*ai*XDSP Multi Band Gate User's Guide

Quickstart TL;DR

1. Decide which audio source you want to listen to as the detector: the input audio or the sidechain input.
2. Check the *Key Listen* switch, set the filters to the frequency range you really want to focus on and then uncheck *Key Listen.*
3. In the *Spectrum Display*, set the crossover points to the frequencies at which you want to divide the sound into the three frequency sections of low, mid, and high.
4. Set the *Threshold* control in the *Detector Window*, so that the *Threshold* line is below the peaks you are interested in, but above the level of the background bleed that you want to gate out.
5. Set the individual envelopes in the *Envelopes Window* to make the *Attack*, *Hold* and *Release* for each frequency range as long or as short as you want.

Background

This plugin is designed to address one of the most time consuming, frustrating, and often ultimately unsatisfying parts of a recording engineer's job: dealing with cymbals in tom mics and hi hats in snare mics. For so many cases, this is also a primary reason people end up having to use triggered drum samples in situations where excessive cymbal bleed makes it difficult to get a full sound from the real recorded drums with EQ, compression and other processing.

In cases where you really want to hype the drums through the use of exciters or "harder" sounding reverbs in particular, you often find you may as well just be using the tom mics as auxiliary cymbal mics. You end up having to make a choice between dull but sustained drums, or tonally pleasing but ridiculously short drums that may as well not even have resonant heads on the bottom.

With *ai*XDSP **Multi Band Gate** ("**MBG**"), you can now set the gate timing of each of three frequency bands exactly how you want. You can make the low end of the toms sustain until the cows come home, while allowing only the stick attack portion of the high band to get through. No more cymbal wash, no more cymbal boost . . . just ATTACK and the big *BOOOOooooom* from the bottom!

Further, in addition to the stereo mix output carrying all three bands, **MBG** has three more sets of outputs so that you can send just the lows to a subsynth for instance, the mids to a clipper, and the highs to an exciter!

I had been mocking up this gate in various forms and with various scripts and functions since right before the **REAPER v1** release and had really meant to include it by at the latest **REAPER v2**, but life got in the way. Thankfully, since then technology has come a long way and its now possible to do this much better than I could have dreamed of back then. It took a long time, but finally, here we are!

Basic Operation

A recommended way to use *ai*XDSP **Multi Band Gate** is to first select which source you would like to use to determine when the gate opens and closes. This could be an external signal coming in on the sidechain inputs or, more commonly, it would be the audio input itself. Choose this in the *Detector Window* by checking or unchecking the *Sidechain* checkbox.

Once you have chosen the detector source, check the *Key Listen* checkbox, and then move up to the *Spectrum Display* and set the detector's high pass and low pass filters by dragging the two vertical filter lines. Be sure to really narrow in on EXACTLY what frequency range you want the

gate to respond to. If it's too high in frequency, you may have cymbals opening your gate at the wrong times. Probably best to use a resonant or dominant peak of the particular drum or source you are interested in, but be aware that well tuned drums will often have a LOT of sustain in their resonant peak, so again this may hold the gate open too long. Once this is set, uncheck the *Key Listen* checkbox.

Drag the horizontal *Threshold* line in the *Detector Window* so that it is above the unwanted trigger sources but below the peaks of your desired triggering sources. If your detector source is the drum itself, this would be the peaks showing the actual hits of the desired drum.

Now move up to the *Envelopes Window* and adjust the desired *Attack*, *Hold*, and *Decay* for each drum. Note the display showing you the actual timing envelopes overlayed on the drum waveform in each window. This will be a handy visual indicator for exactly what the timing controls are doing.

The User Interface

The user interface can roughly be divided into three sections, as shown below: The *Spectrum Display*, the *Envelopes Window,* and the *Detector Window*.

