

DDMF GrandEQ user manual

v1.1.0

Thank you for using DDMF's GrandEQ audio plugin! To get the most out of it, it is recommended to at least have a quick look at this manual. While the interface of the EQ does not try to reinvent the wheel and therefore should be straightforward to use if you already have some experience with software equalizers, you might still find some valuable background info here.

Installation: simply run the full version installer and uncheck the plugin formats you do not want to install. GrandEQ comes in both 64 and 32 bit versions (bundled in so-called Universal Binaries on Mac, and in separate files on Windows) and in VST, VST3, AAX and (Mac only) AU format. For VST on Windows, you will need to specify your VST plugin folder; all other formats will go into their default system-wide folders so you don't have to worry about anything there.

License registration: upon loading the plugin in its unregistered state, it will display a big message asking for a license file. If you haven't done so already, please request your personal file from the login section at the DDMF website. You will then receive a link to your license file in the inbox of your registered email address. Download and unzip that license file so that you end up with a .txt file. Click on the message in the plugin and use the file browser that will open to select your license file. That should be it!

User interfaces: Since v1.1.0, GrandEQ comes in two UI flavours: the original interface includes a filter response graph and stereo VU meters, while the alternative UI has been created with the goal to create the most stripped down, minimalistic user experience so that you can focus on the sound and the sound alone. You can switch between the two interfaces by clicking the "switch" button in the lower right corner; your last choice will always be remembered so you can set it once to your favourite version, then forget about it.

UI version #1:



UI version #2:



Demo version: if you are running the demo version, there will be no request for a license, of course. The plugin itself is fully functional in demo mode, it just will emit a second of low-level white noise every minute, and your settings will not be saved.

General remarks: GrandEQ is a 7 band equalizer comprising two algorithms, one "minimum-phase", one "linear-phase". The difference lies (which you probably already have guessed) in their phase response: minimum-phase algorithms are algorithms that, for a given frequency response, have the smallest group delay. You could say they spread out a signal in the least possible way. But there can be situations where you want to preserve the phase relation between all frequencies, which is when you'd rather pick a linear phase algorithm. Linear phase algorithms are often perceived as "cleaner" especially in the high frequency region. To spare you the pain of having to switch between plugins, GrandEQ simply has both options on board!

Both algorithms represent the state of the art of digital equalizer design. The minimum-phase algorithm follows a publication by John Flynn and Joshua D. Reiss [*Improving the frequency response magnitude and phase of analogue-matched digital filters, Audio Engineering Society, Convention Paper 10016, 2018*]. If the goal is to emulate the full response of analogue hardware equalizers, this algorithm succeeds in coming closer than all previous solutions with minimum latency involved. GrandEQ in minimum-phase mode takes only 32 samples of latency to deliver an outstanding result in both the frequency and the phase response.

In the figure below, you can see that the amplitude response (graph on the left) of GrandEQ (red curve) is almost invisible because of how closely it tracks the true analog response (yellow curve). Both a standard digital EQ and an "uncramped" digital EQ show marked deviations. But not only the amplitude, but also the phase response (right graph) is clearly superior in GrandEQ, tracking the analog target up until > 20 kHz.

