High Fidelity Audio Headphone Playback for Portable and Smartphone Applications

TI Designs Quick Start Guide

TIDA-00385

1. Introduction:

This quick start guide for the PCM5242-TPA6120A2_QFN-REF2 reference design board allows for quick audio testing of the high performance PCM52542 DAC and TPA6120A2 headphone amplifier from a host computer.

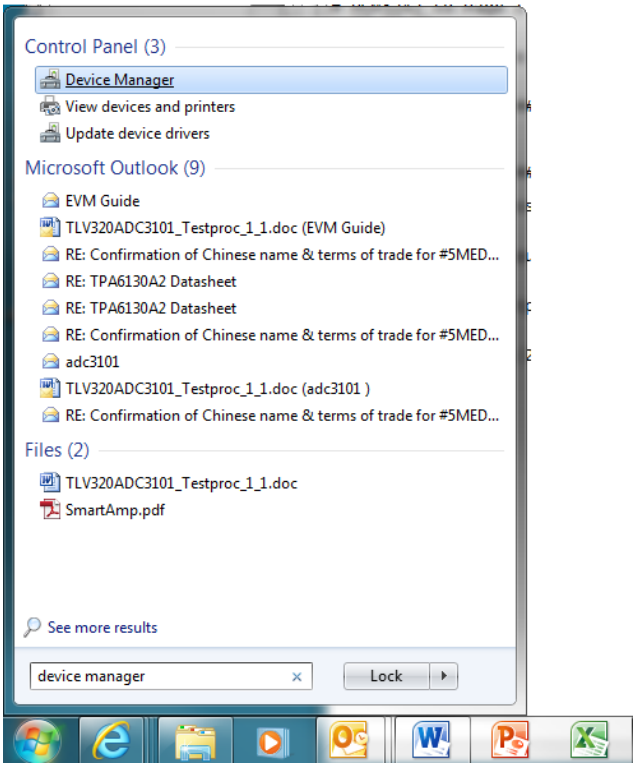
2. Default Jumper Settings for USB Playback:

GPIO6 FLT	Shorted
MODE2 MS	Open
MODE1	Shorted
GPIO2 GPO	Open
GPIO3 AGNS	Shorted
GPIO4 MAST	Shorted
GPIO5 ATT0	Shorted
SCL MC ATT1	Open
SDA MOSI ATT2	Open
ADR1 MISO FMT	Shorted
JP1	Shorted to MCLK (Bypass)
JP2	Shorted to SCLK (Bypass)
JP3	Shorted to LRCLK (Bypass)

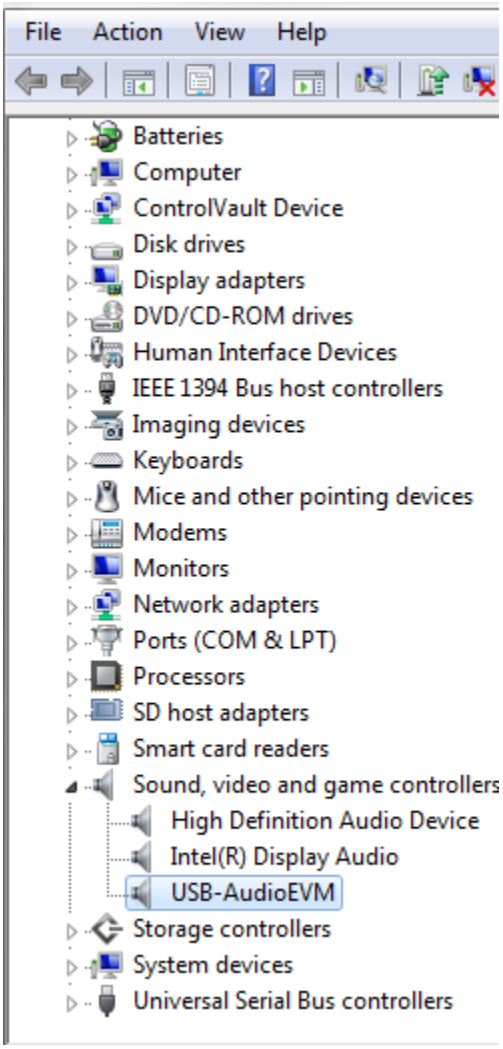
JP4	Shorted to SDIN (Bypass)
JP5	Shorted
JP6	Shorted
JP7	Shorted to INT
JP8	Shorted to INT
JP9	Shorted
JP10	Shorted to USB

3. Connecting to Computer

3.1 Connect mini USB to USB cable to host computer. To make sure the computer has recognized the board, go the “start” menu search “device manager” in the search bar.

