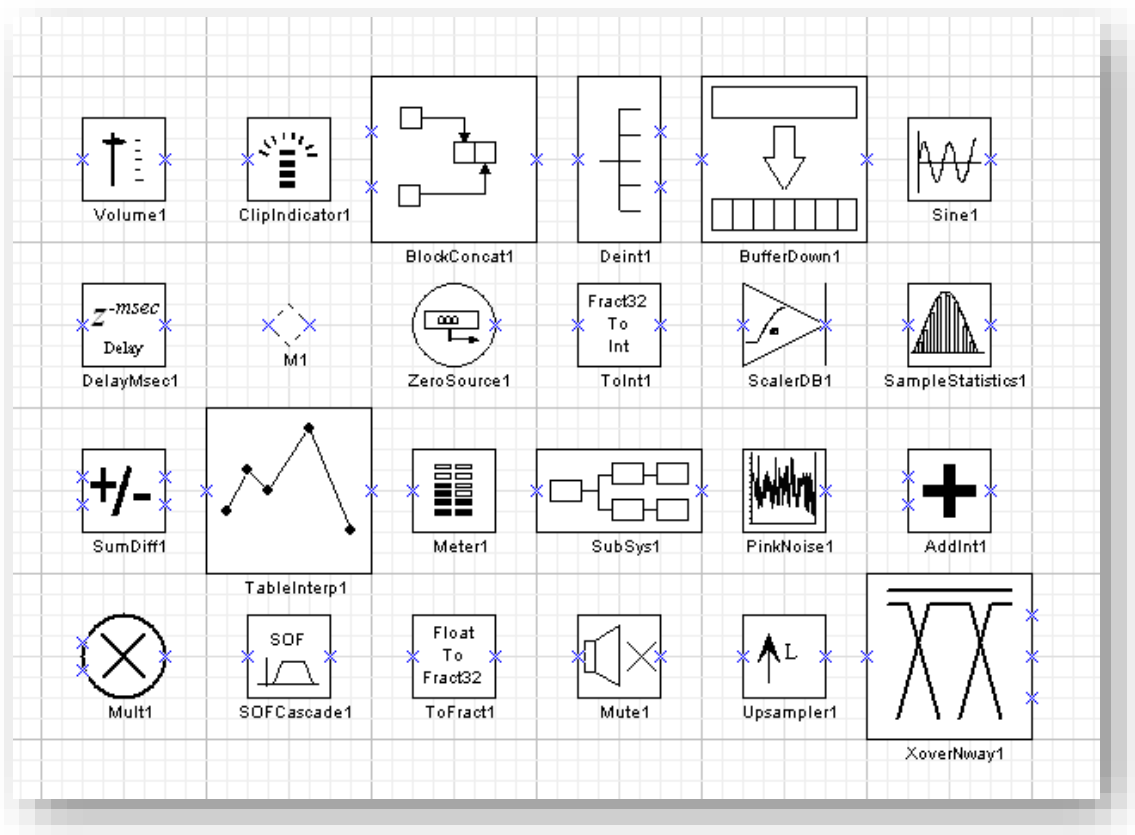




# AUDIO WEAVER DESIGNER

## USERS GUIDE



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**INSTALLATION AND SETUP:**

Thank you for your interest in Audio Weaver. This document describes how to use the Audio Weaver Designer graphical interface for designing audio systems. There are three installation options for Audio Weaver Designer:

Features	Standard	Developer	Pro
Matlab Required?	No	Yes	Yes
Graphical Designer?	Yes	Yes	Yes
Matlab Integrated Scripting?	No	Yes	Yes
Custom IP Modules?	No	No	Yes

This document describes the functionality of the graphical Designer. The MATLAB scripting interface is described in *Audio Weaver Matlab API*. Read more about creating your own modules in *Audio Weaver Module Developer’s Guide*.

**VERSIONS**

Audio Weaver works on 32-bit and 64-bit Windows systems. The Audio Weaver Designer installer follows the naming convention:

xxxxxxx\_X\_Y\_Z.exe

where X\_Y\_Z refers to version X.Y.Z. Take the installer with the latest version number.

Audio\_Weaver\_5.16.A08\_Standard.exe – Version 5.16.A08 Compiled Matlab

Audio\_Weaver\_5.16.A08\_Developer.exe – Version 5.16.A08 incl. Matlab Scripts

Audio\_Weaver\_5.16.A08\_Pro.exe – Same as Dev., including Custom Modules

Note that the compiled version of the installer is substantially larger since it includes the MATLAB compiled run-time environment (MCR) in addition to the Audio Weaver files.

