Expurgate

Contents

1 Introduction

1.1 About Expurgate

Expurgate is a fully-featured gate/expander, with all the customary DMGAudio trimmings.

Let's be honest - gates are not the most exciting of processors, but they are hugely useful. So I've tried to make Expurgate as exciting as possible by including a selection of favourite gate designs. We've tried to make it as quick to use as possible by streamlining the interface, and including a flexible sidechain EQ with spectrum analyser. I've made it as gentle on the CPU as possible whilst still sounding fantastic and also including extra options for more demanding applications to invoke more processing power.

The inclusion of a signal/noise detector can make some tasks, like breath gating, extremely quick to get good results with. Adding sub-band processing means you can use it for tonal and dynamic shaping. The sample-accurate MIDI handling is pretty neat for creative uses, as is the distortion characteristic of using extremely low attack and release times when the safety is off.

We're fairly sure this is the most sophisticated and flexible gate around. As we strive for in our designs, it allows you to get the job done quickly and well. And as always, if you want to go deeper, the options are all there.

1.2   System Requirements

1.2.1   Windows

Expurgate works with Windows XP, Vista, 7 and 8, 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

Expurgate requires OSX 10.5 or newer 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.
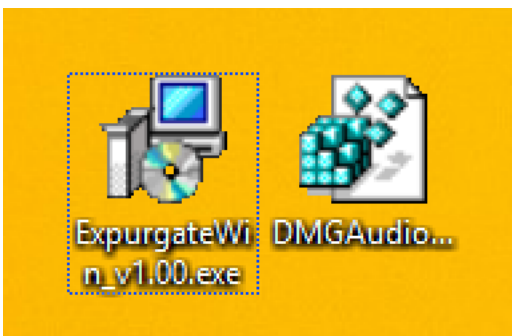
Double-click license.reg, and this box will open:

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 Expurgate is installed! Reload your host, and enjoy!
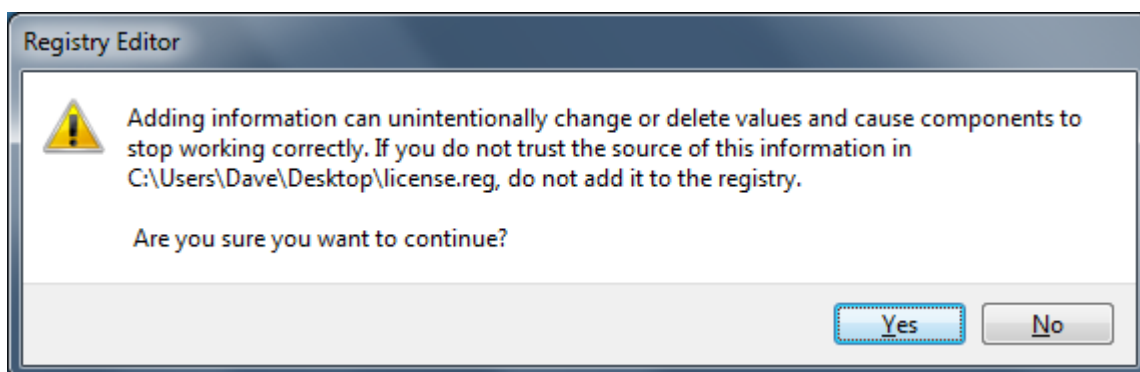
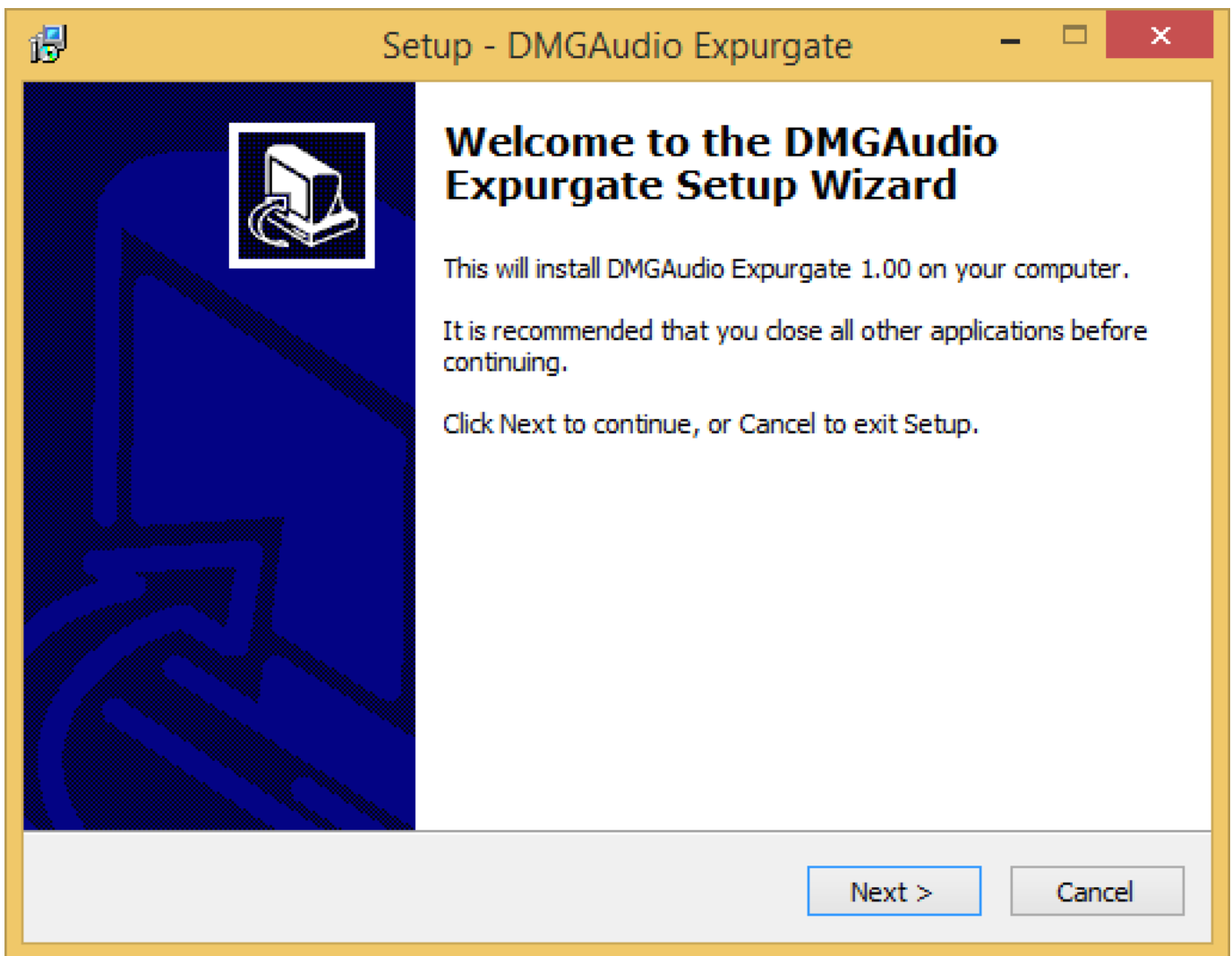### 1.3.2   How to Install on OS X

