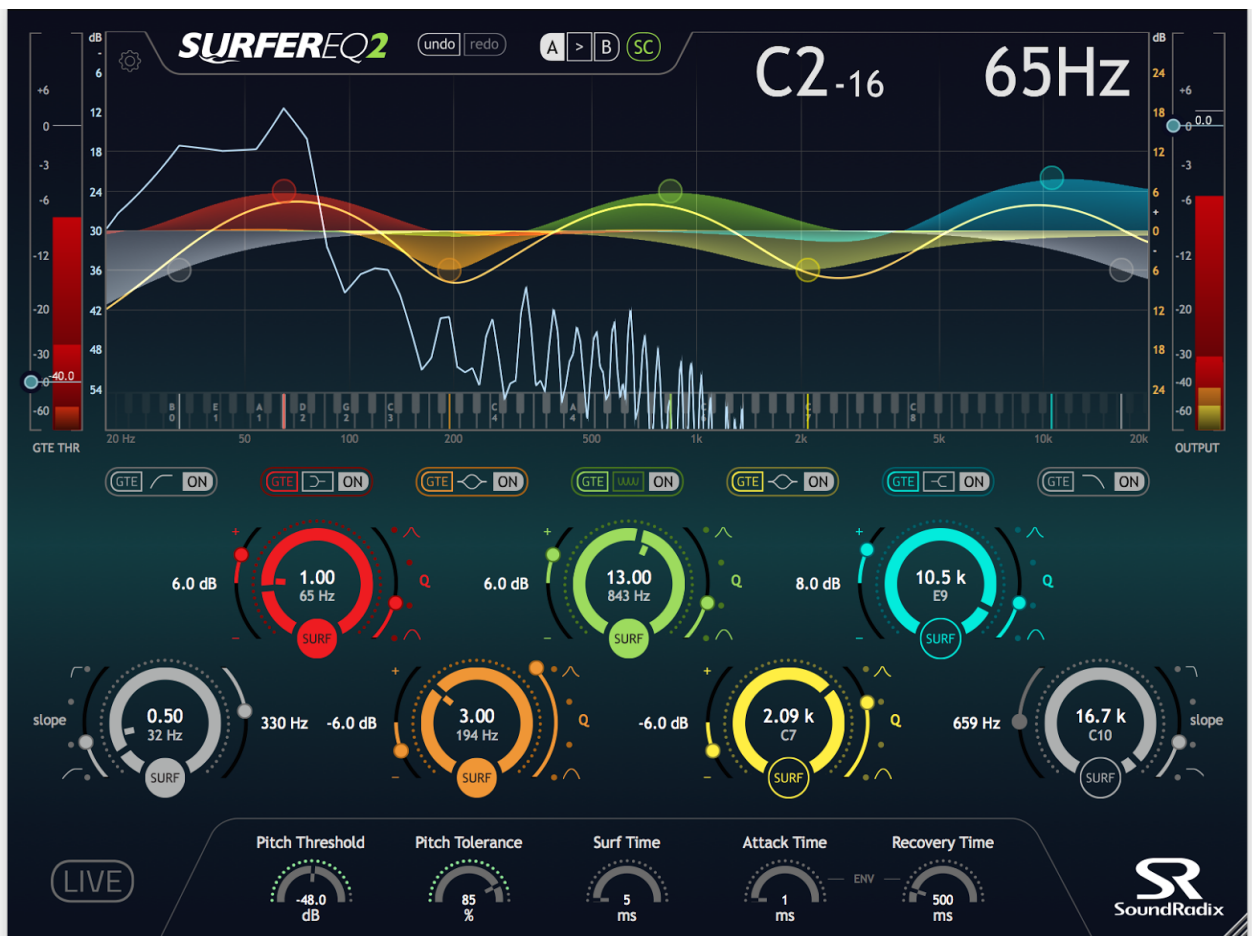




SurferEQ 2



User Manual

RADICALLY MUSICAL, CREATIVE TIMBRE SHAPER

SurferEQ is a ground-breaking pitch-tracking equalizer plug-in that tracks a monophonic instrument or vocal and moves the selected bands with the music.

Synthesizer filters can track the pitch to maintain the timbre of the sound throughout the instrument's voices. However, sound equalizers have always been static. While they are effective for broad tone-shaping and room resonance correction, standard EQs do a poor job at maintaining the vocal or instrument's timbre as the music changes.

Enter SurferEQ.

SurferEQ tracks the pitch of a monophonic instrument or a vocal source and can adapt its bands' frequencies relative to the music in real-time, maintaining the natural harmonic balance of the sound source and making it possible to shape the source's timbre relative to the notes being played.

RELEVANT TO THE MUSIC

SurferEQ follows the pitch of a monophonic instrument or vocal in real-time and can adjust any of its bands accordingly, thus "Surfing" the sound waves.