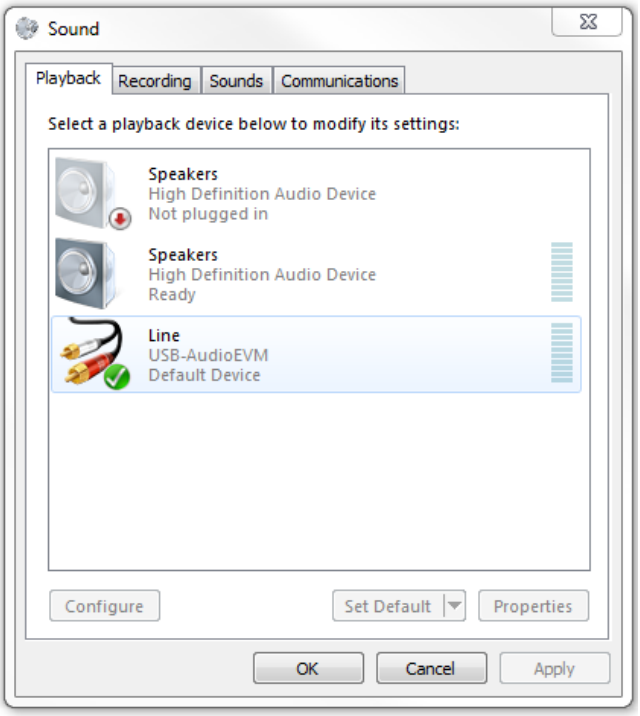


3.2 In the device manager screen under “Sound” or a similar title, make sure you see “USB_AudioEVM”

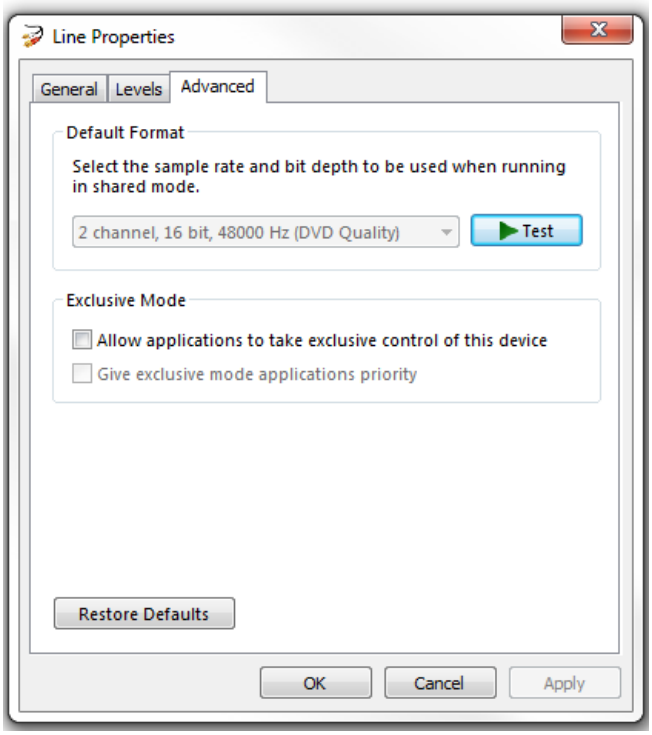


If you see this, the computer has recognized the device.

3.3 Navigate to your computers control panel and find the “Sound” preferences. Make sure “Line” “USB-AudioEVM” is set as the default device.

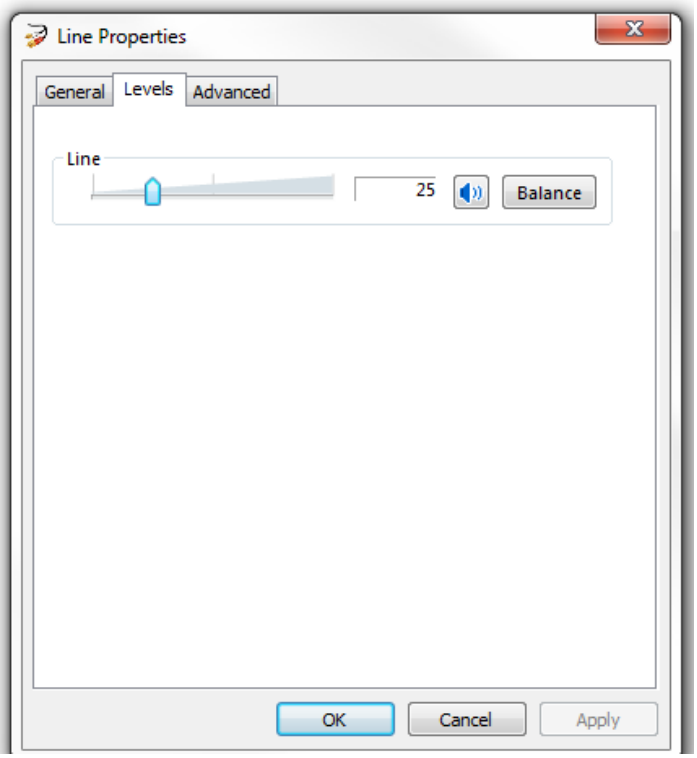


3.4 Double click on the icon and move to the “Advanced” tab.



Set the default format to “2 channel 16 bit, 48000 Hz (DVD Quality)” as above.

