

Grain Strain

Grain Straining Effect Plug-In

Version 1.0

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Beta testing by kraftraum soundcloud.com/kraftraum



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Table of Contents

Introduction.....	3
Acknowledgments.....	3
The Concept of <i>Grain Strain</i>	3
The Grain Section.....	4
The Frame Section.....	5
The MIDI Section.....	5
Common Section.....	6
Parameters.....	7
Common Section.....	7
Grain Section.....	7
Frame Section.....	7
MIDI Section.....	7
Frequently Asked Questions.....	8

Introduction

Grain Strain is a software effect plug-in for Microsoft Windows (VST) and Apple macOS (VST/AU). It is written in native C++ code for high performance and low CPU consumption. The main features are:

- Flexible grain looping with Sync-to-Host options
- Envelopes for both grains and loop iterations (*Frames*)
- Grain frequency control via MIDI (up to eight voices)
- MTS-ESP (<https://oddsound.com/>) dynamic micro-tuning support
- All parameters can be controlled by MIDI controllers
- Plug-in supports Windows and macOS (32 bit and 64 bit)

Acknowledgments

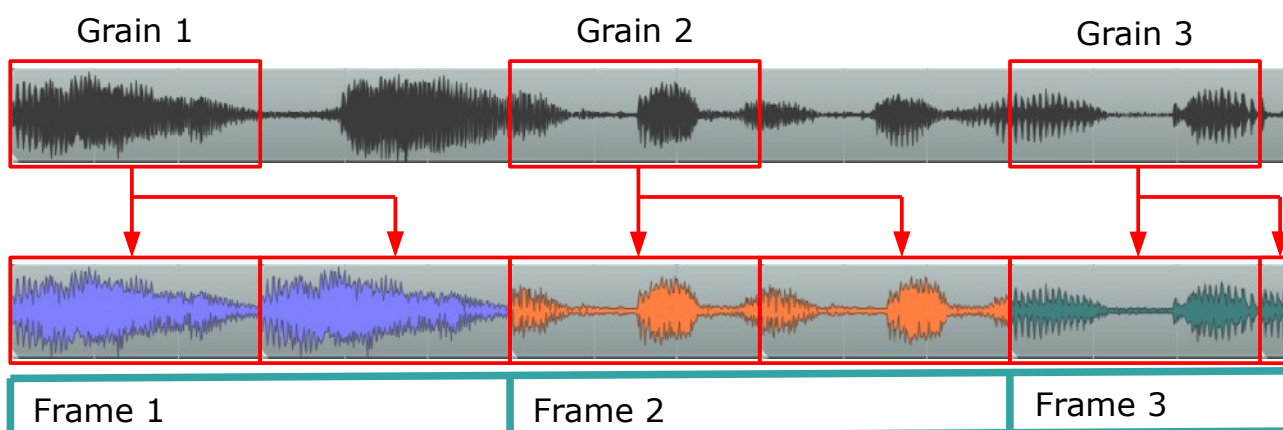
kraftraum (<https://soundcloud.com/kraftraum>) for Beta testing and invaluable input – thank you so much, my dear friend!!!

Oli Larkin and the iPlug/iPlug2 team.

Laurent Bergman for translating the *Full Bucket* manuals to French.

The Concept of *Grain Strain*

Grain Strain captures a sample of specific length (called a *grain*) from the input signal. The grain is looped for a certain period of time/samples (a *frame*). Once the frame has finished, a new grain is captured from the current input stream and looped etc.



The length of a grain can range from 0.2 milliseconds to 2 seconds while the frame length can be up to 5 seconds. It is also possible to set the grain length to the wave length of a certain frequency – this way *Grain Strain* behaves like an oscillator and produces a complex tone from the input signal. In MIDI Mode, up to eight of these “oscillators” can be played via a keyboard or sequencer to produce vocoder-like effects.

The Grain Section

This section specifies the properties of the grains. Grains can be generated according to four modes:

