

APL TDA Real Time

Software installation and quick start guide. V1.1
APL TDA RT software version 002.



Welcome to APL TDA RT – Real Time version of delay estimation and measurement software.

Installation

To run APL TDA RT software demo or commercial version, you must have MATLAB Compiler Runtime (MCR) environment installed on your Windows based PC.

MCR is available here: <http://www.mathworks.se/products/compiler/mcr/>

You must choose R2018b(9.5) 64 bit version.

Or use the direct link:

https://ssd.mathworks.com/supportfiles/downloads/R2018b/deployment_files/R2018b/installers/win64/MCR_R2018b_win64_installer.exe

Run APL TDA RT setup file to install the software.

You may install APL TDA RT software to any folder on your PC HDD, but you must be aware that Windows system (depending on user access rights settings) sometimes does not allow APL TDA RT software to write on the system`s partition of HDD (usually c:).

You may also install APL TDA RT software on flash drive. That way you will be able to run the software on any other PC if necessary.

Activation

You can start using APL TDA RT demo version immediately after installation.

You can start using APL TDA RT commercial version after the activation process. There are 2 alternatives for that.

- 1) Click the “**Activate**” button to get your site ID key. Send it to act@aplaudio.com.
- 2) Send the „APL_TDA.RT_siteID.txt” file which you will find in the installation directory after the first start of APL TDA RT software (next to APL_TDA_***.exe) to act@aplaudio.com and you will receive the license file „APL_TDA_LIC.txt”. Please, copy received file into APL TDA RT software installation directory (next to „APL_TDA_***.exe” and „APL_TDA.RT_siteID.txt”).

Basic Instructions

You must setup your PC sound card and measurement microphone as usually for audio measurements.

The sound card output must be connected to the loudspeaker system which is being tested (you can playback music from PC) and microphone must be connected to the sound card input (you can record mic signal on PC).

Usually, the microphone input must be equipped with +48V phantom power for the microphone. Please, do not forget to switch it on if you are using condenser microphone.

APL TDA RT software consists of 3 independent applications which must run at the same time:

APL_TDA_RT_pl_v002.exe – the test signal player,

APL_TDA_RT_v002.exe – the first analyzer,

APL_TDA_RT_s_v002.exe – the second analyzer.

There is the “START_APL_RT_bat.bat” file in the installation folder to easily start all three apps by double clicking on it. You may create the shortcut file for it and place it on the Desktop for your convenience.

Run APL TDA RT software by using “START_APL_RT.bat.bat” file. It takes some time to upload software to PC memory and initialize it. Please be little patient.

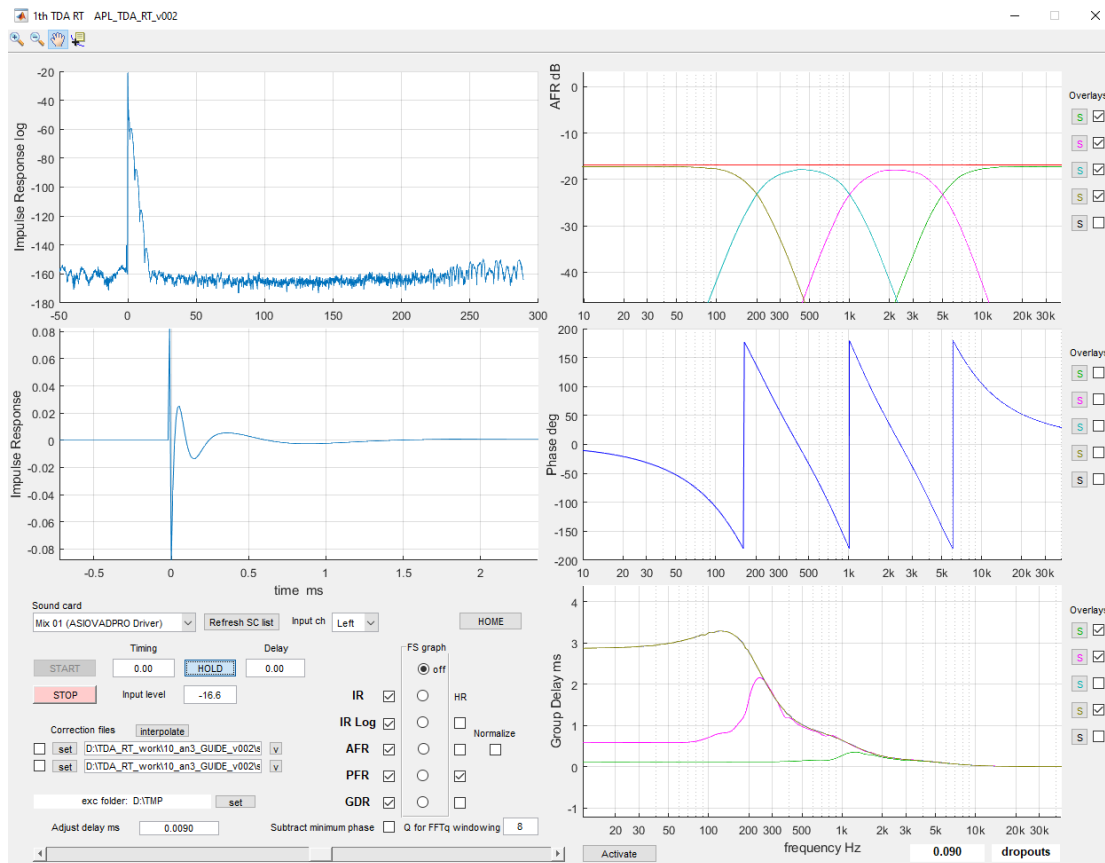
Choose your soundcard’s drivers in the “**Sound card**” drop-down list of the Player and the 1st Analyzer and select relevant input and output channels left or right.

