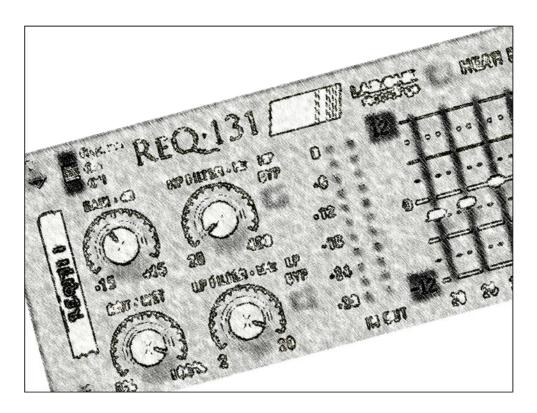
REQUALIZER

31 ISO BAND GRAPHIC EQUALIZER



RACK EXTENSION FOR REASON INSTRUCTION MANUAL



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THANK YOU

Thank you very much for expressing your confidence in our products by purchasing one of our equalizers, the ReQ·131. This 2-channel high-quality equalizer was designed with our experience of both filtering capabilities in the digital realm as well as the crafting of audio for all types of users; producers, engineers and artists alike.

We hope you continue to enjoy using the ReQ 131 in your projects for now and for future.

Lab:One Recordings © 2013

ACKNOWLEDGEMENTS

Thanks to the ReQ Squadron for all the testing, comments, suggestions and feedback. Original coding support from Andrew Best (c/o Blamsoft).

Additional support from Unfiltered Audio (Michael & Josh).

Propellerhead Software (for Reason, the SDK and the concept of the Re)

Presets designed by:

<u>Key</u>	<u>User</u>	Preset type
[LB1] [SE] [GVB]	djfresha c/o LAB:ONE Recordings ScuzzyEye vernon22	ReQ·131 presets Combinator presets, within ReQ·131 RE ReQ·131 presets

DEDICATIONS

This Re is dedicated to all the Propellerhead Reason users & forum threaders, friends, & colleagues we have spoken to over the years.

DjFresha: Thanks goes out to my studio buddies; Dos aka Orco, Puggy, Mist, and Dj EQ, for the support & feedback, shouts go out to all who know me, including FLAVAUNIT crew (Jayeye & Becky, Dj D & Caroline C, Andy 'Ruthless', Ben 'Devious' & Scott 'Sniper'), REBIRTH massive & head honcho Aybee, SUBTRONIK crew (G.I Jones & Damo), good long time friends Kealey 'Keels', Chris 'Drope', John 'Little-John', Stacey 'The Duchess' & Nick 'Gibbo' Purnell.

Also not forgetting my family for the support, and last but by no means least, my wife Alicia who after waiting for me to code this up is now a happy bunny :D

Now let's get into the ReQ·131....

Introduction

The ReQ·131 31 ISO band graphic equalizer is a dedicated rack unit, built as a Rack Extension for the Propellerhead Reason environment. This device has a maximum of what would be 2U space in the real world. Being a Rack Extension (Re), this gives you various options of versatility within your projects.

The ReQ·131 features 31 stereo-linked frequency bands, plus a high-pass and low-pass filter, and includes a gain control (see 'A brief guide of the ReQ·131' section). All these controls are adjustable to suit your application, and these settings can be stored as your own presets, so you can recall them again and again at a later time (see 'How to save and recall presets' section).

The ReQ·131 features two audio inputs and two audio outputs, which are processed independently, which allows you to have two totally separate signals being processed together at the same time using one set of controls. Mono operation is also an option (see 'How to connect audio' section).

ReQ·131 has some other controls which have been developed over time with the audio engineer and the musician in mind. Since v1.2 the inclusion of the following can be found:

- 31 CV (control voltage) sockets, with independent trim knobs, independent bi-polar and unipolar buttons, and invert CV signal buttons, plus a CV trim scale knob which adjusts all CV inputs by scaling (alike how an audio buss fader would work). See the 'CV inputs and controls' for more information.
- STEREO equalisation, MID equalisation, SIDE equalisation (both left and right signals are linked). See the 'Selecting the Signal Path and dB ranges' section for more details
- 5 dB range modes (3dB, 6dB, 12dB, 18dB, 24dB), for subtle shaping to signal carving.
- LPF BYPASS and HPF BYPASS buttons to allow you to bypass the effect of the LOW PASS and HIGH PASS filters.
- HEAR EQ mode which aid you further with your audio massaging and sculpting.
 See the 'HEAR EQ mode and how it works' section.
- a DRY/WET knob, which now gives even more control between original signal and processed signal, to obtain a medium between full effect and bypassed audio.

For reference, the 31 ISO bands are:

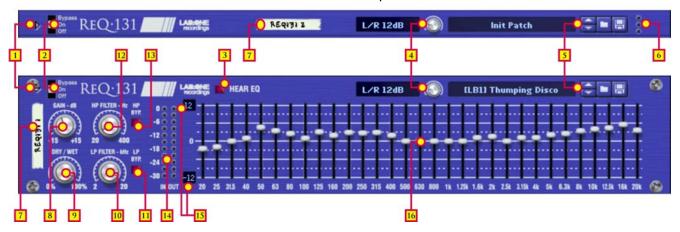
20Hz, 25Hz, 31.5Hz, 40Hz, 50Hz, 63Hz, 80Hz, 100Hz, 125Hz 160Hz, 200Hz, 250Hz, 315Hz, 400Hz, 500Hz, 630Hz, 800Hz, 1kHz, 1.25kHz, 1.6kHz, 2kHz, 2.5kHz, 3.15kHz, 4kHz, 5kHz, 6.3kHz, 8kHz, 10kHz, 12.5kHz, 16kHz, & 20kHz.

On a thirty-one band graphic equaliser, each band covers one third of an octave.