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:

Name	▲
DMGAudio_Expurgate_license.command	
DMGAudio_Expurgate_license.tar	
ExpurgateMac_v1.00.pkg	
ExpurgateMac_v1.00.zip	
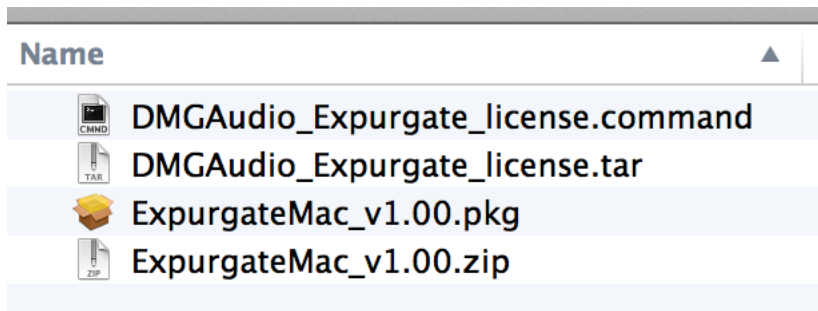
Double-click "license.command" to install the license. The license will install, and you'll get the following message to confirm:
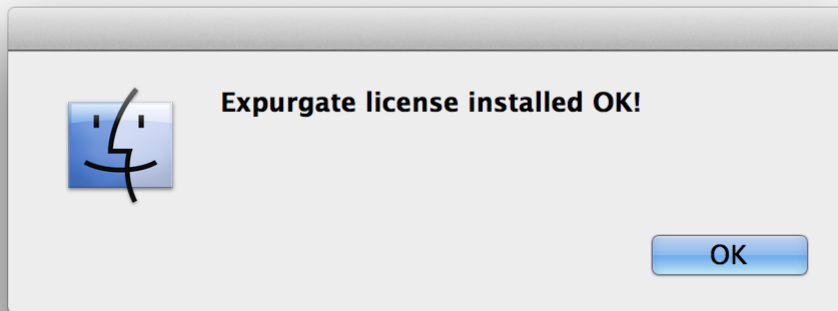
Now double-click the installer, and it will launch. It looks like this:
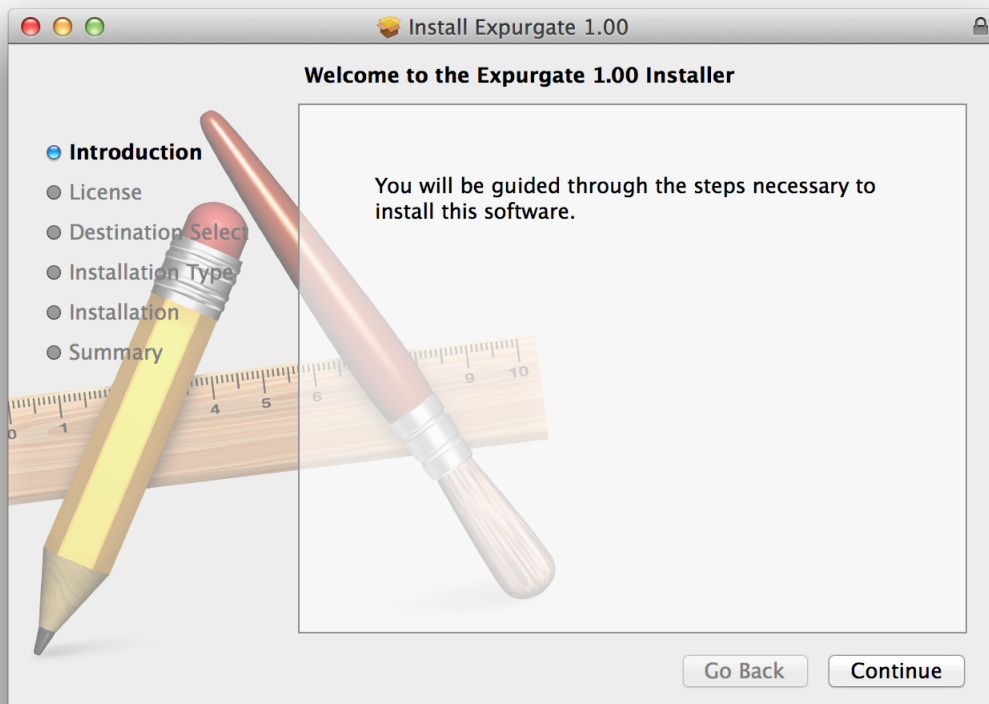
Click through until it installs, and everything is set! Now relaunch your host and enjoy!

