Wave Arts MultiDynamics 7

User Manual

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1.0 Introduction

MultiDynamics is a powerful multi-band dynamics processor useful for mastering, track processing, sound design, and noise reduction. MultiDynamics provides up to 6 bands with independent compression or expansion/gating per band.

MultiDynamics features the following:

- Up to 6 independent bands
- Proprietary crossover filter network eliminates amplitude distortion between bands
- 6 dB/oct, 18 dB/oct, and 30 dB/oct crossover slopes
- Full featured compressor or expander/gate per band
- Clean and vintage compression modes
- Supports external sidechain input and sidechain EQ filter
- Adjustable knees and lookahead
- Zero latency operation when lookahead is off
- Latency compensation
- Per band bypass, solo and mute controls
- Comprehensive visualization of input levels and dynamic EQ response
- Learn function to automatically set band thresholds
- Realtime spectrum display
- Output peak limiter
- Level meters support Peak, Peak & RMS, RMS, and K-system modes

1.1 Overview of interface

Label	Description
1	Menu bar: Bypass, Undo/Redo, Presets, A/B buffers, and Settings.
2	Multiband display with dynamic EQ response and spectrum.
3	Multiband input levels and thresholds.
4	Toolbar with spectrum, dynamics / sidechain EQ mode, bypass, mute, solo, add and delete band.
5	Band parameters, all bands adjustment wheels, and other controls.
6	Information bar showing help tips.

7	Dynamics response plot and band input meter.
8	View popup menu.
9	Level meters and peak limiter.

1.2 What's new in MultiDynamics 7

- All new interface with dark theme.
- Now supports extensive sidechain capability. Each dynamics band can be driven from the input signal or an external sidechain input. You can also specify wide-band or band-filtered signal, or select either the input or external signal filtered by a separate sidechain EQ. Hence you can drive one frequency band based on the signal from another frequency band.
- New Learn feature automatically sets band thresholds to detected peak or RMS levels.
- A peak limiter has been added to the output processing.
- The dynamics gain range has been extended to +/-24 dB, previously +/- 18 dB.
- The input threshold range has been extended to -96 dB, previously -72 dB.
- Input meters and an input gain control have been added.
- User selectable display ranges for dynamics gain and input levels.
- New metering section with options for peak, peak & RMS, RMS, and K-meter systems.
- Realtime spectrum display with many options.
- View options to customize UI look.
- Optional info bar shows help tips for every control and preset.
- Infinite undo/redo per edit buffer.
- Toggle between last two interface sizes.

2.0 User Interface

2.1 Multiband display

Label	Description
1	The green triangle is the Lo Gain control for the band, which sets the gain when the input is **below** the threshold.
2	The bright green line is the dynamic equalization response.
3	The blue triangle is the Hi Gain control for the band, which sets the gain when the input is **above** the threshold.
4	The shaded green region shows the possible range of equalization determined by the Hi and Lo Gain controls.
5	Band edges are shown using vertical white lines. The edges can be moved by clicking and dragging. An entire band can be moved by clicking and dragging in the center area between the top and bottom plots.
6	The currently selected band is highlighted with a blue background.
7	When the spectrum is enabled the spectrum source (input, output, or external sidechain) is displayed in the lower right.

Tips: Holding down SHIFT while dragging the Hi or Lo gains will move both at once.

Tips: if the blue and green arrows are pointing towards each other, the band is compressing. If the arrows are pointing away from each other, the band is expanding.

*Tips: if you Shift-click on a band, this toggles bypass on the **other** bands, allowing you to isolate dynamics processing to the current band. If you Alt/Option-click on a band, this toggles the band solo.*

2.2 Multiband input display

Label	Description
1	The orange ball controls the threshold for each band, drawn with a horizontal orange line. Drag up/down to change threshold.
2	The shaded orange region shows the dynamic input level in each band.

2.3 Toolbar

Control	Description
	Pops up a menu of options for setting the displayed gain range and input range, plus options for the spectrum display.
	Enables/disables the real-time spectrum display.
	Toggle the top display between the dynamics bands and sidechain EQ. If you need to edit the sidechain EQ, switch to SC EQ display and then view/edit the EQ frequency response.
	Enable/disable bypassing of the current band. Bypassing a band means that the dynamics processing is bypassed, hence the audio is passed to the output, but the gain of the band is

	fixed at 0 dB.
	Enable/disable soloing of the current band. Soloing a band causes the other bands to be muted, hence only the soloed band will pass audio.
	Enable/disable muting of the current band. Muting a band causes the band to become silent. Only one band can be soloed, but you can mute multiple bands.
	Create a new band by splitting the current band in two. The new band will inherit all the parameters of the current band.
	Delete the currently selected band.

*Tips: holding Shift while clicking BYP will toggle the bypass on all **other** bands, so only the current band is active. Holding Alt/Option will toggle bypass on **all** bands; this is useful to bypass all dynamics processing while still displaying meters, whereas bypassing the plug-in stops all displays.*

Display options

Option	Description
Gain Range	Sets vertical range of display from -/- 6 dB to +/- 24 dB.
Input Range	Sets displayed input range: 48, 72, or 96 dB.
Source	Spectrum source: input, output, or external sidechain. The "sidechain" option will automatically select input or external sidechain based on SC Mode of current band.
Range	Spectrum vertical display range: 48, 72, or 96 dB.
FFT Length	Fast Fourier transform length in samples. Longer buffers give more frequency resolution but update slower.
Overlap	Sets the number of spectrum updates per buffer, e.g., an overlap of 2 with FFT length of 8192 will calculate a new spectrum every 4096 samples.
Smoothing	Spectral smoothing in octaves.
Decay Limit	Sets the visual spectrum decay in dB/sec.

2.4 View options

The view popup menu has the following options:

Option	Description

View controls	Shows/hides controls and meters. When hidden, the dynamics displays expand to fill the space.
View dynamics response plot	Shows/hides the righthand dynamics response plot.
View info bar	Shows/hides the information bar at the bottom of the window.
Set full view	Hides the controls and dynamics response plot.
Set default view	Shows the controls and dynamics response plot.

