Sonnox

Oxford Dynamic EQ

Manual

Contents

1 What is dynamic EQ?

Equalisation is the audio engineer's most widely used processing tool. However, the equalisation applied is usually static – it remains the same over time.

This is often undesirable! For example, a presence boost which was appropriate during one section of a performance may become harsh during another section.

The two most common solutions are automation and multi-band dynamics processing. Automation is only convenient when the spectral changes occur over a long period of time, and aren't repetitive. Typical multi-band dynamics processors work to some extent, but with inconvenient downsides.

1.1 Multi-band dynamics vs. dynamic EQ

Multi-band compressors/expanders and dynamic EQs work in a similar way. They both split the input signal into multiple parallel paths. Each path is filtered to restrict its frequency range, then sent into a compressor or expander.

A dynamic EQ applies the gain reduction/expansion to the gain parameter of a parametric equaliser which processes the original input signal.

Multi-band compressor/expanders apply their gain reduction directly to each filtered signal, then combine them to reconstruct the original wide-band input signal.

This reconstruction approach has some downsides:

Static phase shift

When the band-limited signals are combined to reconstruct the input signal, a static phase shift is present at their cross-over point. The band-limiting can be achieved using linear-phase filters, however these incur high latency and can degrade transient response at lower frequencies.

Spectral shape

Multi-band processors typically afford less precise frequency adjustment than a parametric equaliser. If steeper filtes are used to provide greater precision, phase shift at the crossover points increases.

Bands cannot overlap

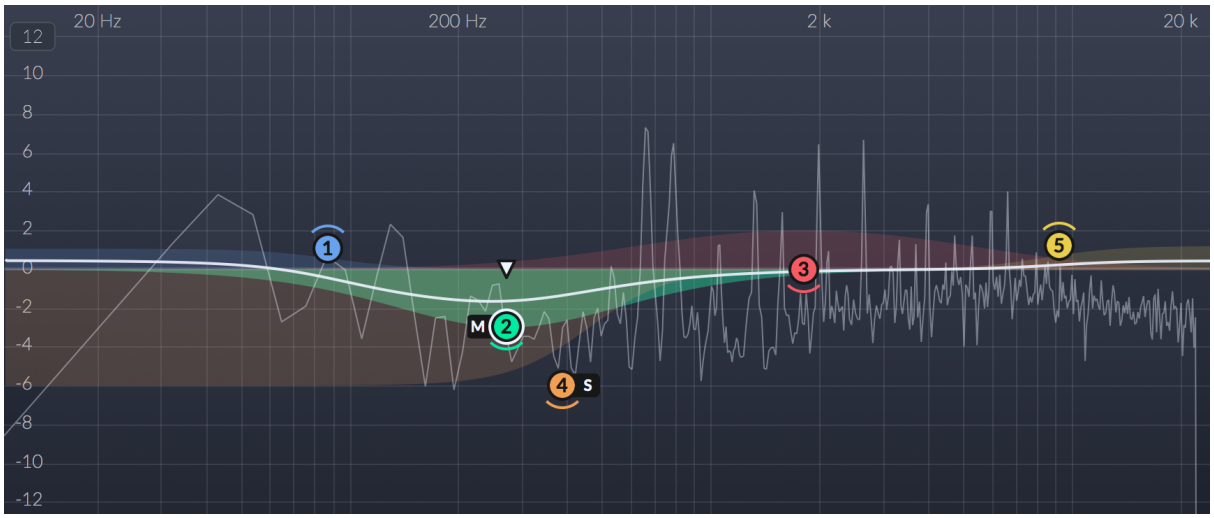
Some multi-band processors get around the phase response issue, but are still left with a problem – the bands cannot be overlapped! This can pose significant problems when a combination of gentle character modification and precise correction is required.

But Multi-band processors do have an advantage over most dynamic EQs. As a boost or cut increases, the width reduces. This is similar to the proportional Q response or gain / Q depenency of many well loved analogue EQ processors.

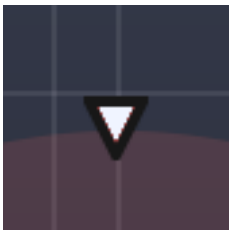
When using an EQ which does not have this gain / Q dependent response, gain changes often require Q changes to maintain the desired effect. Of course, this is highly undesirable if the gain is being modulated dynamically! See Gain-Q Dependency for details.