2 About Expurgate
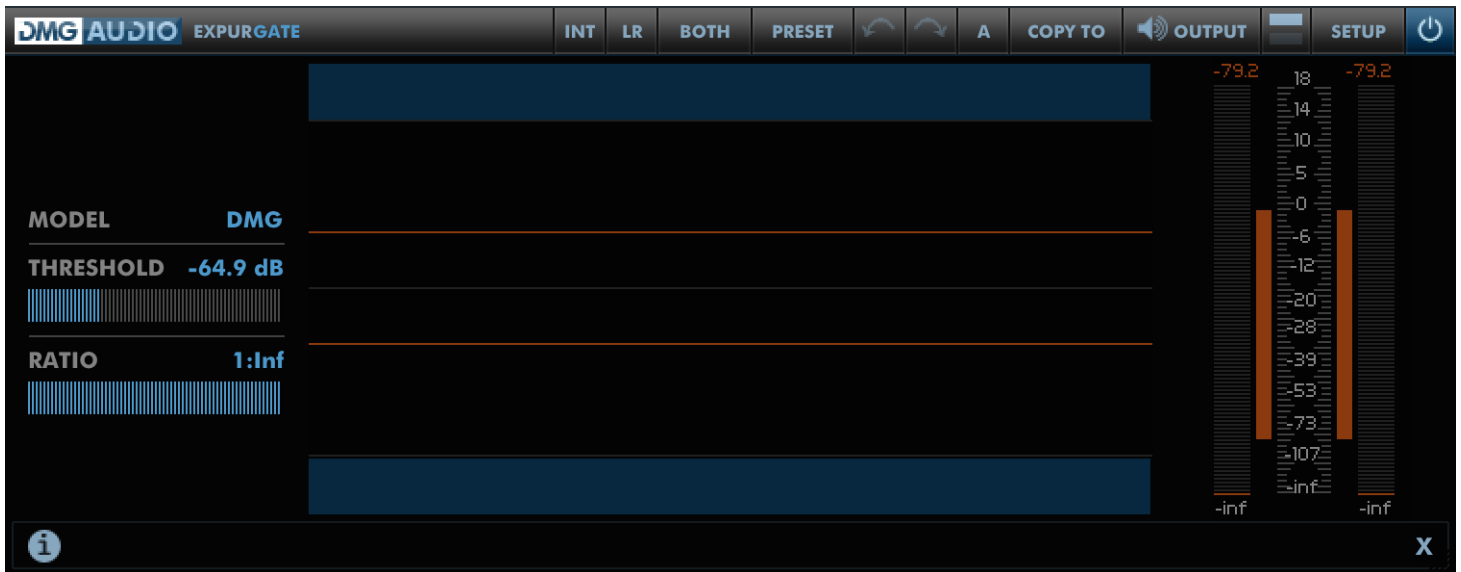
As a rule, your workflow will be: Insert, adjust Threshold, job done. If the processing is too aggressive, reducing the Ratio will give you expansion rather than gating. The job should be over and done within 5 seconds, and that's as it should be. To this end, by default Expurgate opens in the simplified mode shown above, which includes the essential controls, and a time-chart of levels to allow easy calibration of the Threshold.

Presets are accessed using the Preset button, as discussed in the Presets section of the manual.

A/B for parameter settings is accessed from the bar at the top of the screen and allows A-H banks of settings for quick comparison.

To access the fine adjustment controls, click the icon to the left of Setup to show the full UI as shown in Advanced Controls. There's extensive discussion of the advanced functionality of Expurgate throughout the manual. The advanced section offers you a toolbox of controls, and there are further settings for configuration in the Advanced DSP page in the Setup.

You can drag the bottom-right of the UI to resize the plugin UI.

2.1 Block Diagram
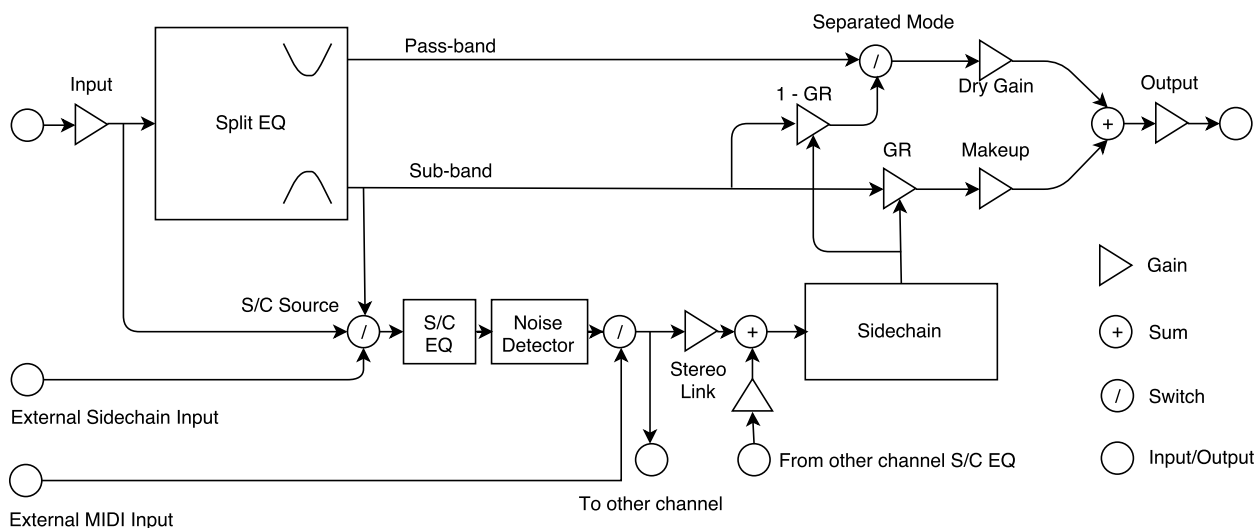
The block diagram shows the signal-flow for each channel. There's also an M/S encoder/decoder that can be engaged around the channels, and a balance control at the end of the signal chain.

In the block diagram, the signal arrives top-left, and is fed into the Split EQ, which separates the signal into the sub-band to be processed and the pass-band. The sub-band has GR applied, and is mixed with either the pass-band or the input to form the output.

Either the input signal or the sub-band can be fed to the Sidechain EQ filters, and then into the Noise Detector. Either the output of the Noise Detector or the MIDI Input is used as input to the Sidechain circuit, which determines how much gain reduction should be applied to the signal.

In Separated Mode, the GR is used to compute the gated signal and its inverse, which can be freely mixed. This functionality is discussed in detail later in the manual.