3.5 Now, go to the levels tab and set the level to “25”. You can adjust this later for more volume however, the default of level of 100 is extremely loud and may damage your headphones do the built in gain of the TPA6120A2 headphone amplifier.



3.6 Plug in a pair of headphones into to “A-out” jack on the board

3.7 The board is now configured and should be correctly setup and should play audio sourced from your computer. If you unplug the board you will have to run through this procedure again.

4. Getting the Board Running

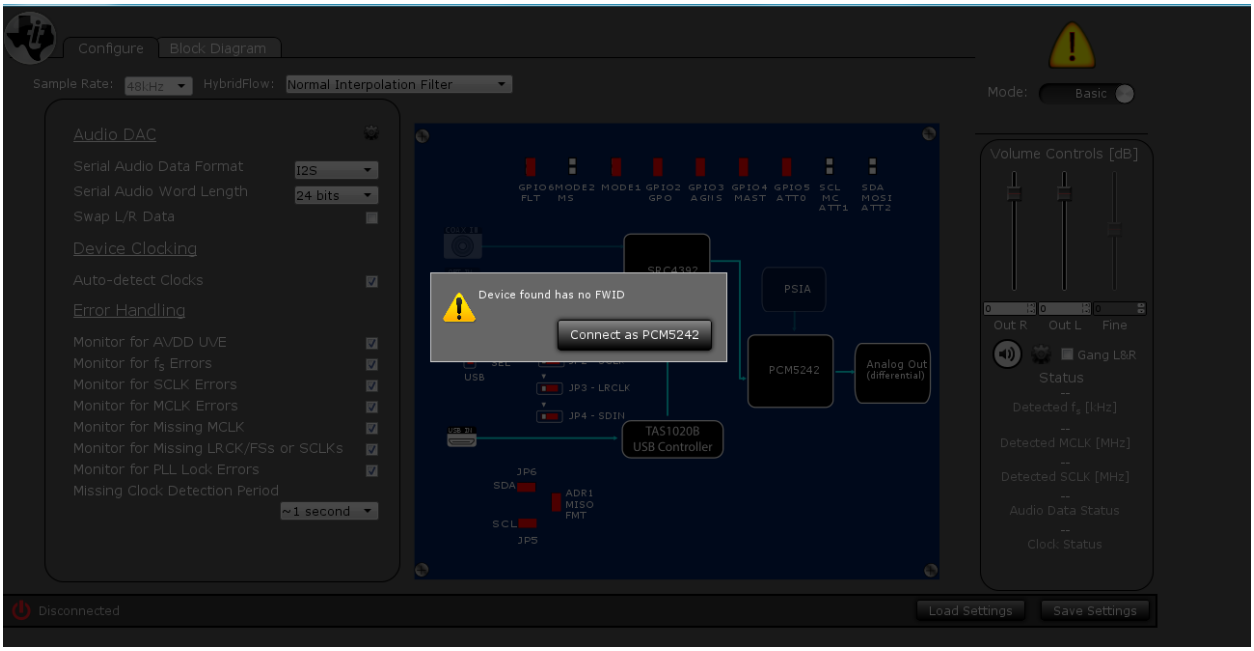
4.1 Download and install the PCM5242RHBEVM PurePath Console GUI from the EVM webpage here:

http://www.ti.com/tool/PCM5242RHBEVM?keyMatch=pcm5242&tisearch=Search-EN

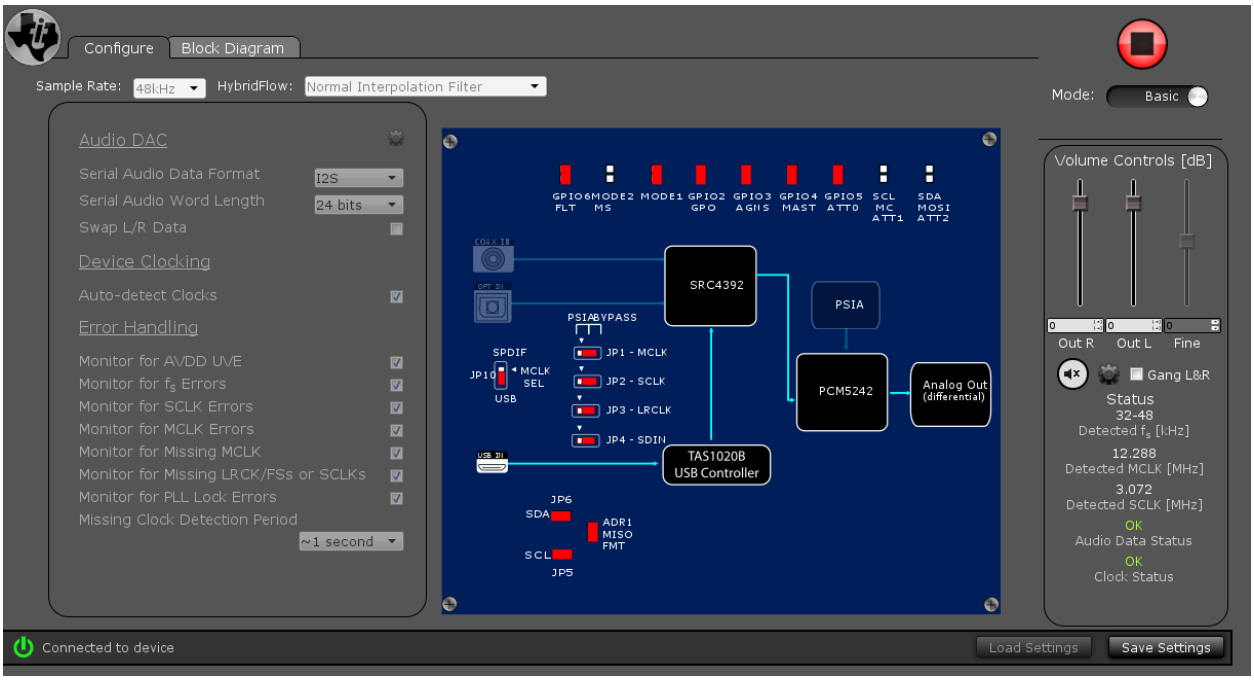
This reference design is 100% compatible with the EVM GUI

4.2 Once PurePath Console is installed connect the PCM5242-TPA6120A2_QFN-REF2 reference design board to the computer and run PurePath Console.

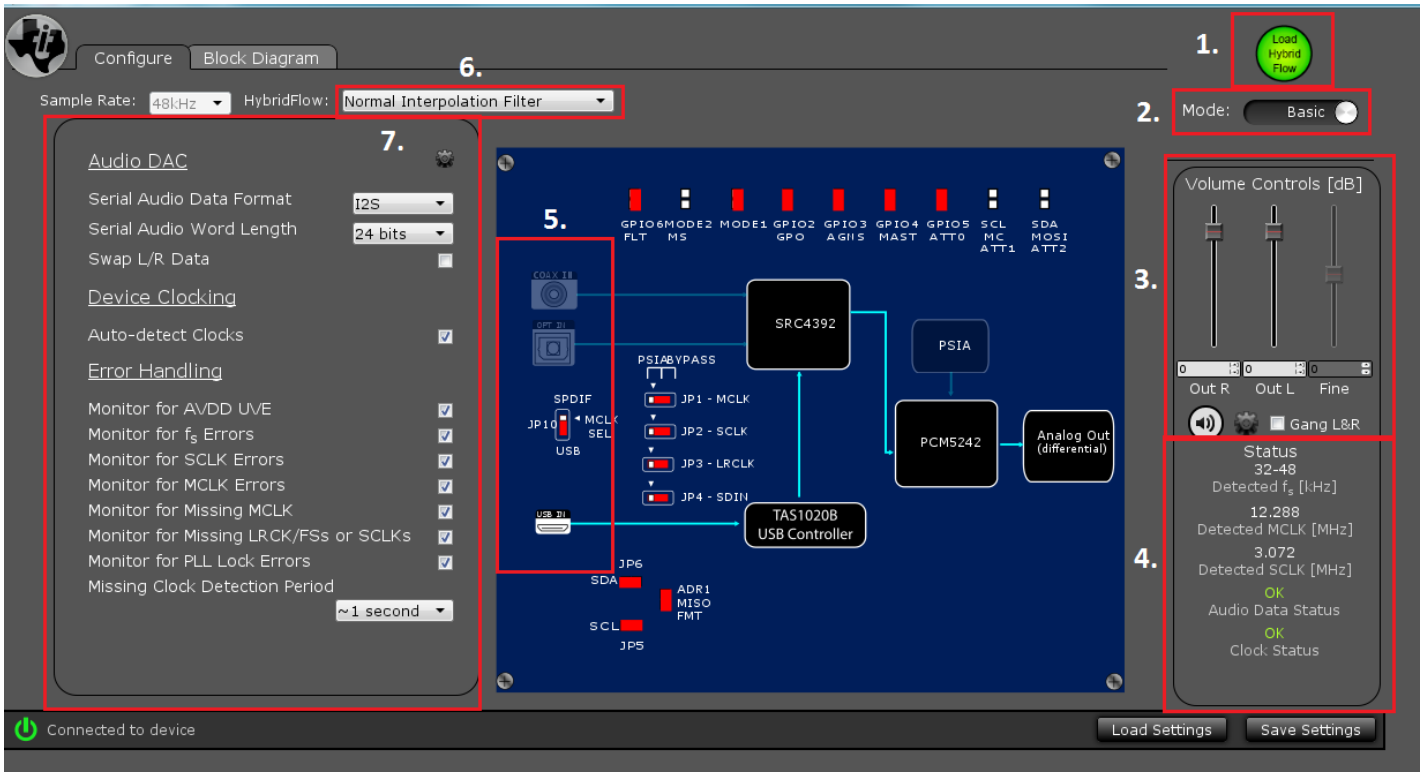
4.3 Upon running the GUI you may be asked to select your target. Make sure to run as PCM5242. If you then see "*Device found has no FWID"* dialog box click on the *"Connect as PCM5242"* Button. This has no bearing on the functionality of the software.