The Oxford Dynamic EQ combines the benefits of dynamic EQ with the Oxford EQ's Type 3 gain / Q dependency, giving you the best of both!

2 EQ Controls



2.1 Offset Gain



The Offset Gain determines the resting, or static gain of each equaliser section.

2.2 Target Gain

The Target Gain determines the gain which the EQ band will attempt to reach dynamically.

This means that each equaliser section's gain is constrained between these two settings, preventing accidental over-processing which can occur with other dynamic equalisers.

> When multiple EQ sections overlap, their combined response can exceed the range defined by each section's Offset and Target Gain settings.

2.3 EQ Enabled

Enable and Disable all processing for this band.

2.4 EQ Listen

Listen to just the frequency range which will be processed. This can help when fine tuning your EQ settings.

2.5 EQ Channel

Select the output channel to apply this band's EQ to.

You can select to process:

- Stereo (both channels equally)
- Left only
- Right only
- Mid only
- Side only

2.6 EQ Type

Select the EQ type which is applied to the output signal.

The available types are:

- Low Shelf
- Bell
- High Shelf.

2.7 EQ Frequency

Set the centre frequency (Bell EQ type), or corner frequency (Shelf EQ types) for this band.

2.8 EQ Q

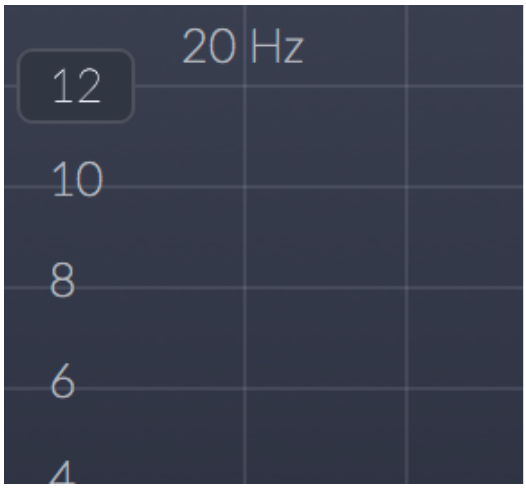
Set the Q (width) of this band's Bell EQ type. The Q control is disabled for the Shelf EQ types.

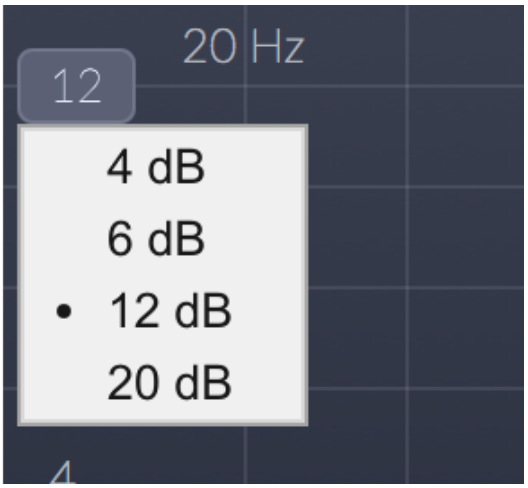
2.9 EQ Colour Fill

Drag up/down to set the Target and Offset Gains, retaining their relative levels.

Drag left/right to set the centre frequency of this band.

2.10 EQ Graph Zoom





Toggle the graph dB scale between -/+4 dB, -/+6 dB, -/+12 dB and -/+20 dB scales.

2.11 FFT Display

This shows the spectrum of the processed output signal. When a Listen button is enabled, it shows the filtered side chain signal.

When used in the UAD Console, the Oxford Dynamic EQ runs in realtime mode. When running in realtime mode, the FFT Display is automatically disabled for maximum efficiency.

3 Side Chain Controls

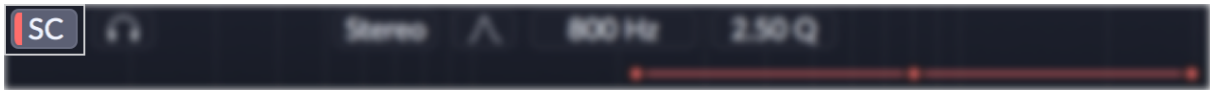
3.1 What is the side chain?

The ‘side chain’ is the signal path which controls the dynamics processor.

The original input signal is copied and filtered to focus on a narrow frequency range. This filtered signal is fed into the band’s dynamics processor, which controls the EQ gain applied by that band.