3 Main Controls
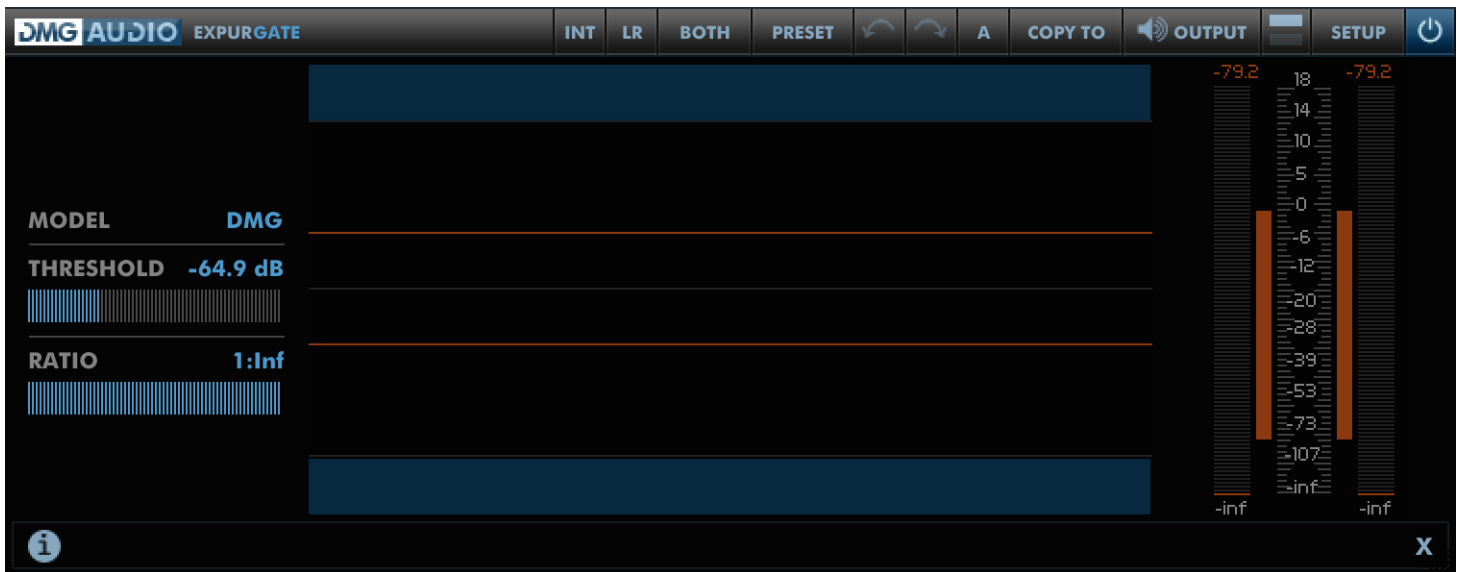
3.1 Controls

The Model menu gives you a list of circuits you might like to use to get the job done. The "DMG" model is a carefully calibrated design taking the best attributes from old analogue circuitry and the improvements we can make in the digital domain (but only where they improve things!).

The "Textbook" model is a very standard design intended to do exactly what you ask with no flourish or tuning. You might find this ideal for MIDI usage, or in replacing standard live-sound gates.

A "Ducker" reduces gain in the presence of sidechain signal; historically used for automatic voiceover to duck music out from under a broadcaster's voice. It's similar in function to a sidechained compressor.

The "Old Digital" model is a very classic digital design. It has unusual Hold and Knee characteristics.

The "Brit Channel" model is probably the most commonly used gate circuit on desk channelstrips. It has a very unusual attack characteristic which you'll hear as a distinctive "analogue" pop on drum transients. It's pretty aggressive, but it gets the job done.

The "Brit Mega" model is another British desk channelstrip gate, probably the second most commonly used. It's much gentler than the "Brit Channel" but certainly no less effective.

The Threshold determines the level of signal below which Expurgate will reduce gain.
The Ratio determines how aggressively Expurgate will act to silence the audio.

You can adjust these controls by dragging the sliders or text values, or by double-clicking the text-values to enter text.
Double-clicking a slider will cause it to jump to where you clicked, and shift-dragging allows fine adjust.

3.2 Time-Series Graph

The Time-series graph shows a scrolling graph of the signal which Expurgate is responding to, alongside a display of the gain reduction at that instant.

The graph is scaled to allow easy reading of levels relative to the Threshold. The red bars on the graph delineate signals above and below the Threshold. The colour of the signal changes to highlight signals that cross the Threshold.

The top half of the graph shows the Left/Mid channel, and the bottom half shows the Right/Side channel.

Dragging the waveform section of the graph will adjust the Threshold level (for both channels, or for the channel dragged), and dragging the GR section will adjust the Ratio level (channel-sensitive as before).

3.3   PPM / GR Meter

The PPM/GR meter shows the output levels of the Left/Right or Mid/Side signals, alongside the gain reduction per-channel. Labels under and above the meter show current signal/gr peak values.

Right/double-clicking the meter switches to a configurable zoomed view, allowing you to zoom in to see fine GR levels.

4   Advanced Controls

4.1 Controls

Each control includes a draggable text-readout that can be double-clicked to allow text-entry.

The **Knee** parameter allows you to configure a soft-knee around the Threshold. This effectively widens the Threshold, so that signals above the Threshold will still receive some gain-reduction, which will increase gently as the level of the signal decreases.

The **Range** or Depth control sets a limit for the amount of gain reduction that Expurgate may apply.

The **Attack** control configures how quickly Expurgate will open and allow audio to pass on detection of a transient. Longer times are more gentle, but can cause Expurgate to open too slowly and soften the start of transients. To allow transients to pass using longer attack times, engage the Lookahead parameter.

The **Release** control specifies how fast Expurgate will reduce gain reduction once a signal that crossed the Threshold has passed. Shorter release times will ensure that more of the audio is attenuated, but may cause Expurgate to close during tails of sounds that you wish to allow to fade out naturally.

The **Hold** control specifies a delay time that will be applied once a transient has passed before Expurgate closes. This can be used to allow shorter release times but still ensure that the ends of words or notes aren't snipped out.