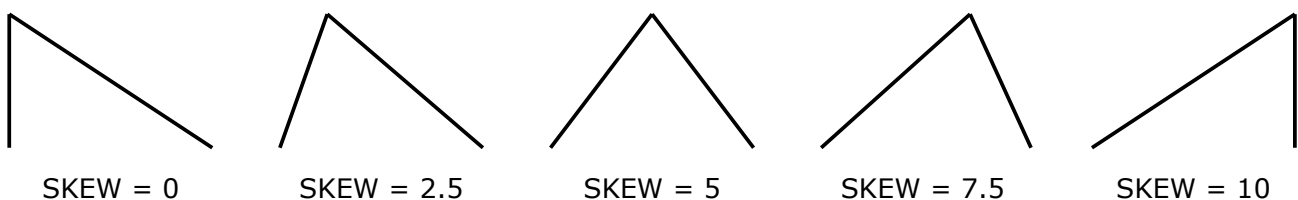
- **M.SEC**
The grain length is set in milliseconds (0.2 to 2000) using the slider control.
- **SYNC**
The grain length is synchronized to the host's tempo and set for example to quarter or sixteenth notes.
- **FREQ**
The grain length is set to the reciprocal of a frequency (16 to 5000 Hertz) using the slider control.
- **MIDI**
The grain length is set to the reciprocal of the frequency of an incoming MIDI note while the grain output signal is gated by an ADSR envelope (see *The MIDI Section*).



The OVERLAP control allows the separate grains to overlap by up to 50%. Especially in FREQ and MIDI mode this is useful to avoid harsh discontinuities at grain boundaries.

The amplitude of each grain can be modulated by a special envelope control. The shape of this envelope is displayed in the envelope screen and controlled by the following parameters:

- **FADE-IN** sets the fade-in (attack) time and shape (logarithmic/linear).
- **FADE-OUT** sets the fade-out (decay) time and shape (logarithmic/linear).
- **SKEW** balances the fade-in versus the fade-out time (see below).



Effect of SKEW on the envelope shape.

The Frame Section

This section is very similar to the Grain section and controls the properties of the frames. Frames can have a length of 0.2 to 5000 milliseconds or (when synchronized to the host tempo) a specific note length.

Like grains, frames can overlap up to 50% and are modulated by their own envelopes.

The important difference between frames and grains is that after a frame has finished, a new grain will be sampled from the input and looped until the new frame has finished. This way you can create loops of even steady waves that change with every frame.

Note that no loop is created when the length of a frame is equal or shorter than the length of a grain!

This is because the grain will be sampled again before it even can loop – the outcome is a copy of the original input signal. However, the envelopes of both grains and frames are still applied and can be used to create percussive repetitions or even Ring modulation.



The MIDI Section

This section is only active if the grain mode is set to MIDI (see section *The Grain Section*). In MIDI mode, incoming MIDI notes set the wave length of the respective grain and thus control the “pitch” of the grain. Using the POLYPHONY parameter, this can be done for up to eight voices.

Furthermore, each voice has its own ADSR envelope generator that is triggered for each note separately. Thus, in MIDI mode you will not get any output signal if no incoming MIDI note is received.

It is worth mentioning that *Grain Strain* is compatible with MTS-ESP by ODDSound, a very cool framework for dynamic micro tuning. For more (and how to get) MTS-ESP plug-ins see <https://oddsound.com>.



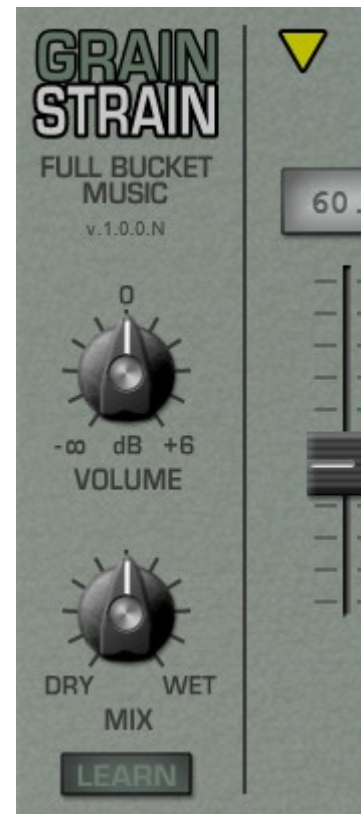
Common Section

In the Control section you can set the total volume and the dry/wet balance of the effect. Clicking on the yellow triangle opens a menu for selecting one of the 10 built-in presets plus an option to reset the current preset to default values.

Every parameter of *Grain Strain* can be controlled by one MIDI controller. If you want to change the assignment of controller (CC; *MIDI Control Change*) to *Grain Strain* parameter the *MIDI Learn* function comes in quite handy: Just click the *MIDI Learn* button in the Control Section (caption turns red) and wiggle both the MIDI controller and the parameter you want to assign (you can abort *MIDI Learn* by clicking the button again). If you want to unlearn the assignment, right-click the *MIDI Learn* button (the label now reads "UNLEARN") and activate it. Now wiggle the MIDI controller or the parameter that you want to unlearn.