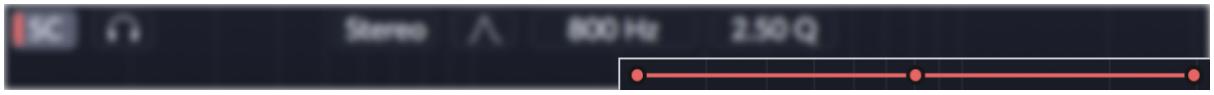
By default the side chain filter matches the EQ band, using the same type, frequency and Q. This provides the easiest way to apply dynamic EQ only when it’s needed.

3.2 SC Enabled



Enable to control the side chain filter independently of the EQ band.

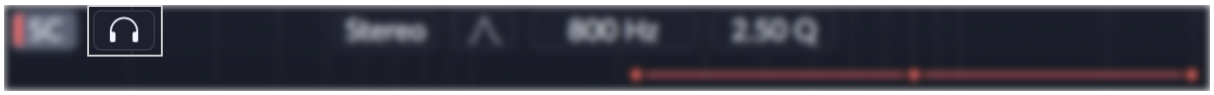
3.3 SC Drag handle



Drag the middle node left/right to set the centre frequency of this side chain filter. Drag the edge nodes left/right to set the Q of this side chain filter.

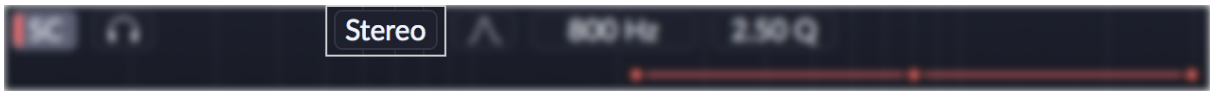
The nodes are greyed out when the side chain is disabled.

3.4 SC Listen



Listen to the side chain signal filtered using the side chain filter settings. This can help when fine tuning the frequency range to react to dynamically.

3.5 SC Channel

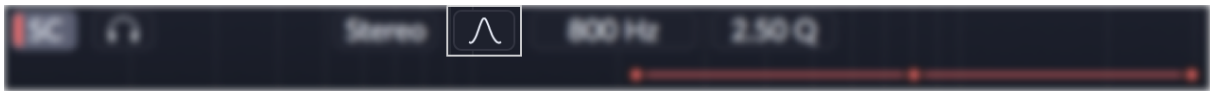


Select the input signal channel to feed into this band's side chain path.

You can select to feed the side chain with:

- Stereo (both channels equally)
- Left only
- Right only
- Mid only
- Side only

3.6 SC Type



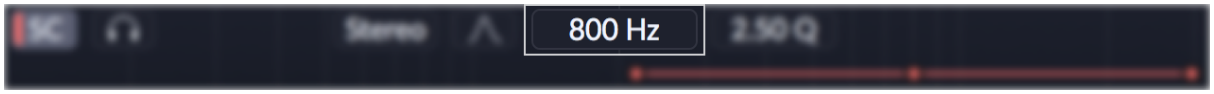
Select the filter type which is applied to this band's side chain signal.

The available types are:

- Low Pass
- Band Pass
- High Pass.

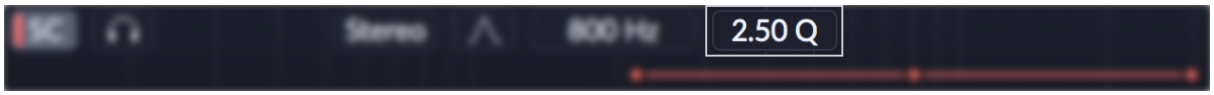
These correspond to an EQ Type of Low Shelf, Bell, and High Shelf respectively.

3.7 SC Frequency



Set the centre frequency (Band Pass filter type), or cutoff frequency (High and Low Pass filter types) of the side chain filter.

3.8 SC Q



Set the Q (width) of the side chain Band Pass filter. The Q control is disabled for the Low Pass and High Pass filter types.

4 Dynamics Controls

Each EQ band is controlled by a powerful dynamics processor, providing upwards and downwards compression and expansion. However, it's not necessary to know the difference between these types of processing. See Trigger for details.

4.1 Detect

Choose Peak to react to overall peak signal level. Choose Onsets to react only to sudden increases in signal level, while ignoring the overall peak level.