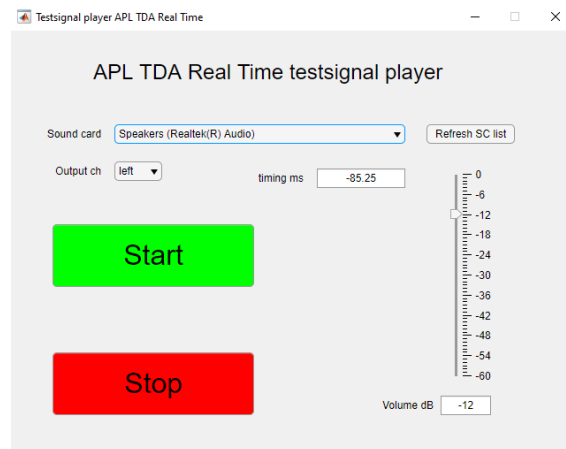
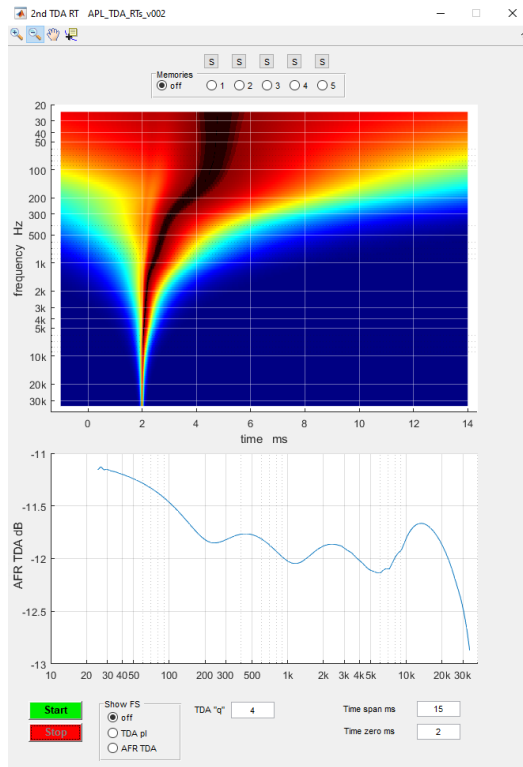
Set the necessary playback volume on your sound card or the Player's window.

Click “Start” button. You should hear the periodic test signal from your loudspeaker system which is being tested. Signal should be as a loud as a normal conversation.

Click “Start” button in the 1st Analyzer's window. When clicking “**Start**” for the first time you will be asked to set the path to the **data exchange folder** for communication between 1st and 2nd Analyzers. The folder should be located on fast SSD drive. Not c:\ if possible.

Now you should see the set of curves which are activated by relevant check boxes in the column next to their names. The next column, in the “**FS graph**” field, is to activate “Full Screen” mode for one of the curves. Next column, “**HR**”, switches on and off the “High resolution” mode for relevant curve. You can save some processing power by switching “High resolution” mode off while working.