2.4 Band parameter controls

Label	Description
1	These six knobs allow the user to change the parameters for the currently selected band. The knob parameters are: lo gain, threshold, hi gain, ratio, attack time, and release time.
2	The “all-bands” wheel controls change the band parameters for all bands simultaneously. Dragging a wheel up/down increases/decreases the parameter in all bands while keeping the relative differences between bands.
3	Press the Learn button to set the band thresholds automatically based on peak levels in each band; the thresholds update continuously while Learn is depressed. Hold Shift to learn RMS levels. The learn bias preference setting is added to the learned levels.
4	Sets the dynamics knee type: hard, medium, or soft.

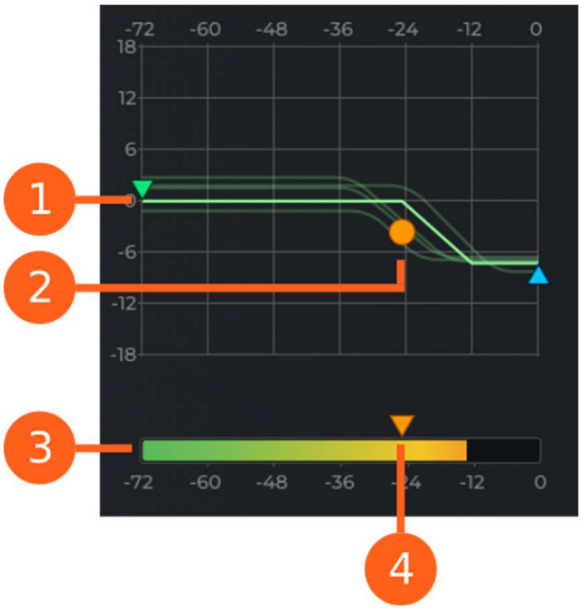
5	Sets the sidechain mode for the current band.

*Tips: holding Shift while dragging a knob changes the control resolution, allowing for fine-tune adjustment. Holding Alt/Option while changing a band parameter forces the parameter change to be applied to **all** bands; this works for knobs and combo boxes.*

*Wheel Tips: Holding Shift switches to fine-tune mode. Double-clicking a wheel sets the default parameter value for all bands, which is a good way to reset all bands to the same value. For the Hi and Lo Gain wheels, holding Alt/Option will adjust both Hi and Lo Gains for **all** bands.*

Learn Tips: when using MultiDynamics for noise reduction, press Learn during a quiet portion of the audio to learn the noise profile. Then use the all bands threshold wheel to raise the thresholds so that all bands remain gated during background noise, or set the learn bias preference.

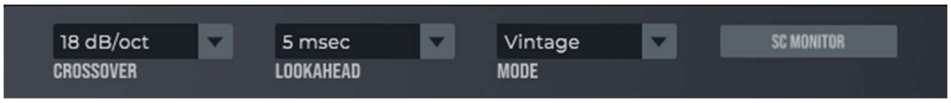
2.5 Dynamics response display



Label	Description
1	The bright green line on the graph shows how the input levels map to gains. This mapping happens before the attack and release time filtering is applied to the gain modulation. The faint green lines show the dynamic response curves for the other bands. The green and blue triangles are the Lo and Hi gains for the current band, drag up/down to change.

2	Drag the orange ball up/down to move both Lo and Hi gains simultaneously. Drag left/right to change the threshold.
3	Input level meter for the current band.
4	The orange triangle shows the input threshold. Drag left/right to change.

2.6 Global parameter section



Parameter	Description
Crossover	The Crossover parameter determines the crossover slope in dB/oct of the bandpass filters. The crossover network in MultiDynamics uses either 1st-order, 3d-order or 5th-order Butterworth bandpass filters. The crossover slope choices are 6 dB/oct (for the 1st-order filters), 18 dB/oct (for the 3d-order filters) or 30 dB/oct (for the 5th-order filters).
Lookahead	Lookahead delays the signals entering the band dynamic processors while the sidechain signals are not delayed, hence the sidechain detectors see the signal before the dynamics processors. This is useful for compressing attacks just in advance of the attack transient, or similarly to open a gate just before an onset in the signal. The same lookahead is used for all bands, and the lookahead affects the latency of the plug-in.
Mode	MultiDynamics has two dynamics modes: clean and vintage. Clean is preferred for gating/expansion, and vintage for compression. The modes are described in more detail below.
SC Monitor	When SC Monitor is enabled, MultiDynamics routes the current band's sidechain signal (post filtering) to the output. This is handy to debug your sidechain setup and verify that an external sidechain signal is getting to the plug-in.

Tips: Use SC Monitor to audition changes to the sidechain EQ. Say you want to isolate a trigger sound using a bandpass filter; set SC mode to internal or external EQ, enable SC Monitor, and adjust the EQ center frequency and bandwidth to narrow in on the sound in question.

2.7 Sidechain EQ controls

When SC EQ is selected, the band display is replaced by the side-chain EQ frequency response, shown below. The EQ is a 6th order filter with 36 dB/oct rolloff slope.

Drag the red control point left-right to adjust the EQ frequency, shift-drag up-down to adjust the width. The same EQ settings apply to both internal sidechain and external sidechain sources.

The EQ controls appear in the global area:

Parameter	Description
Freq	Set the center or cutoff frequency.
Width	Set the width of the bandpass/notch types. Width is measured in octaves relative to the -3 dB points.
Type	Sets the EQ type, either lowpass, highpass, bandpass, or notch.

2.8 Level meters and peak limiter

Label	Description
1	The Limiter button enables the peak limiter, preventing output signals from exceeding -0.1 dB. The meters show the amount of attenuation applied.
2	Input meters and gain control.
3	The hamburger button pops up a menu of metering options, described below.
4	Output meters and gain control. The output gain is applied before the peak limiter, while the meters run after the peak limiter.
5	Peak hold indicators record the maximum value of each meter. Click to reset. SHIFT-click to reset all indicators.