Finally, when clicking on the *Grain Strain* logo a simple menu with two entries opens:

- **Check Online for Update**
When connected to the Internet, this function will check if a newer version of *Grain Strain* is available at fullbucket.de.
- **Visit fullbucket.de**
Open fullbucket.de in your standard browser.



Parameters

Common Section

parameter	ID	description
<i>Volume</i>	0	Total volume
<i>Mix</i>	1	Effect mix (dry/wet balance)

Grain Section

parameter	ID	description
<i>Grain Mode</i>	2	Grain mode (<i>M.SEC, SYNC, FREQ, MIDI</i>)
<i>Grain Length</i>	3	Grain length (0.2 to 2000 ms)
<i>Grain Sync</i>	4	Grain note length
<i>Grain Frequency</i>	5	Grain frequency (16 to 5000 Hertz)
<i>Grain Overlap</i>	6	Grain overlap (0 to 50%)
<i>Grain Fade-In</i>	7	Grain envelope fade-in time and shape
<i>Grain Skew</i>	8	Grain envelope skew
<i>Grain Fade-Out</i>	9	Grain envelope fade-out time and shape

Frame Section

parameter	ID	description
<i>Frame Length</i>	10	Frame length (0.2 to 5000 ms)
<i>Frame Sync</i>	11	Frame note length
<i>Frame Sync to Host</i>	12	Frame Sync-to-Host (<i>OFF/ON</i>)
<i>Frame Overlap</i>	13	Frame overlap (0 to 50%)
<i>Frame Fade-In</i>	14	Frame envelope fade-in time and shape
<i>Frame Skew</i>	15	Frame envelope skew
<i>Frame Fade-Out</i>	16	Frame envelope fade-out time and shape

MIDI Section

parameter	ID	description
<i>MIDI Polyphony</i>	17	Number of voices (1 to 8)
<i>MIDI Attack</i>	18	Attack time
<i>MIDI Decay</i>	19	Decay time
<i>MIDI Sustain</i>	20	Sustain level
<i>MIDI Release</i>	21	Release time

Frequently Asked Questions

How do I install Grain Strain (Windows 32 bit version)?

Just copy the files `grainstrain.dll` from the ZIP archive you have downloaded to your system's or favorite DAW's VST plug-in folder. Your DAW should automatically register the *Grain Strain* VST plug-in the next time you start it.

How do I install Grain Strain (Windows 64 bit version)?

Just copy the file `grainstrain64.dll` from the ZIP archive you have downloaded to your system's or favorite DAW's VST plug-in folder. Your DAW should automatically register the *Grain Strain* VST plug-in the next time you start it.

Note: You may have to remove any existing (32 bit) `grainstrain.dll` from your VST plug-in folder or else your DAW may screw the versions up...

How do I install Grain Strain (Mac VST/AU 64 bit)?

Locate the downloaded PKG package file `grainstrain_1_0_0_mac.pkg` in Finder (!) and do a right- or control-click on it. In the context menu, click on "Open". You will be asked if you really want to install the package because it comes from an "unidentified developer" (me ☺). Click "OK" and follow the installation instructions.

What is the plug-in ID of Grain Strain?

The ID is `fbGR`.

How do I know if a new version of Grain Strain is available?

When connected to the Internet, click on the *Grain Strain* logo (see section *Common Section*) and select the entry "Check Online for Updates". If a new version of *Grain Strain* is available on fullbucket.de the respective information will be shown in a message box.

Why do I hear no sound?

1. Maybe the Grain mode is set to MIDI? In this case *Grain Strain* requires an in MIDI note to generate an output signal.
2. Maybe there is no input signal? *Grain Strain* requires an audio input signal to generate an output signal.

It seems as if Grain Strain does nothing to my input signal!?

If the frame length is less or equal to the grain length, the grain will not loop because a new frame already started. In this case the output of the grain section is just a copy of the input signal. However, the grain and frame envelopes still modulated the amplitude of the output signal (see section *The Frame Section*)

Note that for grain modes other than M.SEC, or when the frame length is synced to the host, it is difficult to tell if the frame length is less or equal to the grain length.

How do I get MIDI data to Grain Strain in FL Studio?

FL Studio requires some message to make an effect receive MIDI notes: The "Midi Out" instrument must be added to the channel rack, the "Midi Out" port must be set

to a free port (10 should be OK), and this port must be set to the same port in the "Grain Strain" settings tab (as in the example above: 10).

Thanks to kraftraum for this tipp!