Spectrum Display

The *Spectrum Display* shows frequency vs level and divides the frequency content of your signal into three different bands: Low, Mid, and Hi. Here you can also work with general functions, like controlling each band's <u>post</u>-gate gain, and there are facilities for input and output meters and gains as well.
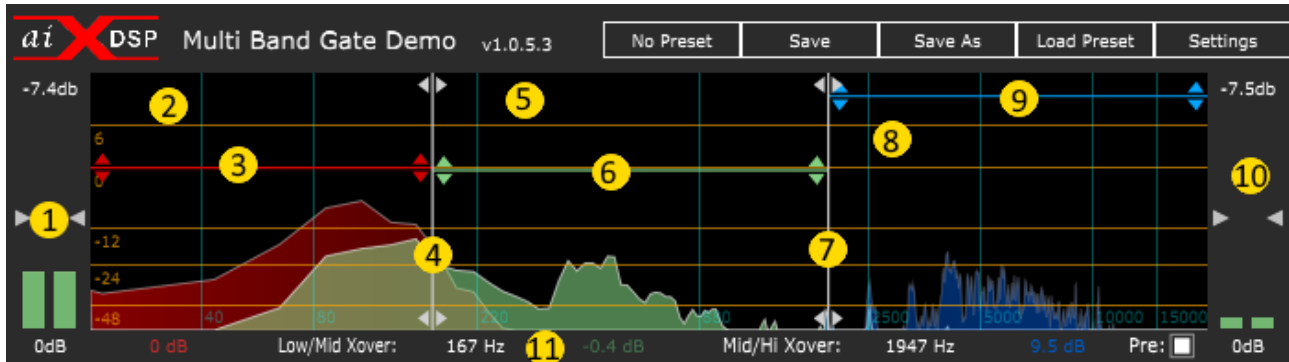
In the picture above, the spectrum display is in its normal mode of operation, and the controls are as follows:

1. Input Meter and input gain control. At the top is a peak reading and an over indicator. At the bottom is the gain amount

2. The Low band

3. Low band gain control bar (post-gate)

4. Low/Mid crossover frequency bar

5. The Mid band

6. Mid band gain contol bar (post-gate)

7. Mid/Hi crossover frequency bar

8. The Hi band

9. Hi band gain contol bar (post-gate)

10. Output Meter and output gain control. At the top is a peak reading and an over indicator. At the bottom is the gain amount (post-gate)

11. Bottom readout bar. From left to right:

    •   Low band gain

    •   Low/Mid crossover frequency

    •   Mid band gain

    •   Mid/Hi crossover frequency

    •   Hi band gain

    •   Pre/Post gate checkbox – if checked, the *Spectrum Display* shows the spectrum of the input audio while, if unchecked, the output spectrum is shown

In this picture, the *Key Listen* switch below the *Detector Window* has been engaged, allowing you to listen to, and monitor the spectrum of, the actual detector signal, whether it is the sidechain or input. Furthermore, you can specify a frequency region of this signal for the detector to listen to. These are the *Key Filters* and the controls are as follows:

1. High pass filter bar – anything below this frequency will be ignored by the detector

2. Low pass filter band – anything above this frequency will be ignored by the detector

Detector Window

The *Detector Window* shows the signal that the noise gate is listening to in order to determine whether to be open or closed. This signal could be the normal input to the plugin or it could be from the sidechain input.

Be sure to note that the detector signal is AFTER the *Key Filters*!

The *Threshold* determines the level above which the gate will open and below which the gate will close. This is THE critical value which will determine just how effectively the entire gate works, so be sure to give it the very most relevant possible signal with as much of the information as you can about the signal you want vs the signal you don't want. For instance, if this signal contains too much cymbal frequency at a level higher than your desired drum, it will be opening at all the wrong times.
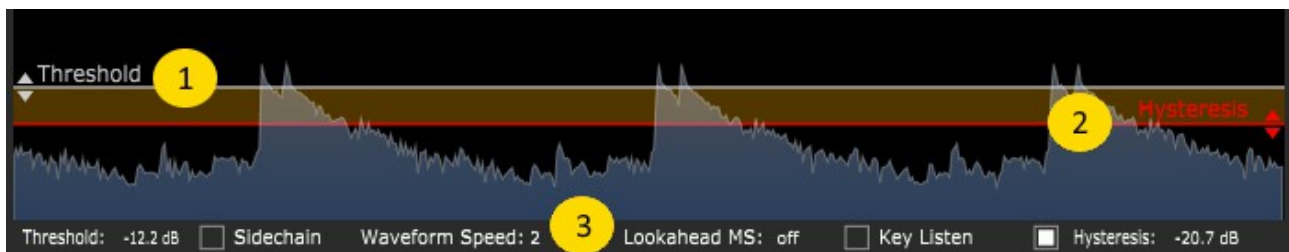
1. The *Threshold* bar – set this below the level of the desired signal's peaks, but above the unwanted bleed

2. the *Hysteresis* bar. *Hysteresis* (if enabled via the checkbox on the bottom row) sets a different OFF threshold than the ON threshold. This will be familiar to users of many guitar noise gates, where it takes quite a bit of energy to open the gate, but it will stay open even with some weaker signals, for instance, to allow a guitar solo's long notes to ring out longer.

3. Bottom readout bar, from left to right:

    •   *Threshold* value

    •   *Sidechain* checkbox – if enabled, the sidechain input (input pins 3 and 4) is sent to the detector, otherwise, the normal input will be the detector source

- *Waveform Speed* – zooms time in or out to make the waveforms easier to see (also sets the speed for the waveforms in the *Envelopes Window*)

- *Lookahead MS*– this opens the gate earlier than the actual detected peak by the specified amount (useful for a variety of creative effects). Be aware that turning this on creates latency. Plugin delay compensation will take care of this in a mix but for a live input this could make some trouble for you!

