

HoRNet ThirtyOne MK2

ThirtyOne MK2 is a plugin that includes a spectrum analyzer and a graphic equalizer, both have the standard 31 one third octave bands.

This pair of tools is very common in every rack of any live mixer as the final tool in the master bus, for this reason we decided to recreate the behaviour and specific time response of a very common Italian analog spectrum analyzer.

The equalizer is also inspired by analog units allowing ThirtyOne to recreate that master chain feeling that you are used to.

We put a great care in recreating the smooth lighting of LEDs driven by a smoothly increasing current flow, each column of twelve LEDs comes after a 20dB/octave filter (like the original hardware unit) and it's response speed is selectable between 0.25, 1 or 4 seconds allowing you to see both fast peaks and average frequency level.

Each of the LED of the bar can have a value of 1, 2 or 3 dBs (like in the original hardware unit) and we also added 6dB/LED option, when changing the resolution the scale on the left of the LED display updates accordingly.

We also added a maximum peak hold LED for each frequency band that can be enabled or disabled that the original unit did not have.

Hovering the mouse on each of the analyzer band will let you know the band frequency and the maximum peak recorded for the specific band.

Right below the spectrum analyzer we have put the 31 sliders that will let you shape the output and fix any particular resonance. Each of the sliders drives a standard 1/3 octave second order filter and can be adjusted from -15 to +15 dB, you can also change the value for each band typing in the box below each slider.

The equalizer has a very special feature called the "Auto EQ", when enabled (both in static and continuous mode) the output of the spectrum analyzer is used to tune the gain for each of the EQ band allowing the equalizer to automatic set itself so that the maximum harmonic balance is achieved, removing frequency masking and improving mix clarity, the HoRNet ThirtyOne MK2 allows you to select the bands that you want to use for the "Auto EQ" and also bypass or set in "listen" mode each of the EQ band.

ThirtyOne MK2 provides three different "Auto EQ" algorithms: Average, Median and Lucky, the first two are based on some mathematical models while the third one is a lucky mistake and we decided to keep it because it sounded good :D

Average:

This is the original "Auto EQ" algorithm and it works by creating an average of the levels of each frequency band, then for each of the bands create another average with the previous and

following band. At this point these two values are compared and the gain for each band is derived. This algorithm is a good all rounder and provides an efficient way to remove spectrum imbalances by smoothing out adjacent peaks without changing the tone of the audio.

Median:

This new algorithm uses the same approach as the "Average" one but instead of doing the average of the bands it takes the median value, this simple difference makes the algorithm behave more like a tilt filter that tends to flatten the spectrum so it works better on muddy programs that lack clarity and high content.

Lucky:

The "lucky" algorithm is actually the "Average" one but without a crucial amplitude to dB conversion that actually creates a set of gain levels that are always positive, since it behaves like the "Average" algorithm it can be used as a general purpose Auto EQ, in the end it's a matter of taste!

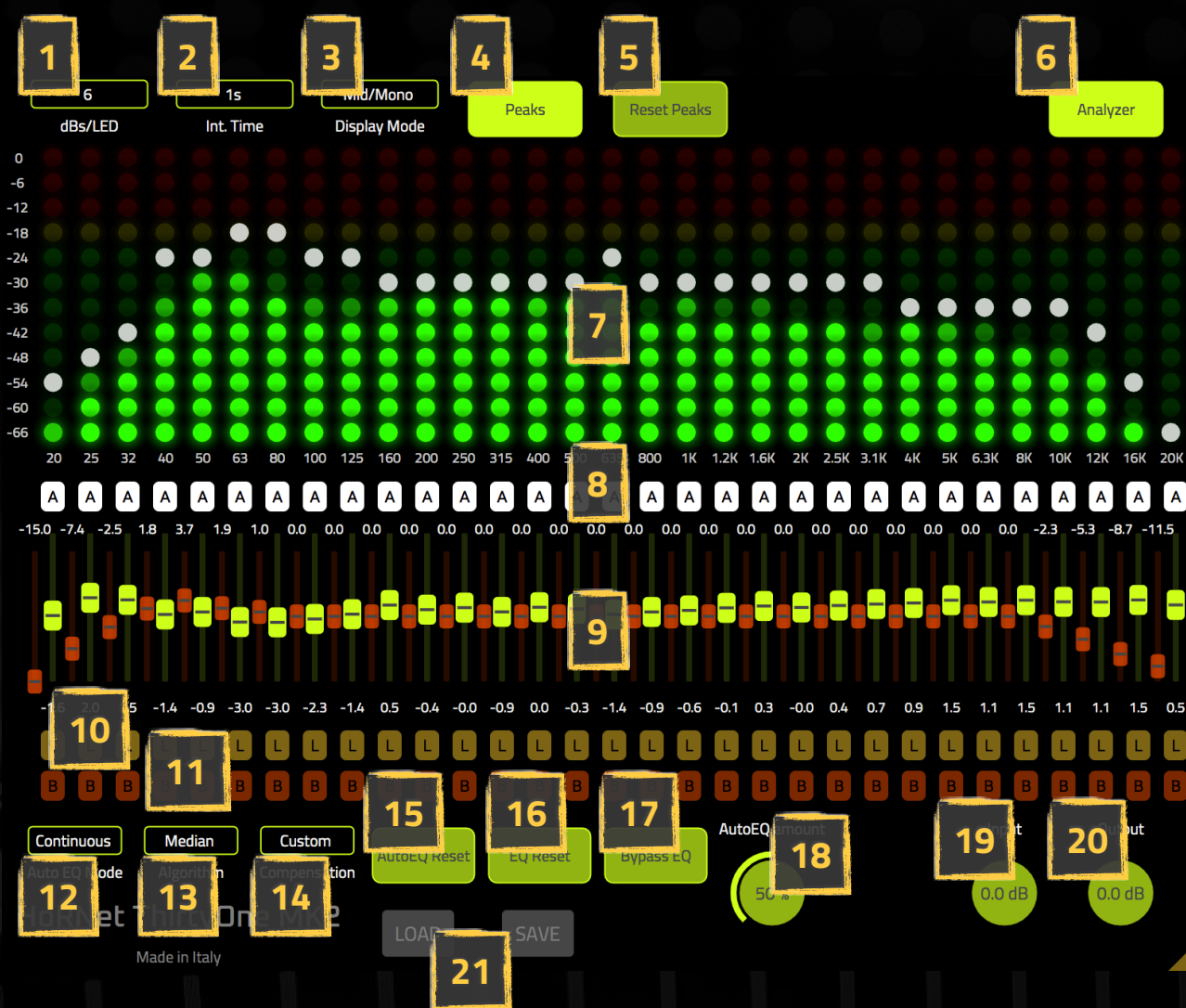
For each of the algorithms you can choose between two different modes for the "Auto EQ", the static and the continuous one.