The **Hyst** or Hysteresis parameter is used to prevent a phenomenon known as "chatter" which you may hear with short Hold and Release times on very dynamic material. If Expurgate is rapidly opening and closing (creating a stuttering signal) and you don't wish to adjust timings, you can increase the Hysteresis. This requires that the signal exceeds a high Threshold to allow audio to pass, and a lower Threshold to decide that the signal has passed. The Hysteresis parameter adjusts the distance between the higher and lower Thresholds relative to the Threshold parameter.

The **Lookahead** parameter introduces latency, but allows Expurgate to start opening ahead of time allowing very smooth operation and slow attack times without loss of initial transients.

4.2 EQ Graph

The EQ Graph includes controls for the Sidechain EQ, the Split EQ, and a spectrum analyser. Clicking the Sidechain or Split EQ text above the graph allows quick auditioning of the filtered signal.

The Graph is zoomable using the mousewheel, or the scrollbar at the base. Each circular node on the graph indicates an EQ band that can be adjusted. Moving the pointer over the nodes opens up a tooltip that allows fine configuration of the band.

The Sidechain EQ includes three bands - one peak, a high-pass/low-shelf band and a low-pass/high-shelf band. Switching between filter and shelf is achieved by clicking the LPF/HPF/Shelf text in the tooltip.

4.2.1 Split EQ

The Split EQ is a single band that can be configured to achieve numerous effects. It is not used for basic gating or expansion tasks, but for more creative or subtle applications it can prove invaluable. When engaged, Expurgate will gate the frequency range selected by the filter but leave the rest of the frequency spectrum untouched.

Hovering over the Split node opens up a tooltip, labelled "Split". Immediately to the right is a label for the filter shape, set to either HPF, LPF or BPF. Clicking the filter label opens up a menu which

offers the different Split EQ types.

Coincident BPF

The Coincident BPF comprises a smooth LPF and HPF. The steepness of each edge is configurable and the Q control adjusts the bandwidth between the two edges. The default settings offer a 24dB/oct slope on either edge, which allows for a minimum phase band-pass crossover.

Butterworth BPF

The Butterworth BPF has the same functionality as the Coincident BPF, but with much steeper slopes. This type is excellent for surgical work.

EE BPF

This offers a 12dB/oct adjustable-Q textbook BPF. It can be used to achieve extremely tight Q values.

Coincident LPF/HPF

This offers a low-pass or high-pass coincident filter, with slope between 6 and 192dB/oct. At 24dB/oct, these filters create a Linkwitz-Riley 4th order crossover, which can be used with flat response in Minimum Phase mode.

Butterworth LPF/HPF

This has the same functionality as the Coincident design, but allows much sharper slopes for surgical work.

4.3 Mixer

The Mixer section includes gain controls for all parts of Expurgate. Each gain includes a fader and text value for quick adjustment. The gains allow you to adjust the Input Trim (pre-Threshold), the Makeup-gain (for the gated/expanded signal), the Dry gain (locked muted by default. When Split EQ is used, this controls the pass-band gain. In Separate Mode, this controls the ungated signal), and the Output Trim (after all processing).

Hovering over the label for Makeup, Dry and Output will allow you to click to mute the signal.

The Balance control allows quick adjustment of signal balance, by attenuating one channel or the other.

StereoLink configures whether each channel of the sidechain sees its own signal (at 0%) or whether both channels receive the same signal (at 100%). This control is independent of control-linkage, so both channels can react independently but share controls, or be controlled differently but react to the same input signal, or share input signal and controls, or be used as two independent processors within the same instance.

5 Advanced DSP
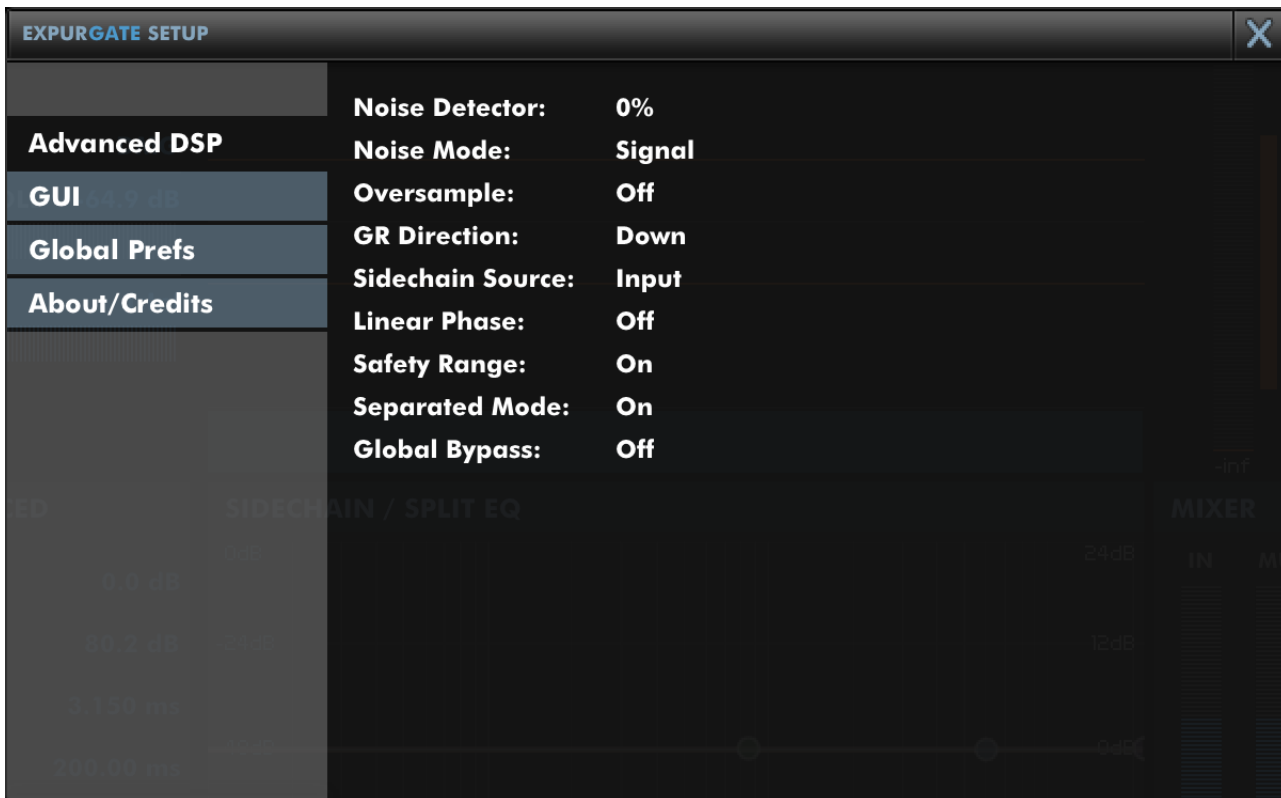
5.1 Global

Noise Detector enables a dedicated sibilance detector which will cause Expurgate to ignore either noise-like or signal-like audio. This can be used to make it very easy to have Expurgate only remove noise from the signal. Try auditioning the sidechain signal (Select Sidechain EQ from the Listen menu) and increasing this parameter. At 0% the Noise Detector is disengaged.

