EQuilibrium

Contents

1 Introduction

1.1 About EQuilibrium

Besides adjusting gain, EQ is the most commonly used process in any audio workflow. Yet it's been years since there was a radical change in how EQs are designed. I've been a student of EQ design my entire career - I was even designing EQs before I started at Focusrite!

I wanted to make a bold statement about what the future should look like - about reclaiming all that was good about the past, and simply adding more.

The EQuilibrium design process started with thinking about what the different facets of an EQ are. We decided that the different facets are these: Curves, Audio fidelity, Interface, Routing. So we looked at each facet individually, and took them deeper.

The Curves are fascinating - I've spent years poring over schematics, collecting transfer functions to find out what it is that makes certain EQs so special. Gain-Q interactivity is one, Gain-frequency interactivity another. Or just interesting settings that bring some vibe. Understanding what curves and interactions have stayed with us over the decades tells us a lot about what we use EQs to achieve. Parallel and series configurations are fascinating too.

Audio fidelity is a real passion of mine - so I revamped the EQuality audio engine to allow a further layer of control; the IIR mode replaces Digital mode in EQuality - that was a bad choice of name, since the entire point of it is that it sounds indistinguishable from the analogue, whilst using the minimum possible amount of CPU usage. Digital+ now has a resizable +, in that you can configure the degree of compensation, and freely tune it. The Phase modes have been revamped entirely - now you can assign phase for each band independently, tune the windowing, and there are graphs for everything, so if you're a mastering engineer wanting to control ringing, you can see the ringing clearly, and what's affecting it!

Interface we've gone perhaps a little overboard with. There's really no grand consensus on how you want to interact with an EQ, so we made it fully configurable. Graphs, knobs, keyboards, textboxes, tooltips, the whole gamut is in there, and can be arranged to suit you. The degree of UI reconfiguration is so extreme we've built a setup wizard, which must be a first for an EQ.

Routing is interesting too. There are scant few fully surround-capable EQs, and it seemed silly not to support routing flexibility to its fullest. For stereo usage there's the simple familiar M/S or L/R configuration, but for surround there's full channel grouping support. We've added per-channel metering, with gains, phase, solo/mute and linkage, so you have half a mixer in there too.

For a few years, I've felt like it was time for a revolution in EQ - no more being held back by the bizarre requirement for rack-ears and photorealistic knobs. It's not photos of gear that bring vibe - it's the soul, the curves! So that's what we've built. A surfeit of functionality predicated on the curves of the greatest EQs from times past.

- Dave Gamble, 2013

1.2 System Requirements

1.2.1 Windows

EQuilibrium works with Windows Vista, 7, 8 and 10, 32bit and 64bit. VST, VST3 and AAX are supported in both 32bit and 64bit hosts. RTAS is supported in 32bit ProTools 7 or newer.

1.2.2 Mac OS

EQuilibrium requires OSX 10.7 or better, on Intel mac. VST, VST3, AU and AAX are supported in both 32bit and 64bit hosts. RTAS is supported in 32bit ProTools 7 or newer.

1.3 Installation and Setup

1.3.1 How to Install on Windows

You need two files to install; the plugin installer and the license file. Both are available from the My Stuff area of the DMGAudio site whilst logged in. If you're using a demo, download the installer from the site, and use the form to have your license file emailed to you.
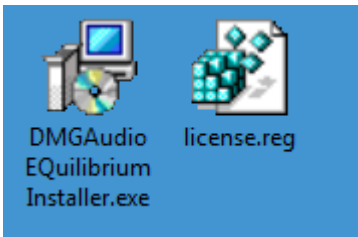
Double-click license.reg, and this box will open:
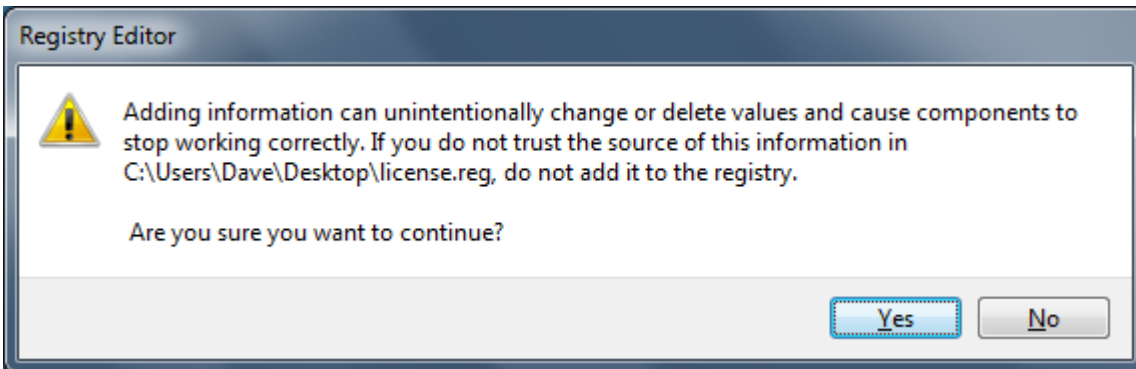
Click "Yes" and the license is installed. Now double-click the zip-file which contains the installer. Double-click the installer; it will look like this:

Click "next" (changing any options if you need to), and EQuilibrium is installed! Reload your host, and enjoy!

1.3.2 How to Install on OS X

You need two files to install; the plugin installer and the license file. Both are available from the My Stuff area of the DMGAudio site whilst logged in. If you're using a demo, download the installer from the site, and use the form to have your license file emailed to you.
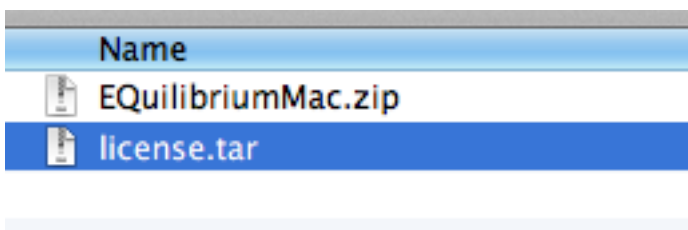
If you are using Safari, one or both of these files may be automatically unzipped for you. If not, double-click them to decompress them, so you get this:

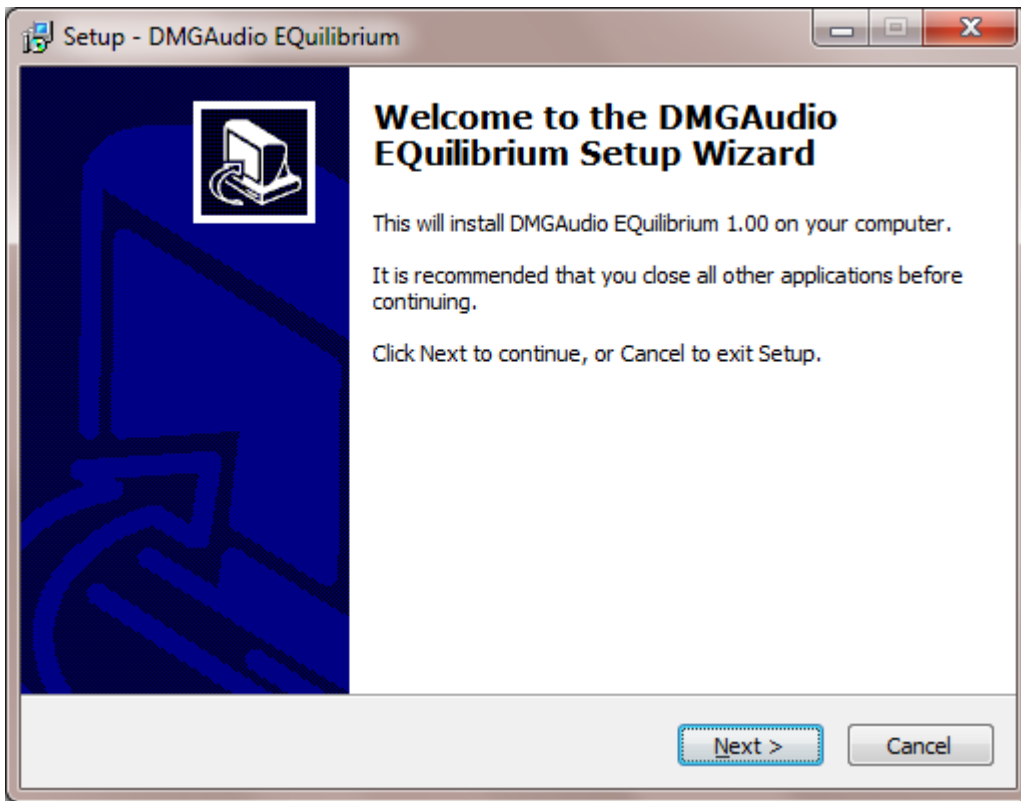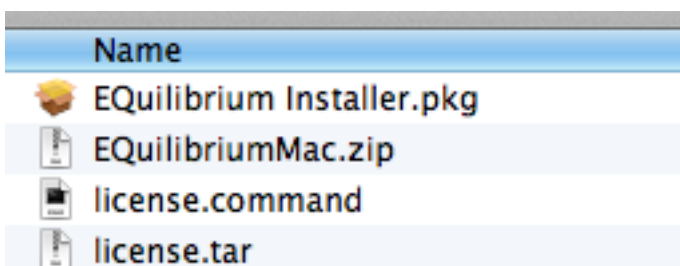Double-click "license.command" to install the license. The license will install, and you'll get the following message to confirm:
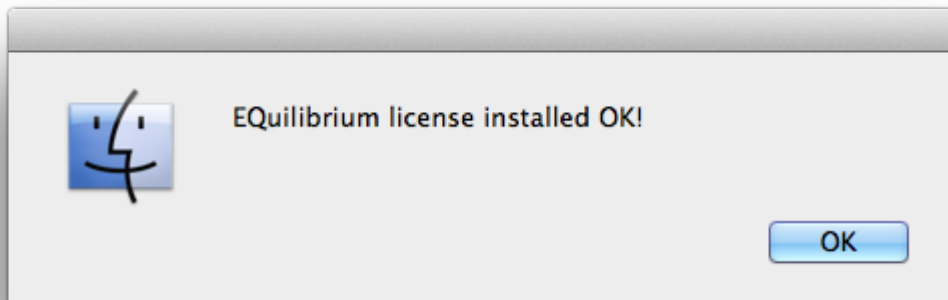
Now double-click the installer, and it will launch. It looks like this:
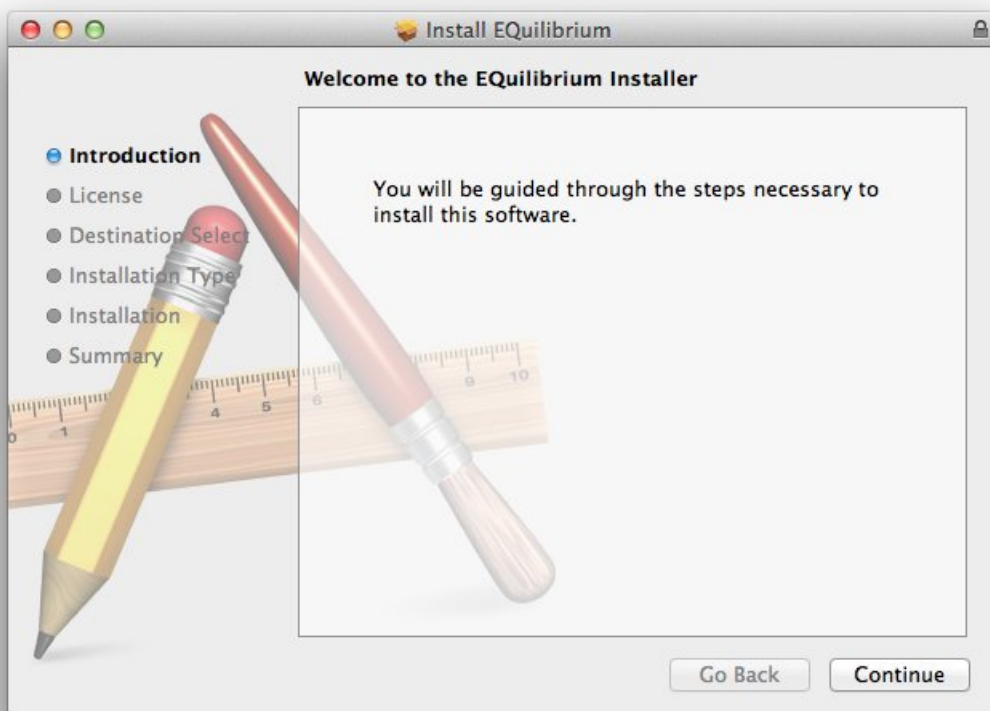
Click through until it installs, and everything is set! Now relaunch your host and enjoy!