- *Key Listen* – Switches the *Spectrum Display* to show the Detector spectrum, switches to the key filters and sends the key filters to the plugin's audio outputs for you to audition

- *Hysteresis* checkbox – if checked, enables the Hysteresis control

- Hysteresis value

Envelopes Window

The Envelopes window shows the normal input audio split into the three bands specified in the Spectrum Display with the actual envelope of the gate's activity overlayed as a red curve for the Low band, green curve for the Mid band and a blue curve for the Hi band. Underneath these three windows are the standard noise gate controls of Attack, Hold and Release for each band. At the very bottom of every band are Bypass, Solo and Mute switches.
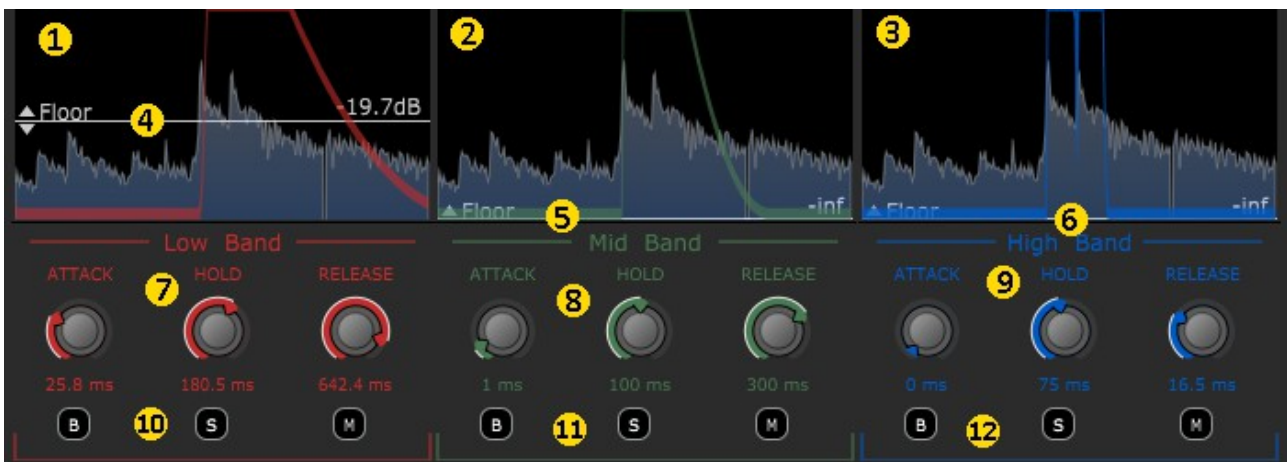
1. *Low Band* windows showing the Low Band waveform and Low Band gate envelope

2. *Mid Band* windows showing the Low Band waveform and Mid Band gate envelope

3. *Hi Band* windows showing the Low Band waveform and Hi Band gate envelope

4. Low Band *Floor* control – This sets the maximum attenuation of the gate effect. -inf is a full gating effect, allowing no sound thru. Any higher value dials in some dry sound for those of you who like expanders, or some background bleed.

5. Mid Band *Floor* control

6. Hi Band *Floor* control

7. Low Band gate controls: *Attack* controls how long after the gate begins to open that the gate becomes fully open. Use this to soften attacks or avoid clicks. *Hold* sets the minimum time the gate will be open before it starts its *Release* phase. *Release* begins once the *Hold* phase is over and is the time it takes before the gate is fully closed again.

8. Mid Band gate controls

9. Hi Band gate controls

10. Low Band **B**ypass, **S**olo and **M**ute switches

11. Mid Band **B**ypass, **S**olo and **M**ute switches

12. Hi Band **B**ypass, **S**olo and **M**ute switches

Signal Flow

```
sidechain        input              crossover
input
   │              │                    │
   │              │                    │
   └───┐      ┌───┘                    │
       ▼      ▼                        │
     detector                          │
     selector                          │
       │                               │
       ▼                               │
     Key                               │
     filters                           │
       │                               │
       ▼                               │
    threshold ─ ─ ─ ─ ─ ─ ─ ─►  low band gate      mid band gate      High band gate
                                and envelope       and envelope       and envelope
                                controls           controls           controls
                                    │                  │                  │
                                    ▼                  ▼                  ▼
                                low band           mid band           high band
                                output gain        output gain        output gain
                                    │                  │                  │
         ▼                          ▼                  ▼                  ▼
      Main out                   Low Out            MidOut             High Out
```