**INSTALLATION STEPS**

1. There is a two-step installation process. First for Audio Weaver and then for the MATLAB run-time.
2. Make sure you run in Administrator mode.
3. It is best to install Audio Weaver outside of Program Files so that you can modify local files and examples.
4. The first time you launch Audio Weaver you may get a firewall warning since communication is via TCP/IP.

## LAUNCHING THE COMPILED VERSION

The installer places an icon on the desktop.



Double click to start the awe\_designer.exe application. The splash screen will appear right away. The first time you run the compiled version it may take 1 or 2 minutes before the interface window appears. This is because it has to unpack about 100 MB of files. Subsequent launches are faster<sup>1</sup>.

## LAUNCHING THE SCRIPT VERSION

Start MATLAB and then add the suitable directory to your MATLAB search path:

```
C:\Program Files\DSP Concepts\Audio Weaver X.Y.Z Developer\matlab  
C:\Program Files\DSP Concepts\Audio Weaver X.Y.Z Pro\matlab
```

From the MATLAB command window, type "awe\_designer". This will launch the graphical interface. *Do not use the awe\_designer.exe application.*

## ADDITIONAL DOCUMENTATION

The following documents are available in your installation's Doc directory:

*Audio Weaver Module User's Guide* – Describes how the audio modules are used in practice. Very important!

*Audio Weaver Matlab API* – Describes Audio Weaver's MATLAB interface.

*Audio Weaver Module Developers Guide* – For writing custom modules. This feature is not part of the free evaluation.

*Audio Weaver Platform Developers Guide* – For porting Audio Weaver to custom hardware.

*Audio Weaver Server Command Syntax* – Documents the commands sent between MATLAB and the Server.

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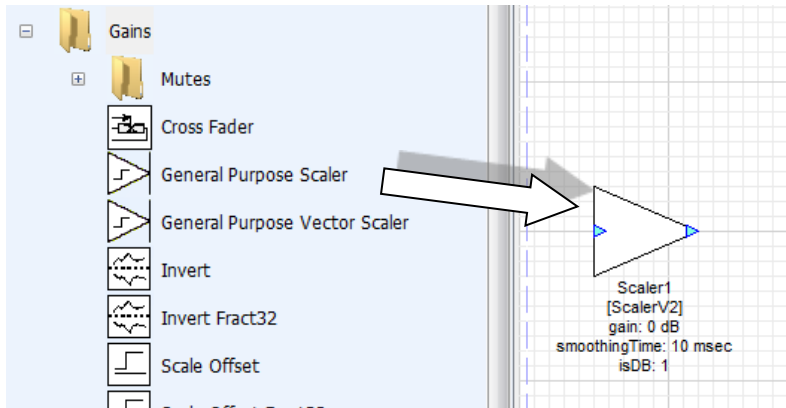
<sup>1</sup> If you run into problems getting the compiled version to launch, run it under a DOS command prompt and watch the debug information scroll by.

**QUICK START GUIDE**

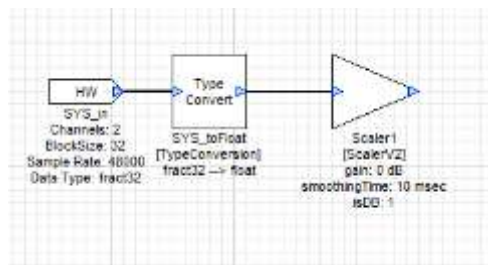
1. Modules are organized into libraries. Use the checkboxes “float” “fract32” and “int” to filter based on your appropriate processor. If you know the name of a module, use the search feature. Our libraries are based on module function. Expand each section to see the individual module options.



2. Drag and drop modules into the layout window



3. Wire them together



4. Right-click to configure modules

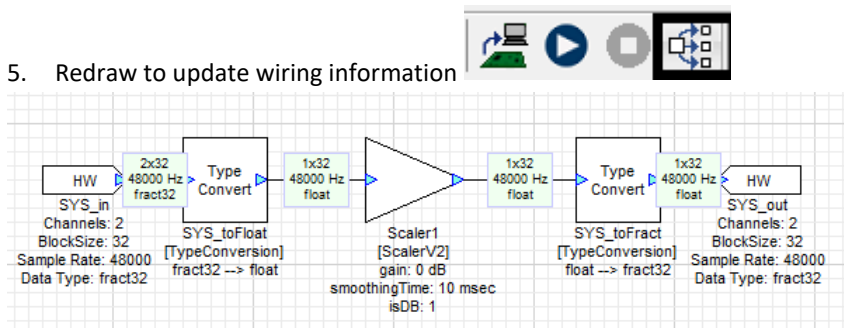
Module: Scaler1					
Variables	Arguments	Properties	Build		
Name	Value	Min	Max	Step	
gain	0	-24	24		Gain in either linear or dB units.
smoothingTime	10	0	1000		Time constant of the smoothing process (0 = unsmoothed).
isdB	true				Selects between linear (=0) and dB (=1) operation