Meter options

Option	Description
Peak	Show peak levels.
Peak & RMS	Show combined peak and RMS levels (shown with a white bar).
K-12	K-system K-12 meters
K-14	K-system K-14 meters
K-20	K-system K-20 meters
Peak Hold	Show peak hold indicator bars on meters.

RMS norm +3 dB	Add +3 dB to RMS meters to comply with AES-17 standard, so that peak and RMS levels of a sine wave are reported the same. This is always enabled with K-meter options.

3. Detailed Description of MultiDynamics

3.1 About multiband dynamics

Multiband dynamics processing combines the techniques of equalization and single band dynamics processing. A multiband dynamics processor can do things that neither an EQ nor a single band dynamics processor can do. However, it is more complicated to use and harder to master.

A simple application of multiband dynamics is to apply compression or expansion to a specific frequency range. For example, you may want to compress the vocals in a mix without affecting the low frequencies (bass, kick drum) or high frequencies (snare, cymbals). A multiband dynamics processor can accomplish this by restricting the frequency range of the compression to the mid-range vocal frequencies.

It is also possible to think of multiband dynamics as providing EQ which is dependent on the level of the input sound. You may want to reduce the level of a high hat, but only when the drums are played softly. This can be accomplished by setting up a high frequency band that decreases gain when the input falls below a threshold (downward expansion). This is more powerful than using a shelving EQ which will change the tonal balance at all levels equally. The multiband dynamics processor can have a flat frequency response at high inputs levels and act like a shelving EQ only at low levels.

Another powerful use of multiband dynamics is noise reduction. One can set up multiple bands to do noise gating, by setting the gain to decrease when the signal falls below threshold. Then the thresholds of each band can be adjusted to be just above the ambient noise level in each band. When the signal in each band is above the ambient noise level, it passes through; when the signal falls near the ambient noise level, it is gated. Multiband dynamics processors, using comparatively wider bands, don’t suffer from the artifacts typical of FFT based noise reducers.

Yet another use for multiband dynamics is to duck music behind dialog. The dialog track is routed to the external sidechain input of a multiband compressor inserted on the music track. The dynamics parameters are configured so that every utterance of dialog causes the compressor to reduce gain. When the utterance ends, the gain is restored. Hence the music track is ducked behind the dialog, allowing better intelligibility of the dialog. Using a multiband processor allows the music to be ducked only in the frequency ranges where there is dialog energy, which makes for a more transparent effect.

Multiband dynamics applied to solo instrument sounds can be used for sound design. It is possible to split up the sound into different frequency ranges,

apply compression to some and expansion to others, and dramatically change the character of the original sound.

3.2 MultiDynamics signal flow

Following is a simplified diagram of MultiDynamics audio routing and meter placement:

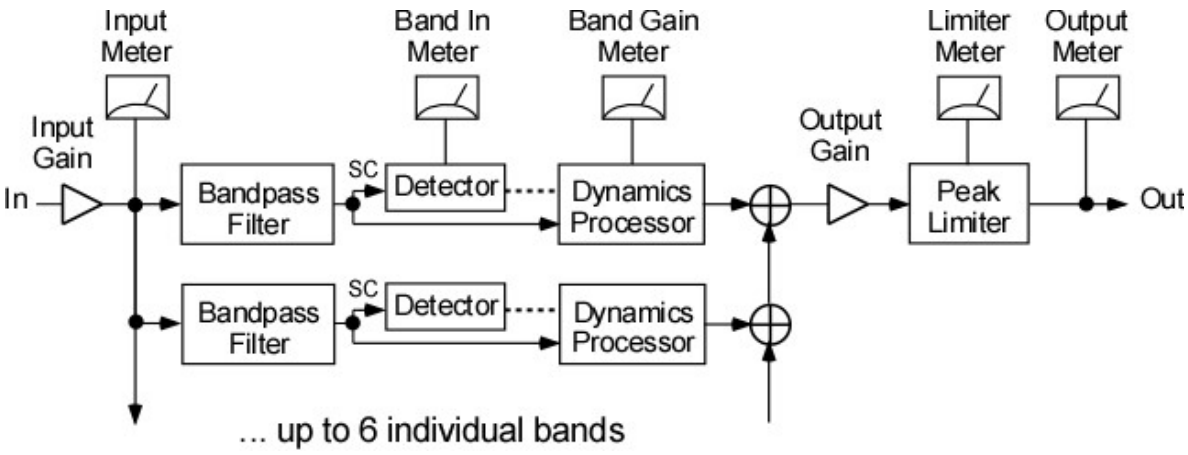


Figure 3.1 Schematic showing MultiDynamics signal flow.

The input signal passes through a set of bandpass filters which separates the signal into individual frequency bands. Each band is processed by a separate level detector and dynamics processor. The resulting band outputs are summed to form the final output which is optionally processed by a peak limiter.

Filter bank

Multidynamics' filter bank is based on allpass filters and has ideal frequency response characteristics, namely, the amplitude frequency response of the summed bands is perfectly flat. However, it does impart phase changes. Using higher order crossovers gives better isolation of the frequency bands at the cost of more phase change between bands. The phase change can be audible, particularly using steeper crossover slopes with closely spaced bands, depending on the input signal.

Tips: you can audition just the filterbank phase response by bypassing all band dynamics (Alt/option-click on BYP), and then bypass/unbypass the plug-in using the power button.

The crossover network in MultiDynamics uses either 1st-order, 3d-order or 5th-order Butterworth bandpass filters. The crossover slope choices are 6

dB/oct (for the 1st-order filters), 18 dB/oct (for the 3d-order filters) or 30 dB/oct (for the 5th-order filters).