Noise Mode determines whether the Noise Detector should allow Signal or Noise to pass. Typically using Signal allows easy removal of breaths and noise. Using Noise can allow removal of musical elements on percussive recordings.

Oversampling engages a 2x oversampling mode which runs the sidechain at double the session sample rate, to make it more sensitive to inter-sample peaks, and runs the gain-reduction phase at double the session sample rate to prevent aliasing from intermodulation distortion.

GR Direction determines whether Expurgate should reduce gain (Downward: act as a gate/expander) or increase gain (Upwards: act as an upwards compressor, making the noisefloor louder). When engaging upward GR, ensure that the "Range" setting is low, to prevent large unexpected gain spikes. The Mode must be set to "Textbook" or "Ducker", since the hardware modelled never supported upwards compression!

Sidechain Source is set to Split or Input, and determines whether Expurgate responds to the filtered sub-band or to the input signal. In both cases, the sidechain EQ bands are used.

Linear Phase pertains to the use of the Split EQ. When engaged, it uses a linear-phase circuit to separate the signal into the sub-band to compress and everything else. When this is disengaged, a zero-latency minimum-phase circuit is used. Note that for perfect reconstruction with minimum phase filters, you should use a 24 dB/oct Coincident LPF or HPF, which will create a 4th-order Linkwitz-Riley crossover. If more gentle filtering is required, a 6dB/oct can be used. For mastering applications, Linear Phase should always be engaged.

Safety Range limits how fast you can set the Attack and Release times. When Safety Range is engaged, the timings reflect realistic real-world settings. When disengaged, incredibly short Attack and Release times can be used which allow for transient and tonal shaping, but will generally incur some distortion.

Separated Mode is discussed in the Separated Mode section in detail. It splits the signal into the gated signal and its inverse, which when mixed give the original input signal.

Global Bypass will bypass all instances of Expurgate in your session. When ANY instance of Expurgate has this setting engaged, ALL instances of expurgate will flash their Bypass icon in the menu bar to indicate Global Bypass. This allows for easy automation of gate bypass to either lock gates open as a track fades, or for creative uses.

6   Other UI

6.1   The Menu Bar

6.1.1   Ext

Expurgate will accept an external sidechain signal or MIDI input (see your DAW's documentation on how to route to a plugin sidechain, or to route MIDI). Clicking the "Ext" button will open a menu allowing you to select from Internal, External and MIDI sidechain inputs.

6.1.2   LR / MS

This button is used to determine whether Expurgate operates in Mid-Side or Left-Right mode. The current mode is shown on the button and is toggled by clicking.

6.1.3   Both / Left / Right / Mid / Side

When "Both" is shown, both channels (mid, side or left, right) are configured by the same parameters, as shown onscreen. Clicking the "Both" button will change the display to show controls for Mid or Left (in Mid-Side mode and Left-Right mode respectively). Clicking again will toggle to to show controls for Side or Right. To re-link both channels, right-click the button and pick "Relink" and both channels will be controlled with the settings that were on the first (Mid or Left) channel. When channels have been unlinked, the Relink menu also offers options for copying settings from Mid->Side, Side->Mid or Left->Right,Right->Left.

6.1.4   Preset

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

6.1.5   Undo / Redo

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

6.1.6   A / B and Copy To

Expurgate 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.

If you'd like the auditioning process to happen with one click, simply right-click on the A/B button. You can configure (in Global Prefs, A/B Toggle) whether this toggles between the last two settings you visited, or between all visited.

6.1.7 Listen Button

Clicking the Listen button opens a menu to allow you to select a signal to monitor. The options are: Sidechain EQ, Split Filter, Output, Passband (anything outside the split filter which is not being processed) and Difference (which allows you to hear the change that Expurgate is making).

Right-clicking the Listen button allows you to quickly toggle between the last two Listen signals, or to cycle through all options (configured by preference).

6.1.8 Layout Button

Clicking the Layout button allows you to hide or show the Advanced controls.
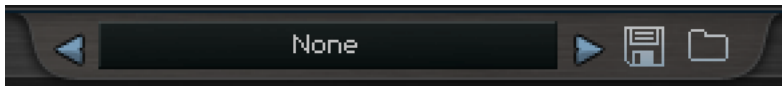
6.1.9 Setup Panel

This opens the Setup Panel, which allows further configuration of Expurgate. See "Preferences and Options".

6.1.10 Bypass

The Bypass button bypasses all processing within Expurgate and routes the input directly to the output.

6.2   Presets

Expurgate includes a set of presets, which you can add to, to build up your library of settings.

By default, on mac they reside at /Library/Application Support/DMGAudio/Expurgate/Presets and on windows, at C:\Users\<you>\Documents and Settings\DMGAudio\Expurgate\Presets You can change the location of the presets on Windows by re-running the installer and changing the "DMGAudio Expurgate resources folder" path during the install.

Saving presets into these folders will allow you to select them from the Preset menu. Don't forget to include these files in your backups.

6.2.1   Previous / Next

These buttons allow you to quickly jump back and forward within the list of presets. They grey out to show you when there's no further to go.

6.2.2   Preset Menu / Name

This shows the Preset name which can be modified with a right-click. Clicking here will open the Preset Menu, which is a multi-level menu of all of the presets you currently have saved. You can arrange this folder to suit your needs, but be aware that installing updates will reinstall the factory set.