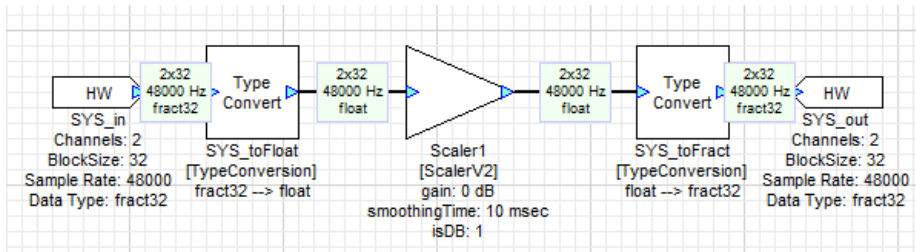
  

Module: Scaler1			
Variables	Arguments	Properties	Build
Name	Value		
isControl	false		Specifies whether the module is controlled by another signal
numPins	1		Number of input and output pins

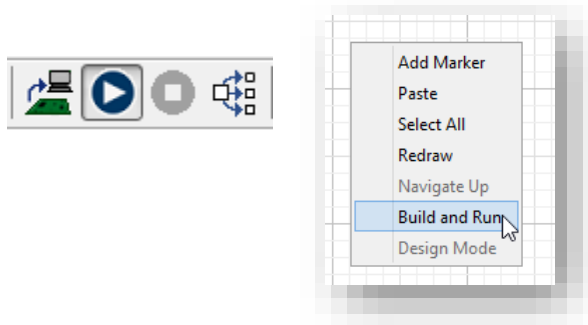
- Inspector* – all tunable parameters. Use at design time or tuning time.
- Module Status* – Activate, mute, or bypass a module.
- View Properties(Variables)* – Change the range of sliders and knobs
- View Properties(Arguments)* – Change at design time only. Configure items, like filter order, maximum delay time, or number of pins - which affect memory allocation or wiring.

5. Redraw to update wiring information





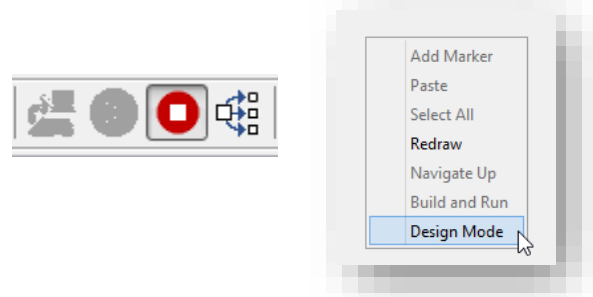
6. Build and run to start real-time processing