The ReQ·131 is designed to be a transparent effect, meaning that if no adjustments are made on the device, the audio passing through the effect is 'clean' and has not been affected by the equalisation filters or the low pass or high pass filters. This is the ideal, so that no coloration is applied to the sound.

A brief guide of the ReQ-131

The ReQ·131 is based on most hardware 31-ISO band equalizer units.



The Front Panel (folded & unfolded views)

FOLD-UNFOLD [1] - To allow the RE to be maximized or minimized

BYPASS SWITCH [2] - To determine signal flow (BYPASS effect, effect ON, or effect OFF)

HEAR EQ button [3], to isolate and examine your EQ effect (see 'HEAR EQ mode and how it works')

SIGNAL PATH AND DB MODE dropdown/selector knob [4], to select audio signal mode & db range PATCH NAME and PATCH BROSWER [5] buttons; for loading & saving presets.

MINI OUTPUT LEDs [6] to indicate signal output signals when ReQ131 is folded.

TAPE STRIP [7] - Used to identify the RE. Double click to edit.

GAIN [8] – A trim control to boost / cut overall volume by +/-15dB.

DRY/WET [9] - A mix control between affected audio and original signal.

LOW PASS FILTER [10], HI PASS FILTER [12] knobs; to remove frequencies at 12dB / octave roll off. Frequency setting determines the point where the roll off begins.

LOW PASS BYPASS [11], HI PASS BYPASS [13] buttons; to bypass the filters.

INPUT LEDs and OUTPUT LEDs [14] to indicate signal input & output, for re-balancing aid.

dB RANGE UNIT displays [15] indicating the min / max dB level of the scale (set by the SIGNAL PATH AND DB MODE selector)

FREQUENCY BAND faders [16] – boost or cut at the set frequency (fixed Q of 1/3rd octave)

The GAIN knob can attenuate between -15dB through to +15dB. This allows you to decrease the gain if you raise the fader bands, or increase the gain if you lower the bands (see 'Working the ReQ·131 in practice').

The DRY/WET knob can be used to mix between wet and dry affected signals. This can be used creatively, to scale the amount of unprocessed signal with the processed signal (pre-filter mix control).

The LOW PASS and HIGH PASS knobs are high pass and low pass filters. These attenuate certain frequencies depending on the setting at a rate of -12dB per octave. These are used to 'cut away' the high frequency content (Low passing) of the audio and the low frequencies (High passing). If you set the Low Pass dial to 10 kHz, this would mean that at 20 kHz the audio signal at that point in the frequency range would be reduced by 12dB (think simply using the dials as precise 'bass' and 'treble' reducers). NOTE: 1 octave range is exactly half or exactly double the current frequency setting, so if 500Hz is the

chosen frequency, 1 octave down is 250Hz, and 1 octave up is 1000Hz. This applies to all frequencies.

The FREQUENCY BANDS are set so they can manipulate the specific frequencies they are set to. They can be used to attenuate the set frequency between minimum and maximum dB range, set by the SIGNAL PATH AND DB MODE dropdown. The bandwidth (known as 'Q' in equalizer terms) is specifically set at $1/3^{rd}$ Octave. This allows you to create 'curves' with the faders, without 'overlapping' of frequency bands (prevents possible phase shifting or other undesired audible side effects). If you push two bands side by side on the ReQ·131, then the combination of both bands would make a wider 'band'. This is how equalizers of this design should work. All faders as of v1.2 now indicate a percentage figure, so if you are in 12dB mode and have the fader set to +75%, the fader would attenuate +9dB at the chosen, if set to -50%, the fader would attenuate the signal -6dB at the chosen frequency.

The SIGNAL PATH AND DB RANGE dropdown display allows the user to select between 15 options; these are a combination of 3 signal paths and 5dB modes. See the 'Selecting the Signal Path and dB ranges' for more information.

The HEAR EQ button is a new approach to equalisation for ReQ·131, in that you can hear the effect of your equalisation settings by turning this feature on. See the 'HEAR EQ mode and how it works' section for a more in-depth explanation.

The dB RANGE displays are dynamic labels which update in accordance to the SIGNAL PATH AND dB RANGE dropdown. They will display the maximum and minimum dB settings for that active mode.

The BYPASS SWITCH is used to enable / disable / bypass the ReQ·131. The PATCH SELECTOR is used to save, load and browse presets for the ReQ·131 The TAPE STRIP is used to show the name of the device. Double click to rename the device. The FOLD / UNFOLD arrow is used to minimize or maximize the Rack Extension.

The INPUT and OUTPUT LEDs are used to assess initial input levels pre-EQ, and final output levels post-EQ and post-Filters. See 'Working with the ReQ·131' for more details on usage.



The Back Panel (folded & unfolded views)

FOLD-UNFOLD [1] - To allow the RE to be maximized or minimized

TAPE STRIP [7] - Used to identify the RE. Double click to edit

CV INPUTS, CV Inverts & CV Bi-polar / Uni-polar modes [17] are used to affect each of the 31 faders independently, and would affect the attenuation of the band filter.

CV TRIM SCALE [18] affects all CV inputs by a set scale (between 0% and 100%), for fine tuning of CV input signals. For more information see the 'CV controls and input options' section.

AUDIO INPUTS and AUDIO OUTPUTS [19] sockets; to connect the RE to various other devices via audio cabling.

The FOLD / UNFOLD arrow is used to minimize or maximize the Rack Extension.

The TAPE STRIP is used to show the name of the device. Double click to rename the device.

The AUDIO SOCKETS are used to connect your ReQ·131 to various modules within the Propellerhead Reason environment, in a form of either an insert or a send effect (see 'Working the ReQ·131 in practice').

Connecting up the audio sockets can be done automatically by Reason, or can be manually done to your own requirements. Mono devices, when connecting a new ReQ·131 to them, can automatically route their mono signal in to the left channel, and the left output of the ReQ·131 is connected to the originally wired socket of the mono device, closing the audio loop. Stereo devices can automatically connect their outputs to the left and right inputs of the ReQ·131, and the ReQ·131 completes the audio chain by connecting its outputs to the originally connected stereo pair sockets.

