Infuser
User Guide

Version 1.0

Table of Contents

Selig Infuser

Thank you for your purchase of the Infuser! It is our hope you will get years of use and enjoyment from this product provided you give it the care and regular maintenance it deserves.

Quick Start

Infuser is setup to work great on many sources by simply enabling any section and tweaking a little from there. While this effect is designed primarily as a subtle/enhancer type effect, it can also provide many creative and less subtle effects as well.

Infuser's front panel is split into two main sections, Boom for the low frequencies and Sizzle for the high frequencies. Enabling one or both section adds enough saturation to be obvious - reduce Level by 6 dB on either section for super-subtle saturation effects, increase Amount to add more saturation/harmonics.
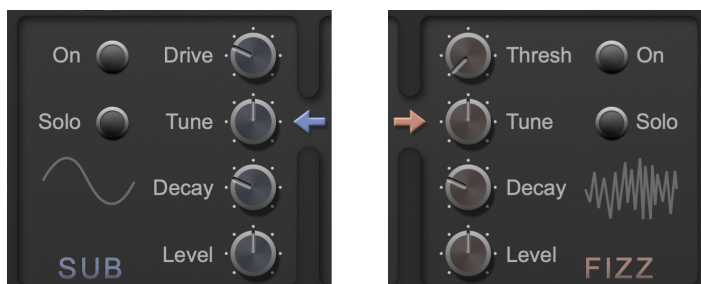
Each section has a related nano-synthesizer specific to that range; a sine generator triggered by the Boom section called Sub, and a noise generator triggered and filtered by the Sizzle section called Fizz. Both of these sections can be used on their own if desired, and the tuning can be unlinked from the main section by clicking on the colored arrow between the two Tune knobs in either section.
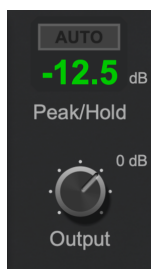
The final output level is read with the peak hold meter, and adjusted with the large Output volume knob.

Overview

Infuser is an audio enhancer effect based on frequency selective saturation, uniquely employing spectral balance compensation when adding saturation to create a more subtle effect (though it should be noted, Infuser can also get less subtle on command).

When working with Infuser you start by selecting a range of frequencies to saturate with the Tune, Bell, and Q controls. Boom defaults to a low shelf on the saturator, and Sizzle with a high shelf - but both can alternatively be switched to a bell shape. The filters and saturators are placed in a path parallel with the original, and this is all pretty standard up to now.

What makes Infuser unique in its ability to simultaneously reduce the frequency range of the *original* audio channel while adding the same range of frequencies via saturation on the parallel Saturation channel. This is done by first splitting the signal into two channels, the saturation channel and the EQ cut channel. This allows saturating a select range of frequencies (or even a single frequency) and add it in parallel to the original without adding more energy to that band of frequencies, which is accomplished by dipping out the same band on the "dry" channel. The overall effect can range from lowering the level of a saturated band, keeping the saturation level equal to the original, to exaggerating a band by increasing the level of the saturation channel. Read more in "Internal Signal Routing" section.

Infuser also includes two built in nano synths to further enhance the sound. There are two main sections, Boom and Sizzle, that are focused on low and high frequency enhancement respectively. They are not necessarily restricted to that range due to each Tune control covering the entire audible spectrum.

Main Features

•Control of specific frequency ranges to saturate.
•Choice of Low Pass/Shelf (Boom), Band Pass/Parametric (Both) or High Pass/Shelf (Sizzle) Filter/EQ types for shaping saturation, with a wide range of Q shapes for extreme isolation or wide band saturation.
•Two bands, Boom and Sizzle, to control saturation with overlapping frequency ranges
•EQs and Filters tuned to semitones, like Coloring EQ.
•Solo buttons on every section for fine tuning saturation and Sub/Fizz effects.
•Sub "nano-synth" generates a sine wave (with saturation option via Drive, triggered post filter to allow isolation of trigger source.
•Fizz "nano-synth" generates white noise and uses a filter shape that mimics the Sizzle filter
•Tuning of Sub and Fizz synths can be linked to Boom and Sizzle Tune or unlinked for fully independent control.
•CV Note/Gate control.
•Interactive Graph to control filter shapes.
•Peak Hold meter with 0.1 dB resolution and manual/auto reset.

