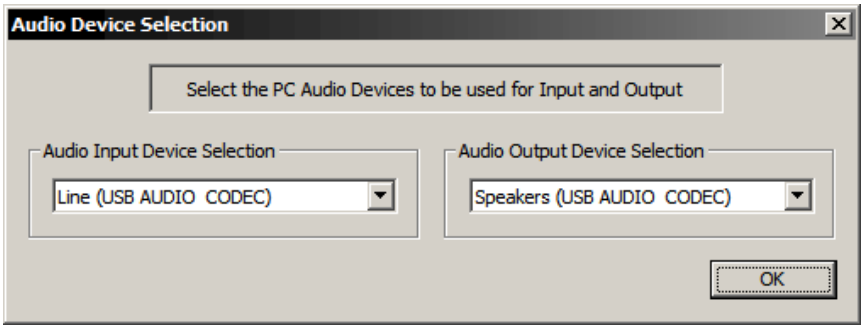
In the future when you want to use DATS LA you only need to connect the DATS LA hardware unit and launch the software. The software will retain its calibration and user settings from session to session, but it is still a good idea to verify the calibration occasionally using the supplied calibration resistor. For full details on using DATS LA see the User's Guide under the Help menu.

DATS LA Troubleshooting

Normally DATS LA software automatically detects the DATS hardware using the default settings with no adjustments being necessary. However, if there is a problem, these are the settings you should verify. This guide assumes that you are using DATS LA software with DATS LA hardware.

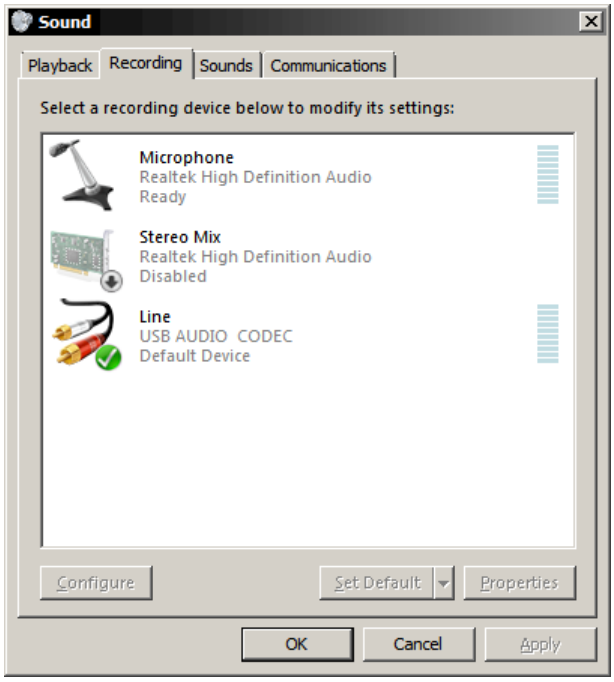
1. Make sure the correct hardware device is selected.

Look under the Edit menu and open the Audio Device Selection dialog. Make sure that “USB AUDIO CODEC” is selected for both input and output as shown below.

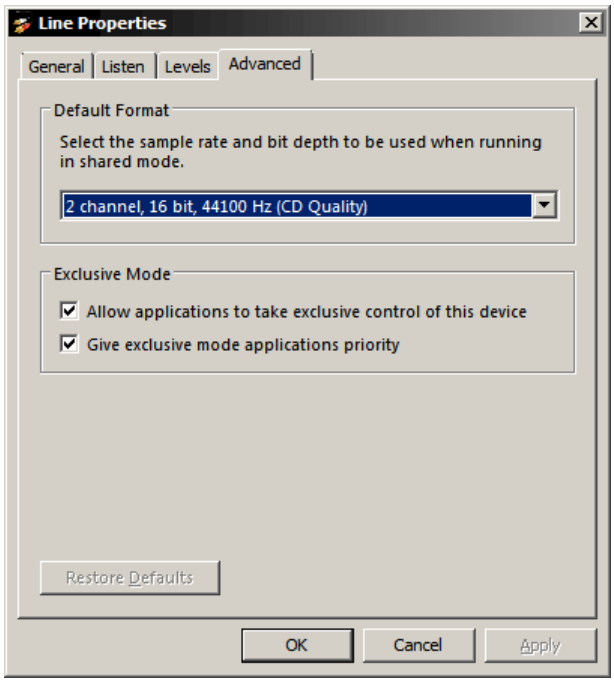


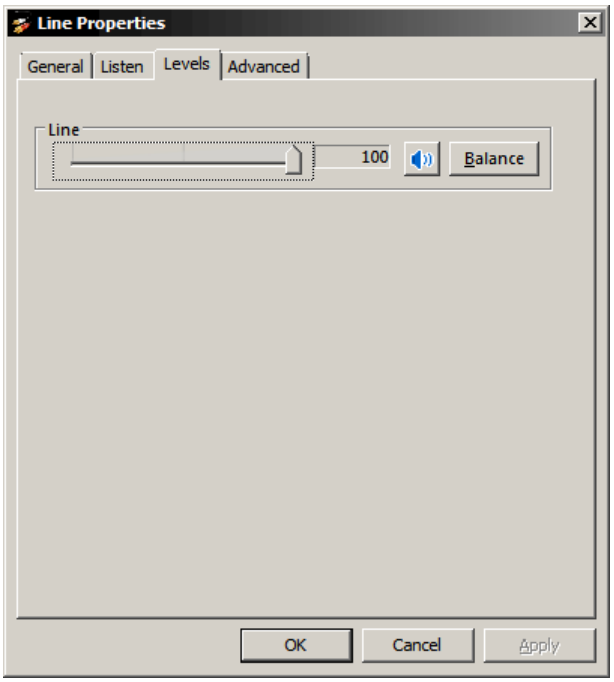
2. Examine the USB port settings to verify 2-channel input at 44.1 kHz. Verify the input level.

From the Windows “Start” button select Control Panel/Sound. Once the Sound control panel opens select the “Recording” tab as seen below (left). Next, double-click on the Line device “USB AUDIO CODEC” to open the Properties window seen below (right).



Switch to the “Advanced” tab and select “**2 channel, 16-bit, 44100 Hz (CD Quality)**” as seen below (left). ***Now click Apply.*** Next, select the “Levels” tab and make sure the level is set to maximum as seen below (right) and that it is not muted. DATS will not operate correctly with 1 channel input or at sampling frequencies other than 44.1 kHz.





Click the “OK” button once to close the Properties window and then click “OK” again to close the Sound Control Panel.

3) Raise the Windows volume control to maximum.

From the task bar raise the Windows master volume control to maximum.

The DATS LA Setup Chart:

The chart below shows a summary of the Windows Sound Control Panel settings for DATS LA.

	Sound Control Panel Settings for DATS LA		
Windows Version	**Default Format** (input and output)	**Playback Level** (1 to 100)	**Record Level** (1 to 100)
7, 8, 10, 11	2 channel, 16 bit, 44100 (CD Quality)	100	100