GRANULIZER 2
INERTIA SOUND SYSTEMS

Operation Manual

Manual version: v2.4

Inertia Sound Systems

Contents

1 INTRODUCTION

Inertia Sound Systems GRANULIZER 2 is a 12 voice polyphonic granular <mark>synthesiser</mark> in Audio Unit (AU) and VST Instrument (VSTi) format, available for Windows, macOS and Linux (experimental). GRANULIZER 2 is capable of producing complex textures using samples by pitch shifting, time stretching, rearranging, mangling and by performing spectral operations on the original sample audio frames.

The plug-in features

- **A powerful and versatile granular engine** with an embedded spectral effect unit, that allows real time processing in the Time - Frequency domain.

- **A warping unit** that operates as a feedback - amplitude modulation with an oscillator that it's randomness depends on the current grain each time.

- **A VA resonant filter**. Analog modelled VA resonant filter (LP / HP) with dedicated envelope.

- **A high quality built in diffusion delay**, with analog modelled, zero delay feedback filters that can be saturated, modulation, and stereo width.

- **A wave view controller** that can zoom, almost at sample detail and that will also normalise the section that it displays so that every detail of the waveform comes to the foreground

- **An intuitive and portable preset system**

- **A help display** that explains the function of every parameter when the mouse is over it.

1.1 Supported OSs, DAWs & Plugin Formats

GRANULIZER 2 officially supports the following OSs and is available in the following formats

- Windows : Windows 10, 11 x64 - VST / VST3 64bit - Ableton Live, Bitwig, Reaper.

- macOS : 10.15.7 - 12.2.1 AU / VST / VST3 64bit. - Ableton Live, Bitwig, Reaper, Logic Pro X. (Intel / Apple Silicon)

- Linux : UBUNTU 20.04 VST / VST3 64bit. - Bitwig, Reaper.

1.2 Demo Restrictions

The plug-in demo is fully functional, but it cannot save or restore its state or save any presets. Furthermore it will stop sounding after 10 minutes of use. You can reload the plugin to keep trying it for 10 minutes every time.

1.3 Granulizer License

When you are purchasing GRANULIZER 2, you can install it to up to 3 different machines. If you need to install it to more, you need to contact Inertia Sound Systems at `https://www.inertiasoundsystems.com`

1.4 Installation

- **Windows** Double click GRANULIZER 2 installer and follow the instructions. VST3 will be installed into ***C:\Program Files\Common Files\VST3*** by default.

  You can choose to install the VST2 version of plugin in your custom plugin folder or use the default location ***C:\Program Files\Common Files\VST2.***

The preset folder can be found into *C:\Users\<user>\Documents\Inertia Sound Systems\Plugin Presets\Granulizer 2*.

The manual can be found into *C:\Users\<user>\Documents\Inertia Sound Systems\Manuals\Granulizer 2*.

- **macOS** Double click Granulizer 2.pkg and follow the instructions.

  The Audio Unit plugin will be installed into */Library/Audio/Plug-Ins/Components*,

  the VST into */Library/Audio/Plug-Ins/VST.*

  and the VST3 into */Library/Audio/Plug-Ins/VST3* by default.

  The presets folder can be found into */Users/Shared/Inertia Sound Systems/Plugin Presets /Granulizer 2*.

  The manual is located in */Users/Shared/Inertia Sound Systems/Plugin Presets/ Granulizer 2.*

- **Linux** Uncompress the **Granulizer_2.4.0.tar.xz**. Open a terminal, navigate to the Granulizer_2.4.0 folder and run the "install.sh" script.

  The VST and VST3 plugins will be installed in the .vst and .vst3 folders respectively, under your home directory by default. The presets and the manual will be installed under the "Inertia Sound Systems" directory in your Documents folder by default.

1.5 Plugin ==Authorisation== & ==Deauthorisation==

The first time and before you authorize, the plugin is loaded in try out mode (figure 1).