Sidechain mode

As diagrammed in Figure 3.1, the sidechain input to each dynamics level detector is typically the same signal processed by the dynamics processor, i.e., the output of the bandpass filter for that band. However, MultiDynamics provides other options for each band's sidechain signal, shown in the figure below:

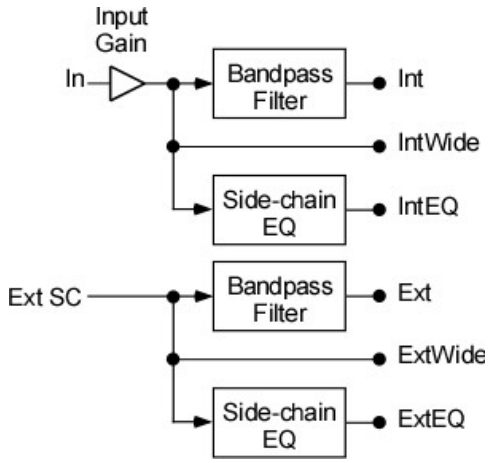


Figure 3.2 Schematic showing the possible sources for each band's sidechain input.

Sidechain mode	Sidechain source
Internal	The output of the bandpass filter for the band, which is the typical situation.
Internal Wide	The wide-band input signal without bandpass filtering.
Internal EQ	The input signal processed through a separate sidechain EQ.
External	The external sidechain signal processed by a bandpass filter. MultiDynamics runs a second filterbank for processing the external sidechain input, this filterbank uses the same set of band-edges and crossover slope as the main filterbank.
External Wide	The external sidechain input without filtering.
External EQ	The external sidechain processed through the sidechain EQ. MultiDynamics runs a second sidechain EQ for processing the external sidechain input, this EQ uses the same parameters as the main sidechain EQ.

3.3 Dynamics controls

Threshold and Ratio

Like traditional dynamics processors, MultiDynamics specifies compression and expansion using threshold and ratio controls. The figure below shows example dynamics response curves for compression and expansion.

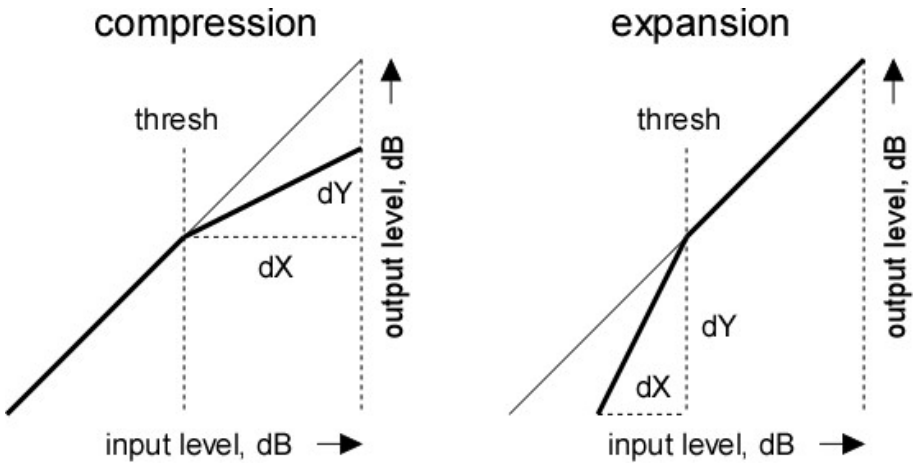


Figure 3.3 Plots of conventional dynamics response curves, compression on left, expansion on right. The response curves map input level to output level; the gain applied is the difference between the y=x line and the response curve.

The response curve is the thick line which shows how the input level on the horizontal axis is mapped to the output level on the vertical axis. Referring to the left-hand figure, compression starts when the input signal exceeds the threshold level. As the signal level increases above threshold the compressor reduces the gain; the attenuation is the difference between the y=x line and the response curve. The ratio defines the slope of the response curve above threshold, but it's actually the **inverse** of the line slope we were taught in high school algebra. A ratio of infinity means the compression line is horizontal, and a ratio of 1 means no compression. The ratio from the above diagram is dX / dY = 2 in the example. Compression ratios are displayed as "ratio : 1" so the compression ratio above is "2 : 1".

Applying more compression by increasing the ratio has the effect of decreasing the amplitude of the output. Compressors typically include a makeup gain control to lift the entire response curve. Some compressors also provide a range control to limit the amount of gain applied.

Referring to the right-hand figure, expansion begins when the input signal falls below threshold. As the signal level decreases, the expander reduces the gain; the attenuation is the difference between the y=x line and the response

curve. The ratio defines the slope of the response curve below threshold, and now the ratio is dY / dX = 2 which does correspond to the line slope. A ratio of infinity means the signal is abruptly cutoff below threshold, and a ratio of 1 means no expansion. Expansion ratios are displayed as "1 : ratio" so in the above example the expansion ratio is "1 : 2".

The underlying principles are quite simple, but the unusual ratio conventions and how they differ between compression and expansion can be confusing. In both cases a ratio of infinity corresponds to the maximum effect, a hard limit in the case of compression and an abrupt cutoff in the case of expansion, while a ratio of 1 has no effect.

MultiDynamics' dynamics response display differs from figure 3.3 because the vertical axis plots the gain rather than the output level. The figure below shows how various expansion and compression ratios would appear in the MultiDynamics dynamics response display.

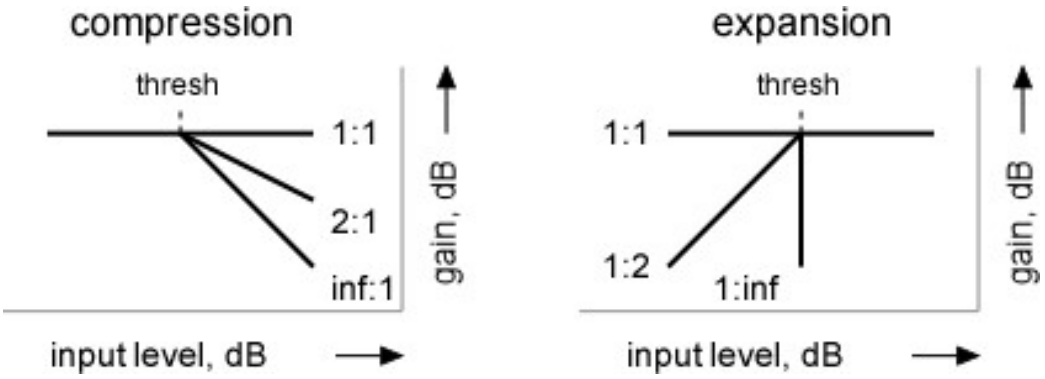


Figure 3.4 Plots of dynamics response curves, compression on left, expansion on right, for different ratios, as displayed by MultiDynamics. The responses gain in dB is on the vertical axis, while the input level in dB is on the horizontal axis.