ReQ·131 processes audio in 3 methods, determined by the SIGNAL PATH; the choices available are Left & Right processing (both channels are independent of each other, and are equalised together) MID-only processing (which analyses the left and right input, determines what is the same information in both channels, and equalises the MID signal) or SIDE-only processing (which analyses the left and right input, determines the difference between the left and right signal information and equalises the SIDE signal). These three signal paths are discussed further within the manual (see page 14)

The CV SOCKETS and CONTROLS are used to extend the possible usage of the ReQ·131 in a 'dynamic' sense, so the faders can be controlled by another device by use of CV (control voltage) information. This can be LFOs or envelopes, or even audio converted to CV (using Scream 4's 'follower' CV socket, THOR's Mod Matrix to receive audio in and process out via the CV out sockets, or Pulverisor's follower CV socket, or even the M-Class Compressor Gain Reduction CV output socket).

NOTE: If using MONO signals whilst ReQ·131 is in MID or SIDE mode, the result would be the same as L/R mode, due to MONO signals have no stereo content naturally.

How to connect audio

To connect the ReQ·131 you can use Reason's own auto-connection system, and the ReQ·131 will decide the best way to auto-wire; if you have a mono-output device (Subtractor, for example), and you wish to add a ReQ·131 to it, the ReQ·131 will auto-connect the Subtractor output to the Left input, and then continue to route the Left output of the ReQ·131 to the Left input of the mix-channel (or next device in your processing chain).

You can do any of the following to create the ReQ·131;

- a) right-click (Win) / CTRL-click (Mac) on the device, select 'Create Device', choose sub-menu 'Studio Effects', and select 'ReQ-131 (31 Band EQ)' from the listing.
- b) with the device selected, use the 'Create', select 'Create Device', choose sub-menu 'Studio Effects' and select 'ReQ·131 (31 Band EQ)' from the listing
- c) using the Tool Palette in Reason (F8), select 'Studio Effects' when in the 'Devices' tab, and locate the 'ReQ·131 (31 Band EQ)' device, click on the icon and drag it to the device you wish to add it to.

How to connect CV cables and sockets

To connect the ReQ·131 CV sockets, you require a source CV signal, which could be from a synth module or effect module within Reason. Only information from a CV output on the source device can connect to the CV inputs on the ReQ·131.

To connect the source CV out to any of the CV inputs of the ReQ·131 simply click-hold with your mouse on the CV out socket of your source device and drag the yellow cable to the CV input of your choice.

See page 15 for more information on how to use CV controls.

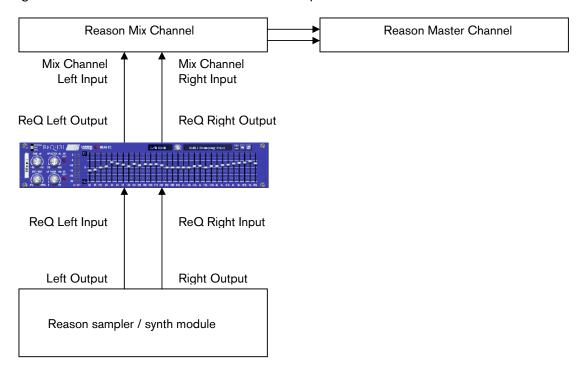
NOTE: CV cable configurations can only be saved and re-loaded within a Combinator device or a Mix Channel / Audio Channel Combinator unit. Also, any Combinator patches using ReQ·131 with external routings (ie a CV input from a device outside of the Combinator) will not recall the correct configuration. Song files however will remember CV connections and CV knob settings.

Working with the ReQ-131

The ReQ·131 is designed to be a flexible device, allowing it to be used however you see best fit. Only typical applications will be listed in this manual.

Experiment with setups to your own way of working, use these as a guide, but not necessarily as the beall-and-end-all approach.

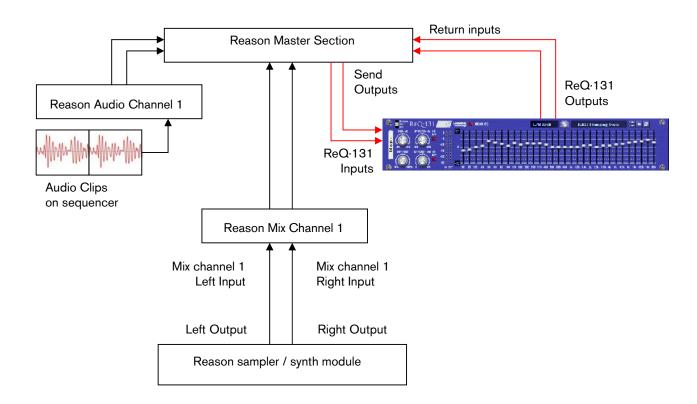
A) Using the ReQ·131 as an insert (mix channel setup).



In setup (A), this would use the ReQ·131 as an insert effect. This means that whatever control you adjust on the ReQ·131, it will affect the total sound coming out of the sampler / synth module. If the ReQ·131 is in bypass mode or has the 'Factory settings' preset loaded, the audio playing would still sound 'clean' and unaffected.

To affect the sound, begin with adjusting the Gain dial if you have a low signal (or alternatively, raise the signal on the sampler / synth module). Low Pass and High Pass dials to taste (not compulsory). Low passing will 'dull' the sound by suppressing the higher frequencies, while High passing would remove some 'body' from the lower end of the frequency spectrum. Adjust the faders on the graphic equalizer to compliment the sounds you wish to 'bring out'. To help you, refer to Appendix 1: Frequency Band 'character' descriptions. To finalise the adjustments, use the gain dial to return the audio back to the same level pre-equalization. What this allows you to do is to be more subjective with your eqing decisions, to see if improvements have occurred. If you leave the level higher after equalization, the natural 'boost' in level gives a false pretence to the ear, making you believe it is better sounding (purely because of being at a slightly higher level). Remember to equalize carefully, so not to make wrong decisions too quickly.