4.3 The GUI will automatically begin running a Hybridflow that allows USB audio streaming form the computer. After it has completed a Red stop button on the top right corner of the GUI would appear. This is used to stop the current hybrid flow and change parameters or hybrid flows. On the bottom left of the GUI window you should see a green power light with the text *"Connected to device"*. The means the board is connected and the computer is communicating.



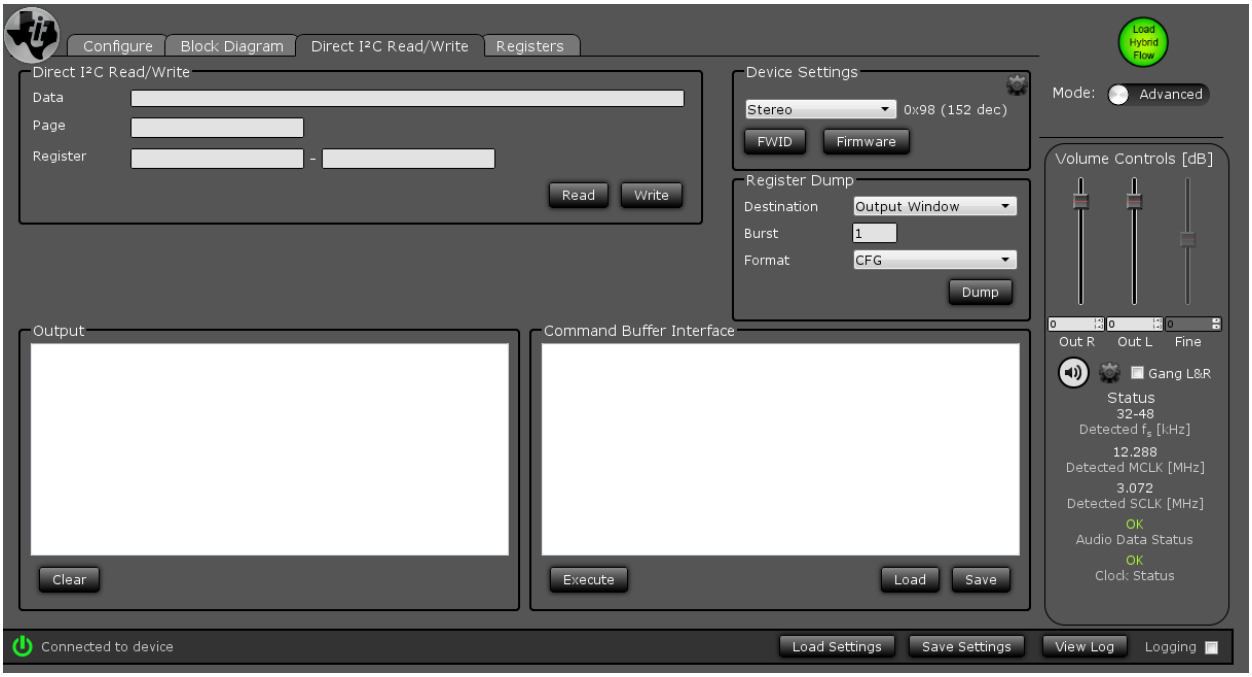
5. Using the PCM5242 PurePath Console GUI