SURF ON

Any of SurferEQ's seven bands can be set to Surf mode to track the pitch of the instrument or vocal source and adjust its frequency relative to the notes being played. Furthermore, SurferEQ's pitch can be controlled via MIDI notes, allowing its EQ bands to be played using a keyboard, thus creating a unique timbre-shaping musical instrument.

UNIQUE FILTER ALGORITHMS

SurferEQ 2 is built using a morphing filter bank comprised of unique "circuit" structures which we've custom-built. We've optimized the circuits to achieve minimal group delays for excellent transient response and vibrant sound (No cookbook EQs here!).

SurferEQ 2's analog-like, asymmetric and Q-coupled filters sound natural even when pushed to extremes. In addition to the high-pass, low-pass, shelf and bell-shaped filters, we've developed a unique, eight-mode Harmonic Filter which enables to control the entire harmonic series of an instrument using just a single band of EQ.

SUPERIOR PITCH DETECTION

One of the great challenges in designing a pitch-detection algorithm is avoiding octave errors while keeping the algorithm efficient enough for real-time processing. We've spent over a year researching and meticulously developing an accurate, real-time pitch-detection engine with virtually no octave errors.

FEATURES

- Groundbreaking pitch-tracking equalizer
- Original asymmetric, morphing EQ algorithms
- Innovative Harmonic Filter
- Side-chain input enabling external pitch detection
- Spectral Gate (normal and reversed)
- 3-mode MIDI control, including an innovative EQ Instrument mode
- Zero-latency mode
- Spectrum analyzer and Spectral Level Meters
- Undo/redo
- 64-bit double-precision internal processing

SurferEQ 2 is compatible with Mac & PC and available in 64- and 32-bit AAX, RTAS, VST and Audio Units formats.

SYSTEM REQUIREMENTS

- Mac: Intel Core CPU, 2GB RAM, OS X 10.6 or higher
- Windows: Intel Core CPU, 2GB RAM, graphics card supporting OpenGL 2.1, Windows 7 or higher
- Plug-in formats: AAX, Audio Unit, RTAS, VST, VST3
- iLok License Manager (iLok 1/2 USB keys as well as HD authorization are supported.)

EQ Display and Frequency Analyzer

In this area, SurferEQ displays the EQ curves and frequency analyzer of the output signal. Click & drag the level scale on the left side of the display to change the analyzer's output scale and zoom-in on low-level frequencies.

Pitch & Frequency Detection Display

Here, SurferEQ will display the detected fundamental pitch and frequency or the received MIDI note, when at least one EQ band is set to Surf mode. The display and pitch detection are turned off when none of the EQ bands are in Surf mode. A MIDI indicator icon will be displayed when MIDI input is received.

Undo/Redo

If you've made a change in any of SurferEQ's parameters and would like to go back to the previous value or compare between values, just click Undo to undo the last change you've made. Click Redo if you would like to keep the last change you've made.

A/B

You may want to quickly compare two states of settings without saving and loading presets. With the A/B memory slots, you can easily set and switch between two different settings. When first launched, SurferEQ's default state is set to A. Click B to make different settings or click the arrows (> or <) to copy the current setting from one memory slot to another. Both the A and B memory slots are saved with your project and presets and can be recalled at any time.

SC (Side-Chain Input)

The side-chain input in SurferEQ makes it possible to use another track as a pitch reference instead of the track being processed. Since SurferEQ's real-time pitch-detection is monophonic, the side-chain input enables to use SurferEQ for polyphonic instruments such as piano or guitars or to provide an external trigger for Surfer's Spectral Gate. Furthermore, you can now make space in your mix dynamically and more naturally, e.g. by using a high-pass filter on a piano track while side-chained to the bass track to minimize low-end build-up without making the piano sound thin, or by slightly dipping the lead vocal's prominent harmonics from the guitars in a busy mix.

To use the side-chain input, select the track or bus you would like to use and set it as the side chain input in your DAW's plug-in menu, and click SC to engage the side-chain input.

EQ Section

There are total of seven bands, comprising of high-pass and low-pass filters and five asymmetrical, Q-coupled bell-shaped bands. Two bands are switchable to Shelf mode and the center band is switchable to Harmonic Filter mode. Each filter has four slopes or modes, ranging from gentle and broad to steep and sharp.

At the center of the frequency dial, the band's frequency will be displayed in Hz and in MIDI notes values. Clicking on the frequency value lets you directly enter either a frequency value in Hz for the band such as "100" or "1k" for 100Hz and 1000Hz respectively or a MIDI note such as "e2", "c3" etc.

Surf On

Each of the EQ filters and bands can be set to either static or pitch-tracking Surfing mode. When the Surf button is turned on, SurferEQ will start tracking the pitch of the track and will lock the Surfing band to its selected harmony value. SurferEQ will display the detected notes and frequencies in the top-right area of its main display.