The Front Panel

Bypass

Standard Reason Bypass/On/Off switch.

Signal Indicator

The signal indicator shows signal presence for both audio and CV inputs for quick indication of proper routing. The Audio Signal LED shows level with intensity, getting brighter when the input gets louder. The CV LED shows bipolar signals with positive values in green, getting

brighter with higher values, and negative values in red, getting brighter with lower values. When there is a CV cable connected but there is no CV activity, the LED will be a dim yellow.

Patch Browser

Standard Reason patch browser.

Boom

On: Activates the Boom band.
Solo: Allows hearing the saturated channel on its own for fine tuning or effects.
Bell: Changes the basic shape from a low shelf/pass to a parametric/band bass shape
Amount: This is the main drive control for the saturation channel, basically the pre saturation gain but also controls the EQ cut on the dry channel.
Tune: Semitone control for the filter, allows musical response with high Q settings.
Q: Classic resonance (width) control able to achieve everything from wide curves to extremely narrow resonances.
Level: This is the final output level of the Boom band, which is summed with the other sections and sent on to the main output.

Sub

On: Activates the Sub band.
Solo: Allows hearing the sub signal on its own for fine tuning or effects.
Drive: Adds saturation to the sine oscillator.
Tune: Semitone control for the filter, allows musical response with high Q settings.
Link Mode (Arrow button): Defaults to being linked to the Boom Tune control, in that mode Tune functions as an offset control in semitones and tuning can change if Boom Tune is adjusted. Unlinked/independent mode means the Tune control functions fully independent from the Boom Tune knob. Note that in both cases the synths envelope follower input is derived from the Boom filter output. This allows you to tune to the kick with Boom, but use CV for Sub Tune to create bass lines etc.
Decay: Decay rate of the envelope follower, which derives its input from the Boom filter output. Since this is an envelope follower decay, and not a synth decay, it can only ever decay as fast as the input source. Try tuning to a different frequency to reduce ringing in extreme cases to achieve shorter decay rates.

Level: This is the final output level of the Sub band, which is summed with the other sections and sent on to the main output.

Sizzle

On: Activates the Sizzle band.
Solo: Allows hearing the saturated signal on its own for fine tuning or effects.
Bell: Changes the basic shape from a high shelf/pass to a parametric/band bass shape
Amount: This is the drive control, basically the pre saturation gain but also some compensation to keep things relatively consistent.
Tune: Semitone control for the filter, allows musical response with high Q settings.
Q: Classic resonance control able to achieve everything from wide curves to extremely narrow resonances.
Level: This is the final output level of the Sizzle band, which is summed with the other sections and sent on to the main output.

Fizz

On: Activates the Fizz band.
Solo: Allows hearing the Fizz signal on its own for fine tuning or effects.
Threshold: Sets the threshold for a gate that keeps low level signals from triggering the Fizz envelope follower.
**Tune:** Semitone control for the filter, allows musical response with high Q settings.
Link Mode (Arrow button): Defaults to being linked to the Sizzle Tune control, in that mode Tune functions as an offset control in semitones and tuning can change if Sizzle Tune is adjusted. Unlinked/independent mode means the Tune control functions fully independent from the Sizzle Tune knob. Note that in both cases the synths envelope follower input is derived from the Sizzle filter output.
Decay: Decay rate of the envelope follower, which derives its input from the Sizzle filter output. Since this is an envelope follower decay, and not a synth decay, it can only ever decay as fast as the input source. Try tuning Sizzle to a different frequency to reduce ringing in extreme cases to achieve shorter decay rates.
Level: This is the final output level of the Fizz band, which is summed with the other sections and sent on to the main output.

Center Display
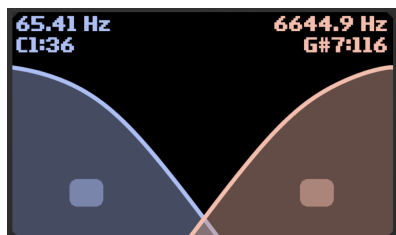
Data Display: In the upper left and upper right of the Center Display are data displays showing the showing three details from the Boom (in blue) and Sizzle (in orange) bands:
Frequency in Hz
Note name and octave
MIDI note number
Blue Dot: X/Y control for the Boom filter, left/right movement controls Tune and up/down movement controls Q.
**Orange Dot:** X/Y control for the Boom filter, left/right movement controls Tune and up/down movement controls Q.