Lo Gain and Hi Gain

MultiDynamics follows the existing conventions for threshold and ratio, and introduces two gain controls called Lo Gain and Hi Gain. Simply put, Lo Gain is the gain applied to the signal when the signal is below threshold, and Hi Gain is the gain applied when the input signal is above threshold. The slope of the transition from Lo Gain to Hi Gain as the signal passes through the threshold is determined by the ratio control. The Lo Gain and Hi Gain controls provide the same functionality as a makeup gain control and range control; the Lo Gain is essentially the makeup gain, and the difference between Lo Gain and Hi Gain is the range.

A traditional compressor lacking a range control will continue to apply more gain as the signal goes further over threshold, but MultiDynamics will limit

the maximum amount of gain to Hi Gain. Similarly, a traditional expander will continue to apply more attenuation as the signal falls below threshold, while MultiDynamics will limit the maximum attenuation to Lo Gain. Thus the Lo Gain and Hi Gain controls define the maximum range of gains that can be applied to the signal. Both Lo Gain and Hi Gain range from -24 to +24 dB, so the maximum gain change as a signal crosses threshold is +/- 48 dB.

To configure MultiDynamics as a compressor, set the Lo gain higher than the Hi Gain, and the gain will be reduced as the signal increases above threshold. To configure MultiDynamics as an expander, set the Lo gain below the Hi Gain, and the gain will be decreased as the signal decreases below threshold.

Attack and Release Times

When compressing, the attack time determines how quickly the gain decreases in response to a peak, while the release time determines how quickly the gain is restored after the peak has passed. Consider how a compressor responds to a drum hit. With a fast attack time, e.g., 1 msec, the compressor will rapidly decrease the gain once the drum attack transient is detected. After the drum transient passes, the compressor starts to release, increasing the gain during the decay portion of the drum sound. Adjusting the attack time affects the sound of the initial transient, increasing the attack time allows more of the transient to pass through before the compression kicks in. Similarly, adjusting the release time affects the sound of the drum decay. Using a fast release time, e.g., 10 msec, causes the compressor to restore gain quickly after the transient and the original drum decay is largely unaltered. Using a longer release time, e.g., 200 msec, causes the compressor to restore gain slowly which has the effect of lengthening the apparent decay time of the drum. Hence the compressor can alter both the attack transient and decay time of the original drum sound.

When gating/expanding, the roles of the attack and release times are reversed. Now the release time controls how quickly the gain is decreased when the signal falls below threshold, and the attack time controls how quickly the gain is increased. Consider again a drum sound, this time in the presence of background noise which we wish to gate. The threshold is set above the background noise. During the decay of the drum, the drum will fall below threshold, and the expander will kick in, decreasing the gain according to the release time. Here we want to approximately match the release time of the expander to the drum decay time. If the release time is too fast, the expander will abruptly cut off the tails of the drums, if too slow then the background noise will be audible during the drum decay tails. The attack time should be pretty fast, on the order of milliseconds, otherwise the slow fade in will alter the attack of the next drum hit. Selecting a lookahead time equal to the attack time is useful when gating so that the gate opens just in advance of the transient.

The attack and release times used by MultiDynamics are "time constants" which characterize exponential curves. The time constant specifies the time for an exponential curve to go about 63% of the way towards the target value. Additionally, the exponentials are applied to the underlying linear gain factors. The upshot of this is that when you specify an attack or release time, the gain will only change partially to the target gain in the specified time. Trust your ears.

Knee

The knee parameter sets the curvature of the dynamics response when passing through the threshold, which is usually called the "knee" point. A soft knee has a rounded shape, a hard knee has a sharp edge. Each dynamics response in MultiDynamics has two knees, the first knee occurs at the threshold, and the second knee occurs when the gain is limited by the hi or lo gain setting.

Mode

MultiDynamics has two dynamics modes: clean and vintage.

The clean dynamics mode is specially designed to minimize harmonic distortion when compressing tonal input signals. Consider how a traditional compressor processes a low frequency sinusoid. As the amplitude of the sinusoid increases past the threshold, the compressor attenuates, flattening the top of the sinusoid, and thus adding odd harmonic distortion. The Wave Arts clean dynamics mode avoids this situation by updating its estimate of the signal level after every period of the input signal. For the case of a sinusoidal input, the clean compression mode will see a purely constant input level, and will apply a constant gain in response. Hence, harmonic distortion is avoided. Clean mode should not be used for "transient shaping" or "low end fattening," because it is specifically designed to retain transients and to avoid distortion of low frequency tones. Clean mode is excellent for gentle compression of material, and is also the preferred mode for gating/expansion to avoid distortion when the gate is open.

The vintage compression mode works just like a traditional analog compressor; the signal level is estimated and gain applied on a sample by sample basis. With fast attack and release times it will compress individual waveforms and create rich overtones. With less aggressive settings it sounds like a very nice traditional compressor.

3.4 Parameters

This section describes all the internal parameters of MultiDynamics as would be displayed by a generic parameter-value plug-in interface. Most of these have a one-to-one correspondence with controls on the user interface.

Band parameters

Parameter name	Values
Band Enable	0 = Off, 1 = Mute, 2 = On, 3 = Solo
Band Hi	20 Hz – 20 kHz
Band DynEnable	0 = Off, 1 = On
Band Thresh	-96 to 0 dB
Band LoGain	-24 to +24 dB
Band HiGain	-24 to +24 dB
Band Ratio	1 to 50
Band Knee	0 = Soft, 1 = Medium, 2 = Hard
Band Att	0.1 to 1000 msec
Band Rel	1 to 2000 msec
Band SC	0 = Internal, 1 = Internal Wide, 2 = Internal EQ, 3 = External, 4 = External Wide, 5 = External EQ

In the above parameter names, "Band" will display as "Band1" through "Band6" for the six frequency bands. If there are N enabled bands, these must occupy bands 1 through N.