Figure 1: GRANULIZER 2, try out mode

1.5.1 ==Authorisation==

To authorize you can either press the "Learn How" Button at the bottom of the plugin or the gear icon at the upper right side. This will take you to the registration view (figure 2)

==There is two ways to authorize the plugin==
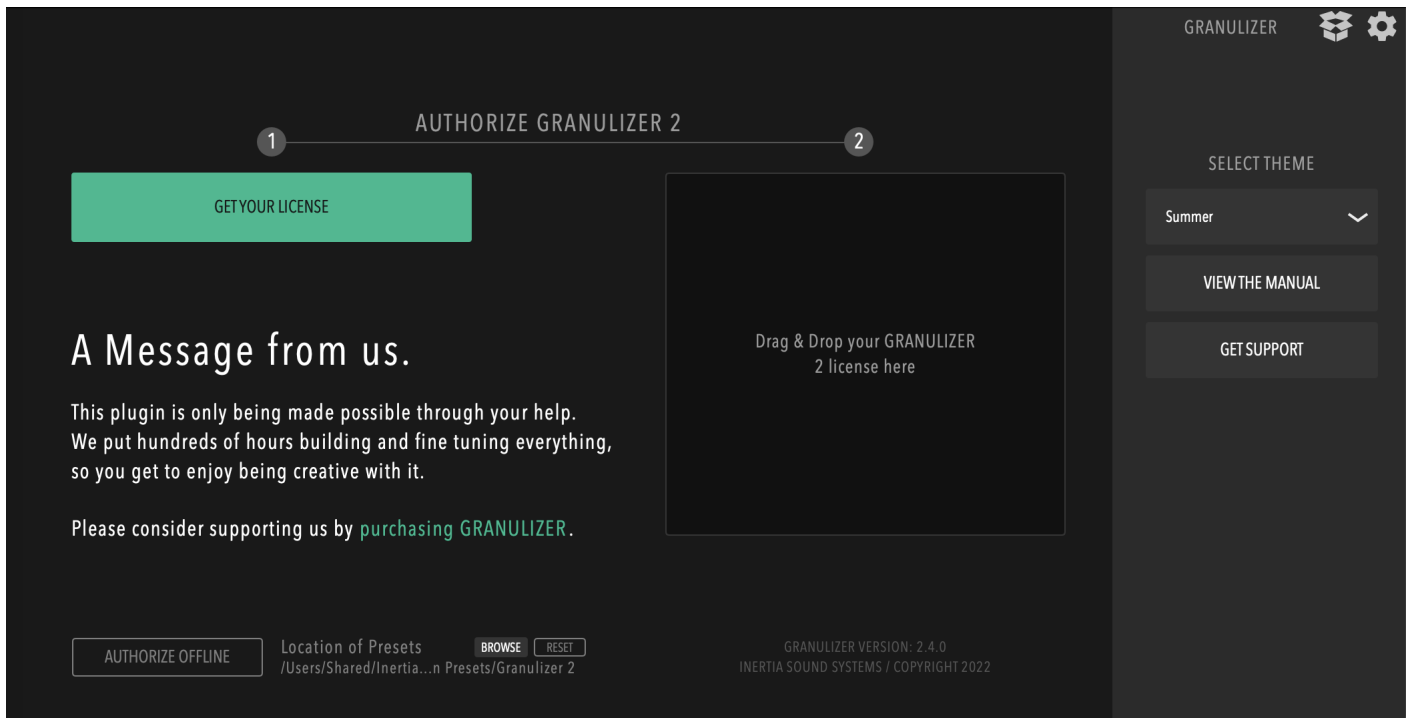
μετά την εικόνα

Figure 2: GRANULIZER 2, registration view

- **Online authorisation**: pressing the "GET YOUR LICENSE" button will take you to the page of your account where you can download the license file of your copy. To authorize the plugin you

Figure 3: GRANULIZER 2, license file

should just drag and drop the license file on the rectangle authorisation area.