2 The EQuilibrium UI

2.1 Overview

EQuilibrium can be heavily reconfigured, so providing a screenshot is a little misleading. So what we've done is switched on loads of things, so we can explain what they all do!

MENU

GRAPH &
ANALYSER

KEYBOARD

BAND STRIPS
(KNOBS MODE)

CHANNEL / MASTER METERS

2.1.1 Graph and Analyser

So, if you want it, there's a graph to show you what the EQ is doing. It's resizable, has loads of options and (we think) is quite pretty. The spectrum analyser is displayed in the same space, and you can have it turn off the graph entirely and just show the analyser if you prefer.

If you are using the graph for control, each point represents an EQ band. You can drag them around to change gain and frequency, and alt-drag will allow you to change Q. Sometimes (say for a filter), that wouldn't make sense, so it remaps parameters to suit. Mousewheel will adjust Q too. Holding shift will give fine adjustments.

You can select multiple bands by dragging a box around them.

You can zoom in and out with the mousewheel (by holding it over empty space), and if your mousewheel supports it, scrolling left and right (using a trackpad) will scroll left and right once you're zoomed in.

You can double-click in space to add a new band at that frequency, and you can configure how your choice of location is interpreted (i.e. you could get it to add HPFs down low, or consistently give you peaks).

Double-clicking on a node will bypass it.

Right-dragging a node will move it, but also engage autolisten, so you can hear the frequency range you're affecting.

If these modifiers (shift,alt,right) feel wrong, you can just reconfigure in the preferences.

Right-clicking a node can be configured to invert gain, bypass, or do nothing.

As a rule, explore! There's endless fun to be found.

Also, as soon as you hover over a band, a set of tooltips pop up, allowing you even finer control over the band - again their look and feel is configurable, or you can be rid of them and work with knobs if you prefer.

The graph can show upto two curves. If you're working in mono or joint-stereo, you'll only ever see one curve, but if you're working in M/S, or using independent L/R, or even in surround, you can pick the curves to display (see Menu Bar, Display Mode).

Likewise, the analyser can display upto two analyser curves, from this EQuilibrium, or imported from others in the session (see Menu Bar, Analyser).

2.1.2   Keyboard

If you're working tonally, it can be handy to have a keyboard, so you can see which notes you're EQing. So there is one.

Dragging nodes on the keyboard will keep them quantized to the nearest semitone in a 440Hz tuned equal temperament scale.

Hovering over a node will show a popup with the note name and its cent detune, which you can edit.

Double-clicking will create a new node on a specific note, ready to be put to use.

The Keyboard will follow the Graph Zoom (if any), so you can dive in for really fine precision work.

2.1.3   Band Strips

The Band Strips are a fully dynamic representation of the EQ. Each band gets a strip with all the appropriate controls for adjusting it. The Band Strips can be configured to include knobs and textboxes, or to eschew the knobs for a compact column of textboxes.

Knobs are draggable as you'd expect, with shift for fine adjust.

Textboxes are also draggable, and double-click allows you to free-text enter values. It recognises most shortcuts like 'k' and so forth.

All controls recognise mousewheel scrolling too.

The Band Strips can also provide a box to show you which channels the band applies to, which for linked stereo is irrelevant, but for Mid/Side or Left/Right, or even Surround work becomes very handy very fast!

The Band Strips will always feature an icon to show the band type (peak, filter, etc), which can be clicked to bypass or re-enable the band.

Right-clicking on the band's icon will open a menu to allow you to change the band's type. If configured, that menu will allow you to pick specific circuit models.

Alternatively, you can have a Subtype box displayed, which allows you to choose models.

Bands can be selected by clicking. You can also add or remove bands from a group by shift-clicking; grouped bands will move together when a control is adjusted.

The black space around the bands can be double-clicked to create a new band. Double-clicking an existing band will duplicate it. Ctrl/Apple + Alt-clicking a band will delete it. Right-clicking in the black space will sort bands by frequency.

Dragging a band, or using the scrollbar will scroll the bands left to right, in case you have too many to fit onscreen.

Dragging in the black area allows you to drag boxes to select groups of bands.

2.1.4   Meters

Meters come in two varieties: Master and Channel.

Channel meters have gain faders, Mute, Solo, Phase Invert, and Link. They describe an actual channel of audio. If you're working with linked stereo, you'd leave them off, but if you're working with M/S or Surround, they allow you to trim each channel of the stem (or, for instance, adjust stereo width).

Master meters have the master fader, and a stereo output meter, showing the Left and Right outputs (pre or post all processing). The "Listen" option allows you to configure whether the meters are listening to the input or output signals.

The "Autogain" option applies automatic gain compensation. Right-click the Autogain button to see the current amount of compensation in a pop-up, along with an option to apply it to the channel faders. Alt-clicking the Autogain button will also apply the autogain adjustment to the channel faders.

The meters can be configured to use different ballistics and K-metering ranges.

2.2   The Menu Bar
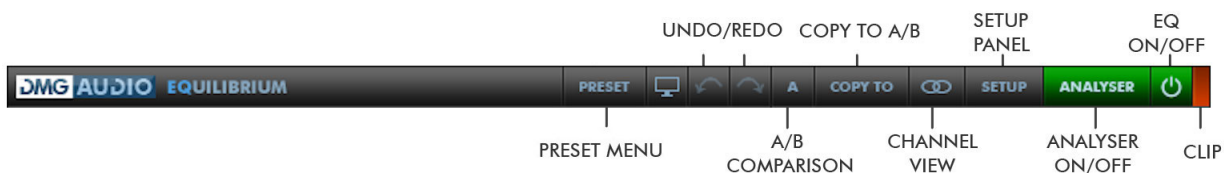
The menu bar is a largely-fixed set of controls for administering tasks around your EQ work.

2.2.1   Preset Menu

Pressing this button will pop out the Preset tray. See "Presets".

2.2.2 Fullscreen

The Fullscreen icon will open EQuilibrium in fullscreen mode. Press Escape to close.

2.2.3 Undo / Redo

A full undo/redo for any parameter changes on the UI.

2.2.4 A/B and Copy To

EQuilibrium maintains 8 banks of controls at all times, so you can easily A/B (or A/H) through different variants of your settings.

For example, you might create a curve, then use Copy To to copy it to B, then modify that a little, and keep going to get as many different settings as you want to evaluate. Then you can use the A/B menu to audition each setting.