6.2.3   Load / Save

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

6.3   MIDI Learn
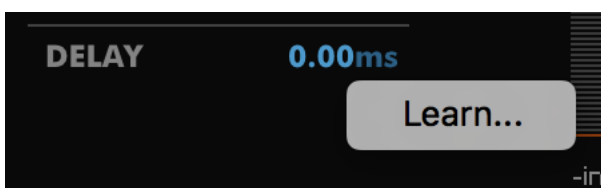
You can right-click (or Ctrl+Click on mac) any control to open the MIDI Learn menu. Selecting "Learn..." will wait for MIDI CC input and bind the control to the first MIDI CC controller received. Parameters are displayed in green to indicate that they have been MIDI Learned. MIDI Learn mappings affect all instances of a plugin and are saved globally, making it easy to map the plugins to your MIDI Controller. Right/Ctrl clicking a Learned parameter displays a menu with information about the mapping and an "Unlearn" option to forget the MIDI mapping.

7 Preferences and Options

7.1 GUI

The settings in GUI are per-instance and can be saved with a preset.
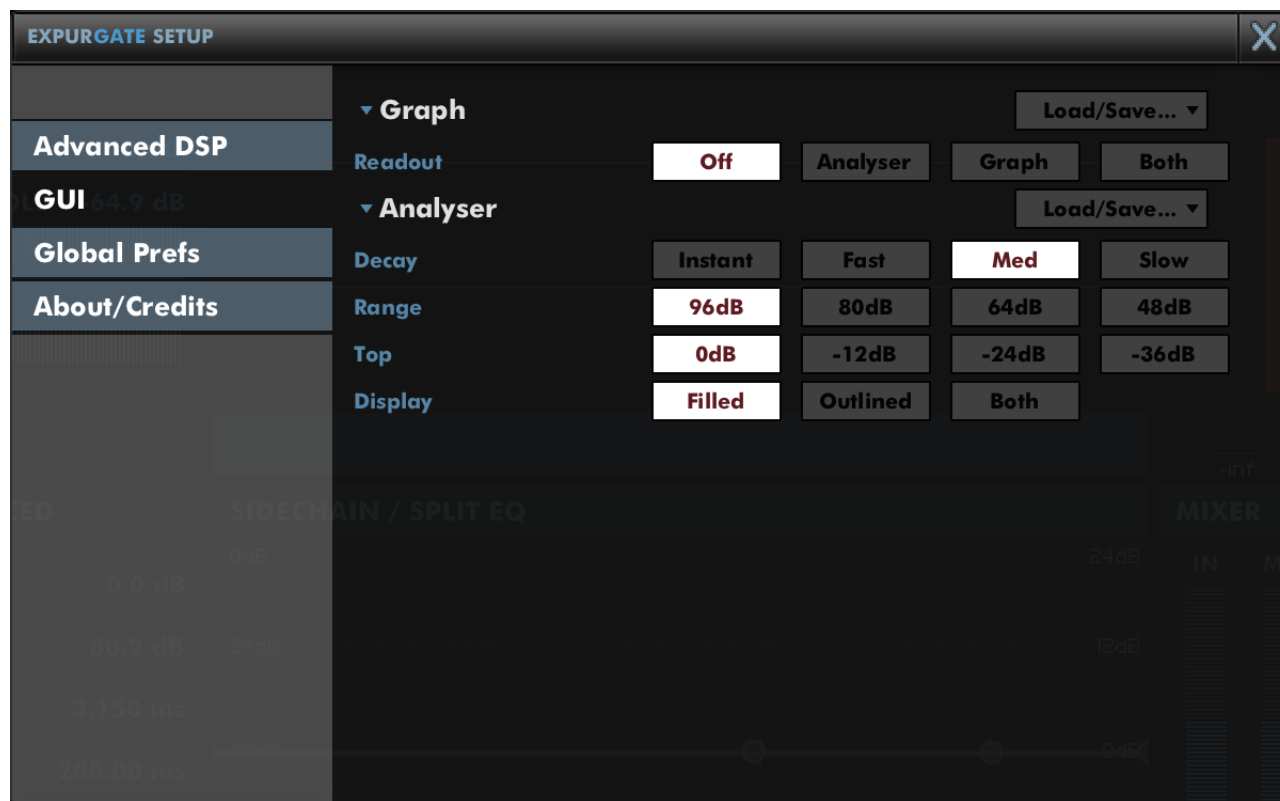
Graph

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

Analyser

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

Range sets the range of the graph in dB.