B) Using the ReQ-131 as a send effect (mix / audio channel setup).



In setup (B), this would use the ReQ·131 as a send effect. This means that whatever control you adjust on the ReQ·131, it will affect the sound coming from the Master Section at a set amount, determined by the Send Effect dial on that specific Mix / Audio channel. This means you can have a clean sound mixed with an altered equalized sound. This is known as Parallel Processing, and may be desired in some cases.

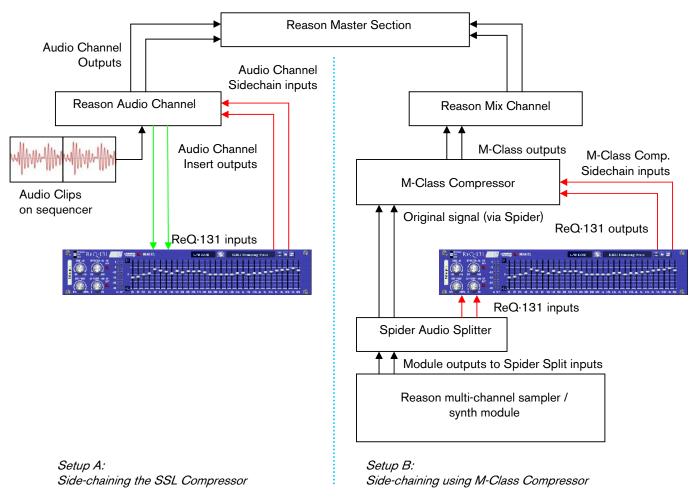
Again you can adjust the ReQ·131 as mentioned in setup (A) above, with the addition of the SEND dial located on the Main Mixer in Reason. Full left setting of the SEND dial has no effect on the sound, while full right setting of the SEND dial will send a maximum level possible to the ReQ·131. This means you can have one ReQ·131 as a send device for all your audio channels. However, latency may have a side effect of cancellation of audio (aka phasing), due to the processing time needed to perform the filtering of the ReQ·131, when used as a Send effect.

Alternative setups

For devices which have multiple outputs (ie NN-XT, Redrum, Thor, Spider Audio), then if required additional ReQ·131's could be added as either mono-devices (only connecting left audio input & output sockets), or as stereo devices. This in turn allows you to edit specific sounds within a preset if you so wish (ie split zone instrument patches may have a bass guitar for one half of the keymap, while a synth lead is using the other half, and you wish to effect the sounds independently). See the next page for more examples of setups.

Another possible option would be to use one instance of ReQ·131, and have 2 mono devices linked into it, and process both inputs in parallel, and output the two signals to two separate mixer channels. This may be desired to help use the same eqing settings on two mono devices at the same time.

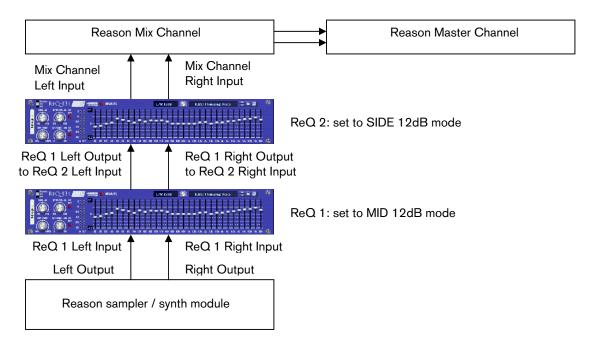
C) Using the ReQ·131 as an insert to a side-chain (mix / audio channel setup)



Above you will see two alternative setups using the ReQ·131 as part of a side-chain effect signal path. The method on the left utilises the Audio Channel insert sockets, to send signal from the Audio clips on the sequencer through the SSL desk channel strip. The insert sockets send the original signal to the ReQ·131, which then can alter the signal by using the 31 band faders, the gain knob and the Low Pass & High Pass filters, to 'exaggerate' the signal more. Reason for doing this may be to use the ReQ·131 to help with sibilance and plosive sounds which can be found in vocal recordings. From the ReQ·131 the outputs are then fed into the channel strips own side-chain sockets, and the 'KEY' button will become active on the SSL desk, indicating that the side-chain functionality of the compressor found on the SSL desk is in operation.

Method 2 on the right shows a similar setup, but using a Spider Audio Splitter unit to divide the original signal / sound source into two parallel pairs of signals, one set is sent to the M-Class Compressor unit audio inputs, while the second pair from the Spider is sent to the audio inputs of the ReQ·131, and the outputs of the ReQ·131 are connected to the side-chain input of the M-Class Compressor. This frees the side-chain of the SSL compressor, so another sound source could be used to control the main SSL dynamics for that channel strip.

D) Using the ReQ·131 to process MID and SIDE signals in series



In setup (D), this approach uses 2 ReQ·131's in series (one after the other), as an insert chain. The difference between this setup and prior setups is that the mode is set for each ReQ·131 to process the specific Mid / Side signals, rather than effect the full signal coming out of the sampler / synth module.

ReQ·131 #1 has been set to 'MID 12dB' mode, meaning that whatever we change on the front panel* of this particular instance will affect ONLY the MID content of the audio signal. What in turn this will do is attenuate frequencies found 'centrally' to the mix (also known as 'phantom centre'), so central sounds can be boosted without affecting hard panned or very wide stereo signals.

Continuing through the chain, ReQ·131 #2 has been set to 'SIDE 12dB' mode, meaning whatever we change on the front panel* of this instance will affect only the SIDE content of the audio. This would allow us to attenuate frequencies that are not central to the mix (ie hard panned signals, phaser / chorus / unison / reverb effects for example). NOTE: some effects mentioned may also include MID signal information as well as SIDE signal information.