Of course, you'd really like the auditioning process to happen with one click, which is a right-click on the A/B button. You can configure whether this toggles between the last two settings you visited, or between all nonempty settings, or between all visited.

2.2.5 Channel View

This button is used to configure what curves the graph displays.

In mono mode, this button hides, as it serves no purpose.

In Stereo mode, this will mostly show the Stereo symbol, and even when working M/S or L/R leaving it in this state will show both curves, one atop the other. However, if the graph starts to look cluttered, you can click the button, and use the menu to pick which curve(s) you'd like displayed.

In Surround mode, this button shows a circle, and you can select the two EQ groups you'd like to have displayed (see Routing) by left-clicking and right-clicking the menu.

2.2.6 Setup Panel

This opens the Setup Panel, that allows access to even deeper features of EQuilibrium. See "Preferences and Options".

2.2.7 Analyser

This button engages or disengages the Analyser to be displayed in the Graph area (so you will need to have a graph onscreen to see it).

Right-clicking opens the Analyser menu, which allows you to pick a primary source from this, or any other EQuilibrium instance (of the same plugin format) within the session. Also on this menu is a choice of Analyser styles (See "Analysers").

If the Analyser style is the regular Spectrum Analyser, you'll be able to choose a second source to superpose over the first - this allows you to, say, overlay the frequency response of the kickdrum while you're EQing the bass, and to see how the responses interplay.
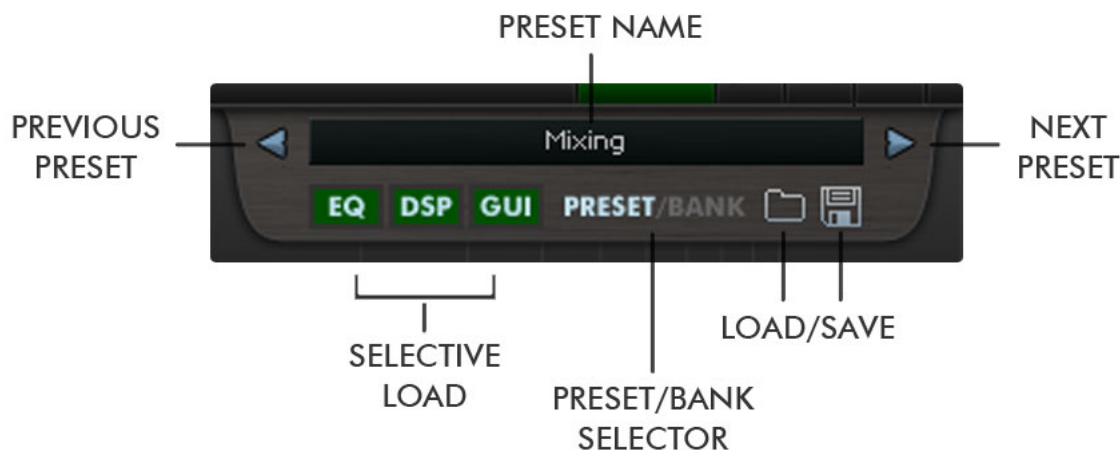
2.2.8   EQ On/Off

This is a "soft" master bypass for the EQ. It glitchlessly bypasses all audio processing.

2.2.9   Clip LED

If you're heading out of EQuilibrium to convertors, or generally watching your gain structure, this is a clip LED to warn you of any overs. You can configure the threshold.

2.3   Presets

2.3.1   Preset Menu / Name

This shows the current Preset name. Left-click on the name to open the preset drop-down menu or right-click to modify the preset name.

EQuilibrium has 20 preset slots which it declares to the host software, enabling you to select presets and automate preset changes from your DAW. These preset slots appear above the separator line in the preset drop-down menu.

Any unused preset slots will be set to default and not appear in the menu, unless they are between two used preset slots where they will appear as "<n: empty>", n being the preset slot number.

To give an unused preset slot a name, select it either from the drop-down menu or using the previous/next buttons (see "Previous/Next"), then right-click on the preset name box and type one in. The new name will now appear in the preset box and preset drop-down menu.

EQuilibrium comes with a set of preset files, which you can add to, to build up your library of settings.

By default, on mac they reside at /Library/Application Support/DMGAudio/EQuilibrium/Presets and on windows, at C:\Program Files\DMGAudio\EQuilibrium\Presets

These presets appear below the separator line in the preset drop-down menu. Saving presets into the above folders will allow you to select them from the drop-down menu. When you select a preset file from below the separator line in the menu, it will be loaded into the currently selected preset slot.

Don't forget to include the preset files in your backups and be aware that installing updates will reinstall the factory ones, so best re-save them with a different name if you modify them for your own use.

2.3.2 Previous/Next

These buttons allow you to quickly jump back and forth between presets. When EQuilibrium loads, they will navigate through the 20 preset slots.

If you use the preset drop-down menu to select a preset file from below the separator line and the preset you select is in a sub-folder, these buttons will now navigate through the preset files in that sub-folder, loading them into the current preset slot. The arrows will turn from blue to grey to indicate you are navigating in a sub-folder.

To return the arrows to scrolling through the 20 preset slots, open the preset drop down menu and click on the selected preset slot (or any other) above the separator line. The arrows will turn back to blue to indicate you are navigating through the preset slots.

The buttons will fade out to show when there are no further presets to select.

2.3.3 Preset/Bank Selector

Presets can be exported either individually or as a bank of all 20 preset slots. Use this selector to determine whether you're loading or saving a bank or preset.

2.3.4 Load/Save

Use these buttons to open a window to save or load presets and/or banks.

2.3.5 Selective Load

When loading and saving presets, EQuilibrium can be instructed to ONLY save or load those parts of the preset that concern the EQ curve overall, the DSP mode and/or the UI layout.

When these buttons are lit (green), EQuilibrium will load and save this section of the data.

Note that bank load/save does not respect the EQ and DSP selective load options. When loading a bank, each preset slot will be loaded with its EQ and DSP settings as they were when it was saved.

The GUI flag is respected whether loading a preset or bank. There is only one set of GUI settings that applies to the whole bank and newly loaded GUI settings will apply to all preset slots.

2.4 Analysers

The analyser section is fairly full-featured, as can be seen from the summary of screenshots below. Note that only the regular Analyser can superpose two responses.

ANALYSER TYPES

ANALYSER
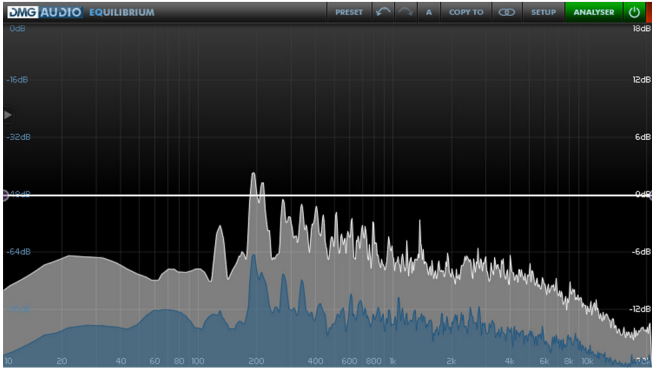
3RD OCTAVE

12TH OCTAVE

BRIGHTNESS BARS

SPECTROGRAPH

BRIGHTNESS/ANALYSER

2.5   Other elements
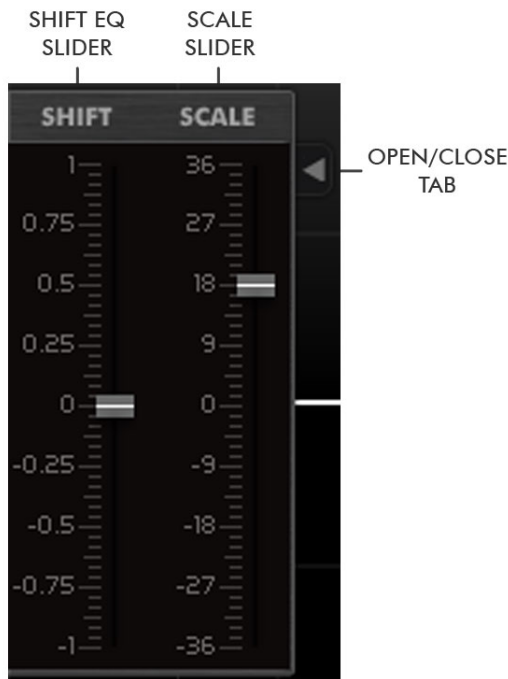
The Shift/Scale sliders are accessed by clicking the small disclosure triangle on the left-hand edge of the UI.