- **Offline authorisation** Press the "AUTHORIZE OFFLINE" button. This will bring up a popup window with all the steps needed to authorise. By clicking OK in the dialog, the authorisation instructions will be saved on your desktop as a text document. Following those you will be able to carry out the offline authorisation.
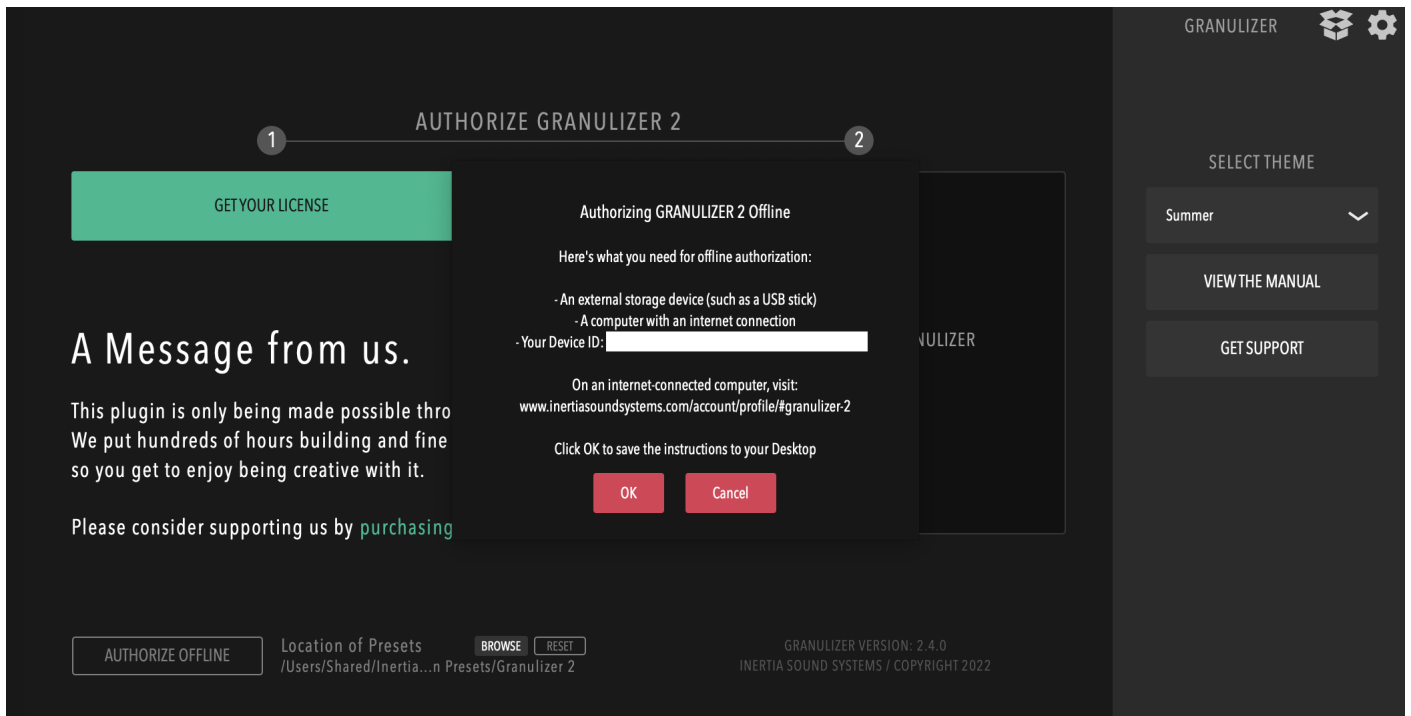
Figure 4: GRANULIZER 2, offline authorisation

Figure 5: GRANULIZER 2, license file

1.5.2   Deauthorisation

To deauthorize the plugin in case you need to transfer your license to a new machine press the "DEAUTHORIZE PLUGIN" button When you deauthorize the license file will be deleted and new ones can be generated for a new machine.