The first takes in consideration only the maximum peak of each band so that you have an EQ curve valid from the beginning to the end of the mix, this mode is very useful in mastering a single track as it gives a "static" EQ correction curve.

The second algorithm is more complex and continuously looks at the level of each frequency band and consequently updates the equalizer to reduce masking and keep the track balanced in every single moment. If you use the plugin with this mode inside a broadcasting chain you can always guarantee a constant frequency optimized output even if the content of your audio changes a lot.

"Auto EQ" is linked to the frequency analyzer output so changing the analysis speed affects the algorithm, using the 0.25s changes the equalization very fast and allows you to track also the fast frequency spikes, while using the 4s setting works more on the average frequency content. To tune the "Auto EQ" output you can use what we call a "compensation curve" which is an offset that is applied to every level computed by the "Auto EQ", so if you think that the resulting EQ curve is too extreme in some band you can correct it using the "custom" setting of the compensation curve. The default one is a gentle shape that rolls off highs and gives a little more weight to lows. If you find a compensation curve that you like you can export it and then load it in other projects using the "load" and "save" buttons.

The resulting EQ curve can be decreased or increased using the "EQ Amount" knob that scales every gain computed by the "Auto EQ" algorithm by a fixed value and allows you to increase or reduce the level of each band while maintaining the same ratio between them.



1. dBs/LED

This control lets you choose how many dBs are displayed for each LED, you can choose between 1, 2, 3, and 6 dBs for each LED.

2. Int. Time

This drop-down allows you to choose the integration time for the spectrum analyzer, this value also affects the response speed of the "Auto EQ".

3. Display Mode

This control allows you to choose between mid and side, you can use it to display one of the two stereo components, it has no effect on the equalizer which always works like a stereo EQ.

4. Peaks

Enables or disables the display of the maximum peak for every frequency band.

5. Reset Peaks

Resets the maximum peak for each band.

6. Analyzer

Enables or disables the spectrum analyzer. This does not disable the processing of the filters which is needed for the Auto EQ but only the display of the bands.

7. Spectrum Analyzer

This area is occupied by the led bars of the spectrum analyzer, each bar represent a frequency.

8. Auto EQ enable buttons

These white buttons allows you to enable or disable every single band for the "Auto EQ" algorithm. When the buttons are turned off the gain of the slider will not be changed automatically by the algorithm.

9. Equalizer faders and compensation curve faders

These faders allow you to change the level of every single band, they are automatically adjusted by the "Auto EQ" if they are enabled with the white button and the "Auto EQ" is engaged.

The red faders are shown only if the "custom" option of the compensation curve is chosen and are used to create a custom offset curve to modify the behaviour of the "Auto EQ".

10. Listen buttons

Click any of this button to put the band in solo mode and listen only to the corresponding frequency in isolation.

11. Bypass buttons

Each of these buttons disables the processing of the corresponding EQ band.

12. Auto EQ Mode

This dropdown box lets you chose between the static and continuous mode for the Auto EQ, it's also used to turn it off

13. Auto EQ Algorithm

With this control you can choose the Auto EQ algorithm to use between "Average", "Median" and "Lucky".

14. Auto EQ Compensation curve

This dropdown lets you choose between the three available compensation curves for the "Auto EQ": none, default and custom.

15. Auto EQ Reset

This button resets the internal status of the "Auto EQ" allowing you to re start the band levels evaluation for the "Auto EQ".

16. EQ Reset

This button resets every slider of the EQ to its 0 position

17. Bypass EQ

This button completely bypasses the EQ processing. If you are interested in just the spectrum analyzer, this saves a lot of CPU.

18. Auto EQ Amount

With this knob you can dial the amount of EQ curve to apply to the sound. It behaves like a multiplier from 0 to 1 for the gain of each band. When set to 0% no EQ is applied while with 100% the actual value of the slider is applied.

19. Input

This knob allows you to increase or decrease the input level

20. Output

This knob allows you to increase or decrease the output level

21. Load and Save preset

With this two buttons you can save and load fill plugin presets or just the compensation curve you have set so it can be used in other instances of the plugin