7. Tune in real-time using inspectors

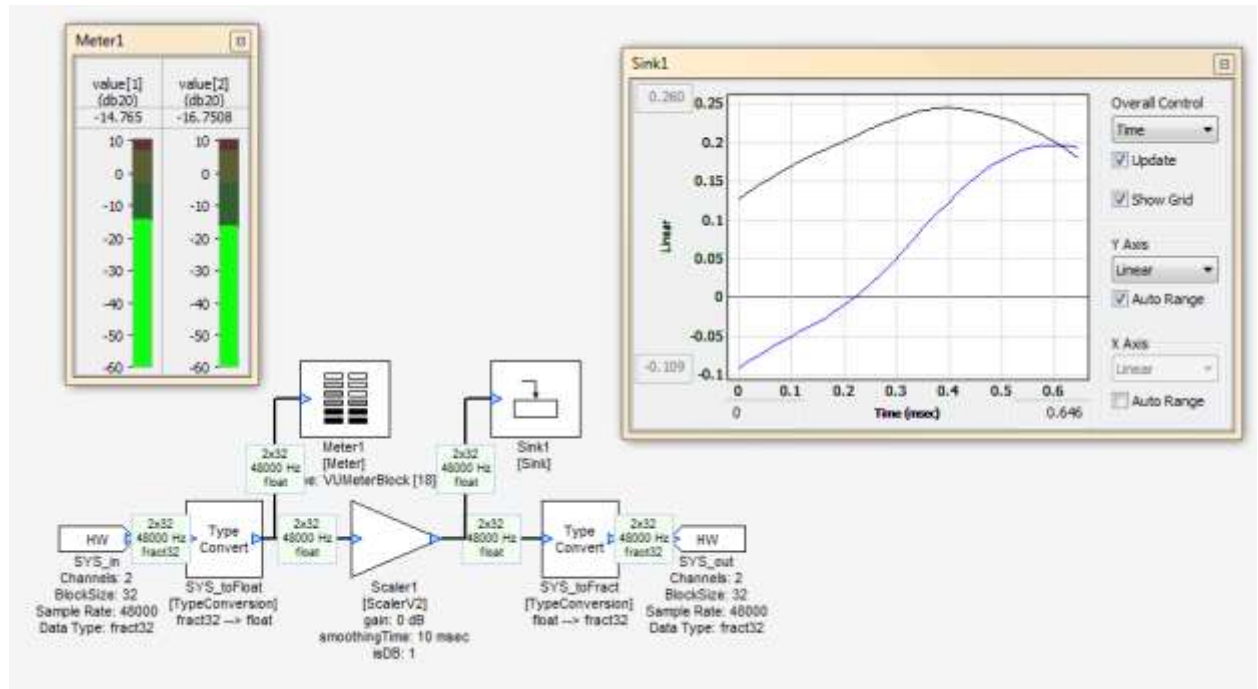


8. Return to Design Mode and keep editing

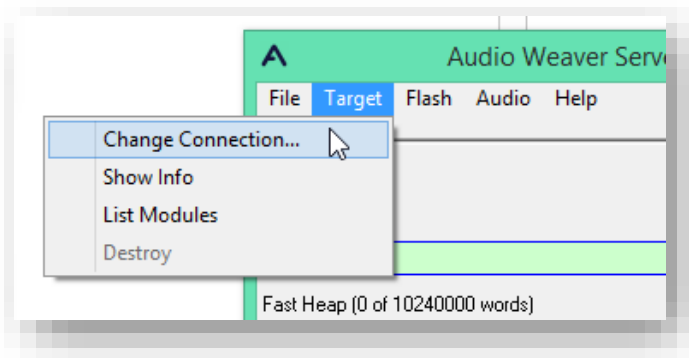




9. Add Sink and Meter modules to view signals. These are found in the Sinks folder.



10. Switch to an embedded target using the Server



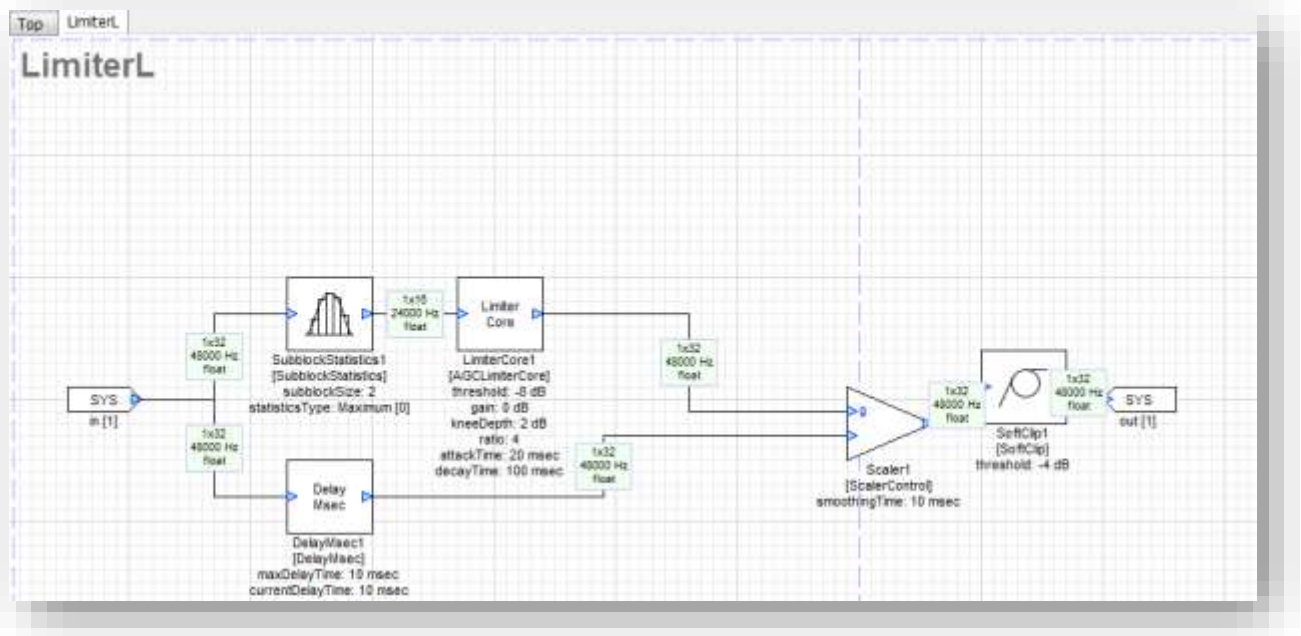
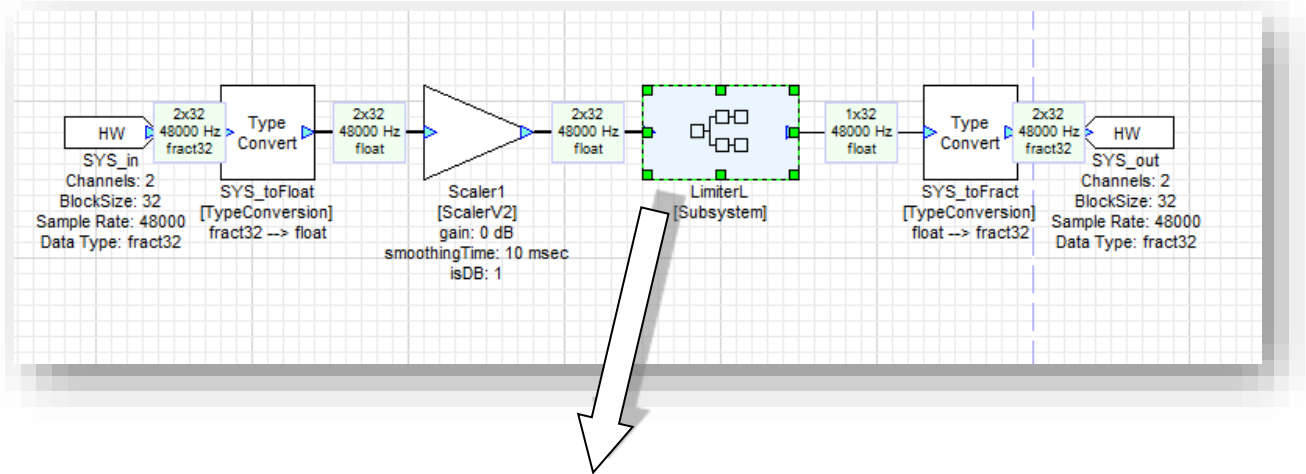
11. Build and run to start real-time processing. Then profile the CPU load and memory using the Tools→Profile System menu item.