Figure 6: GRANULIZER 2, deauthor2.4ion

2 PLUGIN SETTINGS

- Theme Selector: A drop down menu that allows you to choose between the Light (classic) theme and an alternative dark one.
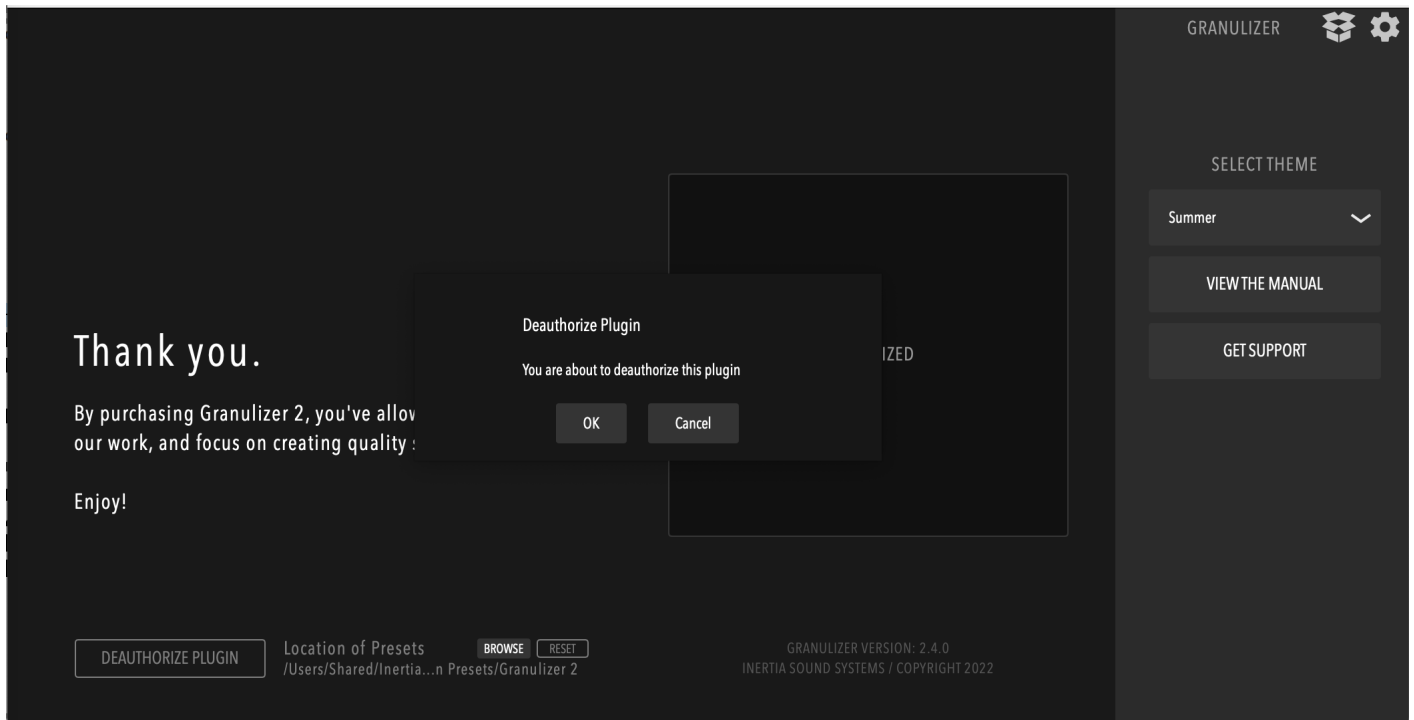
- Manual Button: Open the manual without browsing for it in the file explorer, for quick reference.

- Support: Open a browser window with the plugin's support page.

- Presets folder location. Granulizer 2.4 introduces presets portability. You can relocate your presets folder by clicking BROWSE and choosing the new location, or RESET the presets folder location to the original one. This will move the entire folder including factory presets, packages, and caches. Is highly recommended that you backup this folder before you proceed with this action. The presets folder should be relocated or copied manually to a new location. GRANULIZER 2 does not perform folder actions itself. Any new preset created or package do

To go back to the main view of the plugin, click the gear button again.