The BandHi param of the highest enabled band is ignored, the highest band always extends to 20 kHz, or more precisely to the Nyquist frequency for the current sampling rate.

Global parameters

Parameter name	Values
Bypass	0 = Off, 1 = On
Input Gain	-18 to +18 dB
Output Gain	-18 to +18 dB
Lookahead Delay	0 = Off, 1 = 1 msec, 2 = 2 msec, 3 = 5 msec
Crossover Slope	0 = 6 dB/oct, 1 = 18 dB/oct, 2 = 30 dB/oct
Dyn Mode	0 = Clean, 1 = Vintage
SC Monitor	0 = Off, 1 = monitor Band1, 2 = monitor Band2, etc.

SC EQ Type	0 = LowPass, 1 = HighPass, 2 = Notch, 3 = BandPass
SC EQ Freq	20 Hz - 20 kHz
SC EQ Width	0.01 – 4 octaves
Limiter Enable	0 = Off, 1 = On
Limiter Ceiling	-6 dB to -0.1 dB

3.5 Latency

When lookahead is set to Off and the limiter is Off, MultiDynamics runs without any latency. The limiter, when enabled, adds 3 msec of latency. The lookahead adds the same latency as the lookahead setting. So the total latency is the lookahead plus an extra 3 msec if the limiter is enabled.

4. Installation and Registration

4.1 Installation

Installers for MultiDynamics are found on the downloads page of the Wave Arts website. There are separate installers for Mac and Windows. Mac installers are ".dmg" files which after downloading will expand into a ".pkg" installer file; double-click on the ".pkg" file to launch the installer. Windows installers are ".exe" files; double-click on the ".exe" file to launch the installer. The installers provide various options for selecting which plug-in formats to install and whether to use Pace/iLok or Wave Arts licensing.

4.2 Registration

We support two licensing methods – Wave Arts licensing and PACE/iLok. When installing the plug-ins you must select which version of the plug-ins you wish to use. When you purchase a plug-in, you will be e-mailed a serial number (looks like WA-PPP-XXXX-XXXX where PPP is a product code and X is a hex digit). Use the serial number to unlock the plug-in as described below.

4.3 Wave Arts licensing

Prior to registration, the plug-ins operate in demonstration mode; they are fully functional but stop operating after 30 days. To unlock the plug-in after purchasing, open the plug-in, select the Tools->Register option, and enter your name, email address, and serial number. The plug-in will contact our registration server and download a license file which will unlock the plug-in. You should see a message saying your registration was successful.

If your computer is not connected to the internet, use the Tools->Offline Register option and follow the instructions to generate a keyfile at our website registration page and import the keyfile.

If you have purchased a plug-in suite, when you unlock any one of the plug-ins within the suite, the entire suite will be unlocked.

4.4 PACE/iLok licensing

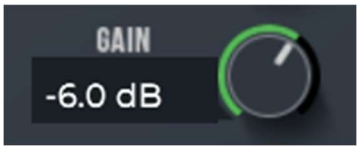
All our plug-ins support PACE/iLok. Prior to activation, the plug-ins will allow you to start a 30-day trial by creating an iLok account. To unlock the plug-in after purchasing, go to our Product Registration page, select "PACE/iLok", and enter your serial number. A PACE redeem code (looks like XXXX-XXXX-

XXXX-XXXX-XXXX-XXXX-XXXX-XX) will be displayed and also emailed to you. There are two ways to redeem the code and generate a license. When opening the plug-in a dialog window will appear and give you the option to Activate the plug-in, you can paste the PACE redeem code there, and proceed to create or login to an iLok account and then transfer the license to an iLok or your machine. Otherwise, go to http://www.ilok.com, create an iLok account, and download and install the iLok License Manager. Within the manager, under the Licenses menu, select "Redeem Activation Code" and paste your redeem code. Then transfer the license to either an iLok dongle or your machine. The plug-in will run only if it can find a license on an iLok or the machine.

When purchasing a plug-in suite, the redeem code will generate multiple licenses, one per plug-in in the suite, but the licenses are grouped together.

5. Plug-in Control Operation

5.1 Knobs



Please refer to the following guide for information about the various ways you can use knobs:

Function	Mac	Windows
Increase/Decrease a parameter value (rotate clockwise/counterclockwise)	Click on the knob + drag up/down -or- Mousewheel	Click on the knob + drag up/down -or- Mousewheel
Fine adjustment — increase/decrease	Shift + click + drag up/down -or- Command + click + drag up/down	Right click + drag up/down -or- Shift + click + drag up/down -or- Control + click + drag up/down
Reset knob to default value	Double-click	Double-click

By default knobs follow up/down mouse motion, but this can be changed in the preferences settings.

5.2 Text Entry

Many value displays are editable text. A text field is editable if your mouse cursor changes to an I-beam when moved over the text. Following is a table that fully describes how to use the text editing features:

Function	Mac	Windows
Enter text entry mode	Click in the display	Click in the display

Select text	Click + drag	Click + drag
Select entire text	Double-click	Double-click
Delete character to left of cursor	Delete	Backspace
Delete character to right of cursor	Fn+Delete	Delete
Move the cursor left/right	Left/Right arrow keys	Left/Right arrow keys
Extend the current selection	Shift + click + drag -or- Shift + left/right arrow keys	Shift + click + drag -or- Shift + left/right arrow keys
Exit text entry mode	ESC -or- Return/Enter -or- Click on panel	ESC -or- Return/Enter -or- Click on panel
Select next parameter to edit	Tab	Tab
Select previous parameter to edit	Shift + Tab	Shift + Tab

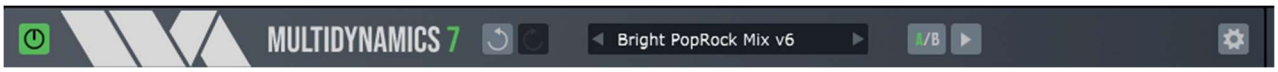
You'll find that many parameters, such as frequency, will recognize units typed into the text field. The following values, when typed into a frequency value box, are equivalent:

2k = 2 kHz = 2000 = 2000 Hz

5.3 Sliders

Function	Mac	Windows
Increase/Decrease a parameter value	Click + drag	Click + drag
Fine adjustment — increase/decrease	Shift + click + drag	Right click + drag -or- Shift + click + drag -or- Ctrl + click + drag
Reset slider to default value	Double-click	Double-click

6. Menu Bar and Preset Manager



This section describes the operation of the menu bar, preset manager, and the other functions available in the menus.

