dEQ6

DYNAMIC 6 BAND EQUALIZER

MANUAL

TBProAudio 2022

1   Introduction

Welcome to dEQ6, a 6 band stereo/MS dynamic equalizer with high quality oversampling and accurate spectrum analyzer.

dEQ6 controls the filter gain of each band by a compressor/expander. This reduces or increases the gain in a specific frequency range, depending on the program material. The detector signal for the compressor/expander is processed by a pre filter which is controlled by the centre frequency and Q-factor of the dynamic filter. This ensures that the compressor/expander is only activated by content in the specified frequency range.
On top dEQ6 comes with a new function called AB-LM Lite providing perceptual loudness matching.

dEQ6 makes it much easier to work with dynamic filtering:

- Monitor the difference of input and output signal. This helps to verify the correct function of the dynamic filters.
- Display the difference of input and output spectrum.

2 Features

dEQ6 offers following features:

- 6 independent filter + compressor/expander
- 3 filter types, analogue design, minimal phase, zero delay
- many comfort functions to setup multiple bands
- independent stereo/left/right/mid/side processing per band
- side chain support, narrow/full band
- sample rates up to 192 kHz
- "real" over sampling, up to 4x
- hi-res spectrum analyzer with 32k FFT
- pre/post-EQ spectrum, max/average/live spectrum, stereo/left/right/mid/side
- smoothed, ISO R40 smoothed, raw data spectrum and bar spectrum
- post filter predictive spectrum
- spectrum delta mode
- advanced input/output meter
- EQ cheat sheets
- spectrogram
- frequency tracker
- extended input/output meter, Peak/RMS/EBU/VU
- perceptual loudness matching (powered by AB-LM Lite) and gain "freezing"
- narrow-band sweeping mode
- spectrum freeze mode
- sample exact A/B toggle for all processing modes
- monitor delta mode
- precise parameter input
- undo/redo
- large, resizable and easy to use GUI
- XML based preset management
- full DAW automation support, smooth parameter change
- 64-bit internal processing
- very efficient CPU usage design

3 Overview

The interface of dEQ6 is straightforward and easy to use.

In the middle is the main EQ/spectrum display which lets you monitor the incoming and outgoing spectrum and adjust the filter response curve.

On the bottom are all controls of the 6 filter (e.g. type, threshold and attack/release times).

The main meters, gain and mix control are placed on the right side.

On the left side are the controls for the analyzer settings (e.g. frequency/magnitude range).

The top area keeps the plug-in option menu and various plugin controls like, main analyzer mode (all channels, left, right, mid or side), preset management, curve display control, bypass/freeze/reset button and AB-LM Lite (perceptual loudness matching).