Onset detection is useful for reacting to transients, staccato notes and even sibilance!

4.2 Trigger

In Above mode, gain changes dynamically when the signal is above the Threshold. Use Above mode for downwards compression and upwards expansion.

In Below mode, gain changes dynamically when the signal is below the Threshold. Use Below mode for upwards compression and downwards expansion (gating).

> When selecting a Trigger mode, just ask yourself: “Do I want to start applying gain when the signal **rises above** the Threshold, or when the signal **falls below** it?””

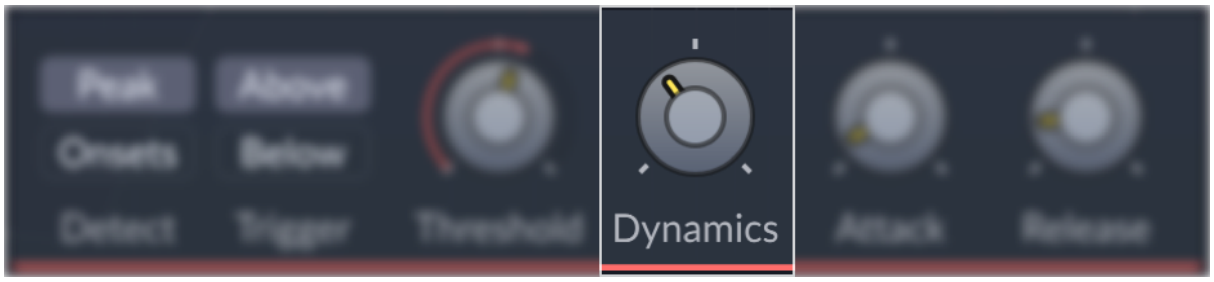
See Dynamic Transfer Function for more details.

4.3 Threshold

Set the level at which the dynamics processing becomes active (depending on the Trigger setting).

This Threshold level is preceded by a 10dB knee to smooth the transition away from the Offset Gain.

4.4 Dynamics



Set how reactive the band's gain is. This is similar to a compressor's ratio control.

At high Dynamics settings, the band's gain is more likely to reach the Target Gain. At 0% the band will stay at the Offset Gain.

4.5 Attack

Set how slowly the band approaches the Target Gain.

4.6 Release

Set how slowly the band recovers to the Offset Gain.

5 Output controls

5.1 Output Trim

Set the output gain of the plug-in to avoid clipping or match the dry and processed signal levels.

6 Tech Notes

6.1 DSP load

In order to conserve as much of your DSP resources as possible, the UAD Oxford Dynamic EQ doesn't use DSP resources for disabled EQ bands.

This means that if there are insufficient DSP resources available when it's inserted, you'll only be able to enable some of the EQ bands. If you would prefer to always know that, once inserted, all EQ bands will be usable, just enable the **DSP Load Lock** option in the UAD Meter & Control Panel's Configuration tab.