3   FEATURED PACKAGES

GRANULIZER 2.2, introduced a new major feature, the **featured preset packages**. GRANULIZER 2.4 improves the packages mechanism and is ready to bring more available featured packages with a variety of sounds and presets.
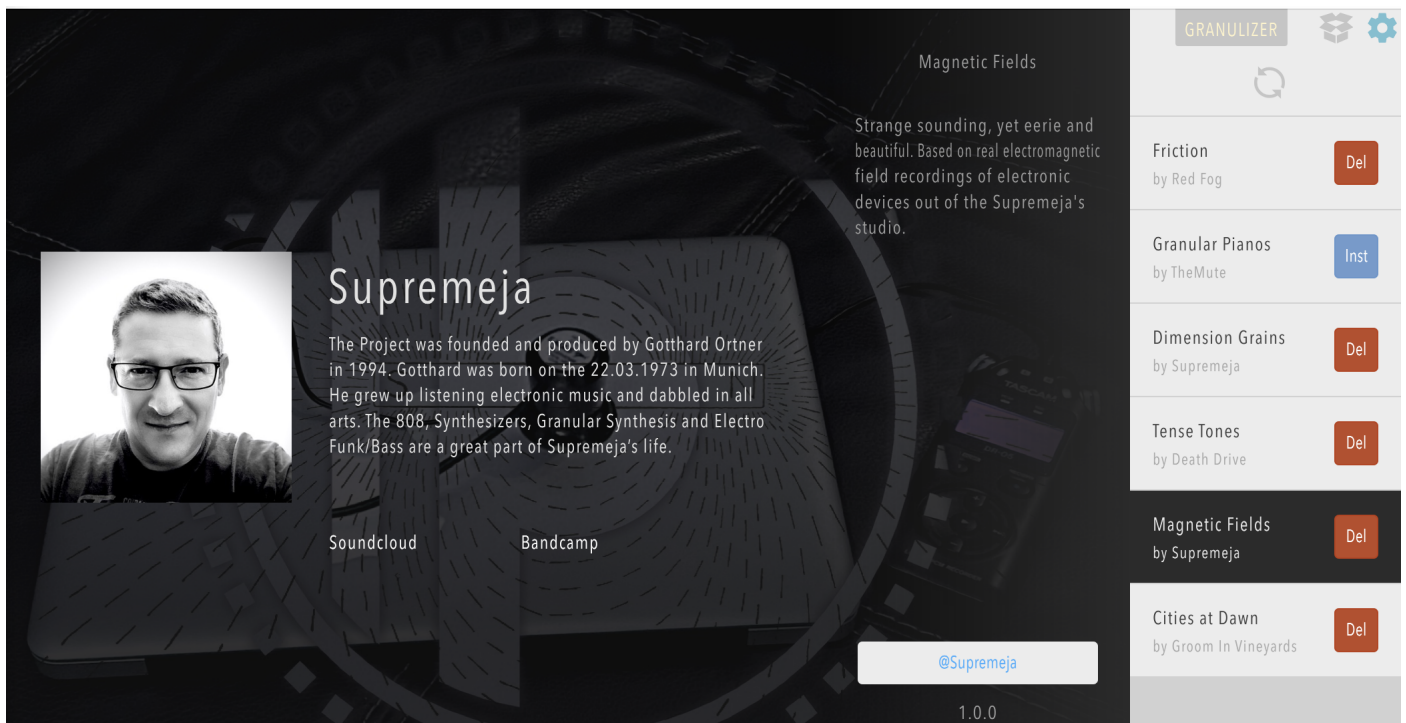

Figure 7: GRANULIZER 2, Packages

You can bring up the featured packages by pressing the presets icon, left from the settings icon. Here you can find and install preset packages from featured artists. Since the content is dynamic and most importantly, our aim is to build a community of authors that will contribute great presets of different taste, feel free to press the refresh button every now and then, and discover new great presets that are ready to install for free.

Every package page includes information about the featured package, and furthermore, for each featured artist you can bring up their bio by pressing the "@" button below the package description. For every artist there is link buttons included, that when pressed they open a browser window with the featured artist's work.

You can start installing the packages that you like and get back to the main view to continue tweaking the plugin, while the data is being downloaded, by pressing again the box button. Once a package is installed, it will appear in the presets browser, ready to be selected.