To determine what you are equalising in each mode, you can do the following: 'BYPASS' one of the ReQ·131's and activate the HEAR EQ button, to hear ONLY the signal of the MID/SIDE matrix alone and out of context, so you can really focus on that particular signal type. Turn off HEAR EQ to hear your equalised MID/SIDE signal in context with the non-processed part of the MID/SIDE matrix signal.

Additionally, you can use the DRY/WET knob in all setups explained, to mix and compare between your new EQ adjustment and your original signal, which gives you the opportunity to process in parallel

For more information on selecting the signal mode and what MID and SIDE information is, please refer to the sections 'Selecting the Signal Path and dB ranges' on page 14, and 'HEAR EQ mode and how it works' on page 15.

^{*} all except the GAIN control, which affects the final output level of the RE, and controls the dry level & wet level at the same time.

Using the LED meters with the ReQ·131

The Input and Output LEDs can be used to assess initial audio signal levels, and processed final output levels. The best way to use the meters is as follows;

- 1) Set the output of the sound module (synth / sampler / insert effect) so that the input meter on the ReQ·131 is around the highest green LED and the lowest yellow LED this aids your decisions later in and also helps to prevent any clipping if any louder signals come through the signal chain into the ReQ·131.
- 2) Use the filters and the EQ faders to your desired choice, be it boosting or cutting of frequencies.
- 3) Whilst affecting the signal within the ReQ·131, you will notice the Output LEDs may vary above or below the input levels. This is due to signal spectrum & frequency changes in relation to the adjustments you have made. To compensate, use the GAIN dial to reduce the output level (if the output LEDs is higher then the input LEDs, commonly due to boosting) or raise the output level (if you have cut some key frequencies from your signal chain, the output level overall would be reduced); ideally aim to match the level of the input LED signal, so that you can do a direct comparison (as close as possible) when you bypass the ReQ·131.
- 4) In conjunction with all the adjustments, as a final check you can use the DRY/WET knob and adjust between 0% (no EQ effect) to 100% (full EQ effect), so that you can cleanly listen to the EQ effect or the original signal without 'breaking' the signal flow by using the BYPASS fader (which may cause ultra fast signal dropouts or pops whilst playing audio through the ReQ·131, throwing the user off due to hearing fast transients that are not intended to be part of the signal).

NOTE: The input and output LEDs at maximum will show a RED LED at the top of the meter. Flickering RED LEDs may be subject to clipping, so reducing the input / output audio levels will help ensure you get a cleaner sound without digital distortion. However, if this is the desired effect there is nothing stopping the user from over-driving the inputs / outputs if desired.

This method will help you to determine if your decisions relating to filter use and / or EQ band filtering are good or bad, without raising or lowering the level too much, which would be bias towards whether your EQing is right or wrong.

Human nature determines louder sounds as 'better', even as little as 3dB gain can give the listener a 'false' pretence that a 3dB louder mix sounds better than a 0dB levelled mix of the same material (ie -5dB to some people sounds better than -8dB, purely down to the volume).

This is why using the levels as well as the gain dial, filter dials and EQ faders can help the producer / artist / musician make better equalisation decisions while using the ReQ·131.

Selecting the Signal Path and dB ranges

ReQ·131 has a built in dropdown menu listing which is dedicated to signal path choices with dB range choices. The options available are:

Signal Path:	Affects	dB ranges	
L/R :	Total content of the stereo signal	3dB	
MID:	Mid content of the stereo signal, does not affect the Side content	6dB 12dB	
SIDE:	Side content of the stereo signal, does not affect the Mid content	18dB 24dB	

There are a total of 15 options available, 3 signal paths and 5 dB ranges. This gives ReQ·131 more flexibility into what can be equalised.

The benefits of this can be useful, in respect to audio engineers, musicians and producers alike.

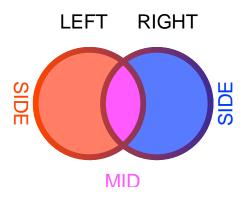
The 3 signal paths available are L/R (corresponds to left and right audio signals), MID (the same audio found in both left and right signals) and SIDE (the difference between left and right audio signals. Mid and Side processing can be daunting to start with for new users, so there is a further explanation below regarding reasons for the options in ReQ·131, and to help gain further understanding. More confident users and professionals would appreciate the addition of Mid and Side control to ReQ·131 to aid more clinical tasks when final mixing and mastering is a concern.

To select any of the possible signal paths and dB ranges, click the SIGNAL PATH AND dB RANGE display to reveal a popup with the available options. On selecting your specific path and range, the display will update as well as the maximum / minimum scale displays on the device front.

A brief explanation of MID and SIDE signals: What are they?

So some users new to this may think that left and right equalisation is the only approach, without any knowledge of Mid and Side information. So what is Mid and Side?...

In simple terms, Mid/Side processing is when a recorded stereo signal, consisting of a left and right channel (representing what will be played through the left and right speaker), is encoded to a mid and a side channel (using sum and differences of the left and right channel; mid = left + right, side = left - right), then processed as desired, then decoded back to left and right. Have a look at the image below to make this a bit easier.



To get a basic understanding to how MID and SIDE matrix works, the image on the left is a simplified version of how MID and SIDE works. The Red circle denotes LEFT audio, while the BLUE circle indicates the RIGHT audio. MID information (in pink) is like how the image looks, an 'overlap' where there is the same information of left and right together, so would audibly appear 'central' or 'in the MIDdle' to the audio panorama. The remaining information (Red SIDE, blue SIDE) is the difference between the LEFT and RIGHT audio signals, making this SIDE information. Depending on the source material depends on how much SIDE information is available to process.