6.1 Enable

The enable button looks like a power button. When lit the plug-in is enabled, and when unlit the plug-in is bypassed – it passes audio but without modification.

6.2 Undo/Redo

Clicking the Undo button causes the parameters and view options to revert to their settings prior to the last edit. The undo stack is unlimited, so you can keep clicking and revert back to the settings when the plug was initially opened. Clicking Redo restores the last undo. You can continue to redo back to the settings before undo was first used. However, if you make any edits the redo stack is discarded.

The A and B buffers (described below) have independent undo/redo stacks. The undo/redo stacks store all parameters and many of the UI view options. Plug-in preferences are not stored in the undo/redo stacks.

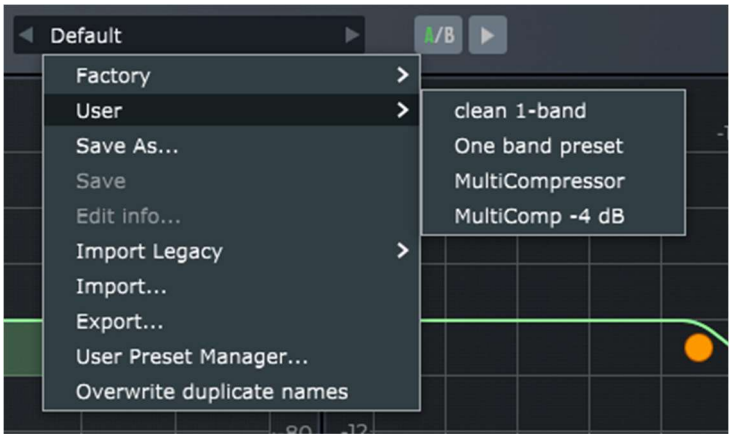
6.3 Preset name and arrow controls

The currently selected preset name is displayed in the text field in the menu bar. Changing any parameters causes an asterisk (*) to be displayed at the end of the name. This indicates that changes have been made to the preset. In order to save the changes to a user preset you must select the “Save…” item in the Preset menu, described below.

The arrow controls to the left and right of the preset name cycle through the set of factory and user presets. Clicking the right arrow goes to the next preset, clicking the left arrow goes to the previous preset.

6.4 Preset menu

The Preset menu contains lists of factory and user presets for easy selection, and options for managing presets. The functions are described in the following sections.



6.4.1 Factory Presets

Factory presets are selected from a rolloff menu at the top of the Preset menu. Factory presets cannot be modified or deleted.

6.4.2 User Presets

User presets are selected from a rolloff menu just below the Factory presets in the Preset menu. When you first run a Wave Arts plug-in, there will not be any user presets and the menu will be empty. When you save a preset using the "Save" option the preset is added to the User menu. All instances of a plug-in share the same set of user presets. So, after you save a preset with one instance of a plug-in, you can go to another instance and find that the preset can be found in its User preset menu too.

User presets are stored in an XML format file called "<plugin> Presets.xml", where <plugin> is the name of the plug-in you are using. If the file is deleted, an empty preset file will be created automatically the next time the plug-in runs. User presets files are stored in the following directory, depending on the operating system, where <username> is your login name:

Mac OS-X:
/home/<username>/Library/Application Support/Wave Arts/<plugin>/

Windows:
C:/Users/<username>/AppData/Roaming/Wave Arts/<plugin>/

6.4.3 Save As…

When you have created an effect you want to save as a preset, select the "Save As…" option. You will be asked to name the preset and the preset will be saved in the set of User presets. If you supply the same name as an existing user preset, the existing preset will be either be overwritten with the

new preset or the new preset will be given a unique name, based on the setting of the "Overwrite duplicate names" option.

6.4.4 Save

The Save option is used to save changes to a user preset. The Save option is enabled when the current preset is a user preset and you have made changes, in which case an asterisk (*) will be appended to the preset name. Select the Save option to save the changes to the preset.

6.4.5 Import Legacy

Import legacy will find any user preset files from earlier versions of the same plug-in and will display them in a rolloff menu. Selecting a preset file will import the presets into the current user presets, converting the legacy presets to the current version.

6.4.5 Import…

User presets can be written to files using the "Export" function, and read from files using the "Import" function. Selecting the "Import…" option will open a file chooser to select the preset file for importing. After selecting the file the presets are read and will appear in the User Presets menu.

Duplicate preset names are handled according to the "Overwrite duplicate presets" setting.

Import can be used to import presets from an earlier version of the plug-in; the preset parameters will be converted to the current version of the plug-in.

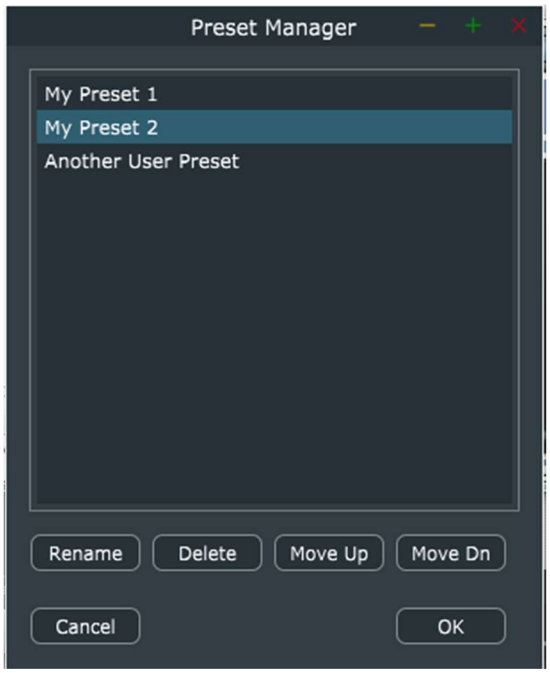
6.4.6 Export…

Selecting the "Export…" option will open a file chooser to specify the output file. Then your user presets are written to the file.