4   EXISTING USERS - THE PRESET UPDATER

GRANULIZER 2.4, 2.3 and 2.2 use a slightly different preset and data folder structure than previous versions. If you are an existing user and your current version is 2.0 or 2.1, the first time you open GRANULIZER 2.4 an alert window will come up that will prompt you to backup your existing presets and data to a "Backup" folder, and to also update them to version 2.4.

The preset updater will also copy the audio that was used from user presets to its new location. It is highly recommended to update your old presets and folder structure, for the presets to function normally. It is also recommended to create manual copies of your old setup.
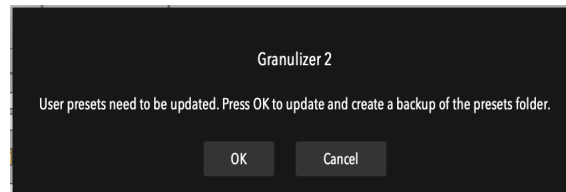
Figure 8: Presets update.

5   SUMMER and KAFKA themes   Όχι όλα κεφαλαία

GRANULIZER 2.4 introduces two new themes, the SUMMER and KAFKA . Themes can be selected from the Settings Scene as pointed out in section 2.

Figure 9: Dark theme.

6   SUPPORTED AUDIO FILES

- Windows : WAV, AIFF, mp3, m4a, AAC, ogg vorbis, flac

- macOS : WAV, AIFF, mp3, m4a, AAC, caf, ogg vorbis, flac

- Linux : WAV, AIFF, mp3, m4a, AAC, ogg vorbis, flac

7   CPU & MEMORY CONSUMPTION

- **CPU Consumption.** The plug-n is designed to use the CPU with efficiency and has been created with optimised math and DSP libraries. However there is cases that the plug-in can consume a fair CPU amount. CPU consumption varies with sample rate, polyphony, SIZE, DENSITY, and SPEED parameters. This can be more perceivable when high SIZE, DENSITY & SPEED have high values and the FX section is active. These parameters can deliberately take extreme values in order to push the time stretch and spectral manipulation abilities of the plug-in to the limits, on
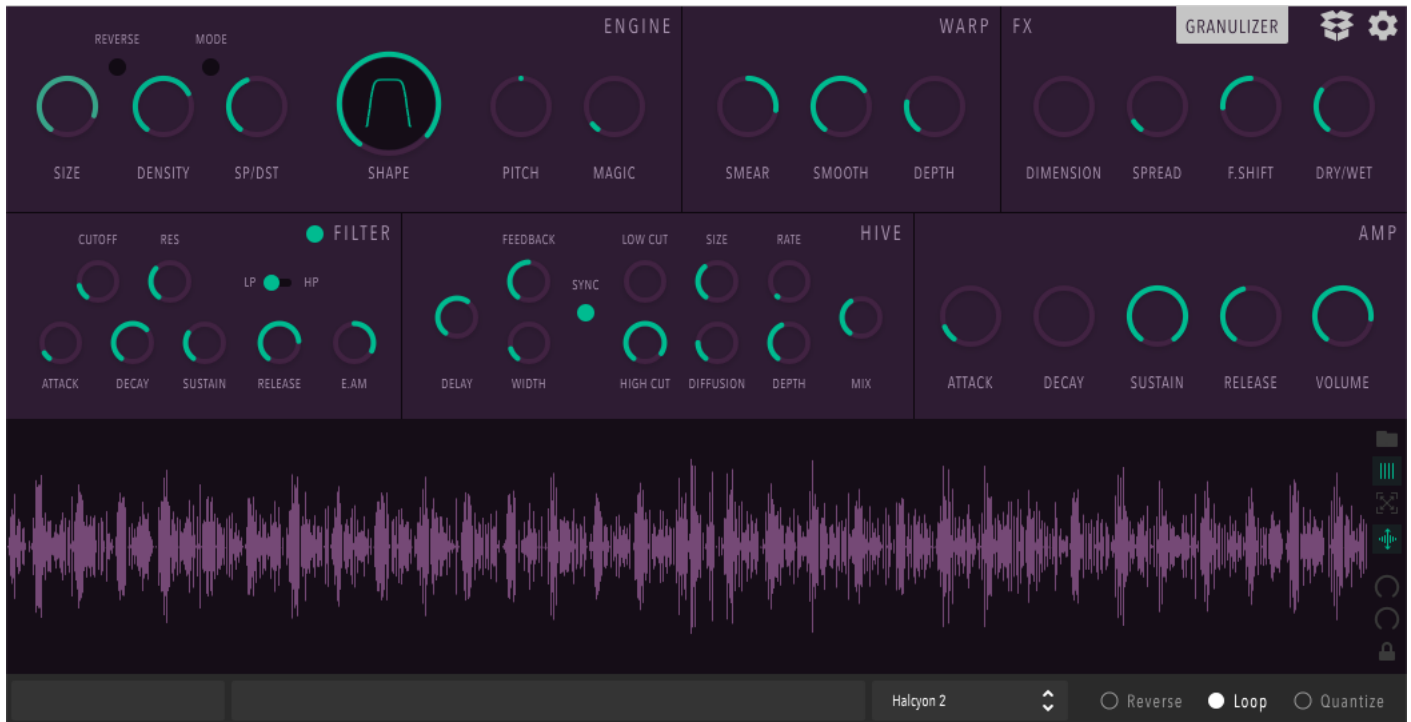
Figure 10: Aubergine theme.