This means with ReQ·131 you can process on the middle or side, rather than just stereo-linked equalisation. This allows you, amongst other things, to EQ centre panned signal portions differently from portions that are wide in stereo. For example, with mid-side processing, you could add some high frequency sparkle to some wide stereo piano, while hardly affecting the centre panned hi hat. Or you could add some low end to the centre panned bass, while hardly affecting any wide stereo synth pads. This is all done purely in a matter of taste.

This in turn makes ReQ 131 a dedicated device to help control all aspects of your productions in regards to equalisation, not only of the stereo signal but also the mid and side content too.

NOTE: Even though we now have control available to equalise MID and SIDE information, the equaliser bands and filters process the audio in a stereo-linked fashion. Whichever signal mode you are in, the faders will affect BOTH channels at the same time.

HEAR EQ and how it works

ReQ·131 has the option to listen to the affect of the EQ itself, via the HEAR EQ button, without the original content. This can be beneficial to help identify if certain instruments or sounds should be brought forward or sent to the back of the mix, in any of the signal path modes.

In L/R mode;

- When you turn HEAR EQ on with all faders set to zero, you should hear no signal at all. This is because the EQ is having no effect on the final audio
- If you raise any of the faders above the zero line, you will hear portions of audio based on that specific frequency centre; this will indicate what you are ADDING to the final signal.
- If you lower any faders below the zero line, you will hear portions of audio based again on that specific frequency centre, with the difference that this will be the audio REMOVED from the final signal. NOTE: this will invert audio frequencies whilst in HEAR EQ mode, so even though it sounds alike the original, the phase relationship with the original is an inversion.
- This can be very convenient to tell what you are adding or removing, giving you more insight to what the equalisation is doing to your final signal.

In MID or SIDE mode;

- when you turn HEAR EQ on with all faders set to zero, you should hear only the signal of your
 chosen path, either MID signal or SIDE signal only, without any equalization effect applied. This
 can be useful to aid with better decisions to decide what will be equalised in your chosen mode.
 It works very much like standard L/R mode with HEAR EQ off, except you are listening to an
 EQ'd version of the MID or the SIDE signal.
- Raising any of the faders will increase the level of the specific frequency centre on the chosen signal path only, without affecting the unprocessed side (ie boosting MID while leaving SIDE alone
- Lowering any of the faders will decrease the level of the specific frequency centre on the chosen signal path only, without affecting the unprocessed side (ie boosting MID while leaving SIDE alone
- When you turn HEAR EQ off, you will hear your EQ'd signal path put back with the unprocessed signal

Which ever mode you are using, when you use the WET/DRY knob as a balance, you will be either:

- Mixing original stereo signal with equalized stereo signal
- Mixing original MID signal + unprocessed SIDE signal with equalized MID signal + unprocessed SIDE signal
- Mixing original SIDE signal + unprocessed MID signal with equalized SIDE signal + unprocessed MID signal

HEAR EQ can also be used creatively if you so desire, especially useful for sound design

CV inputs and controls

ReQ·131 has a total of 31 CV inputs, trim knobs (to scale CV input signals) and two toggle buttons for each CV input (Bi-polar/Uni-polar mode, and Invert CV signal). Each of the 31 CV sockets connect to the 31 faders on the front of ReQ·131, giving more creative use of the equalizer where the user sees best fit. On top of this is an extra CV trim control, which will scale all CV trim controls to a set about (between Off and 100%), so even finer CV input control can be possible.

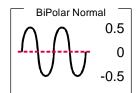
Each CV input has a frequency number noted underneath it, to distinguish which filter it is paired with.

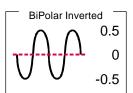
To use the CV inputs, simply connect a CV output from another device. Default settings for CV trim knobs are at maximum, so be aware of possible loud signals if using CV inputs whist in 18 or 24dB modes.

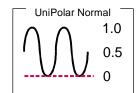
To change the polarity of the CV input signal, turn on the corresponding RED CV INVERT buttons above the CV input socket. This will convert all positive CV numbers to negative, and negative to positive.

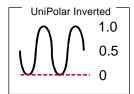
To change the signal type from bi-polar (default) to uni-polar, turn on the corresponding BLUE CV POLAR buttons above the CV input sockets. This will convert any bi-polar signals (between -0.5 and 0.5 CV) to uni-polar (0 and 1 CV).

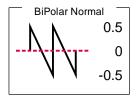
In relation to the fader controls when using CV inputs, polarities and inversions please see the illustration below

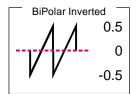


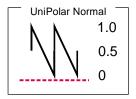


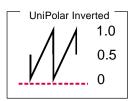












From the example above, we can see the effect of changing the polarity and bi-polar / uni-polar modes has on CV input signals.

NOTE. CV signal patching will remain only within Mixer / Audio Channel effect chains, or within a Combinator, and of course your template Reason rack setup files (denoted as *.reason).

ReQ·131 will not save CV input chains, but will keep bi-polar / uni-polar and CV trim scale settings within the presets.

For more CV information, please refer to the Reason Operation manual.

How to save and load presets

ReQ·131 comes with a collection of basic presets as a 'starting' point. Depending on your application may depend on how you wish to use the ReQ·131. Listed within the presets are some general application setups which may help guide you to the type of sound you want, and you may adjust them to suit accordingly.

As default, every time you create a ReQ·131, the 'Factory Startup' preset will load, initializing all the settings ready for you to use from scratch. To browse the bundled presets, simply use the browser up & down buttons to activate the next preset in the listing, or alternatively you can click and hold on to the preset name to show a popup windows, for faster section.

To save your own presets, simply click the 'save' button located next to the preset name display, and select where to save the preset (ideally create a new folder and keep it as a favourite in the Reason browser window, for easier finding and retrieval at a later date). The presets are saved as a repatch name, and can only be used with that specific Rack Extention.