Preset Export is also useful for making backup copies of your user presets. If you have a large set of user presets, be sure to export them to a backup file.

6.4.7 User Preset Manager

The User Preset Manager provides a simple interface to organize user presets. You can rename presets, delete presets, and organize them by moving them up/down in the list.



6.4.7 Overwrite duplicate names

If this option is selected, then when you save a preset using "Save As…" using the same name as an existing preset, or when you import a preset with the same name, the existing preset is deleted and replaced with the new preset. If the overwrite option is not select, the duplicate preset name is handled by renaming the new preset, appending "(Copy)", "(Copy 1)", "(Copy 2)", etc. as needed to avoid a duplicate name.

6.5 A/B buffers

The A/B edit buffers allow you to compare two different sets of parameters or presets. One of the A or B indicators is always lit; the one that is lit shows the current buffer. Clicking the A/B button will switch to using the other buffer, thus changing the effect settings (assuming different settings are stored in A and B). This is quite literally an A/B compare function.

Once you have settings you like in buffer A, switch to buffer B and setup different settings, then click A/B to switch between the two.

6.6 Copy buffer

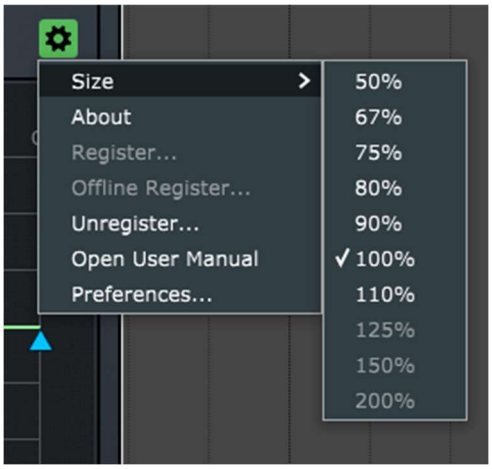
Clicking the Copy (arrow) button switches to the other buffer *while also copying the buffer*, hence the two buffers will be equal after the copy. The arrow points to the right when A is selected, and points left when B is selected.

Typical buffer use is:

1) Get settings you like in buffer A.
2) Copy to B, switching to buffer B.
3) Further edit the settings in buffer B.
4) Click A/B to compare the two buffers.

6.7 Tools menu

The Tools menu contains various important options, described below.

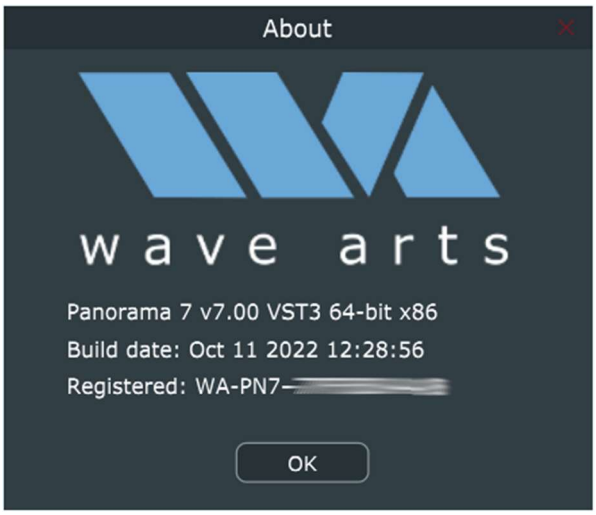


6.7.1 Size

The Size menu rolloff lets you change the interface size with one mouse gesture. After changing the size, clicking the plug-in title in the title bar will toggle between the last two selected sizes. Sizes that would be too large for the display are disabled.

6.7.2 About...

The About option displays important information about your plug-in. An example is shown below:



On the top line, the plug-in name and version are displayed, along with the current plug-in format (AAX, VST3, AU), bit depth, and CPU architecture. This is useful to determine which format of the plug you are running. The build date of the plug-in is displayed on the next line. If the plug-in is using Wave Arts licensing, the registration status is displayed on the next line. If the plug-in is operating in demo mode, the time remaining (if any) is displayed. If the plug-in has been successfully registered (unlocked), the serial number is displayed. If the plug-in is using Pace/iLok licensing, it will display "Pace/iLok licensing".

6.7.3 Register…

Select this option to register (unlock) your plug-in. Enter your name, email address, and serial number, and click OK. This option is not available if using Pace/iLok licensing.

6.7.4 Offline Register…

Select this option to register the plug-in when your computer is not connected to the internet. This option is not available if using Pace/iLok licensing.

6.7.5 Unregister...

Select this option if you no longer need to use the plug-in on this machine. The license file will be deleted and the serial number usage count will be decremented, allowing you to register on another machine. After confirming, the plug-in will revert to an unlicensed state, either bypassed or demo mode. The unregister option requires an internet connection. This option is not available if using Pace/iLok licensing.

6.7.6 Open User Manual...

Select this option to open this user manual in a browser.

6.7.7 Preferences...

This option opens the Preferences dialog to customize the plug-in operation.

Trademark Notices

VST is a trademark of Steinberg Media Technologies GmbH

Support

For assistance, please send email to:

support@wavearts.com

If you are having problems with a plug-in, please include the following information: plug-in name, operating system, and host software you are using. The version numbers are also helpful.

For software updates, revision history, frequently asked questions (FAQ), and more, please visit our website at:

www.wavearts.com

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