6.2 Gain-Q Dependency

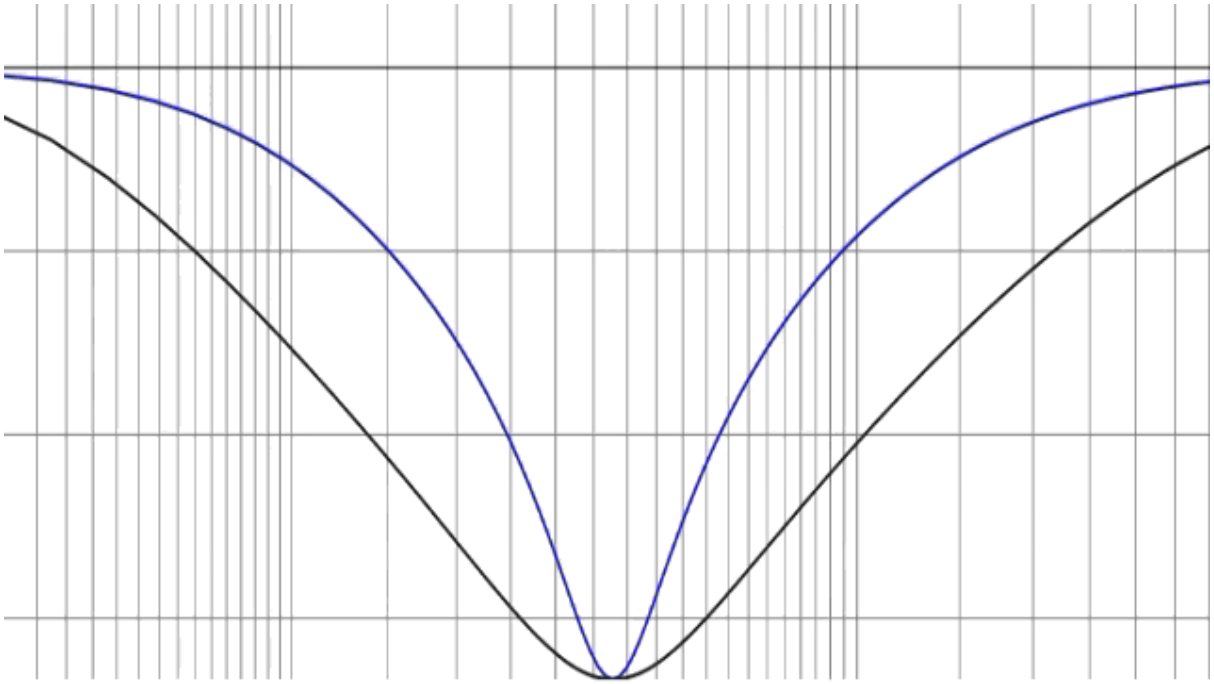
Filters with some amount of gain / Q dependency are sometimes referred to as 'proportional Q filters'. The Oxford Dynamic EQ provides gain / Q dependency which matches the R3 EQ's Type 3 response.

From the Oxford R3 EQ user guide:

> This style of EQ has a moderate amount of gain / Q dependency whereby the Q reduces with gain. This provides the EQ with a softer characteristic as EQ is progressively applied and since the effective bandwidth is increased for low gain settings, it sounds louder and more impressive when used at moderate settings. The gentler Q curve also lends itself better to overall EQ fills and more subtle corrections in instrument and vocal sources. Turning the Gain control seems to produce the effect that the ear is expecting, without needing to adjust the Q control too often. Therefore EQs of this type are often dubbed as 'more musical sounding'.
>
> This EQ most resembles the older and well-loved Neve types, their modern derivatives and the later SSL G Series. Also many of the more popular outboard EQs have this dependency to some extent.

This gain / Q dependency is highly important for a dynamic EQ, where the gain is modulated dynamically. A dynamic EQ with no gain / Q dependency will tend to

sound over-processed or harsh as more gain cut/boost is applied.