dEQ6 Overview
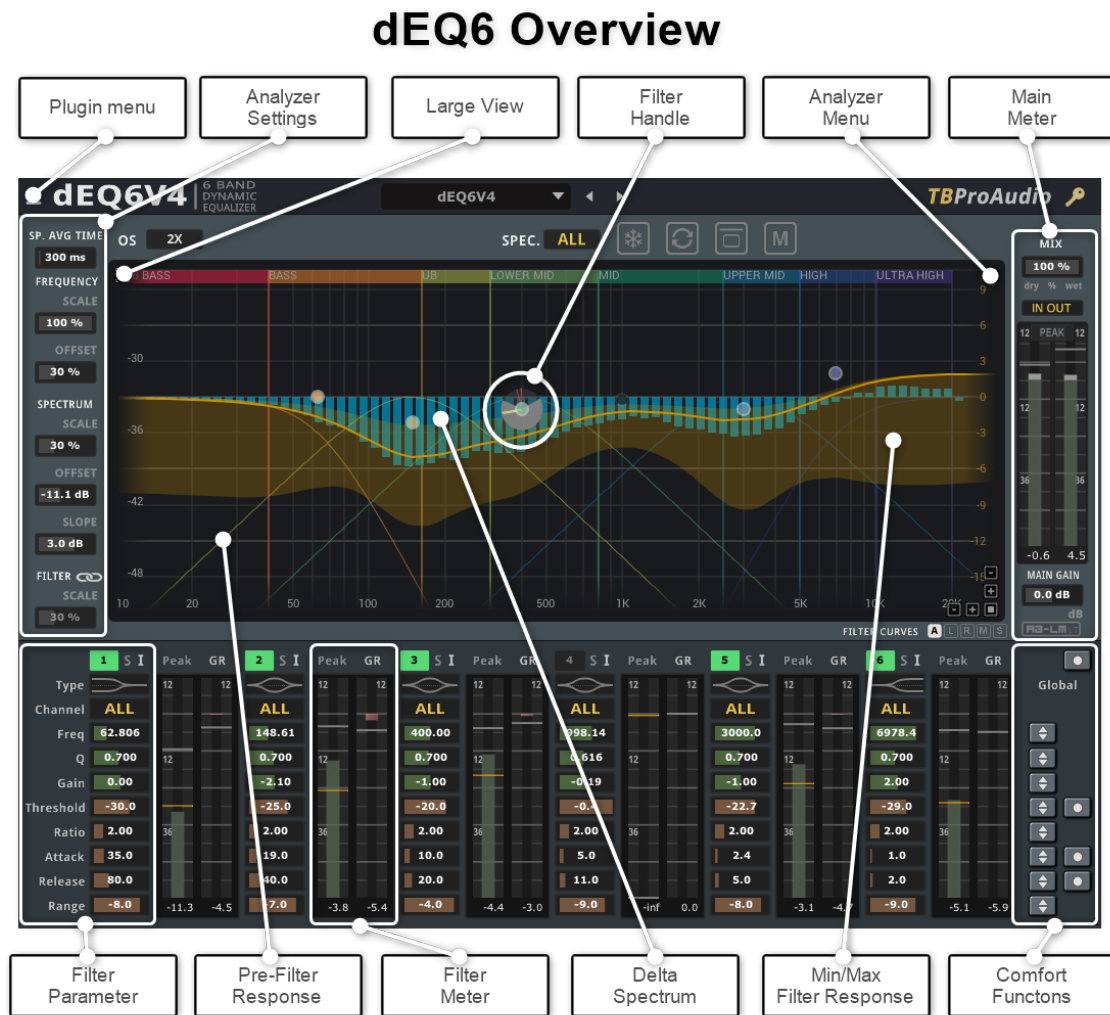
Interactive EQ display

The spectrum/filter curve view can be enlarged with the top left icon.

The filter button activates the filter and can be dragged by mouse. Right mouse click open the filter popup menu. The analyzer popup menu hosts various settings of the spectrum analyzer and the reference spectrum management.

The 5 small left icons control the display of the various filter response curves.

The EQ magnitude area scales the EQ range (mouse wheel).

The frequency area scales and offsets the frequency view (mouse wheel, mouse click drag). The spectrum magnitude area scales ad offsets the spectrum view (mouse wheel, mouse click drag).

Filter parameter
dEQ6 consists of 6 stereo dynamic filter in series. Each filter can be configured individually by setting type, stereo placement (all, left, right, mid and side), frequency, gain, q-factor, threshold, ratio, attack, release time and gain reduction range.
Additionally the source of the compressor detector can be changed to internal/external and narrow/wide-band.
dEQ6 offers 3 analogue modelled filter. The filter quality can be increased by using oversampling. This ensures "analogue" filter magnitude/phase response near Nyquist frequency.
Comfort functions
Many filter parameters can be controlled together e.g. filter gain, threshold or range.
Some parameter can be set depending on program material or frequency range e.g. threshold, attack or release. These functions help to set up complex jobs quickly and easily.

Plugin modes
dEQ6 offers high-quality oversampling (up to 4x). Oversampling is used to correct magnitude/phase distortions near Nyquist frequency.

4 Minimum System Requirements

- Windows 7, OpenGL 2 GFX card
- Mac OS X 10.11, Metal GFX card
- SSE2 CPU
- Win: 32/64 Bit VST, 32/64 Bit VST3, 32/64 Bit AAX
- OS X: 64 Bit VST, 64 Bit VST3, 64 Bit AU, 64 Bit AAX
- Tested with: Cockos Reaper, Steinberg Cubase/Nuendo/Wavelab 6+, FL Studio 12+, PT2018+, Reason 9.5+, Studio One, Ableton Live
- For latest information please visit www.tbproaudio.de

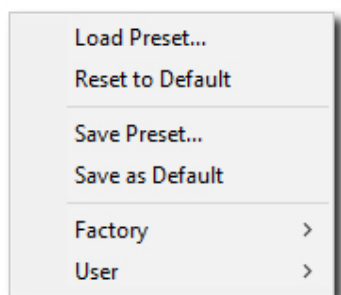# 5 Plugin Controls

Mouse usage:

Click and drag horizontally changes parameter value
Shift click and drag slows down parameter change
Ctrl click rests to default value
Double click opens value edit box, finish with enter.