Figure 11: Summer theme.

computers that can handle it. Keeping these parameters below the 3/4 of their maximum value will result in less CPU cycles consumption.

Depending on the machine power, parameter knobs that push the CPU at high settings are gradually changing colour from blue to purple.

- **Memory Consumption.** When an audio file is loaded to the plugin, it is resampled so that it matches the sample rate of the host. All of the audio data is kept in RAM so that you get the maximum responsiveness when a loop area is selected or when the audio file is reversed. This means that large audio files and high sample rates may consume a significant amount of memory.

Figure 12: Kafka theme.

The plug-in is not intended to use large audio files, but there is no restriction imposed regarding file size of audio file duration currently. As long as there is enough RAM to handle large audio files the plug-in is working as intended. A 30 minute stereo audio file at 96kHz consumes about 4 GB of memory.

8   PARAMETERS & OPERATION

8.1   Overview

GRANULIZER 2 features the following sections:

- **Engine**, The actual granular synthesis engine, with controls for grain size, density, speed - distance, temporal envelope shape, mode of operation, grain direction and grain randomisation (magic).

- **Warp**, Grain warping engine, with controls for depth, smear, and smoothness.

- **Filter**, 24dB / oct VA resonant filter (LP / HP) with dedicated filter envelope.

- **FX**, Spectral Processing with controls for spectral dimension, spread, formant shifting and effect mixing amount

- **Main**, With controls for amplifier attack, decay, sustain, release, and output volume.

- **Hive**, Fully featured high quality diffusion delay.

- **Session Setup**, With controls for sample reverse, quantisation for the grain speed parameter, loop mode.

8.2   Sections & Parameters

8.2.1   Engine

- **SIZE** : Sets the grain size in milliseconds

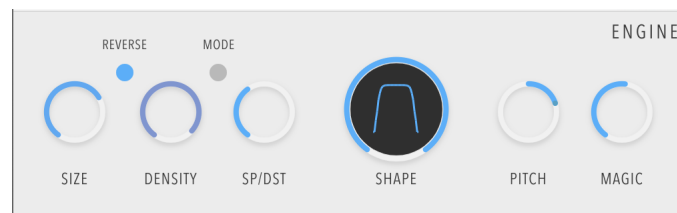**Figure 13:** Inertia Sound Systems GRANULIZER 2

Figure 14: Engine

- **DENSITY** : Sets the density of the grains, i.e how many grains are produced (Mode OFF).

- **SP/DST** : Sets the playback speed of the grains or the spacing between them according to the MODE parameter value.

- **SHAPE** : Sets the shape of the envelope of each grain. Lower values shape the envelope towards a delta function, whereas higher are shaping the envelope to a rectangular window.

- **PITCH** : Sets the pitch of the grains in semitones.