Peak Hold Display

Peak Hold Auto: When enabled (on by default), the Peak Hold meter is Reset automatically after 3 seconds unless the measured peak value exceeds the current value – in which case it is updated accordingly.
Peak Hold Reset: Provides a manual reset of the Peak Hold meter, activated by clicking directly on the display.

Peak Hold Display: This numeric display shows the decibel level rounded to the nearest one tenth of a dB. This is a wide range control, able to display levels down to -160 dBFS and up to +200 dBFS - not that you'd ever need that much range, I just added it for all the intrepid audio explorers out there (you know who you are).
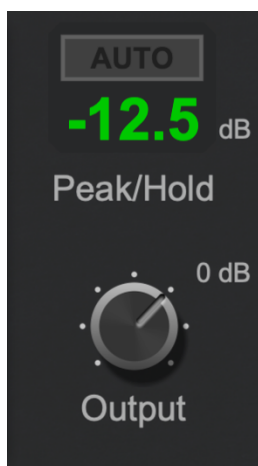
Output

This is a trim control for the final output, able to provide from -48 dB to +24 dB gain. Granted more times than not you'll be reducing rather than increasing gain on the output, but you never know – here's one for all the explorers out there.

The Back Panel
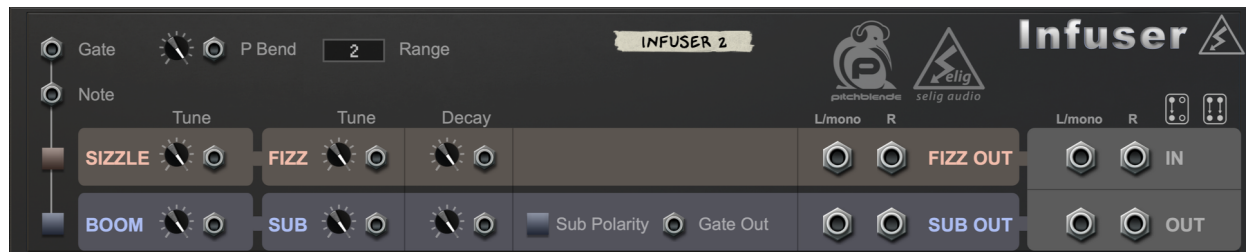
Audio I/O

In addition to the main stereo audio inputs and outputs, you also have separate outs for the Sub and Fizz section. These outputs are totally independent from the front panel, meaning On/Off, and Solo have no effect. To hear ONLY the separate outputs, turn OFF the front panel section.

CV I/O

All CV inputs allow control of the internal parameters of the device, and include the standard "CV Trim" control on all Reason devices.

Gate/Note: These are standard Reason sequencer control inputs, connect to devices such as Matrix or RPG8. There are separate buttons to activate Boom and Sizzle if you only need to control one band. Alternatively use a Player to CV device to derive Note/Gate from any source!
Tune/Decay: These allow you to modulate the Tune and Decay controls like with other Reason devices.
Sub Gate Out: This is the signal that syncs the internal sine oscillator so the waveform starts at the same phase every time (important!). Use this to trigger samples in Redrum, or trigger a synth envelope, etc.
Pitch Bend CV: While it's unlikely you'll ever use this, someone else WILL use it. This one is for you, someone else, and all the other someone elses out there.

Misc

Sub Polarity does what you'd expect, inverting the polarity of the Sub sine wave oscillator - for those times the Sub isn't "kicking" *with* the drums. If adding the sub section sounds weaker than expected, try flipping the polarity with this button.

CV Gate/Note buttons allow isolating the CV control to either section, or use it for both. Routing Icons show the possible internal/external routing paths, in this case they show the device can be run mono or true stereo.