5.1 Presets

Preset menu loads and saves user presets. Presets stored under %localappdata%/dEQ6V4 (Windows) or /Users/xxx/Library/Application Support/dEQ6V4 (Mac OSX) are imported as user presets. Previous and next button step trough all presets.
"Reset to default" sets the current plugins settings as the default settings.

"Save as Default" sets the current settings as start-up/default settings.

5.2 Plugin menu

Click on the menu icon to get info about the plugin, online version check, open the online manual and change-log and change GUI size/scale.

5.3 Undo/redo

Undos and redos parameter changes.

5.4 Plug-in settings

5.4.1 Over sampling

Incoming signal could be over sampled up to 4 times. Over-sampling reduces magnitude/phase distortions near Nyquist frequency and let the filter sound much more "analogue".

5.4.2 Analyzer

This control selects the main analyzer mode:

All: shows the summed left/right spectrum.
Left: left spectrum.
Right: right spectrum.
Mid: M/S mid spectrum.
Side: M/S side spectrum.

5.5 Analyzer Settings

5.5.1 Spectrum Decay

Adjusts the decay of the spectrum analyzer. 1 to 9999ms, 9999ms enables average mode (AVG).

5.5.2 Main Gain

Output volume.

5.5.3 Mix

Mix of original and processed signal.

5.5.4 Freeze

Freeze current spectrum measurement.

5.5.5 Reset

Resets spectrum display.

5.5.6 A/B

Passes the incoming signal directly to the output.

5.5.7 Monitor

Lets you monitor the delta signal IN - OUT. In this mode you can easily verify the correct functioning of your dynamic filter.

5.5.8 AB-LM Lite

Please refer to chapter 7.

5.5.9 Frequency Scale

Scales the frequency range of the spectrum display

5.5.10   Frequency Offset

Offsets the frequency range of the spectrum/filter curve display

5.5.11   Spectrum Magnitude Scale

Scales the magnitude of the spectrum analyzer

5.5.12   Spectrum Magnitude Offset

Offsets the spectrum curve

5.5.13   Spectrum Magnitude Slope

Slope tilts the graph of the frequency spectrum around 1kHz with the given slope in dB. Values from 3dB to 4.5dB give a more "natural" balance between low and high frequencies.

5.5.14   Link filter to spectrum

Links the scaling of spectrum and filter magnitude range.

5.5.15   Filter Magnitude Scale

Scales the magnitude of the filter curve display.

5.6 Main Meter

A small LED On top lids up if level goes over 0.0 dBFS.
Numbers below the meters display the maximum values. Reset by mouse click.

5.6.1 Channel Mode

In/out, In Left/Right, Out Left/Right, In Mid/Side, Out Mid/Side and off.

5.6.2 Meter Mode

Peak (dBFS), RMS (AES 17, dBFS), EBU ML (LUFS), EBU SL (LUFS) and VU (dBVU).

5.7 Dynamic Equalizer Parameter

5.7.1 Off/Static/Dynamic

Sets filter band to inactive, static or dynamic (filter plus compressor).

5.7.2 (S)olo

Solos the band, band needs to be active (static or dynamic)

5.7.3 (I)nternal/(S)ide-(C)hain

Each filter band uses the intern or the external side-chain signal as input for the compressor, either narrow band or full band ("+" mode).
I: internal, narrow band
I+: internal, wide band
SC: side-chain/channel 3+4, narrow band
SC+: side-chain channel 3+4, wide band

5.7.4 Type
Selects the filter type of the band:

LowShelf: to boost or attenuate low frequencies
Peak EQ: traditional peak filter
HighShelf: to boost or attenuate high frequencies