Module Name	Class Name	Percent	MIPS	Total Ticks	SIMD	Alloc Order	Alloc Priority	Fast Heap
Top	NewClass	2.9855	4.61	3343.9688	N/A		0	35
SYS_toFloat	Fract32ToFloat	0.54863	0.85	614.4961	N/A		0	10
ScalerDB1	ScalerDBSmoothed	1.0807	1.67	1210.4961	N/A		0	15
SYS_toFract	FloatToFract32	1.3562	2.09	1518.9766	N/A		0	10

ADVANCED FEATURES

CREATE SUBSYSTEMS TO ADD HIERARCHY

Drag out the Subsystem module from the Subsystem folder, then double click or right click and select 'Navigate In' to design the internal system. Add System Input and Output pins from the Subsystem folder.



FILE PROPERTIES (LAYOUT→LAYOUT PROPERTIES MENU ITEM)

The screenshot shows the 'Audio Weaver Layout Properties' dialog box. It is divided into several sections: 'Statistics' (File, Module Count: 10, Non Virtual: 10, Class Count: 10), 'PC/Linux Audio' (Source: File, File Name: 'Bach Piano 48kHz.mp3', Record Output Audio checkbox, Save Directory, Record File Name), 'Build' (Generate script file (.aws) checkbox, Validate system output pin checkbox), and 'Protection' (Protect Layout... button). Callouts on the left point to the 'File' list, the 'File Name' field, the 'Record Output Audio' checkbox, the 'Build' section, and the 'Protect Layout...' button.

Shows which modules are used in your design

Selects the audio source

Record the output audio

Settings for product

Prevent editing of your design

GLOBAL PROPERTIES (FILE→GLOBAL PREFERENCES MENU ITEM)

The screenshot shows the 'Audio Weaver Global Preferences' dialog box. It includes sections for 'Server Connection' (Local Server, Reconnect to Server), 'General' (Reopen internal pages, Minimize target reads and writes, Stop audio when exiting Tuning mode, Close Server On Exit), 'Module Browser' (Show deprecated modules, Filter modules by target), 'Inspectors' (Keep on top, Poll Rate (Hz): 10), 'Compile' (Max message length: 250, Time out (seconds): 10), 'Diff' (Tool Path), and 'Default Audio File for New Layouts' (Audio File: Bach Piano.mp3). Callouts on the left point to the 'Reconnect to Server' button, the 'General' section, the 'Module Browser' section, the 'Inspectors' section, the 'Diff' section, and the 'Default Audio File' field.