The Shift EQ Slider allows you to retune the frequencies of all bands together. Playing MIDI notes or pitchbend into an instance of the plugin will have a similar effect.
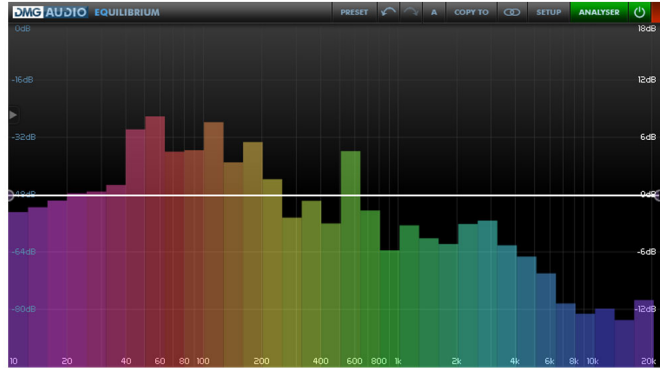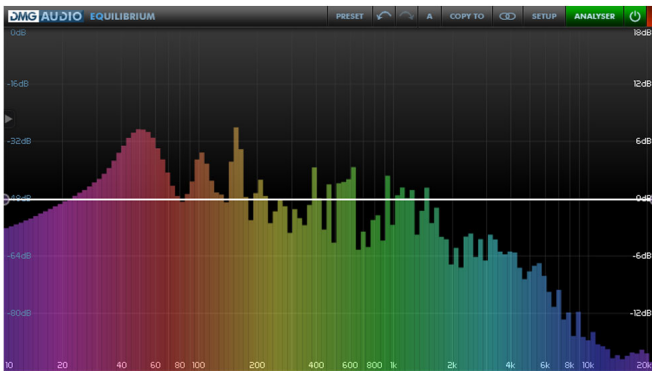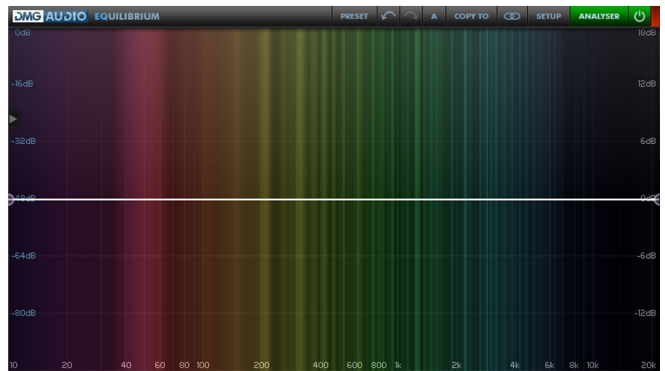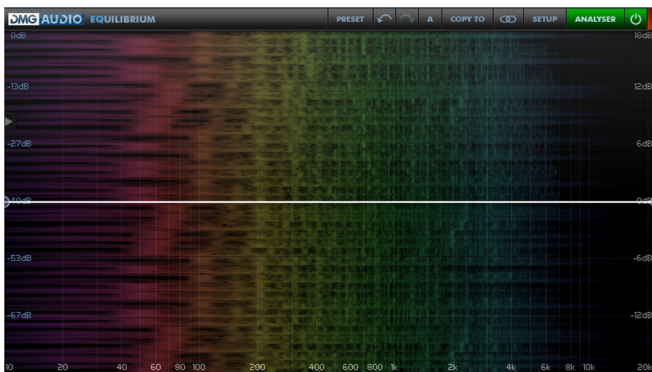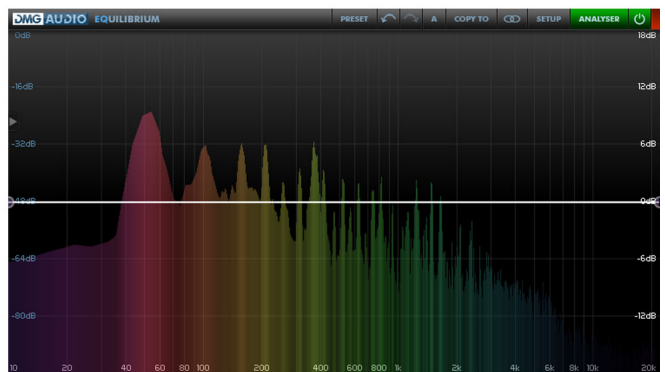
The Scale Slider allows you to vary the gain intensity of all bands together. You can use this to try "easing back" settings, or even try the inverse.

3   EQ Curves

3.1   Peaks

An EQ band is symmetric if cutting and boosting cancel each other out. So if two bands are at the same frequency, and have the same Q setting, and one has -3dB gain while the other has +3dB gain, with a symmetric EQ, you'll hear no change at all. With an asymmetric style, there is no cancellation. Some of the types here are symmetric, some are not. Most types are symmetric, but I've described each below.

Gain-Q interaction is a catch-all phrase used to describe the way in which changing gain can alter the Q of the band - what's written on a silkscreen is only rarely "true" in any sense. Some EQs will affect a broader area as the gain increases, some will affect a narrower area, and the relationship between the two can make working with them a lot of fun. It can get stranger too, with Q affecting gain, and even gain affecting frequency, but when we talk about the "interaction" of a band (as opposed to the interaction between the bands of an EQ), this is what we mean: The way in which the combination of the settings yield an unexpected, but useful result.

3.1.1 DMG

This is the DMGAudio parametric peak, with +/-36dB of range, Q from 0.1 to 50, and now a per-band "Music" control, to allow per-band control over gain-q interaction; you can pre-set this per band as a preset, and maybe never think about Q again!

3.1.2 4kg

Modelled on a classic British console EQ. Increasing gain increases the frequency of the peak. Fairly broad Q, even at highest Q settings, but about 20dB of gain (depends on Q), which will allow you to use it for aggressive adjustments.

3.1.3 Ox 1-4

Modelled on another British console. Ox1 is symmetric, but Q increases with gain.

Ox2 is for extremely broad peaks, symmetric, Q tightens as gain increases.

Ox3 is a "musical", symmetric peak, with a prescribed Gain-Q interaction.

Ox4 is an asymmetric version of Ox1.

3.1.4 110

The 110 is an extremely musical mix EQ, symmetric, with a delightful gain-q interaction characteristic, such that tightening Q increases gain.

3.1.5 550

The 550 is THE classic US EQ, symmetric, and featuring a proportional Gain-Q interaction.

3.1.6 88

The 88 is modelled on one of the last large-format analogue consoles, and represents what could be the logical conclusion of analogue EQ design. A very precise Gain-Q interaction.

3.1.7 32

The 32 is modelled on the EQ from an almost legendary console. It's response and gain-q interaction is almost indistinguishable from the 550, though it's not obvious that there's a lineage there. Nonetheless, so legendary is this console, that a precision model is included. The 32 preset is prewired with the exact Q values to map up to the original console EQ.

3.1.8 EE

There's a lot of science in the Filter section, but here's some science for the Peaks! The EE circuit is the Electronic Engineering model of a theoretically perfect peak, with an asymmetric response.

3.1.9 FlatTop

A standard bell with an interesting twist. The "SOFTEN" parameter allows you to flatten the top of the EQ response, while exactly preserving the energy applied to the overall spectrum. You can use this to reduce the resonance of a boost, while preserving how much the general area is amplified.

3.1.10 Butterworth

Not exactly a peak, but there's nothing it's really closer to either. Broad flat boosts.

3.1.11 250

An incredibly expensive classic mastering EQ. One of the originals, no less, if not THE original parametric EQ.

It's 12-ish dB of boost/cut, and Q range have been mapped exactly onto the pots... but it doesn't give you exactly what it promises... check the graph! Sounds amazing anyway. For the authentic experience, run a few bands in parallel.

3.1.12 8k2

If the 250 isn't the original parametric, then the 8k2 is. It has about 15dB of range. Very similar in character to the 250.

3.1.13 4ke Brown/Black/CT

Classic British console. It was once claimed that the majority of hit records were mixed on these boards. The Black version has 18dB of range, as opposed to the Brown's 15dB.

CT affects the interaction of the gain/q.

3.2 Shelves

3.2.1 DMG

The classic DMGAudio shelves, with shiftable resonance.

3.2.2 4kg

The counterparts to the 4kg peak model - unusual resonant shelves from a classic console.

3.2.3 110

Eerily similar to the 4kg, very interesting resonant shelves. Have a listen to how they move with frequency!

3.2.4 550

Quite legendary "reciprocal gain" shelves. They're only first order, so no resonance, but you'll see that there's massive gain-frequency interaction.

3.2.5 Pultec Boost/Cut

Wouldn't be complete without them, would it?

The Low Shelf versions feature both Boost and Cut (so it doesn't matter which you pick, you can still get that warm resonant bottom end).

The High Shelf versions are quite something. I've taken the liberty of expanding the frequency ranges across the spectrum, because it's a lot of fun.

3.2.6 First Order

Counterpart to the DMG Shelves, these are smooth, ideal first-order shelves, for gentle mastering work, or subtle balance changes.

3.2.7 Tilt

A full-spectrum tilt for Mastering work.

3.3 Filters

3.3.1 DMG

Classic DMGAudio 6->48dB/oct, with enhanced Q range, based on the classic unnormalised coincident pole audio designs.

3.3.2 Coincident

A frequency-normalised version of the audio standard; smooth curves, not too aggressive, something of a standard for audio.

3.3.3 Butterworth

As steep as it gets without ripple, but no steeper. An Engineering classic.

3.3.4 Chebyshev

Technically the Type 1 Chebyshev; you can use the Q to specify the ripple (in dB); extremely steep filters.

3.3.5 Bessel

Another engineering classic that's perfect for Mastering (though since you can use Linear Phase, perhaps a little redundant). The Bessel filter has a perfectly smooth phase response, so there's no misalignment of transients.

3.3.6 Critical

The Critical (critically damped) filter has no overshoot in its impulse response. 10-20 years before Coincident-pole filters became the norm, Critical was all the rage. Consider it a Vintage version of the Coincident.

3.3.7 Legendre

The Butterworth is as steep as it gets with no ripple, but if you don't mind a hint of shelving, you could go steeper, and that would be the Legendre.

3.3.8 Elliptic

Another engineering classic - absurdly steep cutoffs, at the expense of some ripple (specified with the Q knob, in dB again) in both passband and stopband.