5.7.5 Channel
Controls which part of the signal (all/left/right/mid/side) is affected by the filter

5.7.6 Frequency
Sets the frequency of the filter band from 10Hz to 22kHz

5.7.7 Q-Factor
Set the bandwidth of the filter band, widening or narrowing

5.7.8 Gain
Sets the filter gain (if applicable) from -48dB to 48dB

5.7.9 Threshold
Level in dBFS where compressor starts to work. Change actives dynamic mode.

5.7.10 Ratio
Controls the compression ratio above threshold from 0.5 - 50.0
Values above 1.0 *compress* the signal, values below *expand* the signal

5.7.11 Attack
Calibrated in ms, adjusts attack time of the compressor from 0 - 1000 ms

5.7.12 Release
Calibrated in ms, adjusts release time of the compressor from 0 - 1000 ms

5.7.13 Range
Calibrated in dB, adjusts maximum gain reduction of the compressor from -60 - 0 dB

5.7.14 Global

This set of buttons modify all parameter in a row, if filter is active (e.g. all Q-factor values of all active filter).

E.g. In order to initialize dEQ6 at the beginning, load the initial program, set all filter to "dynamic", let the audio run, click "set threshold" button (which sets all active threshold values to max peak value) and decrease threshold level further until red filter curve starts to moving and/or GR meters start to glow red.

Off/Static/Dynamic: mouse click toggles all static bands to dynamic and visa versa, shift mouse click toggles all disabled bands to dynamic and visa versa.
Freq: increase/decrease dynamic filter centre frequency (mouse click and drag up/down, mouse wheel)
Q: increase/decrease dynamic filter steepness
Gain: increase/decrease dynamic filter gain (static)
Threshold: increase/decrease dynamic filter threshold level, set threshold to max peak level (mouse click)
Ratio: increase/decrease dynamic filter ratio
Attack: increase/decrease dynamic filter attack time, set attack depending on dynamic filter frequency
Release: increase/decrease dynamic filter release time , set attack depending on dynamic filter frequency
Gain: increase/decrease dynamic filter gain range

5.7.15 Peak Meter

Displays current peak value in the range of -60 dBFS and +12 dBFS. The small gray line indicates max peak value, the small yellow line the current threshold value which can be changed by mouse click and drag, or mouse wheel. Change by mouse activates dynamic mode.
Below the LED meter the numerical value of the maximum peak value is display. It is reset by mouse click.

5.7.16 GR Meter

Displays current gain reduction value in the range of -60 dB and +12 dB. The small gray line indicates max gain reduction value.
Below the LED meter the numerical value of the maximum gain reduction value is display. It is reset by mouse click.
Click on GR meter range (12, 6, 3db) cycles through different ranges.

5.8 Interactive EQ/spectrum display

The interactive display combines filter curve and frequency spectrum in one display. The view and all filters can be fully controlled with the mouse.
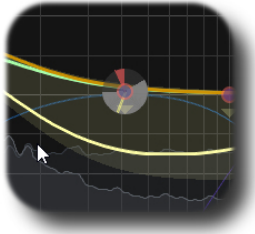
5.9 Enlarge view

 Toggles size of spectrum/filter curve view.

5.9.1 Filter button

Click and drag the filter button to set frequency, gain or Q of the filter. Additional shift key slows down the mouse movement.

Dynamic mode: The current level is displayed as grey circular bar. The current gain reduction is shown as red bar and the threshold as yellow line.

Double click on the button activates/de-actives the filter. Additional ctrl key resets filter settings. Right mouse opens the filter popup menu:
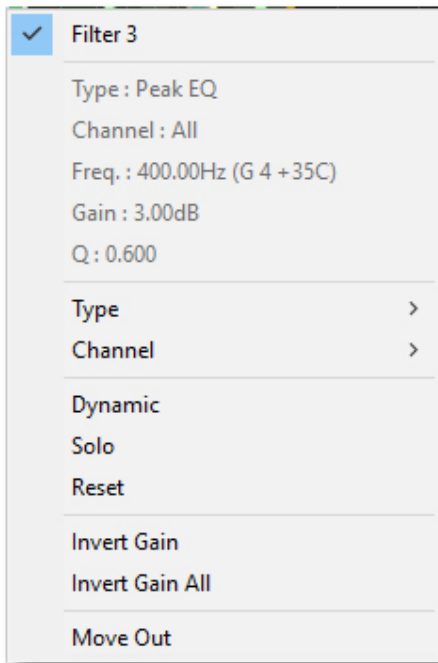
Title: activates/de-activates the filter
Type: selects current filter type
Channel: selects current stereo placement
Dynamic: enables dynamic filter
Solo: solos filter
Reset: resets filter to default values
Invert Gain: inverts filter gain (where applicable)
Invert All Gain: inverts the gain of all active filters (where applicable)
Move Out: resets and de-actives the filter and sets the filter frequency to highest value (moves the filter out of the view)