The “**Normalize**” check box is switching on the normalization mode for AFR. When switched on the AFR curve is drawn around the zero dB line on the graph.

The “**Input level**” field is showing analyzer's input level in decibels below Full Scale. If you see 0 dB here, it means that the input receives too high signal level. You should use the gain control of your soundcard's microphone input to set appropriate signal level.

The “**Timing**” field is showing actual time shift between the Player and 1st Analyzer. This number can be random and almost never affects behavior of the TDA RT. But, if it is close to zero, the overall latency of 1st Analyzers graphs will be minimal possible. To create such synced workflow you should copy the value shown in the “Timing” field of the 1st Analyzer (double click, ctrl+c) into clipboard and then paste it into the “Timing” field of the Player. You must do that when both -Payer and 1st Analyzer are running. If you stop one of them, you will lose the synchronization and must do this process again. But it is not important to keep such synchronization for all of the time.

The “**HOLD**” button activates the time synchronization hold mode. When this button is clicked, the timing value will be stored, but actual timing value of the particular measurement, will be displayed as a delay in the “Delay” field. It allows to measure delays and keep reference time for crossover tuning when HF way (the source of time reference) is switched off.

The “**Subtract minimum phase**” checkbox is allowing to clearly see the crossovers Phase Frequency Response and Group Delay Response when minimum phase problems of particular loudspeakers are excluded. Curves become much clearer and more informative.

The “**Q for FFTq windowing**” field sets the Q parameter to be used in frequency dependent windowing. It should be in range from 1.8 to 8. Lower value of Q will give clearer curves, less affected by reflections. Higher value of Q will give more details, but more affected by reflections.

The “**Adjust delay ms**” field and slider is usable to set the “zero” time for 1st Analyzer more correctly than it is doing it by itself. You should input a delay of 0.01...0.02 ms to make the phase curve's HF part easier to read and understand.

The set of buttons and check-boxes on the right side of the 1st Analyzer are intended to control **overlays**. The “S” button stores current curve in the particular overlay. The checkbox next to it controls the appearance of the particular overlay. Overlays are stored permanently as *.txt files on HDD and your set of overlays can be used even for the next measurement session.

The “**Correction files**” section is for use of microphone`s correction files. The “set” button allows to choose correction file. Its name will be displayed in the name`s field. The checkbox activates particular correction. The “v” button allows to see the curve of the correction. The “Interpolate” button allows to convert the correction file from the “free” format to the “full” one that contains all frequencies necessary for the program`s work. The “free” format file must contain 2 columns - frequency in Hz and gain in dB, divided by tab. The frequency points can be any for this format.

The “**Calc. time**” field is showing the time which is taken for calculation of one particular measurement. You can evaluate the power of your PC by watching this number. The appropriate number here is 0.08, 0.1, 0.12 s. If you see a number close to the 0.341 or higher, your PC does not have enough power to do calculations for each particular measurement.

The “**dropouts**” field is active only for the case when 1st Analyzer cannot take all the data blocks from the input due to the computing overload.

The 2nd Analyzer's window does not have overlays but has 5 **memories** to store particular measurement's TDA graph and AFR curve. The “s” button stores the current graph and curve to the relevant memory. The set of 5 “radio” buttons allows to pick which memory is shown currently.

Buttons in “**Show FS**” field can open the TDA graph and AFR curve in a large Full Screen window.

The “**TDA q**” field sets the Q parameter for TDA graph calculation. It is set to 4 by default. Higher value will increase the frequency resolution but decrease time resolution. Lower value will work the opposite way.

The “**Time span ms**” and “**Time zero ms**” fields control the appearance of TDA graph.

There are 4 “tools” in upper left corner of the both analyzer windows: **zoom in tool**, **zoom out tool**, **pan tool** and **data cursor tool**. They are working on all curve graphs except the TDA graph. For the TDA graph “Time span” and “Time zero” fields should be used.

When “zoom in” tool is active, right click on a zoomed in graph and chose option “Restore View”. It will revert the zoom to the initial state. The “HOME” button will do that for all of the graphs.

The “**data cursor tool**” is creating a data label on some curves point allowing to read actual values of this point. You must keep “alt” key pressed to create multiple labels.

You should use the “**Refresh SC list**” button to update available driver list in case when you have connected/disconnected some soundcard while applications already started.