When Surf is engaged, an additional marker is added to the band frequency, and the dial can be used to adjust the required harmony. The dial will start rotating automatically and will display the frequency in Hz for the currently playing material and set harmony.

To fine-tune the frequency or harmony, hold the Ctrl key on your keyboard while adjusting the frequency or gain dials.

The speed at which SurferEQ morphs from one note to the next and/or from one filters state to another (gain included) can be defined using the Surf Time control at the bottom of the SurferEQ user interface.

Harmonic Filter

Engages our unique Harmonic Filter. Eight different types are available: clicking the Harmonic Filter mode engages the first four modes, selectable using the Q selector; clicking the Harmonic Filter mode again will switch it to additional four extreme harmonic modes with automatic gain compensation which can be used to create quite wild and unexpected sounds.

GTE - Spectral Gate

The new Spectral Gate feature in SurferEQ enables engaging any of the bands only when the input signal crosses the threshold set by the GTE THR (Gate Threshold) slider or, when in reverse mode, disengaging the band when the input signal crosses the threshold.

Attack and Recovery times can be set via the controllers at the bottom of SurferEQ's user interface.

Common uses for this feature include recovering SurferEQ's cut filters when the side-chain input is silent. For example, when dipping the prominent vocal frequencies from a guitar track in a busy mix, SurferEQ will recover the cuts in the guitar when the vocal track is silent.

The reverse mode enables to low-pass the cymbals' bleed into the tom tracks to preserve the natural resonance of the toms instead of gating them completely. When the drummer hits the toms, the filter will disengage and will allow the full range of the toms get through and then recover back to the filtered sound while the toms' resonance is decaying.

Other uses include EQ'ing the transients and the body of the tracks separately or creating a compressor-like effect, fattening the sustain of the bass track without altering the natural dynamics of the track.

Slope/Q Selector

Toggles between 6, 12, 18 and 24 dB/Octave HP/LP filters, four types of bell and shelf bands and four types of Harmonic Filter.

HP/LP Surf Frequency Limit

The High-Pass and Low-Pass surfing frequency limiters can be used to limit the cut-point frequency when the HP or LP filter are in Surf mode, e.g. setting the High-Pass limit to 300 Hz will stop the HPF cut-frequency at 300 Hz even if the surfing frequency was 400 Hz.

Pitch Threshold

Sets the noise-floor level threshold for the pitch-detection engine. This helps filter out noise or bleed from entering the pitch-detection engine for better detection accuracy.

The meter around the control knob monitors the input level for easy setup.

Pitch Tolerance

Adjusts SurferEQ's pitch-detection sensitivity. The meter around it shows the strength of the pitch in the source. Inputs with strong pitch will be reflected in higher meter readings while sources with lesser pitch, such as percussion instruments, will show lower readings. Lowering Pitch Tolerance will make SurferEQ more sensitive to pitch, while increasing it will require a more prominent tonality for Surfer to accept it as a valid pitch.

Live Mode

When engaged, SurferEQ will switch to a zero-latency mode for use in live situations or for latency-free monitoring. In this mode, SurferEQ's pitch-detection and surfing will be late by 20 milliseconds.

Main Power Switch

The Sound Radix logo toggles between On and Off states smoothly, without changing the latency it reports to the host for uninterrupted, click-free comparison.

Additional Settings & MIDI Control

MIDI Enable

It is possible to control SurferEQ's frequencies via MIDI for easy detection, manipulation, and frequency ducking. You can even use it as a whole new class of EQ instrument!

MIDI Mode 1 : Note Overrides Detection

Designed for easy correction of the pitch-detection engine when required. A MIDI Note On input will override the internal pitch-detector. On MIDI Note Off, the pitch-detection engine will resume its operation.

MIDI Mode 2 : Surf by Note

Designed for frequency-specific ducking. Pitch/frequency is controlled by MIDI and the internal pitch-detection engine is disabled. MIDI Note On/Off toggles Surf-enabled bands.

MIDI Mode 3 : Instrument Mode

Designed to be played like an instrument where the source audio acts as an oscillator. Pitch/frequency and sound are controlled and triggered by MIDI Notes.

Additional Automation Parameters

Override ON

Overrides SurferEQ's pitch-detection for cases where noise throws it off.

Override Pitch

Sets the global pitch frequency of SurferEQ when Override On is On. Leave at 0 for no frequency change (stay at last detected frequency).

Notes

- Automatic delay compensation must be turned on in your host. In Pro Tools 10 and earlier, latency compensation settings must be set to large.
- Pitch detection is intended for monophonic sources.

Acknowledgements

SurferEQ uses the following libraries:

- JUCE by ROLI Ltd. - <http://juce.com>
- KISS FFT by Mark Borgerding - <http://sourceforge.net/projects/kissfft>
- Protocol Buffers by Google - <https://developers.google.com/protocol-buffers/>

Resources

<http://en.wikipedia.org/wiki/Harmonics>

http://youtu.be/i_0DXxNeaQQ



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