Mouse drag: changes filter **frequency** and **gain**
Shift key + mouse drag: slows down mouse movement

Mouse wheel: changes filter **Q**
Shift key + mouse wheel: changes filter **Q** slowly

5.9.2 Spectrum and filter curve view

The frequency range can be changed by placing the mouse over the frequency area and using the mouse wheel (or shift key + mouse). The frequency offset is changed by dragging the mouse. Ctrl key + mouse click resets view settings.

The range of the spectrum magnitude can be changed by placing the mouse over the spectrum magnitude area and using the mouse wheel (or shift key + mouse). The spectrum offset is changed by dragging the mouse.

The range of the filter magnitude can be changed by placing the mouse over the filter magnitude area and using the mouse wheel (or shift key + mouse). Ctrl key + mouse click resets view settings.

The small icons "A", "L", "R", "M" and "S" toggle the display of the respective filter curves:

5.9.3 Analyzer popup menu
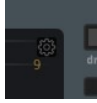
The analyzer popup menu hosts many options to adjust the spectrum analyzer and the curve display.

- Pre Filter Spectrum
  Sidechain Spectrum
- Post Filter Spectrum
- Delta In/Out Spectrum
  Predictive Post Spectrum
◄ Spectrum Curve Type
  Show Max
  HiRes Analyzer
◄ Spectrogram Mode Inplace
◄ Frequency Tracking

  Show Spectrogram
◄ Spectrogram Orientation
◄ Spectrogram Frequency Scale
◄ Spectrogram Color
  Spectrogram Color Inverted
- Spectrogram Legend

- Show Analyzer Grid
- Show Pre-Filter Curves
  Show Musical Note
- Show EQ Info
  Show only selected curve

◄ EQ Cheat Sheet

  Reset Analyzer View

Pre Filter: toggles display of pre-filter spectrum
Sidechain: toggles display of sidechain spectrum
Post Filter: toggles display of post-filter-spectrum
Delta InOut: toggles display of delta spectrum (post – reference)
Post Predictive Spectrum: toggles display of pre filter spectrum plus filter curve
Spectrum Curve Type: smoothed (moving averaged), ISO smoothed (frequencies according ISO R40), raw data and bar spectrum (1/6-1/48)
Max: show additional maximum spectrum
HiRes Analyzer: activates high resolution FFT
Spectrogram Mode Inplace: off, standard, heat map (normalized spectrogram), overlay to spectrum view.
Frequency Tracking: shows frequency maximum
Spectrogram: please refer to chapter 6 of the manual
Show Analyzer Grid: toggles display of spectrum/magnitude grid
Show Add EQ Curves: toggles display of individual filter response curves
Show Musical Note: toggles display of piano key display
Show EQ Info: toggles display of EQ info while dragging the EQ buttons
Show only selected curve: displays only the curve belonging to the active filter. Filter becomes active through a click on the filter button
EQ Cheat Sheet: toggles display of various cheat sheets.

Reset Analyzer: resets settings of the spectrum/filter curve view

5.9.4 Narrow-band Sweeping Mode

Enabled by holding the alt key. Please note that also the gain of the narrow-band is affected by the cursor position. The narrow-band filter gain is determined by the scale on the right side (filter magnitude).
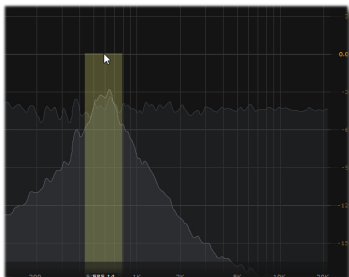
6 Spectrogram