3.3.9 AllPass

"Is it doing anything?" The AllPass has no effect on frequency magnitudes - it exists purely to phase-rotate the incoming signal. Phasers are built out of them. In Linear or Minimum phase modes, they do precisely nothing, but in Analogue or IIR modes, they allow you to compensate for phase artefacts in recordings, or create new ones.

3.3.10 Harmonics

This one uses a little creative license. This was built to order, and is most fun with 48dB/oct and a fairly high Q value. Try both the HPF and the LPF.

4 Preferences and Options
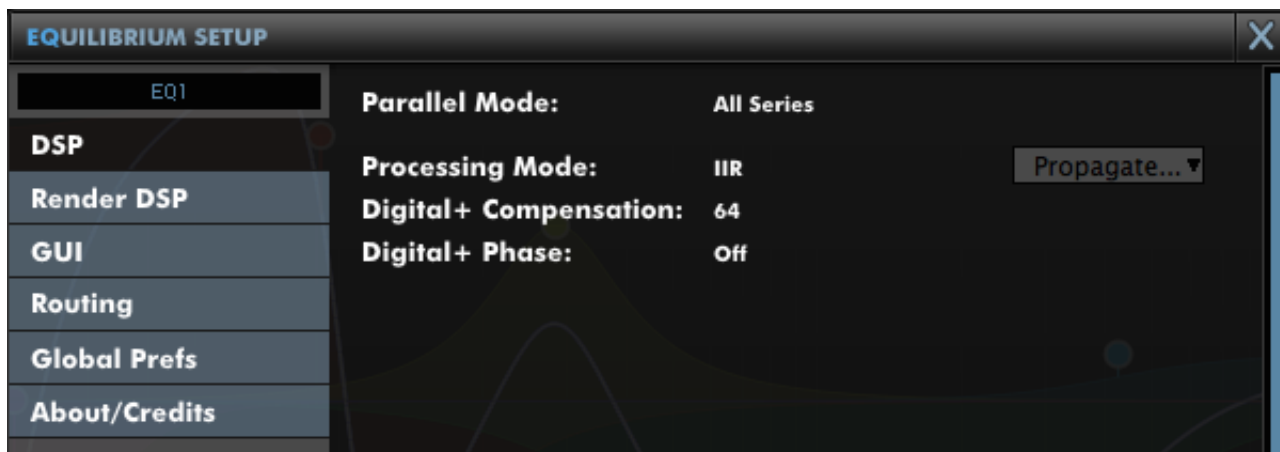
In the top-left is a textbox you can use to name the plugin instance, to make it easier to find for importing analyser responses.

The tabs down the side each open a different page of controls.

4.1 DSP

4.1.1 Parallel Mode

Some classic EQs are configured in parallel, rather than in series.

This tends to be noticeable in that the bands interact in a gentle way, rather than adding aggressively as series bands do. You might find parallel configurations less radical, but make more subtle work easier.

You can configure peaks to be in parallel, or peaks and shelves to be in parallel, or leave everything in series.

4.1.2 Processing Mode

The rest of the controls in this section are determined completely by this choice.

IIR mode corresponds to Digital / Digital+ in EQuality - it's extremely low CPU usage, but you have no control over phase. For almost every usage in tracking and mixing, IIR without Digital+ compensation is the way to go. For channels that need the extra edge, turn up the Digital+ compensation until going a step higher ceases to make audible change. Digital+ Phase will use the Digital+ compensation to correct both phase AND magnitude.

There's a menu to the right entitled "Propagate..." which allows you to push these settings to other instances of EQuilibrium in your session.

In FIR mode, the options open up further:

EQUILIBRIUM SETUP

EQ1	
DSP	
Render DSP	
GUI	
Routing	
Global Prefs	
About/Credits	

Parallel Mode: All Series

Processing Mode: FIR   Propagate... ▼

Phase: Free

Cursor 21658.7Hz   Graph 0.07 deg   -180deg

-120deg

-60deg

0deg

60deg

120deg

10   20   40 60 80   200   400 600   1k   2k   4k 6k 8k   20k

Impulse Response:

0d ▼

15dB

30dB

45dB

60dB

75dB

90dB

105dB

Impulse Length: 8192
Impulse Padding: x1
Window Shape: Kaiser
Window Parameter: 0.50

Setup Wizard...

Phase determines how you'd like the phase response to be implemented. You can choose from global minimum, analogue, zero-latency analogue, linear phase or free.

Analogue provides the same cumulative minimum phase response as hardware. Zero-latency analogue uses only the tail portion of the impulse response, thus allowing for zero latency but at the cost of phase accuracy at higher frequencies. Minimum phase applies a transformation to reduce the phase delay as far as possible.

In Free phase mode, the phase graph (under the word Phase:) gains handles. You can zoom in and out, and adjust the handles to adjust the degree of phase influence of each band.

Handles at the 0deg line are linear phase, at 180deg (the bottom), minimum phase, and at -180 degrees (the top) the band gets inverse phase, which provides very unusual characteristics, especially for resonant shapes.

Having designed the phase response, the Impulse Response display is next. In the top-left is a dropdown to quickly select which channel's response is displayed. In the top-right is another small

menu to adjust the display scales.

The graph shows the impulse response generated by the EQ and phase curves you've selected, in white. You can zoom in and out using the scrollbar underneath.

Superposed in purple is the windowing shape, which the impulse response is multiplied by to get the final response for processing. It serves to minimise ripple, and shorten the tail lengths, with minimal loss of response definition.

The Impulse Length is selected below; the higher the length the greater resolution is applied. At the highest setting, you will likely need to dedicate the CPU to the processing.

Impulse padding is a truncation strategy for reducing wrap-around of ringing in the Impulse Response design procedure. If you see a tail wrapping around from the left, try increasing the padding.

The Window Shape menu includes a dozen of the standard engineering windows which can be adjusted using the Window Parameter box. The default is the Kaiser, which is an extremely good bet in almost all audio work, but the classic Rectangular/Hamming/Hann/Blackman variety are included too in case you'd like to compare, contrast and listen. Rectangular is not suitable for most audio work, and provided for research purposes.

Most window types support the Window Parameter. Increasing the Window Parameter (for example from 0.5 to as much as 1.0) will tighten the impulse response so as to reduce preringing. Decreasing the Window Parameter will process the impulse response more gently, yielding more accurate frequency-domain results, albeit at the risk of increasing preringing. Sharper frequency response shapes run greater risk of introducing prering, and can be compensated by increasing the Window Parameter.

These settings are provided as a luxury for mastering engineers who demand the most uncompromising impulse response design resources.

4.2   UI

The UI setup window has a group structure. You can expand a group by clicking its name, or on the triangle to its left. The Load/Save box to the right allows save/recall of settings in groups or overall from a global default.

4.2.1   Layout
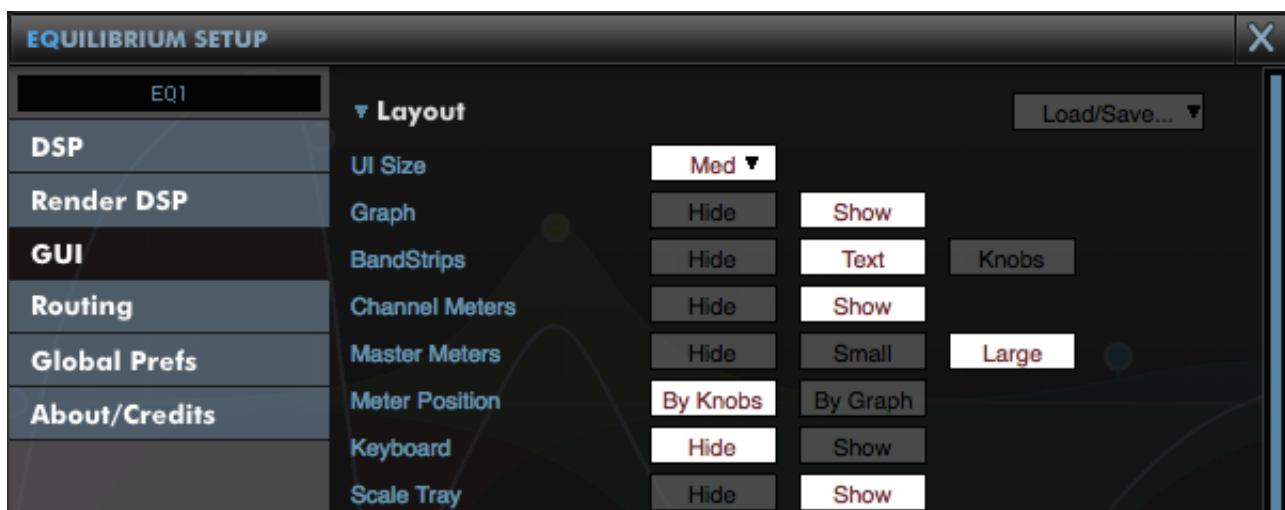
The **UI size** is a function of which elements are onscreen, but this control gives you some flexibility about overall size. Setting this to "Free" allows you to drag the bottom-right of the plugin window to adjust sizing.

The **Graph**, **BandStrips**, **Channel Meters**, **Master Meters**, **Keyboard** and **Scale Tray** options allow you to configure which elements are available on the UI.

The **Meter Position** control allows you to position the metering block next to either the graph or the bandstrips.

4.2.2   Graph

Handles allows you to disable/enable/enlarge the handles for each band of EQ on the graph.

Scrollbar allows you to disable/enable the scrollbar for zooming into the graph.

Filled Bands determines whether bands are rendered filled or outlined.

Band Opacity sets the opacity of a filled band.

Display selects whether bands, the overall response, a combination, or neither are rendered.