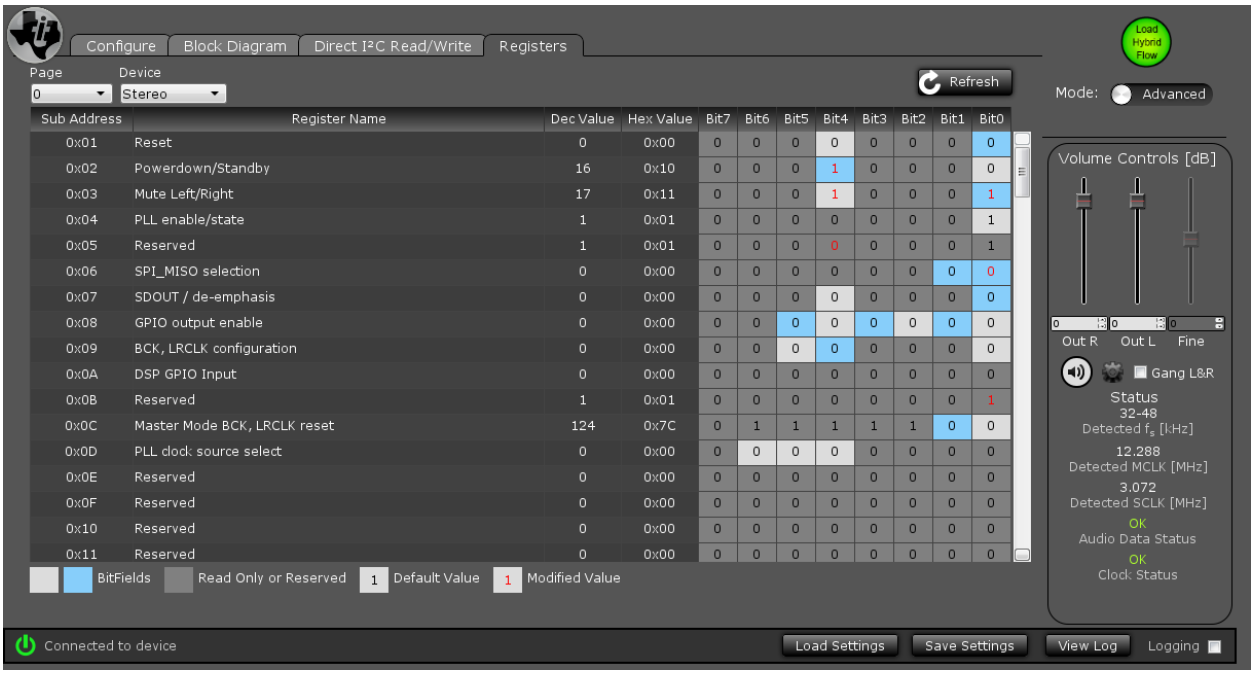
1. Starts and stop Hybridflows. This button must be clicked for operation. When running a Hybridflow, windows 6 And 7 cannot be changed. You must stop the Hybridflow first.

2. Controls the mode of the GUI. Advanced mode adds "*Direct I2C Read/Write"* tab on the top of GUI window which allows I2C scripts to be entered for manual register control. It also adds a second "*Registers"* tab to allow for viewing and changing resister values using a register map view.