Connect to a remote

General settings. Minimize target reads and writes speeds up tuning.

Browser behavior

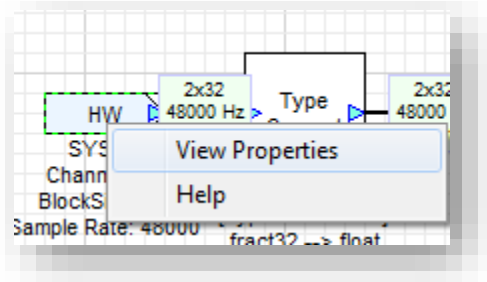
Inspector behavior

Diffing systems

Default Audio File

CHANGING INPUT PIN PROPERTIES

Right-click on the **HW** pin to change number of channels, block size, and sample rate.



Module: SYS_in	
Properties	Build
Name	Value
blockSize	32
numChannels	2
sampleRate	48000
dataType	fract32

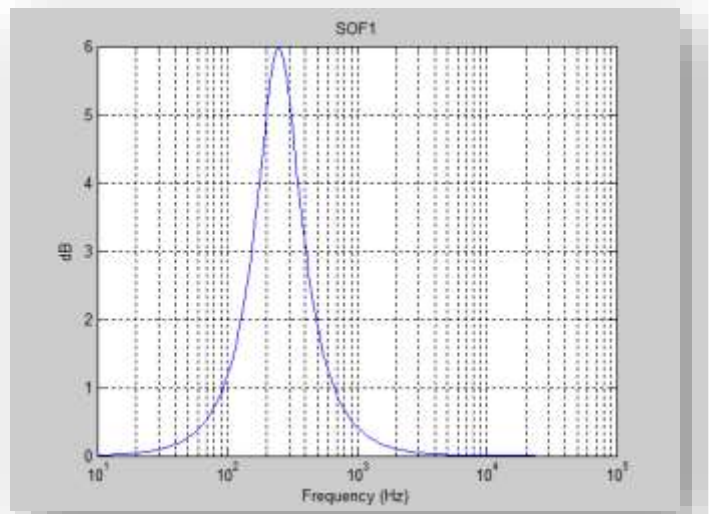
The output pin information is *inherited* from the connecting wire.

### FREQUENCY RESPONSE MEASUREMENTS

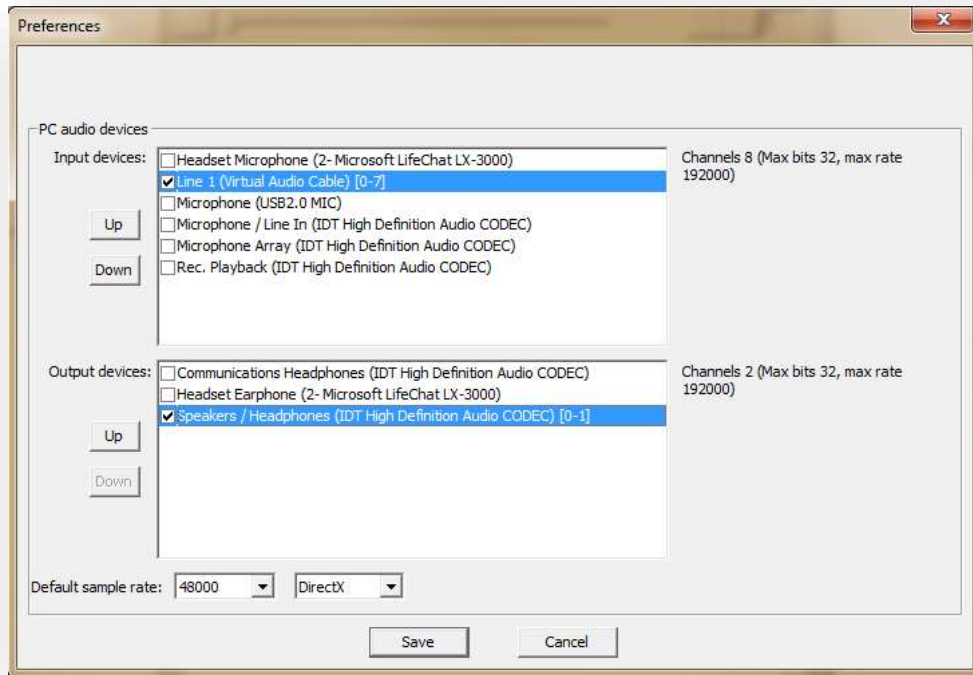
Right click on a module and select "Plot Frequency Response". Or, use the Measurement menu.