The **Readout** values, if selected, are displayed at the top of the graph.

Background and **BG Fade** allow you to tweak how the background is rendered.

Tooltips, **Tooltip for Subtype** and **Tooltip type menu** configure the look and feel of the tooltips on the graph.

Tooltips follow allows you to get the graph tooltips to react to parameter changes outside the plugin (i.e. a control surface).

Crosshairs draw a horizontal and vertical line across the graph which coincide at the center of the band you're adjusting, to make it easier to read-off frequency and gain values as you adjust.

Filter Drags determines whether dragging a filter node vertically adjusts Slope, Q, or is disabled. Hold Alt to switch parameter or, if disabled, to use the wheel setting (below).

Filter Wheel determines whether using the mousewheel on a filter node adjusts Slope or Q.

Band Numbers enables display of each band's number (for automation purposes).

Frequency Labels decides the cosmetic format of graph labelling.

Band Colours chooses whether the bands are coloured by frequency, or by number.

Mousewheel Zoom can enable or disable zooming into/out of the graph.

New Band Q Follows Zoom determines whether new bands created whilst zoomed-in have tighter Q values.

**Right-Click** chooses whether right-clicking a node inverts it, bypasses it, or does nothing.

Sticky Selection determines whether a node remains selected after clicking on it.

MouseWheel Ctrl determines whether holding Ctrl/Apple and scrolling the mousewheel adjusts Frequency or Gain.

MouseWheel Invert sets the mousewheel direction when used on the graph.

Range determines the minimum gain range that the graph will show onscreen. It will automatically expand to fit bands in use.

4.2.3 BandStrips
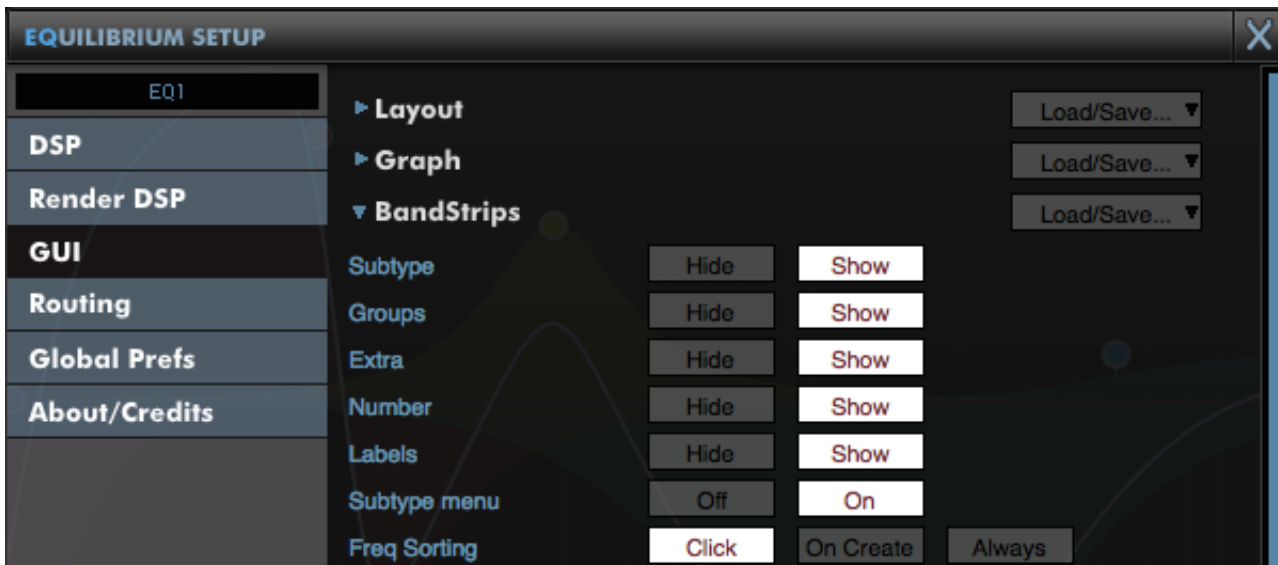
The BandStrips section allows you to determine which elements are displayed on the strips.

Subtype allows selection of circuit models of EQs.

Groups allows selection of routing groups from the strip.

Extra shows extra parameters (such as gain-q interaction, or shelf shift)

Number shows the channel number for automation

Labels shows labels as a key for what each row of the strips control.

Subtype menu determines whether Subtypes can be accessed from the Type menu when right-clicking the band's icon on the BandStrip.

Freq Sorting allows you to have the band strips sorted by frequency automatically. "Click" will only sort when you right-click the black area around the strips, "On Create" will sort every time a new band is created, and "Always" will keep the bands in order at all times.

4.2.4 Meters
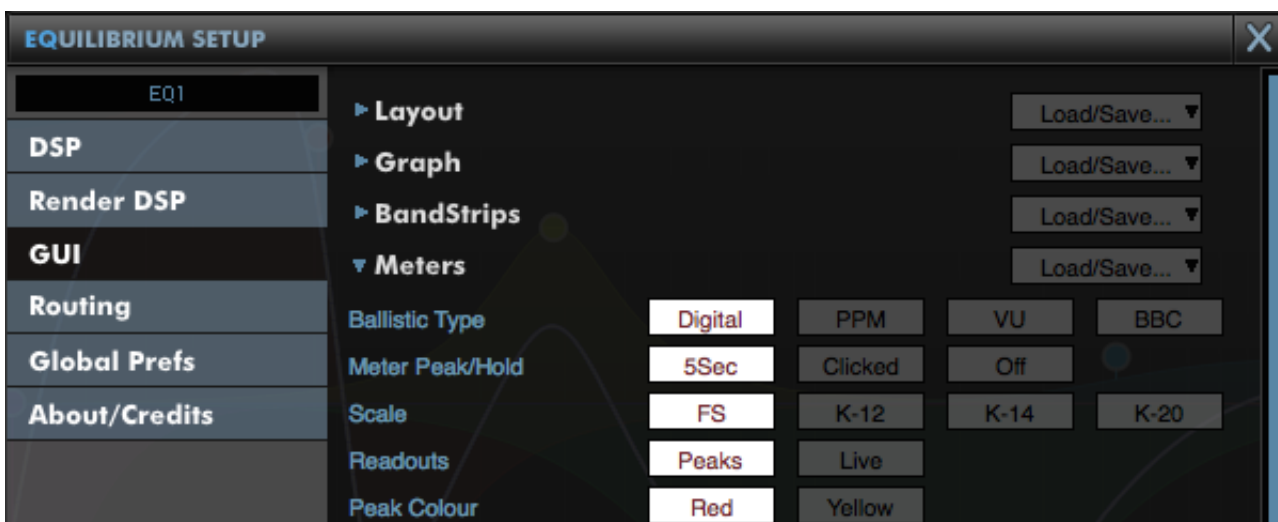
This section allows you to configure the meter ballistics, K-meter scale and peak-hold behaviour.

4.2.5 Analyser
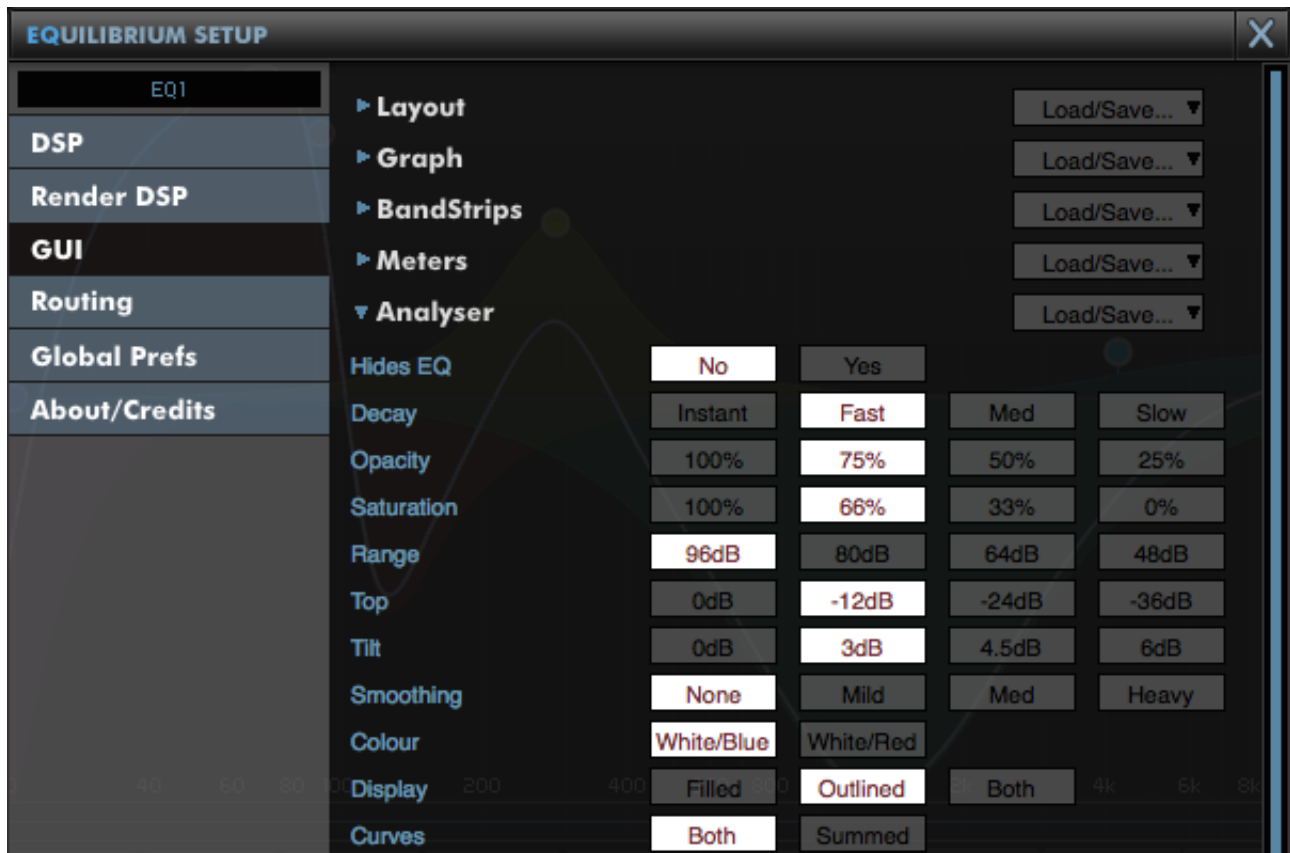
Hides EQ causes the EQ response curve to be hidden whenever the Analyser is engaged.