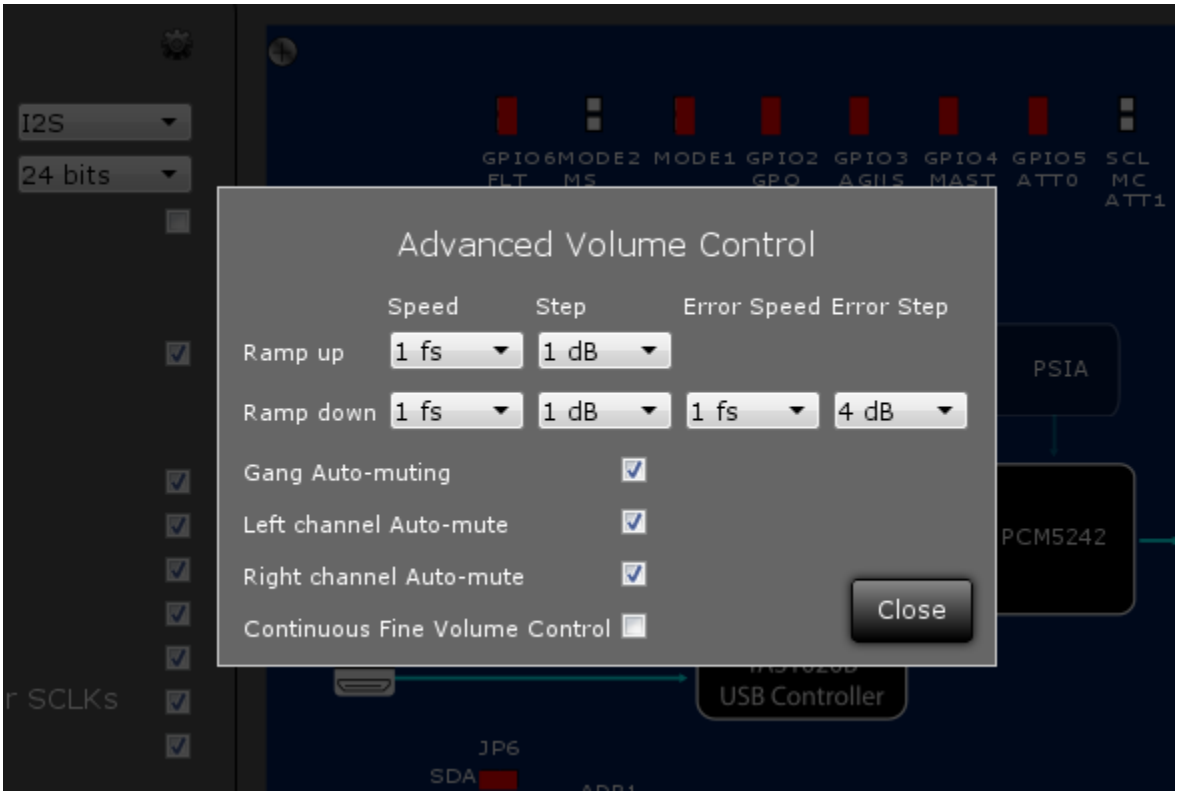
Direct I2C Read/Write Tab



Registers Tab

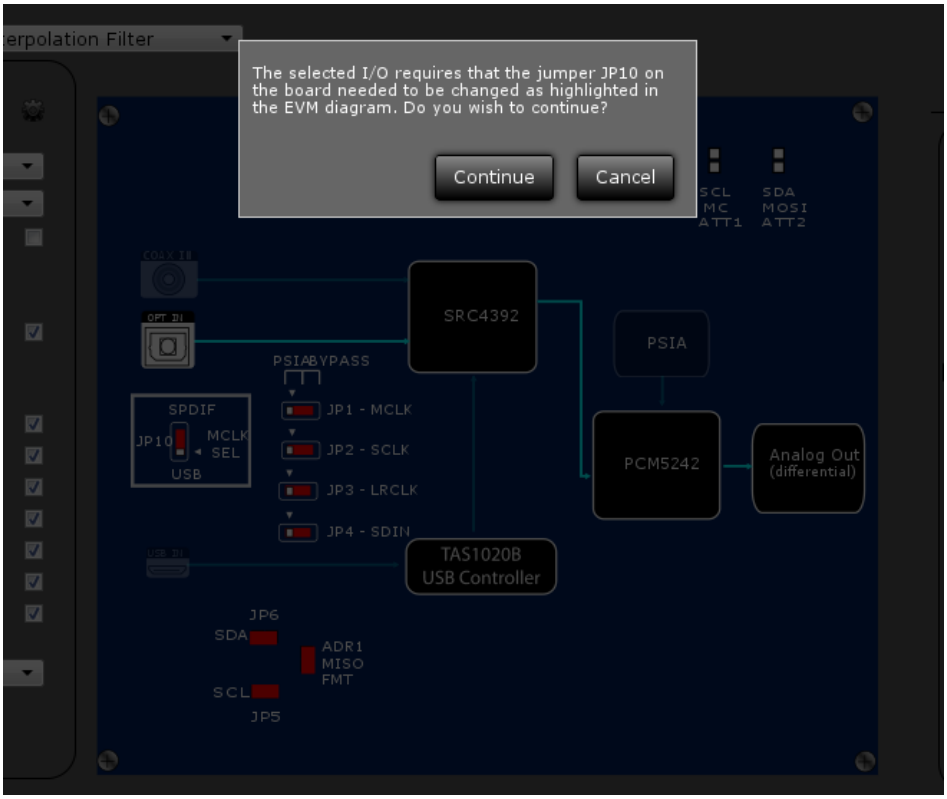


3. Controls to volume of the PCM5242. Clicking on the gear icon allows for advanced volume control including auto mute.

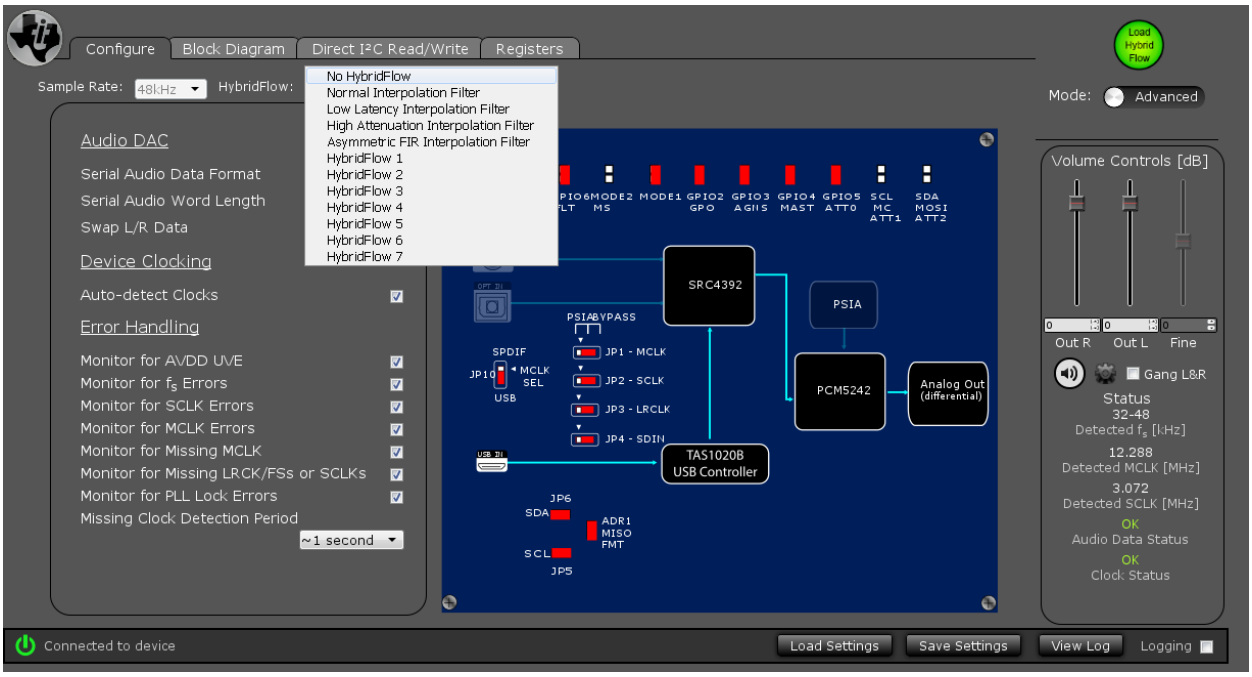


4. Displays clock status

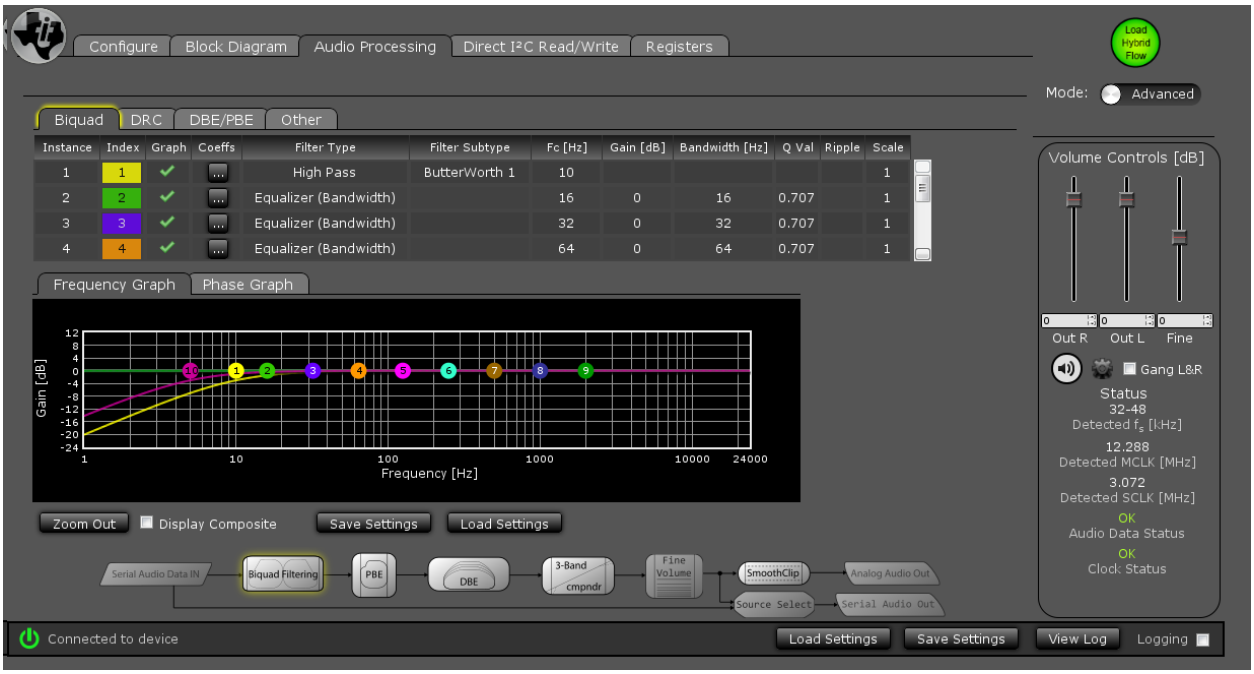
5. Controls source input. Clicking on another input source will configure the part for that source. The GUI will issue a warning outlining any necessary jumper changes.



6. Drop down menu controls the interpolation filter and Hybridflow to be used. Different hybridflows offer different functionality and will add an "*Audio Processing"* tab to the GUI window. In the audio processing tab, biquad filters, DRC, DBE, DDE and other features of the PCM5242 can be configured.



Audio Processing available with HybridFlow 1



7. Controls the DAC properties including data format and word length. Clicking on the gear icon allows control over DAC gain and other parameters. When running headphones, generally the DAC gain should be set to -6dB for the right and left channels to avoid headphone damage.

6. Performance Evaluation:

To evaluate the performance of the PCM5242 DAC and TPA6120A2 Headphone amp, jumpers JP1-JP4 can be removed from the default “BYPASS” selection. This disconnects the I2S audio from the TAS1020B USB controller. By inserting an external I2S source, such as an audio analyzer, in the “PSIA” side of jumpers JP1-JP4, I2S audio is sent directly from these pins to the PCM5242 allowing for accurate performance evaluation. Pin 3 on headers JP1-JP4 is ground for convenient connection of shielded cables.

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