### CONFIGURE THE PC SOUND CARD

Access this from the Server's File → Preferences menu item. Choose your sound card and sample rate for

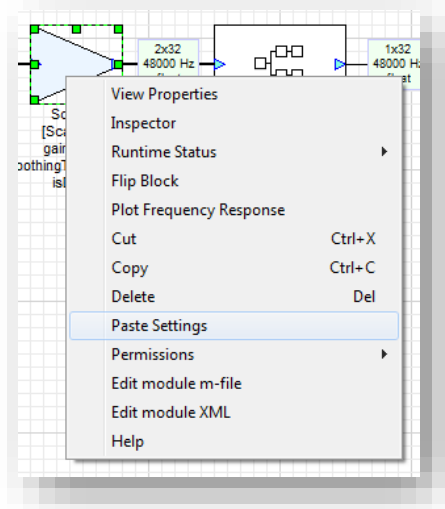


analog I/O. Multiple sound cards can be enabled. Choose between DirectX and ASIO drivers.



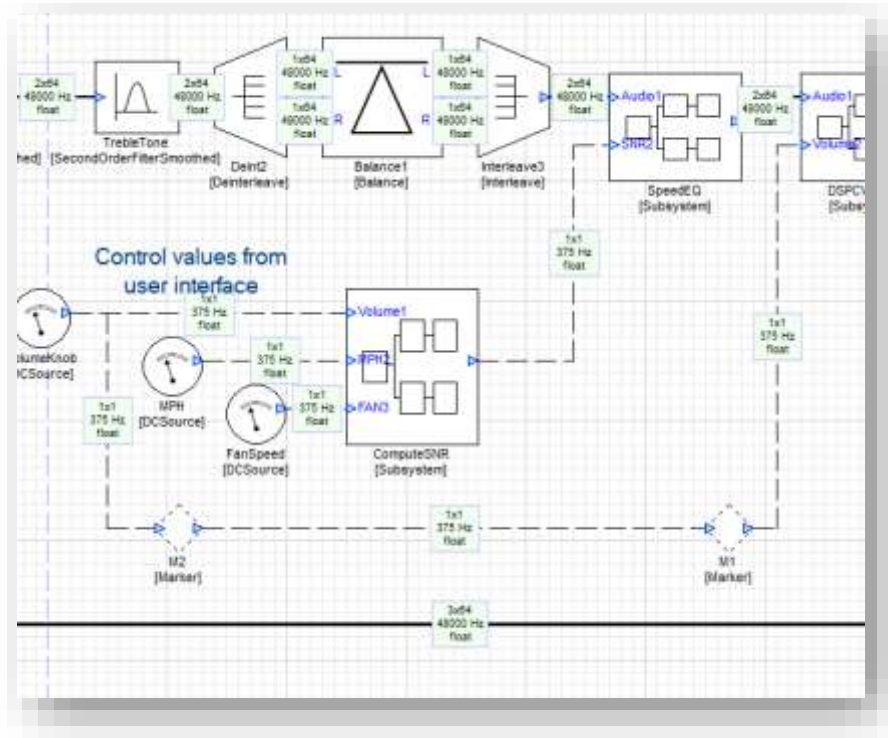
PASTE MODULE SETTINGS

This copies settings from one module to another. Copy a module, then right click on another module of the same class and choose "Paste Settings".



SHOWING WIRING INFORMATION

Access from the View→Wire Info menu item. Display number of channels, block size, sample rate, and data type. 2x64 means two channels and a block size of 64 samples.

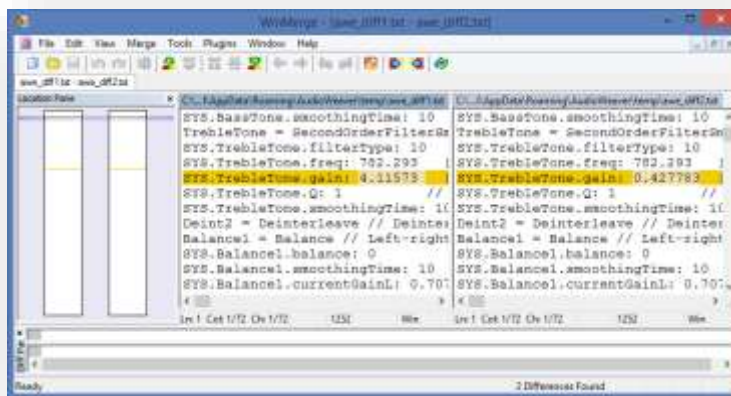


MANAGING INSPECTORS

Use the Inspector menu to create inspector groups for efficiently tuning the system. Show and hide groups of inspectors. These menu items speed up inspector handling