Decay sets the decay time for the smoothing of the response. The attack characteristic is always an instantaneous peak-type response.

Opacity sets the opacity of the plotted response curve.

Saturation sets the colour saturation (fully coloured to greyscale) for the plot.

Range sets the range of the graph in dB.

Top allows you to reduce the highest gain level shown on the graph.

Tilt tilts the spectrum readout. With no tilt, white noise is rendered flat.

Smoothing allows you to have the response smoothed for a less detailed view.

Colour chooses the graph colour.

Display allows you to configure the standard Analyser mode to be plotted filled or outlined.

Curves allows you to configure the standard Analyser to render two curves, or to sum them.

4.2.6 Misc

MouseWheel Sensitivity configures mousewheel response for knobs and textboxes.

Hide Mouse will cause the mouse to disappear while you're adjusting a value to reduce distraction.

Inverted Q will invert the effect of dragging up and down on Q value.

Show True Q will display the actual Q value on a band, after gain-q interaction has been applied (applies to DMG subtypes)

Slider Labels configures the behaviour of small textboxes that follow the slider handles for the Shift/Scale sliders.

Swap Alt/Right swaps over Alt and Right, so that Alt-dragging engages autolisten, and right-click-dragging adjusts Q.

New Band Types determines how the frequency and gain values of a newly created band on the graph influence the type of the new band. By Freq will create filters at extreme frequencies, shelves at high/low frequencies and peaks in the mids. By Gain will create notches for extremely low gains.

Number format affects the cosmetic display of numbers on the UI. Precise adds an additional decimal place.

Refresh Rate determines how fast the UI is permitted to update. Higher values use more CPU, but feel smoother to use.

MIDI Bend Range determines how many semitones a full extension of the MIDI pitch-bend wheel will shift EQ frequencies by.

MIDI Input allows you to disable MIDI control per-instance.

Extended Frequencies will extend the frequency range of EQ bands from 10Hz to 22kHz (the default) to 5Hz to your session's Nyquist frequency (i.e. up to 48kHz in a 96kHz session).

Autogain MS determines whether the autogain will adjust both channels together, or each channel individually. Acting individually, it will attempt to maintain the stereo width.

Autogain Weighting configures the autogain algorithm. The weightings determine the sensitivity of the compensation algorithm to EQ in different parts of the spectrum. White and Pink tell the autogain to anticipate white or pink signals, and 1770 will apply the ITU1770 K-weighting filter curve.

Parameter Lock Colour sets the colour used to indicate that a parameter is locked (click with shift+alt+ctrl / shift+alt+apple).
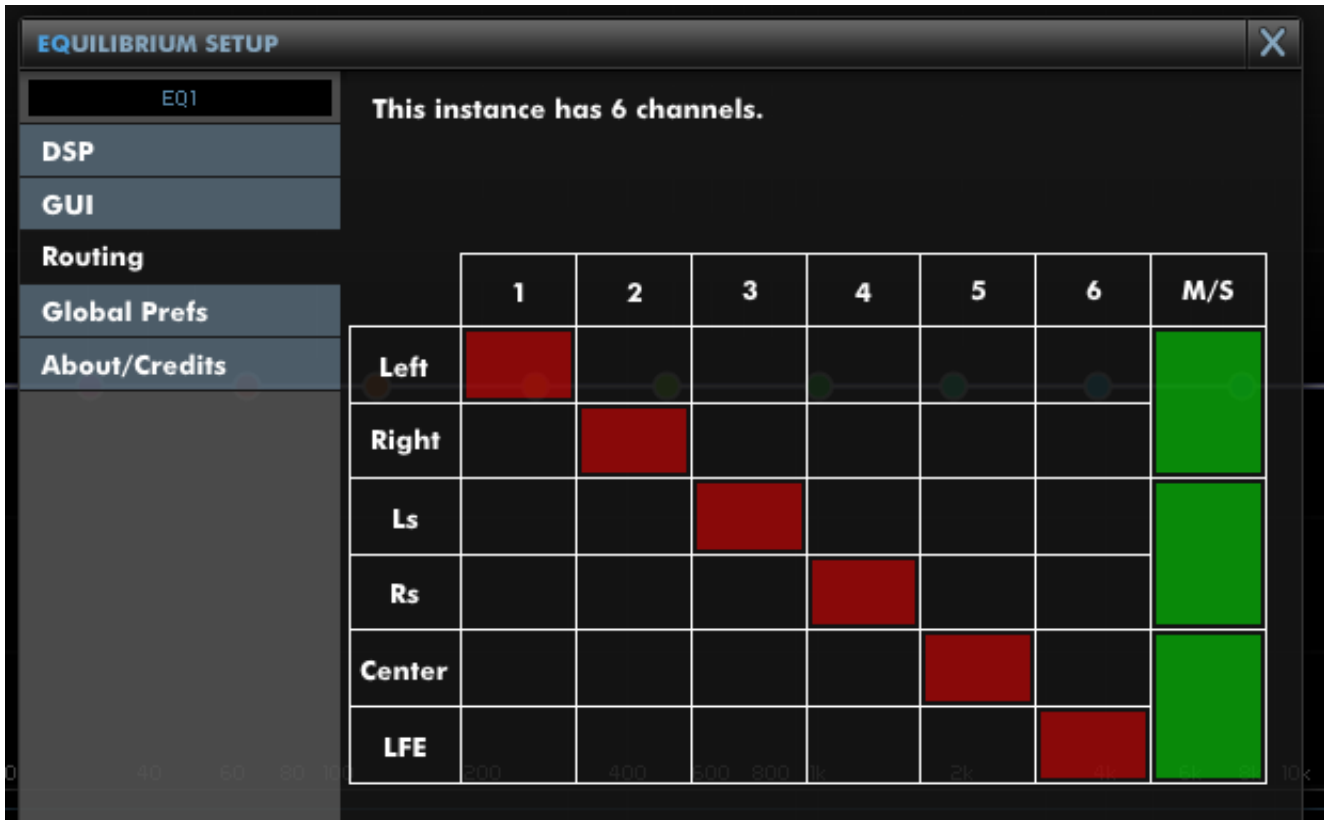
4.3 Routing

4.3.1 Stereo
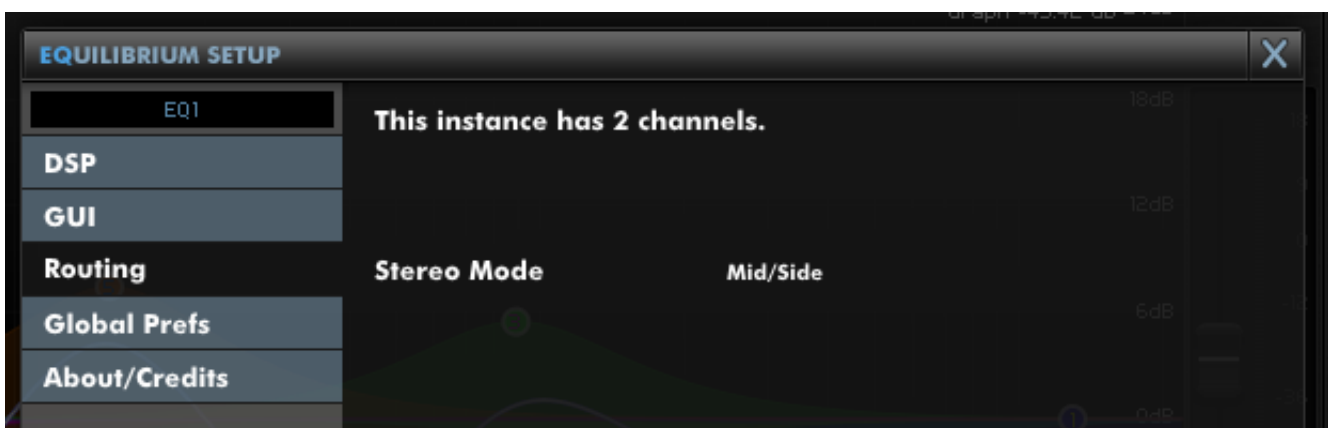
In stereo, this section reports that the instance has found itself inserted on a 2-channel stem, and allows you to select whether you wish to use Mid/Side or Left/Right processing. For joint-stereo work, this setting can be ignored.

4.3.2 Surround

In the surround case, this page allows more sophisticated control.

The matrix allows you to name (by double clicking) a group, and choose which channels should be processed by that group.

Pictured, each group has a default name, and each contains one channel. However, you might choose to group Left, Right and Center (select all boxes in column 1) and rename "1" to "Front". Then, per-band, you can assign a band to process "Front", or disengage that processing.