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

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

7.2 Global Prefs

The settings in Global Prefs are shared between all instances.
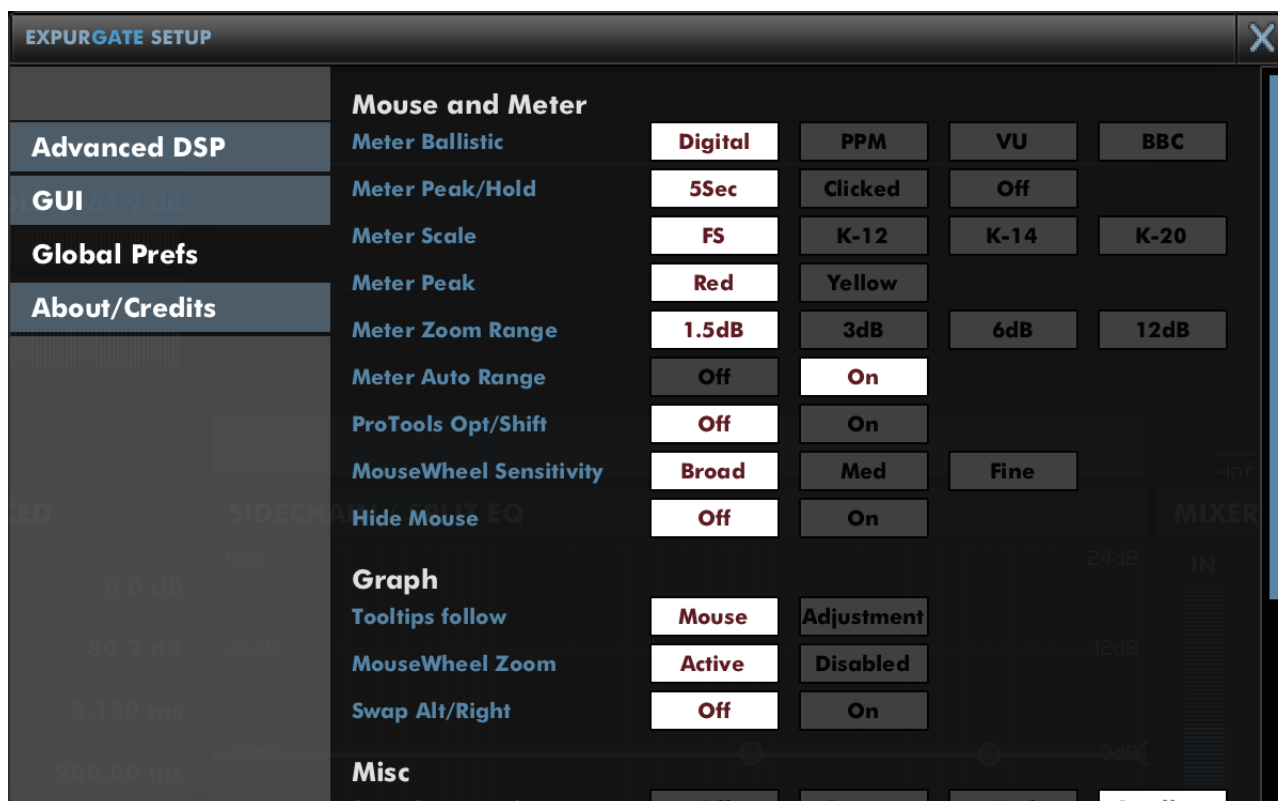
Meter Ballistic allows you to pick the ballistics used by the meters.

Meter Peak/Hold sets the holding behaviour of peaks.

Meter Scale allows configuration of a K-Meter scale for the PPM meter, between the K-12, K-14 and K-20 standards.

Meter Peak is used to select the colour of the peaks shown on the PPM meter.

Meter Zoom Range configures the range shown in PPM zoomed mode (when the meter is double-clicked or right-clicked).

Meter Auto Range allows the PPM meter to zoom out to ensure that GR values can be displayed when in PPM zoomed mode.

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

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.

Advanced DSP

Instance Prefs

Global Prefs

About/Credits

MouseWheel Sensitivity	Broad	Med	Fine
Hide Mouse	Off	On	

Graph

Tooltips follow	Mouse	Adjustment
MouseWheel Zoom	Active	Disabled
Swap Alt/Right	Off	On

Misc

Save Compression	Off	Fastest	Med	Smallest
A/B Toggle	Last 2	Visited	MIDI Learn	
A/B Automation	Just AB	All		
Graph Threshold	Historical	Current		
Listen Toggle	Last 2	Cycle		
Mouseover Help	Off	On		
OpenGL	Disable	Enable		
Save As Default	Save			

Graph

Tooltips follow allows you to choose whether the EQ graph tooltips respond to mouse movement, or adjustments made by a control surface.

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

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

Misc

Save Compression allows you to adjust the degree of compression used when saving state for a preset or within a session. If you want to text-edit presets, or want fastest-possible save times, switch this Off. By default this is set to Smallest to minimise session file sizes.

A/B Toggle allows you to determine how right-clicking the A/B menu cycles through A/B banks. Last 2 swaps between the last two A/B banks you have visited. Visited allows you to cycle through all A/B banks you've visited so far. If you want to assign the A/B bank selector to a MIDI CC parameter, select 'MIDI Learn' and then a right-click on the A/B menu will bring up MIDI learn options.

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.

Graph Threshold By default, the time-graph shows the historical record of the processing. However, it can be useful (particularly for looped audio) to show what processing would have taken place as you adjust the Threshold parameter. Selecting "Current" will use the current Threshold value to allow quick tuning of the setting.

Listen Toggle allows you to determine how right-clicking the Listen menu cycles through options. Last 2 swaps between the last two signals you have auditioned. Cycle will advance through all listen options.

Mouseover Help allows you to hide or reinstate the help display at the base of the plugin window after it has been closed.

OpenGL 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.

Save current state as default is used to save the state of this instance as the state that new instances will have when created.

8   Advanced Topics

8.1   Separated Mode

Suppose you are gating a signal, retaining some elements and rejecting some others. By default the output signal is just the retaining signal. Under some circumstances, this might feel too aggressive, and being able to mix back in the rejected signal would allow you to soften the effect, like a wet-dry blend. Separated Mode provides exactly this.

By default, Separated Mode is disengaged, and the "Dry" fader in the Mixer section is disabled. When you engage Separated Mode (Setup/Advanced DSP), the "Dry" fader is re-enabled, and allows you to mix the rejected signal back in. When both "Dry" and "Makeup" faders are at unity gain, the output is identical to the input.

Some classic live sound gates are designed around the idea of having an internally preset Range setting, but allowing the user to choose a Range by wet/dry blending the gated signal with the input. This method allows you to achieve sharp attack/release curves (using a large Range value) but with a gentler overall degree of reduction.

8.2   MIDI

Expurgate includes a sample-accurate MIDI implementation allowing you to use MIDI note events to trigger opening or closing the gate. The procedure for routing MIDI to the plug-in will be described in your DAW documentation.

Once MIDI is routed in, selecting "MIDI" as the sidechain input, from the leftmost menubar button, will allow you to use MIDI to trigger the gate to open. For best results, use the "Textbook" model to have MIDI notes open the gate and "Ducker" for MIDI notes to close the gate.

Disengaging "Safety Mode" (in Setup/Advanced DSP) will allow extremely short attack and release times, enabling you to sample-accurately slice the input audio according to MIDI notes (typically this would be used without Hold or Lookahead, although creative possibilities exist with both).

Expurgate ignores note numbers and channels, feeding the MIDI data to the sidechain of both channels. The velocity is translated to represent a signal level following the equation $signal_{dB} = 20log_{10}(velocity$ which gives 0dB for a velocity of 127, -6dB for a velocity of 63, -12dB for a velocity of 32.

9   Troubleshooting

9.1   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

y 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 Expurgate Product Page.

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