The spectrogram provides a different visual representation of the audio spectrum compared to classical spectrum curve. X and y axis represent time and frequency of the signal, the different colours the signal strength.
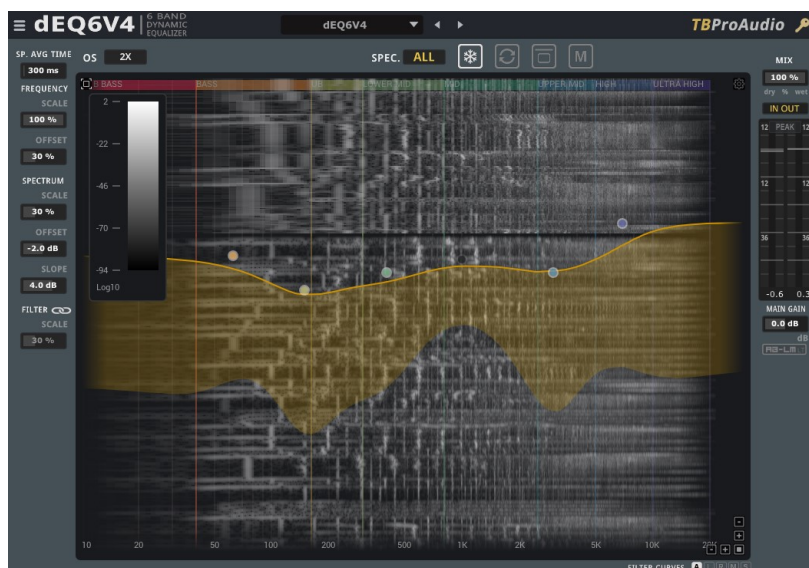
dEQ6 provides following features to get more value from the spectrogram representation:
- display of spectrogram either horizontal or vertical
- linear, logarithmic, Mel, Bark and ERB frequency scale (vertical only)
- frequency slope and amplitude offset
- various coloration schemes

The frequency range can be changed with the control "frequency scale". The frequency range can be repositioned with the control "frequency offset". The control "spectrum offset" controls the amplitude of the spectrogram and therefore the coloration.

7   AB-LM Lite

AB-LM Lite is a **perceptual A/B loudness matching** algorithm to help you avoid the pitfall of 'louder is better', so you can evaluate the impact of the plugin on your incoming and outgoing audio signal at equal loudness.

When you engage AB-LM Lite, the algorithm analyzes the incoming signal and compares it to the outgoing signal via its RMS values and applies an automatic gain adjustment so you can focus on the plugin settings and what they are actually doing to your audio, without being distracted by loudness differences.

Please to note that AB-LM Lite limits the gain adjustment to +/- 12dB to avoid gain overshoots.

AB-LM Lite lets you automatically minimize the loudness either quickly (mode fast) or gently (mode slow).

The "target" symbol top right of the fader sections freezes the last AB-LM Lite gain and switches AB-LM Lite off. This function prints the last AB-LM Lite gain settings to the gain structure of CS-5501.

The small white LED indicates if AB-LM Lite freeze gain is active. Click on the "target" symbol sets freeze gain to 0.0 dB.

AB-LM Lite is an automatic, simplified algorithm to help your workflow, based on our more advanced dedicated AB-LM plugin, which allows perceptual loudness matching of third party plugins and even complete plugin chains. AB-LM also offers more advanced options, including advanced measurement modes and snapshots.

For the more advanced features of AB-LM, please see www.tbproaudio.de.

8   Demo mode versus Registered Mode

In demo mode (without activation) the plug-in mutes audio every 90 seconds for a short period. This could be circumvented by clicking on the "TBProAudio" logo within 90 seconds.

9   Plugin activation

The plugins needs to be registered/activated to remove demo restrictions. Please go to www.tb-proaudio.de to purchase the activation key. After purchase you will receive an email from TBProAudio with either the (zipped) activation key file or the activation key in text form. Go to the plugin menu->Activate plugin. Please follow the steps described here: https://www.tbproaudio.de/support/productactivation. After successful activation the key symbol shown in the GUI appears in golden colour.

10 Conclusion

So finally if you have any questions or suggestions just let us know. And have fun with our tools.

Your team from TBProAudio :-)