You can also engage M/S for pairs of channels as presented. So, for instance, if M/S is fully engaged, grouping "Left", "Ls" and "Center" would give you all the Mid channels, and grouping "Right" and "Rs" would give you the Side channels.

4.4   Global Prefs
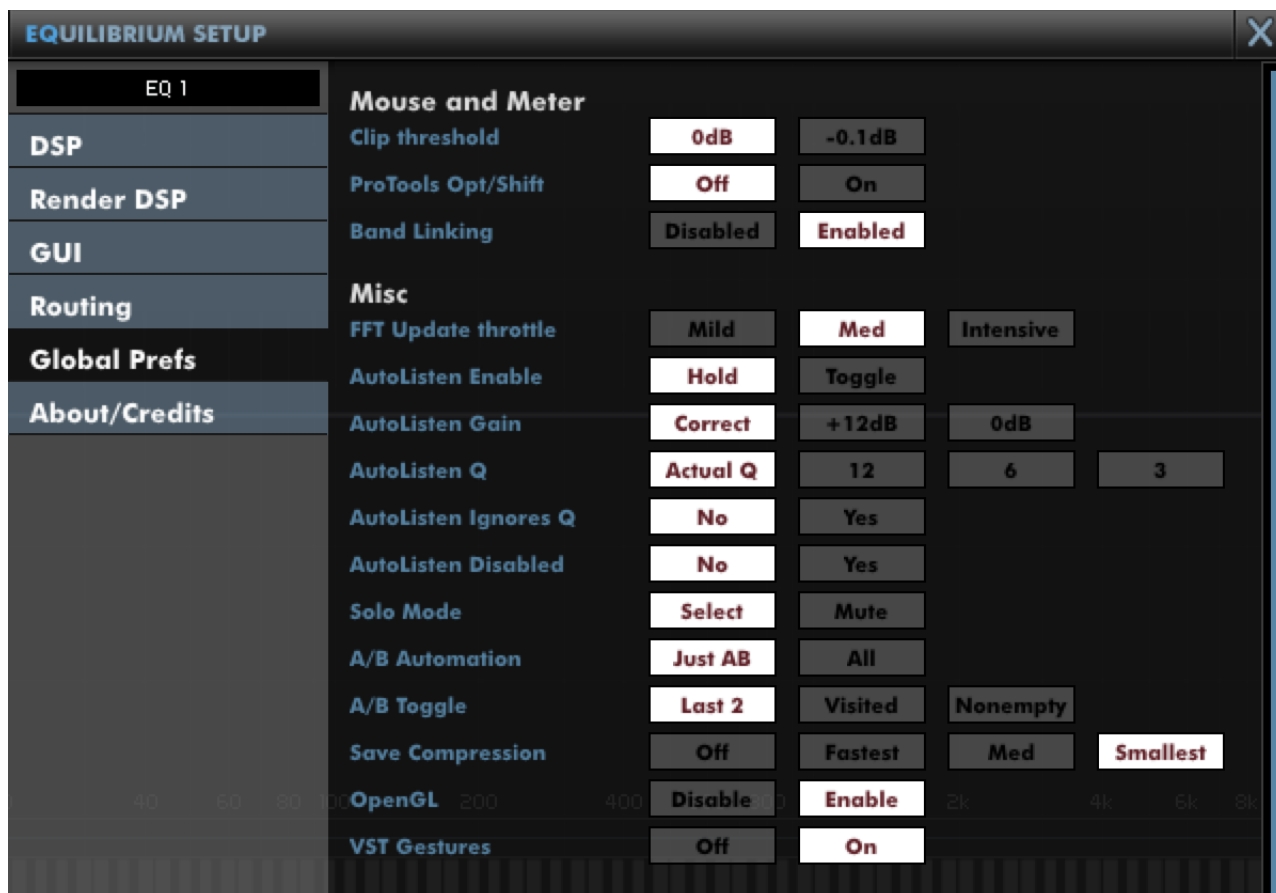
Clip threshold determines whether the top-right Clip LED activates when a signal breaches 0dB or -0.1dB

ProTools Opt/Shift determines whether you expect ProTools style keyboard modifiers (Opt/Alt for reset to default and Apple/Ctrl for fine-adjust).

Band Linking allows you to disable selection of multiple bands, so that every adjustment affects only one band.

FFT Update throttle determines the rate at which Impulse Responses will be computed in response to coefficient changes. Higher values use more CPU, but can feel more responsive to use (though be aware that if your Impulse Response has significant latency, then it is temporally impossible to hear a change before that latency passes).

AutoListen Enable allows you to select whether autolisten engages temporarily or is toggled on and off.

AutoListen Gain allows you to specify whether the AutoListen output level reflects the settings of the band ("correct") or has a fixed value, which may make monitoring easier.

AutoListen Q allows you to choose to hear your actual settings ("correct") or jump to a Q of 12, 6, or 3 to assist with locating frequencies, without needing to adjust the band's Q.

AutoListen Ignores Q will disable AutoListen from engaging in response to an adjustment of a Q value.

AutoListen Disabled allows you to entirely disable the AutoListen functionality.

Solo Mode allows you to select how Solo is implemented: "Select" is the default.

A/B Automation allows you to determine whether changing A/B bank writes full automation to the session, or just records the change of A/B bank.

A/B Toggle allows you to determine how right-clicking the A/B menu cycles through A/B banks. Last 2 visits the last two A/B banks you have visited. Visited allows you to cycle through all A/B banks you've visited so far. Nonempty allows you to cycle through all A/B banks that contain some EQ data.

Save Compression determines how heavily presets will be compressed. "Off" will give fractionally faster saves but bigger session files.

OpenGL on Windows only, allows you to disable OpenGL in case there are compatibility issues with your machine. Toggling this option will require you to close and re-open the UI.

VST Gestures allows you to stop the plugin from sending begin and end edit calls to the host before and after a parameter change. This should not normally be necessary, but if preset changes are slow then try disabling this. Note it is possible this may have an impact on automation.

5 Render DSP
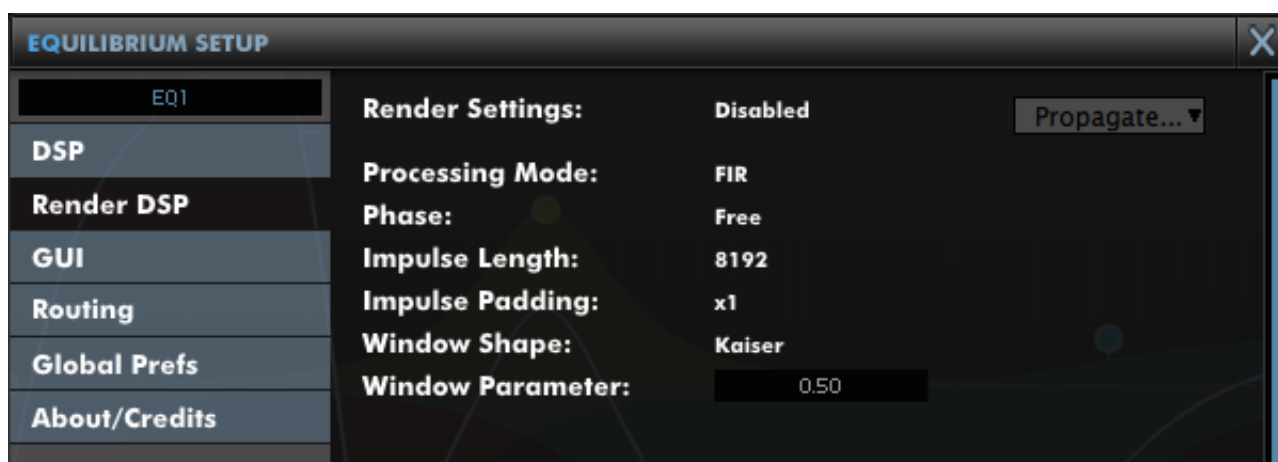
When working, you might want to configure your EQ using a very-low CPU mode, but switch to much higher DSP settings for render. The Render DSP tab allows you to set settings to be used while rendering. The topmost parameter is "Render Settings", which must be enabled for these parameters to be used for a render. The other parameters are duplicates of the controls in the DSP tab. Note that not all hosts support a plug-in changing it's latency for offline rendering. If you experience a small delay in rendered audio then change or disable the offline render settings, or render in realtime.

6 Troubleshooting

6.1 Tips and Tricks

6.1.1 Windows Resource Path

By default, on Windows, the resources (presets and manual) will be installed into Program Files. When installing, the last option onscreen ("resources") determines where they are installed. If you need to install presets elsewhere, you can change this path, to keep presets elsewhere. This is especially useful with Windows 7 and 8 when running as a non-admin user, as it avoids potential

permissions issues.

6.2   Get in touch

If you run into trouble, get in touch! We're here to help, after all!

For technical support, feature requests and general discussion, visit: http://dmgaudio.com/contact.php

Or you can just email us directly at: contact@dmgaudio.com

For support with DMGAudio software, sending email is the way to go. It allows us to be much faster and more responsive, and we try to spend more time answering our emails than hanging out on social media!

For general discussion though, please feel free to drop by on Facebook/Twitter and tell us how you're getting on. We'll be posting news about updates there too - but also do join the DMGAudio mailing list to make sure you never miss out.

[f] http://facebook.com/dmgaudio

[t] http://twitter.com/dmgaudio

Questions about licensing, license transfers and discounts are covered in our FAQ.
Information about version numbers, updates, features and bug fixes is listed under the Specifications tab on the EQuilibrium Product Page.

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