Applications

Basic Concepts

Give and Take

The single most unique and useful feature of Infuser is how it carves out a place for the saturation. Infuser accomplishes this feat by first splitting the signal into two parallel paths, "EQ" and "Saturation".
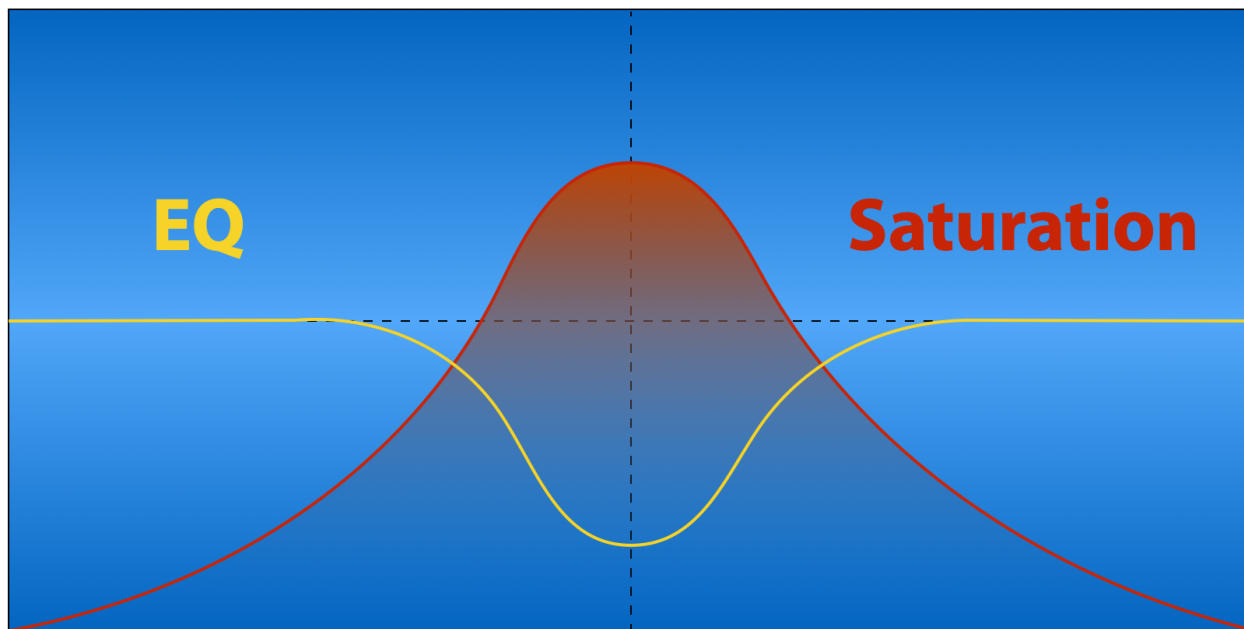
On the first path, the EQ cut is gradually applied as you increase the Amount control, while on the other path the filtered signal is saturated more and more.

At the default settings there is an overall boost when adding saturation, like with an EQ boost. Simply reduce the Level to bring just the saturation signal down to match the level of the original path for an extremely subtle saturation effect (good for vocals).

A Level of -6 dB is a good starting point for the more subtle applications, while the default 0 dB is a better starting point when an audible boost is desired.

Internal Signal Routing

Infuser is a simple device, but there is some complexity to its routing and interaction between modules. For starters, the signal is split into two paths for each section, Boom and Sizzle.

Boom & Sizzle

Tune/Q/Bell

Input — Cut EQ — To Sum

Filter — Saturation — Amp
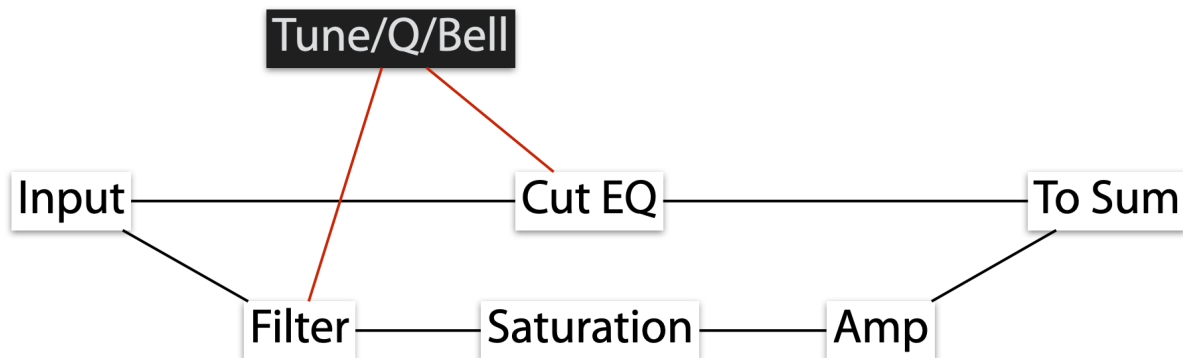
Then there are the "nano-synths" sections (Sub and Fizz) each with their own audio path all feeding the main output. Then there is the relationship of the Sub section to Boom, and Fizz to Sizzle. Here's how each section relates to the others.

