Skstudio

NLW vst effect
User manual

rev.Draft
26.03.09
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1   Introduction

NLW (Non Linear Works) is a VST virtual effect for Windows. It requires a VST compatible host to run.
VST and Windows are trademarks of the respective owners.

2   Licensing and protection

A license is given for personal and professional use.
There is no protection system. Permission is given to the licensed person.
Each licensed copy of the software shows the owner's name on the user interface.

3   General description

NLW is an effect for dynamic processing of audio signals. Two modes are implemented: Dynamics and Harmonics. Dynamics is for dynamic processing of the signal, while Harmonics is for overddrive, harmonic enhancement, distortion.

It has one stereo audio input, one sidechain stereo audio input and one stereo output.

Route a mono track to both inputs (center panned) or a stereo track to the stereo input.

The interface has been kept as simple as possible, by means of graphical controls, but it is a very complex effect.

The interface comprises six areas:

1. Visualisation (top)
2. Dynamic curve (left-bottom)
3. Sidechain-audio equaliser (upper)
4. Splitting equaliser (lower)
5. Input, output, parameters sliders (right-bottom)
6. Mode and preferences (the bottom line)

This version works only in "internal sidechain" mode.

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4   Details

4.1   Visualisation

Instead of bars, instruments, leds, a graphical dynamic interface is implemented to analyze the signal and show how the plugin affects the audio.
Four signal are shown:

Input (left-right mix) - Full blue
Sidechain signal (the output of the AC-DC converter) - Line yellow
Control signal (increasing from top to bottom) - Line grey
Output (left-right mix) - Line Red

The screen scrolls from left to right, so that a region doesn't move while on the screen.

4.2   Dynamic curve

This area contains controls and screen for the overall dynamic curve.
This version includes the following controls:

- compression threshold
- compression ratio (1:1 to oo/1)
- compression knee (0 to 80dB softness)
- compression max gain reduction
- gate threshold
- gate ratio (1:1 to oo/1)

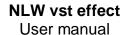These controls are NOT repeated on the interface.
Please note that this is an overall dynamic curve, it is not a gate plus a compressor. While the gate section is before the compressor, the same dynamic parameters (i.e. time constants, sliders area) apply to the whole curve.
The curve has a slightly different meaning in "Harmonics" mode. It becomes a waveshaper, with linear scale for vertical and horizontal axis.

The gain control curve is shown, too, in a linear scale.

4.3   Sidechain audio equaliser

This is a linear phase graphic (probably will be paragraphic) equaliser with ten overlapping bands. The bands divide the whole spectrum (20-2000Hz), being equal-spaced on a log frequency scale.

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This equaliser has a different routing depending on Dymanics or Harmonics mode selection:

Dynamics: the eq affects the sidechain signal
Harmonics: the eq affects the audio signal before the other eq

In Dynamics mode this eq is useful to shape the sidechain signal.
In Harmonics mode this eq is useful to eq the audio before distortion.

The graphical control for sidechain eq contains an additional control. The small square to the left adds a DC component to the sidechain signal (bottom = no DC, top = -12dB). This is very useful for distortion, in Dynamics as in Harmonics mode.

4.4 Splitting equaliser

This module is very useful for limiting which frequency region is affected by the effect.
It is a linear phase splitting equaliser, with two controls:

- cross-frequency (the audio gets divided in two channels, summing to the original audio)
- Hi-frequency band level (the higher frequency, right, part of the audio is attenuated or amplified and then summed back to the low frequency band)

Please note: only the lower frequency band is affected by the sidechain equaliser in Harmonics mode! This means that if you raise a frequency, on the sidechain eq, higher than the cross frequency, in the splitting eq, you don't get any result.

The lower frequency band goes through Dynamics/Harmonics.
The higher frequency band is routed directly to the wet-dry slider.

4.5 Sliders

These are more parameters for input, output and dynamics.

Time constants have different ranges for Dynamics (slower) or Harmonics (faster) modes.

- Input: attenuation or amplification fro the input signal (affects the sidechain in internal sidechain mode)
- Look: lookahead time, in samples. You can see how it delays the audio looking at the screen on top (input-output waveform displacement)
- Time: the time constant for the AC-DC converter (peak to rms)
- Attack: attack time for the Dynamics/Harmonics section.
- Release: release time for the Dynamics/Harmonics section

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- Style: this is a very useful control, it fades from a feed-forward style compression (modern, fast and transparent) to a feedback style compression (old designs, less fast and warmer)
- Wet/Dry: this is a sample-accurate unprocessed-processed signal mixer. Useful for parallel-compression (together with the splitting equaliser)
- Output: attenuation or amplification for the output overall signal

4.6 Mode/Options

Two large button let you select the mode. Parameter settings are not affected, while their meaning can be different and the sound changes radically.
Option are to be added.

5 Typical use of the software

This software was built for dynamics control on mono or stereo signals with a great control on the results and a great versatility.
Harmonics mode has been added to get from subtle (harmonic enhancement of a track or mix) to heavy (drive and distortion).

5.1 Compressing a drum track

Use as a common compressor, set style for cleaner or warmer sound, add nonlinearitioes with DC component (in sidechain eq), control the envelope through fine lookahead adjustment, get great effects through gating and compression attenuation limiting (dynamics curve).
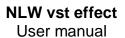Get very different behaviour by means of the sidechain eq and the splitting eq and mixing low frequency band, hi frequency band an wet-dry.

5.2 Driving a bass guitar

Set to Harmonics mode, get lots of different sounds by setting a low threshold and an high ratio, moving the max gain reduction control very near to zerodB (up, very near to the curve), setting a dc component from the sidechain eq, setting the gate.
Lots of different results by means of the eqs.

5.3 Adding harmonics to a track or a mix

Set to Harmonics mode, set the sidechain eq all way down for each band (you get silence), slowly raise some bands to get some distortion (set very low threshold and very high ratio) and mix it back to the original audio with upper band level and wet/dry slider.

Remember: in Harmonics mode only bands below the splitting eq cross freq affect the sound!

Have fun!