DIFFING SYSTEMS

This requires a Diff tool like WinMerge, to be installed. First specify your Diff tool under the File→Global Preferences menu item. Then use the menu item File→Compare Systems to make the comparison



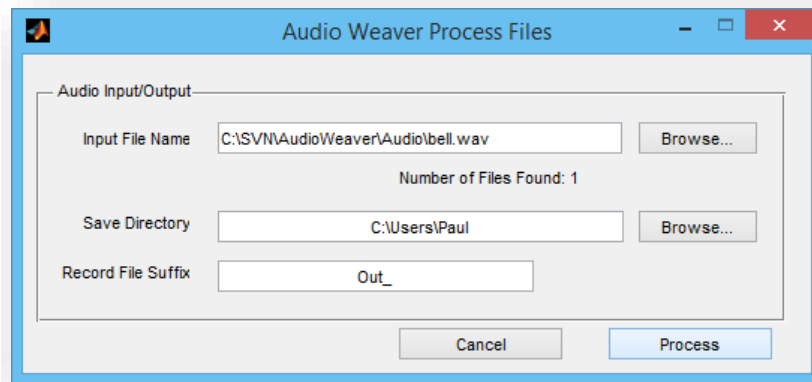
RECONNECT TO THE SERVER

If you accidentally close the Server, use this menu item to relaunch.



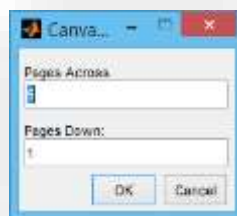
PROCESSING WAV FILES

Non-real-time processing. Sends data through your design and records the output. Faster than real-time on the PC. (Increase your blockSize to speed up processing.)



MANAGING THE CANVAS

Increase your drawing space using the Layout - Canvas Size menu item.



Zoom in and out using toolbar buttons

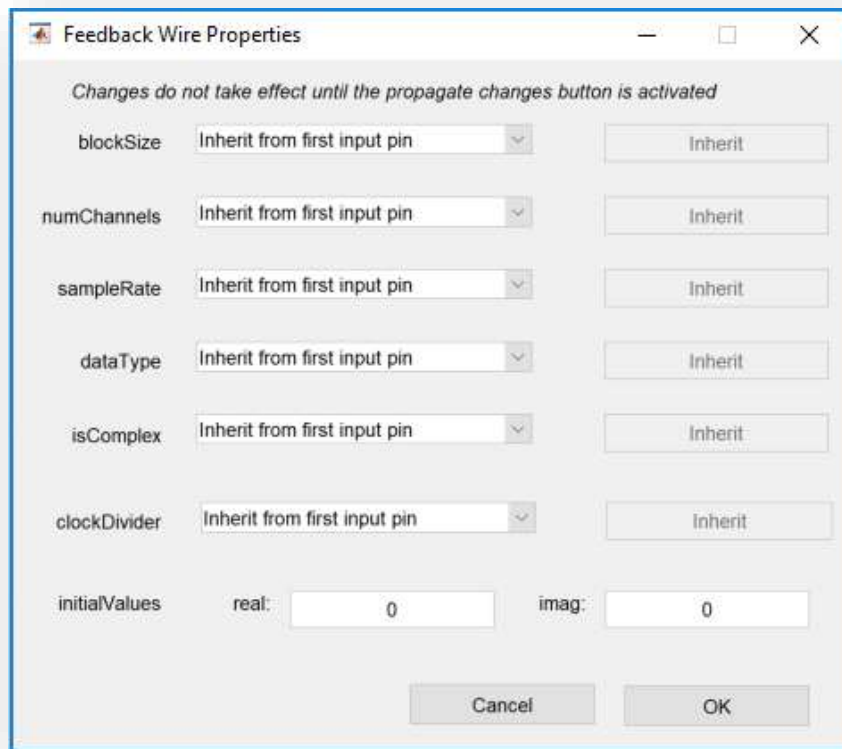
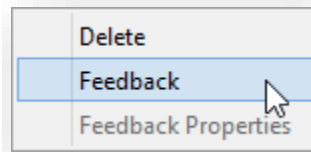


Align and Nudge items



FEEDBACK WIRES

Feedback wires have to be manually specified. Right-click on a wire and select:



Then configure details of the feedback wire using Feedback Properties. See the *Audio Weaver Module Users Guide* for a detailed explanation of this feature.