Sub

Tune/Q/Bell

Input — Trig — Sine — Drive — Amp — To Sum

Filter — Env Foll
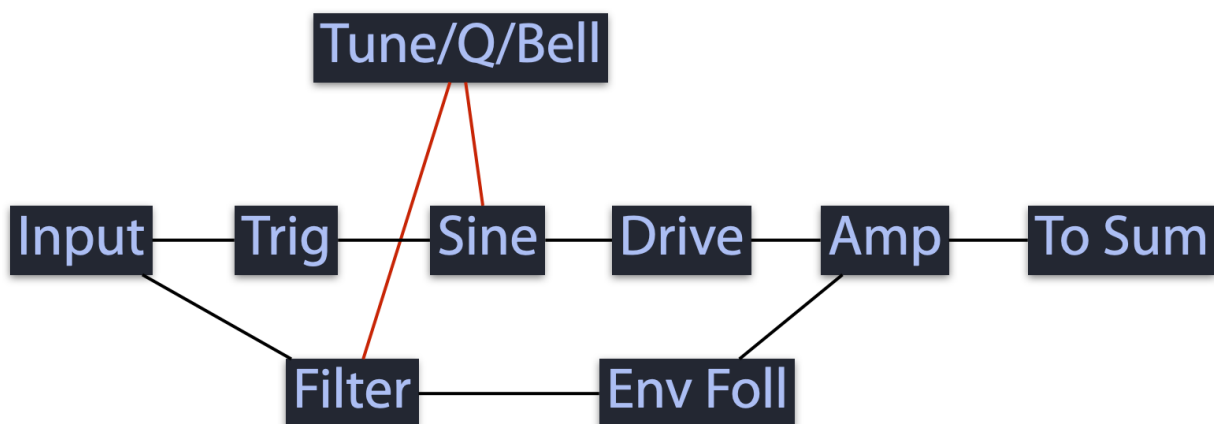
Boom/Sizzle are audio processing modules which also feed the respective Sub and Fizz sections. The output of the Boom filter is sent (without saturation) to provide the envelope for the Sub VCA as well as the trigger detector for syncing the phase of the sine oscillator (and for the Sub Gate out on the back panel).

The output of the Sizzle filter is sent to the Fizz Envelope Follower/VCA as well as determining the shape and Q of the filter on the noise source (the Tune can be independent).