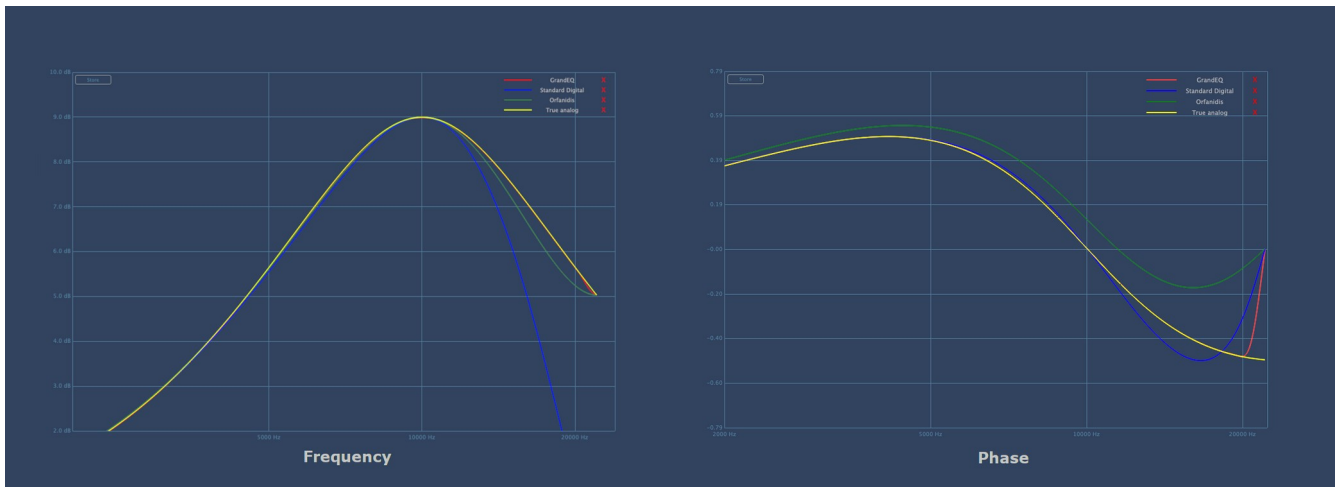


Figure 1: Comparison of amplitude and phase response of GrandEQ (red), standard digital EQ (blue), uncrampled digital EQ (green) and true analog response (yellow).

The linear phase algorithm, on the other hand, is based on an elaborate time-reversed approach to IIR filter design which was introduced by A. Kurosu and coworkers (*IEEE Transactions On Signal Processing, Vol. 51, No. 5, May 2003*). By sectional convolution, perfect linear phase characteristics and virtually no harmonic distortion is achieved. The result is maybe the cleanest linear phase algorithm available today.

Usage: despite its high-end approach under the hood, GrandEQ follows a rather traditional design approach so you should have no problems familiarizing yourself with the available controls. There are 7 bands, arranged in series, with 4 controls each. Those are:

TYPE: the filter type for a band. The available options are Bell, Low Shelf, High Shelf, Low Cut, High Cut, Band Pass and Notch.

GAIN: set the gain in dB for Bell, Low Shelf or High Shelf filters. For all other filter types, the Gain knob is disabled.

FREQ: the frequency for the selected band.

WIDTH: the bandwidth parameter of the selected band. Note: smaller values lead to broader band widths!

The filter types for each band can be selected either by turning the respective TYPE knob, or by clicking on the filter type name display. This will show a drop-down menu with the available filter types.

The GAIN, FREQ and WIDTH knob will display their current value while dialing them so that you always know what the current settings are. If you right-click on any of those knobs, the value can be directly edited using your keyboard. Double-clicking a knob will make it return to its default value. Holding down the shift key will activate the finetuning mode, which is helpful to make smaller adjustments. The Ctrl key will activate "velocity mode" where the change in slider values is

proportional to the vertical speed of your mouse movements. All bands can be switched on or off by clicking on the yellow-golden light on the very top of each of the 7 columns.

A/B setting: GrandEQ has two internal states, called A and B. This can be useful for situation where you quickly want to compare two different settings. Switch between the two states using the A and B button, and copy the state that is currently selected to the currently unselected state by pressing the Copy button.

MP/LP: those two buttons let you switch between the minimum and the linear phase algorithm which were briefly introduced above. Please note that the latency changes when switching algorithm, so there will be a quick shift in your audio playback. Also, please note that due to the LP algorithm using a time-reversal scheme, each filter will be traversed twice, so the filter shapes will be different when compared to the MP algorithm.

LR/MS: when running on a stereo channel, GrandEQ can operate in L/R or in M/S mode. This means that the two internal channels are either being applied to the left and the right channel of your audio material, or to the mid and the side channel. The latter is often useful to, e.g., concentrate your bass more in the middle and let the outer part of your stereo image appear somewhat more airy. The default mode is the L/R mode.

Connected to that topic are the Ch1/Ch2 buttons and the Link button: when the link button is activated, both channel settings are identical (regardless whether you are in L/R or in M/S mode). When the Link button is deselected, you can make changes in each channel independently. Pressing Ch1 then lets you dial in your settings for the first channel, and vice versa. In L/R mode, Ch1=L and Ch2=R. In M/S mode, Ch1=M and Ch2=S.

Furthermore, there is a global Gain knob and a global on-off switch, acting as a bypass button. And of course (if you are using UI version #1) the graph display, which renders the current frequency response of the EQ. Please note that, in the lower-right corner of the graph, you can select the vertical resolution of the graph: the default value is 12 dB, but you can also opt for 3, 6 or 9 dB. And finally, the two voltage meters show the time-dependent peak voltage values (where 0 dB = 0 dBFS) for the two output channels of GrandEQ (with a time constant of 300 ms).

The user interface can be resized with a standard resizing tool located in the lower right corner of the UI. Just grab it with your mouse and select a size that feels right for your screen resolution. The size of the UI will be remembered for all instances of GrandEQ that you will open on your machine.

That's it! I hope you have as much fun using the EQ as I had creating it. If there are any bugs, issues or suggestions, please contact support@ddmf.eu .