To load alternative presets, click the 'browse patch' button to locate presets (which are not part of the bundled pack within the ReQ·131). To preview the patch, simply play the sequencer with the ReQ·131 setup so it is in use, and select the 'load patch' button, and select within the browser the specific preset. The ReQ·131 will update whilst you are previewing, so you can hear the effect before finally committing to the chosen patch. If you cancel browsing the ReQ·131 will reset back to its prior state before patch browsing.

MIDI Implementation table

Below is a listing of all MIDI Control Change (CC) numbers, which can be applied to your choice of device.

MIDI CC	CONTROL	RANGE
4	GAIN	+ / - 15dB
7	DRY/WET	0 - 100%
47	HEAR EQ	OFF / ON

MIDI CC	CONTROL	RANGE
5	HIGH PASS	20Hz - 400Hz
45	HP BYPASS	OFF / ON

MIDI CC	CONTROL	RANGE
6	LOW PASS	2kHz - 20kHz
46	LP BYPASS	OFF / ON

All equalizer bands have a fixed bandwidth (Q) of 1/3rd octave. Attenuation of band depends on the SIGNAL PATH AND DB MODE settings

12	EQ 1	20Hz
13	EQ 2	25Hz
14	EQ3	31.5Hz
15	EQ 4	40Hz
16	EQ 5	50Hz
17	EQ 6	63Hz
18	EQ 7	80Hz
19	EQ8	100Hz
20	EQ 9	125Hz
21	EQ 10	160Hz

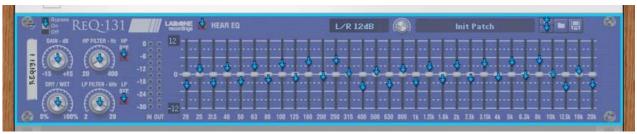
EQ 11	200Hz
EQ 12	250Hz
EQ 13	315Hz
EQ 14	400Hz
EQ 15	500Hz
EQ 16	630Hz
EQ 17	800Hz
EQ 18	1kHz
EQ 19	1.25kHz
EQ 20	1.6kHz
	EQ 12 EQ 13 EQ 14 EQ 15 EQ 16 EQ 17 EQ 18 EQ 19

33	EQ 21	2kHz
34	EQ 22	2.5kHz
35	EQ 23	3.15kHz
36	EQ 24	4kHz
37	EQ 25	5kHz
39	EQ 26	6.3kHz
40	EQ 27	8kHz
41	EQ 28	10kHz
42	EQ 29	12.5kHz
43	EQ 30	16kHz
44	EQ 31	20kHz

How to 'latch' your own MIDI via Remote Overriding

Reason allows the user to re-define certain controls via MIDI devices by using the Remote Override configuration. This means that a control on the ReQ·131 can be mapped by any MIDI controller you have connected to your DAW. However, you can only map one specific control to any of the available Remote 'receiving' controls on the Rack Extension. Also, Remote Override controls are only saved within each independent Reason song file. Ideally, if you use a dedicated piece of MIDI equipment for the ReQ·131, a template start-up file would be a better option, so that the Remote Override template is pre-defined on each new song from the off.

All the controls on the ReQ·131 are Remote Override-able. To access the override editor, select from the 'Options' Menu 'Edit Remote Overrides'. The Rack will now display the specific device selected, with either pre-defined Remote control indicators (the Remote symbol), yellow Lightning bolts (overridden Remote controls pre-defined) or blue arrows (unassigned Remote controls)

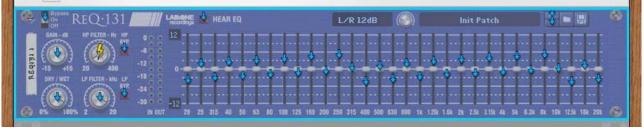


The ReQ-131, displaying all available Remote overrides, currently not set

You can right-click one of the controls and select 'Edit Remote override'. This will open a new popup window, with some available options, and to show you which MIDI controller is currently set to that specific Remote Override.



By moving one of the controls on your MIDI device (already predefined in Reason), you should then see MIDI activity indicator display that a MIDI message was received. Note also the control surface and the control itself on the MIDI device that was adjusted relays to the new Remote Override. Once you are happy with the control being set, you can click 'OK' to continue with the new setting, or 'CANCEL' to abort the mapping. Also note that if you accept this mapping, the control (if already linked to another) will be fixed to the new mapping. Any previously set mappings will be 'moved' to the new mapped control. This should be used with care if you already have pre-defined Remote Override mappings.



The ReQ·131, with a Remote Override mapping defined on the HIGH PASS control, indicated by a yellow Lightning bolt

This Remote Overriding method can be handy if you don't know how to set up your own MIDI controller to the dedicated MIDI controls mentioned in the previous chapter. For speed, you can simply double click a blue arrow, and the arrow with turn into a spinning yellow Lighning bolt, indicating that Reason is awaiting a MIDI signal to that control. You can then adjust a MIDI control on your MIDI device, and the control will map automatically without the need to use the popup previously mentioned. Double-click each specific control you want to map to save time and to use the mapping in a faster method.

All Remote Overrides can then be used to record automation within Reason, which can be fine tuned using the Sequencer and the clips (see the Reason Operating Manual for more information on how to edit & record automation)

Remote templates (which are currently in use by supported manufacturers) are currently not available for ReQ·131, but may be implemented and available in the near future

Appendix 1:

Instrument Frequency ranges

To understand EQ and its intricacies you need hands-on experience, but through practice and use of the ReQ·131 you will start to become accustomed to certain 'ranges' of the frequency spectrum.

Also, every sound that you use may sound different to someone else, even if you use the same sound – different variables come into play (amplitude, pitch, envelope, bit rate,.. etc.), so you need to keep in mind that the below listed frequency settings can be used with 'a pinch of salt'; EQing is like seasoning of your sound, it adds flavour (and can also take it away too).

The Kick Drum

Any apparent muddiness can be rolled off around 300Hz. Try a small boost around 5-7kHz to add some high end.