Fizz
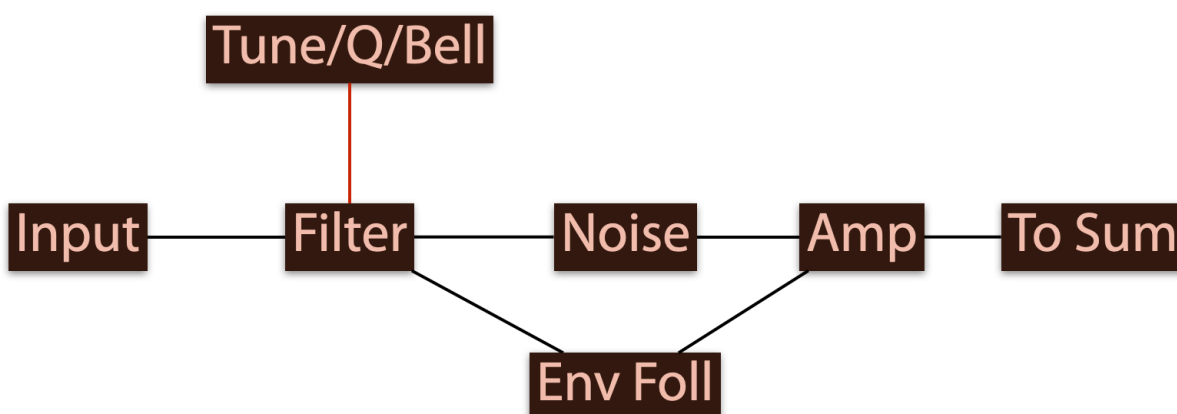
The basic concept for the Sub and Fizz sections comes historically from analog versions of these same concepts. For the Sub section, the old school version was to patch a sine wave generator to a gate, and trigger the gate from the kick or toms (or even snare) track. Then you tune the sine wave to best reinforce the original track, adjusting decay times and levels as you go to get a good blend. The end result is a stronger bottom end and more focused/obvious pitch element to the sound. For the Fizz section, the analog way was to patch a noise generator (or AM radio tuned to static) to a gate and trigger it from the snare, adding top end back to dull and poorly recorded snares. Both of these old school techniques are updated with a more sophisticated system including triggered sync and polarity for the Sub as well as an integrated Drive circuit to add harmonics, and a filter, decay envelope, and threshold for gating out the quiet signals to keep them from triggering the filtered noise. In most cases you're adding noise that is filtered so only the top few octaves remain, but you can also change to a bell shape and add mid range noise just as easily.

Focused Saturation

Unlike other frequency selective saturation devices, such as a multi-band saturator, Infuser allows extremely focused saturation. Starting with the Bell shape, and setting the Q to the

maximum, you will effectively be saturating only a signal frequency! This effect can be highly effective on drums/percussion because it allows you to send only the fundamental tone (as one example) into saturation. The effect can be increased weight and sustain of the drum sound, and when pushed further a distinct pitch can be perceived. When the pitch element becomes strong enough, it can become the bass line for a song. Using CV (see below) can allow bass lines to be programmed, taking the effect even further!

CV Control

There is a lot you can do with CV and Infuser. Let's start at the Note/Gate CV Inputs, which can be switched to Boom or Sizzle or both.

Note Tracking
The basic idea is to use CV from a device like The Matrix to "play" notes on Infuser. This would most commonly be done for the Sub section, to turn it into a triggered bass synth (triggered from the kick drum most commonly). You can also use a Player that converts MIDI to CV such as LoveOne's MIDI-CV Converter or similar.

Included Presets

For such a simple device we provide "starter" patches, which are intended to be starting points. In many cases there may be more sections enabled then you actually need, and solo can be useful here to see what each section is adding to aid in deciding whether or not you need it. Most patches are meant to be subtle, but any patch with a sub element can be exaggerated to great effect. Ultimately, using the separate Sub output is useful when wanting to get the most out of that feature.

There's not much more to say about that, except to load a preset and start turning those knobs!

Appendix

MIDI CC Chart:

Sub:
[12] = "sub_enable"
[13] = "sub_solo"
[14] = "sub_tune_mode"
[15] = "sub_tune"
[16] = "sub_tune_abs"
[17] = "sub_decay"
[18] = "sub_drive"
[19] = "sub_level"

Boom:
[20] = "boom_enable"
[21] = "boom_solo"
[22] = "boom_bell"
[23] = "boom_amount"
[24] = "boom_tune"
[25] = "boom_q"
[26] = "boom_level"

Sizzle:
[40] = "sizzle_enable"
[41] = "sizzle_solo"
[42] = "sizzle_bell"
[43] = "sizzle_amount"
[44] = "sizzle_tune"
[45] = "sizzle_q"
[46] = "sizzle_level"

Master
[47] = "master_level"

Fizz:
[48] = "fizz_enable"
[49] = "fizz_solo"
[50] = "fizz_tune_mode"
[51] = "fizz_tune"
[52] = "fizz_tune_abs"
[53] = "fizz_decay"
[54] = "fizz_thresh"
[55] = "fizz_level"

Credits

Infuser
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Crafted by:
David Antliff, for Pitchblende Ltd.
Giles Reaves, for Selig Audio, LLC.

Many thanks to our families for letting us mess around with software, all those who've helped out along the way, and of course all the dedicated beta testers!

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