Blue

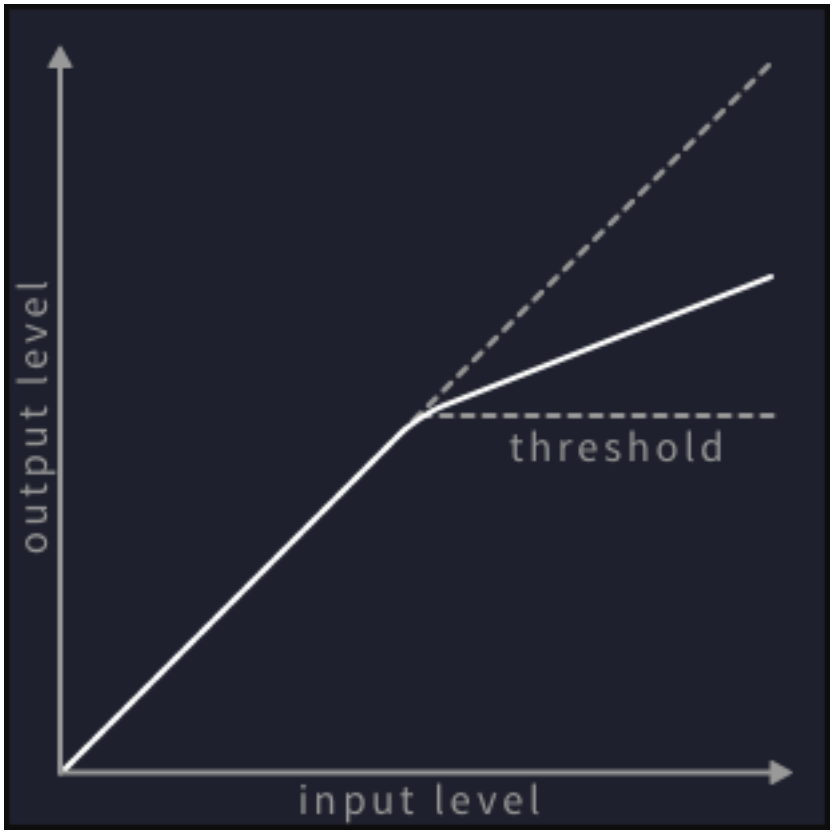
Oxford Dynamic EQ

Black

Standard dynamic EQ

6.3 Dynamic Transfer Function

6.3.1 Downwards Compression

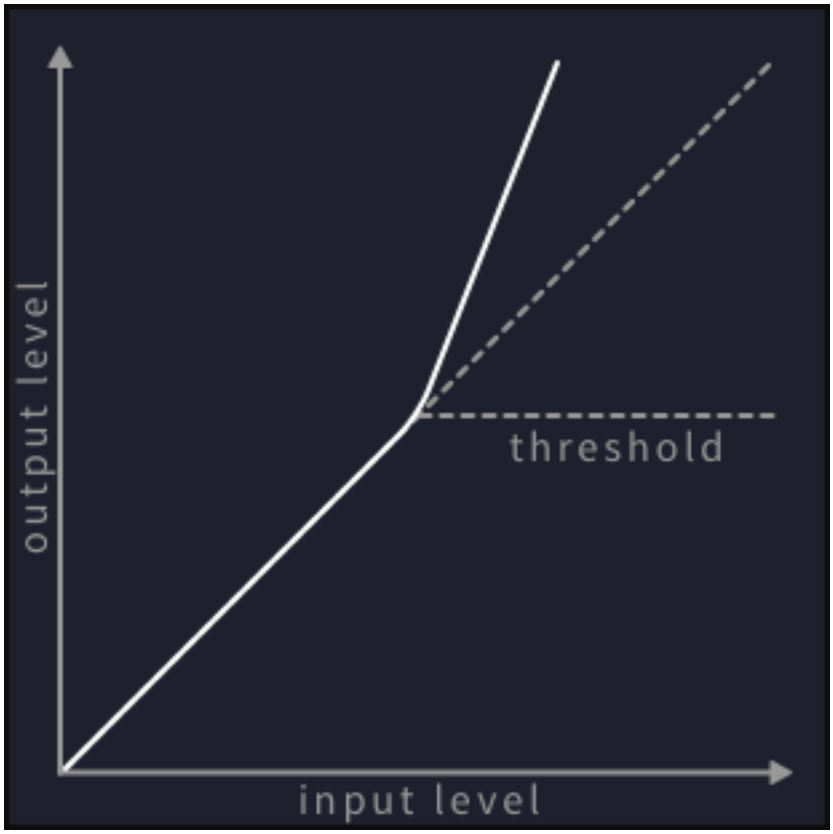


Settings

Trigger **Above**

Target Gain **<** Offset Gain

6.3.2 Upwards Expansion

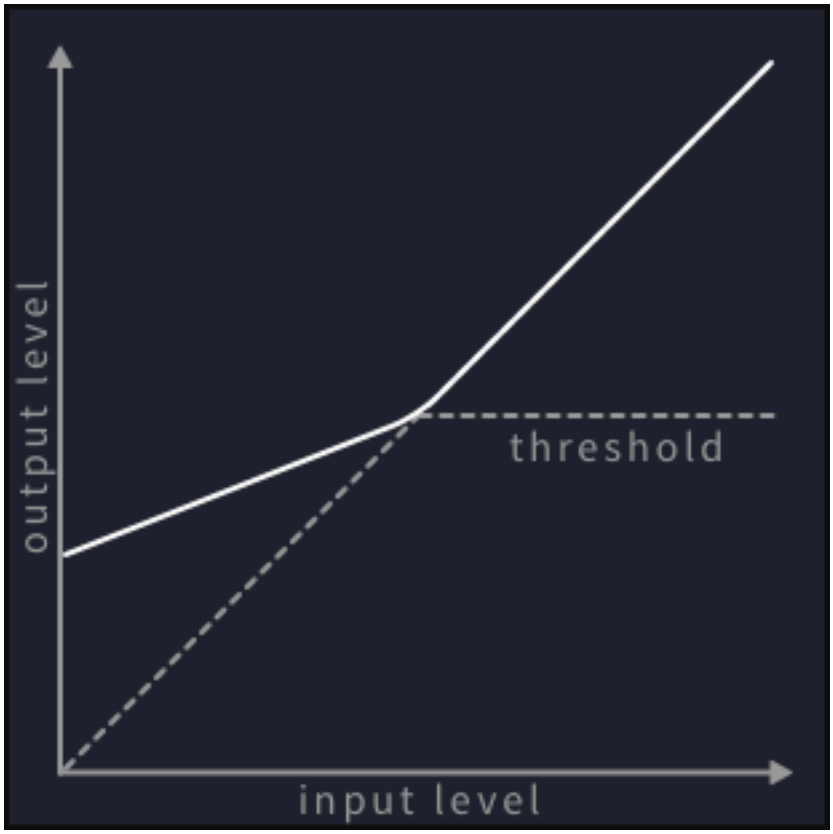


Settings

Trigger **Above**

Target Gain **>** Offset Gain

6.3.3 Upwards Compression



Settings

Trigger **Below**

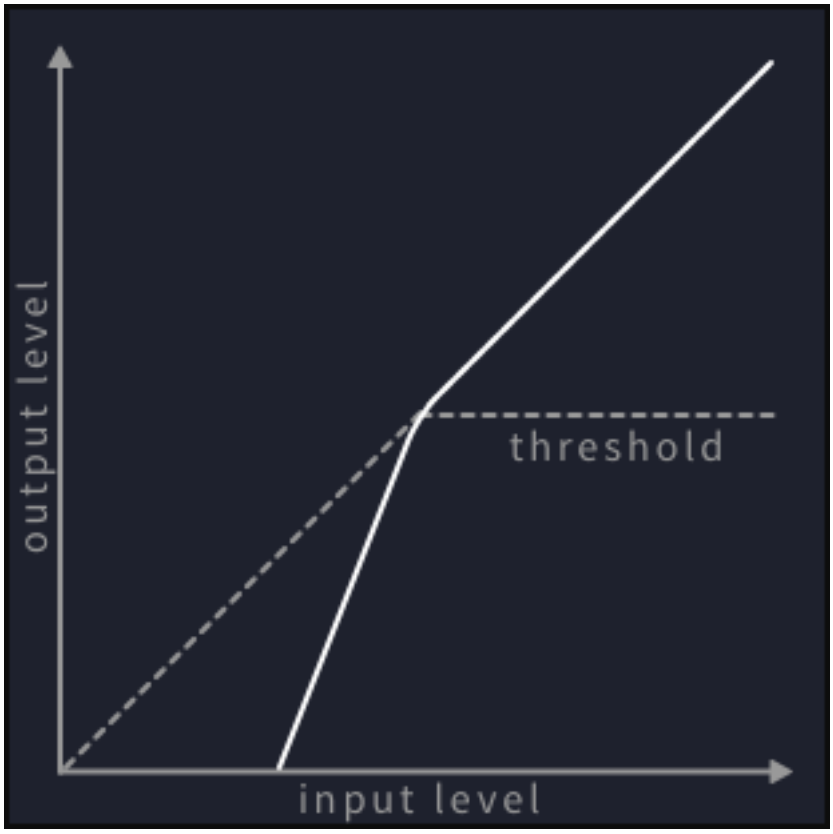
Target Gain **>** Offset Gain

6.3.4 Downwards Expansion

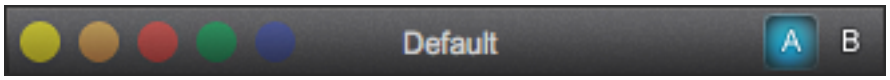
Settings

Trigger **Below**

Target Gain **<** Offset Gain


output level
threshold
input level

7 Preset Manager Toolbar



Sonnox Oxford plug-ins come equipped with their own onboard Preset Manager, which is displayed at the top of the plug-in window. The reasoning behind this is to allow increased portability of your presets across all the host applications, while also providing a consistent and versatile interface. While most host platforms allow creation and loading of presets, those host-created preset files are not portable between different host applications. With the Oxford plug-ins' Preset Manager, you can create a named preset in one host application and load it when using an alternative application.

The Sonnox Preset Manager is fully described in a companion document — Sonnox Toolbar and Preset Manager User Guide — available for download at www.sonnox.com/docs

8 Copyright and Acknowledgements