50-100Hz ~ Adds bottom to the sound 100-250Hz ~ Adds roundness 250-800Hz ~ Muddiness Area 5-8kHz ~ Adds high end presence 8-12kHz ~ Adds Hiss

The Snare

Try a small boost around 60-120Hz if the sound is a little too wimpy. Try boosting around 6kHz for that 'snappy' sound.

100-250Hz ~ Fills out the sound 6-8kHz ~ Adds presence

The Hi hats, The Cymbals, The Rides & The Other High-end Percussive sounds

Any apparent muddiness can be rolled off around 300Hz. To add some brightness try a small boost around 3kHz.

250-800Hz ~ Muddiness area 1-6kHz ~ Adds presence 6-8kHz ~ Adds clarity 8-12kHz ~ Adds brightness

The Bass

Try boosting around 60Hz to add more body. Any apparent muddiness can be rolled off around 300Hz. If more presence is needed, boost around 6kHz.

50-100Hz ~ Adds bottom end 100-250Hz ~ Adds roundness 250-800Hz ~ Muddiness Area 800-1kHz ~ Adds beef to small speakers 1-6kHz ~ Adds presence 6-8kHz ~ Adds high-end presence 8-12kHz ~ Adds hiss

The Vocal

This is a difficult one, as it depends on the microphone that was used to record the vocal. Apply either cut or boost around 300hz. Apply a very small boost around 6kHz to add some clarity.

100-250Hz ~ Adds 'up-frontness' 250-800Hz ~ Muddiness area 1-6kHz ~ Adds presence 6-8kHz ~ Adds sibilance and clarity 8-12kHz ~ Adds brightness

The Piano

Any apparent muddiness can be rolled off around 300Hz. Apply a very small boost around 6kHz to add some clarity.

50-100Hz ~ Adds bottom 100-250Hz ~ Adds roundness 250-1kHz ~ Muddiness area 1-6kHz ~ Adds presence 6-8Khz ~ Adds clarity 8-12kHz ~ Adds hiss

The Electric Guitar

Again this depends on the mix and the recording. Apply either cut or boost around 300hz, depending on the song and sound. Try boosting around 3kHz to add some edge to the sound, or cut to add some transparency. Try boosting around 6kHz to add presence. Try boosting around 10kHz to add brightness.

100-250Hz ~ Adds body 250-800Hz ~ Muddiness area 1-6 kHz ~ Cuts through the mix 6-8 kHz ~ Adds clarity 8-12 kHz ~ Adds hiss

The Acoustic Guitar

Any apparent muddiness can be rolled off between 100-300Hz. Apply small amounts of cut around 1-3 kHz, to push the image higher. Apply small amounts of boost around 5 kHz to add some presence.

100-250Hz ~ Adds body 6-8kHz ~ Adds clarity 8-12kHz ~ Adds brightness

The Strings

These depend entirely on the mix and the sound used.

50-100Hz ~ Adds bottom end 100-250Hz ~ Adds body 250-800Hz ~ Muddiness area 1-6hHz ~ Sounds crunchy 6-8kHz ~ Adds clarity 8-12kHz ~ Adds brightness

Appendix 2: EQ Tables

Below is a general guide to what specific frequencies may do to your sounds / mix.

50 Hz

- 1. Increase to add more fullness to lowest frequency instruments like foot, toms, and the bass.
- 2. Reduce to decrease the "boom" of the bass and will increase overtones and the recognition of bass line in the mix. This is most often used on bass lines in Rap and R&B.

100 Hz

Increase to add a harder bass sound to lowest frequency instruments.

Increase to add fullness to guitars, snare.

Increase to add warmth to piano and horns.

Reduce to remove boom on guitars & increase clarity.

200 Hz

- 1. Increase to add fullness to vocals.
- 2. Increase to add fullness to snare and guitar (harder sound).
- 3. Reduce to decrease muddiness of vocals or mid-range instruments.
- 4. Reduce to decrease gong sound of cymbals.

400 Hz

- 1. Increase to add clarity to bass lines especially when speakers are at low volume.
- 2. Reduce to decrease "cardboard" sound of lower drums (foot and toms).
- 3. Reduce to decrease ambiance on cymbals.

800 Hz

- 1. Increase for clarity and "punch" of bass.
- 2. Reduce to remove "cheap" sound of guitars

1.5 KHz

- 1. Increase for "clarity" and "pluck" of bass.
- 2. Reduce to remove dullness of guitars.

3 KHz

- 1. Increase for more "pluck" of bass.
- 2. Increase for more attack of electric / acoustic guitar.
- 3. Increase for more attack on low piano parts.
- 4. Increase for more clarity / hardness on voice.
- 5. Reduce to increase breathy, soft sound on background vocals.
- 6. Reduce to disguise out-of-tune vocals / guitars

5 KHz

- 1. Increase for vocal presence.
- 2. Increase low frequency drum attack (foot/toms).
- 3. Increase for more "finger sound" on bass.
- 4. Increase attack of piano, acoustic guitar and brightness on guitars.
- 5. Reduce to make background parts more distant.
- 6. Reduce to soften "thin" guitar.
- 7 KHz

- 1. Increase to add attack on low frequency drums (more metallic sound).
- 2. Increase to add attack to percussion instruments.
- 3. Increase on dull singer.
- 4. Increase for more "finger sound" on acoustic bass.
- 5. Reduce to decrease "s" sound on singers.
- 6. Increase to add sharpness to synthesizers, rock guitars, acoustic guitar and piano.

10KHz

- 1. Increase to brighten vocals.
- 2. Increase for "light brightness" in acoustic guitar and piano.
- 3. Increase for hardness on cymbals.
- 4. Reduce to decrease "s" sound on singers.

15KHz

- 1. Increase to brighten vocals (breath sound).
- 2. Increase to brighten cymbals, string instruments and flutes.
- 3. Increase to make sampled synthesizer sound more real.

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