- **MAGIC** : Randomises SP/DST parameter separately for each stereo channel. Small values produce huge stereo width. Larger values create a more random sequence of grains.

- **REVERSE** : When active, the audio contained in each grain is reversed.

- **MODE** : When MODE is OFF both density and SP/DST are bound to the SIZE parameter, this means that these values change internally in order to maintain a certain speed or density. When MODE is ON both DENSITY and SP/DST are independent of grain size and can be freely set in milliseconds

8.2.2   Warp

- **SMEAR** : Sets the smear amount of the warping generator function.

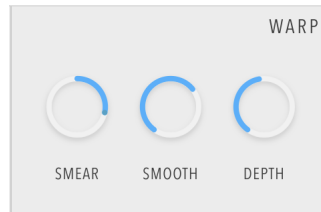- **SPREAD** : Sets depth of the warping effect.

Figure 15: Warp

- **SMOOTH** : Sets the smoothness of the warping function.

8.2.3   Filter

Figure 16: Filter

- **CUTOFF** : Sets the cutoff frequency of the filter.
- **RESONANCE** : Sets the resonance of the filter.
- **E.AM** : Sets the envelope amount of the filter (bipolar).
- **TYPE** : Sets the filter's type (LP / HP).
- **ATTACK** : Sets the Attack Time of the filter envelope.
- **DECAY** : Sets the Decay Time of the filter envelope.
- **SUSTAIN** : Sets the Sustain of the filter envelope.
- **RELEASE** : Sets the Release Time of the filter envelope.
- **ON** / **OFF** : Activates or deactivates the filter.

8.2.4   FX

Figure 17: FX

- **DIMENSION** : Sets the level of affection of Granulizer's custom spectral compressor.
- **SPREAD** : Sets the amount of the grains' diffusion.
- **F. SHIFT** : Sets the amount of the grains' frequency shift.
- **DRY/WET** : Sets the FX section mix to the dry sound.

8.2.5   HIVE

Figure 18: Hive

- **DELAY** : Sets the delay time in either msecs or host tempo depending on the value of the sync parameter.

- **FEEDBACK** : Sets the feedback amount.

- **HIGH CUT** : Sets the frequency of the low-pass filter.

- **LOW CUT** : Sets the frequency of the high-pass filter.

- **DIFFUSION** : Sets the diffusion amount of the diffusion network.

- **SIZE** : Sets the size of the diffusion network.

- **WIDTH** : Sets the stereo width of the effect.

- **RATE** : Sets the modulation rate of the delay time.

- **DEPTH** : Sets the depth of the modulation.

- **MIX** : Sets the effect mix.

- **SYNC** : When active delay times become host tempo based.
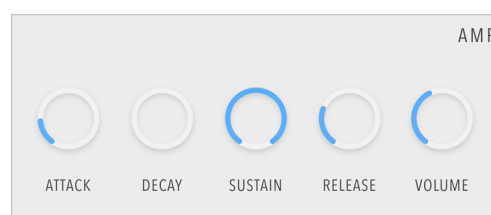
8.2.6   Main

Figure 19: Main

- **ATTACK** : Sets the amplitude envelope attack time.

- **DECAY** : Sets the amplitude envelope decay time.

- **SUSTAIN** : Sets the amplitude envelope sustain.

- **RELEASE** : Sets the Amplitude envelope release time.

- **VOLUME** : Sets the overall volume of the plugin.

8.2.7   Session Setup

- **QUANTIZE** : Sets the SP/DST parameter to fixed values when the MODE parameter is inactive. When MODE is active the Grain Speed parameter is synced to the host tempo. Quantisation is useful to stretch a loop to multiples of the original speed, when the loop has the same BPM as the project you are working with, or to repeat the produced pattern at host tempo intervals.

- **LOOP** : When LOOP parameter is active playback will go on as long as midi notes are active. If LOOP is inactive playback will stop at the end of the sample.
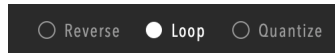
- **REVERSE** : Reverses the whole audio sample.

Figure 20: Session

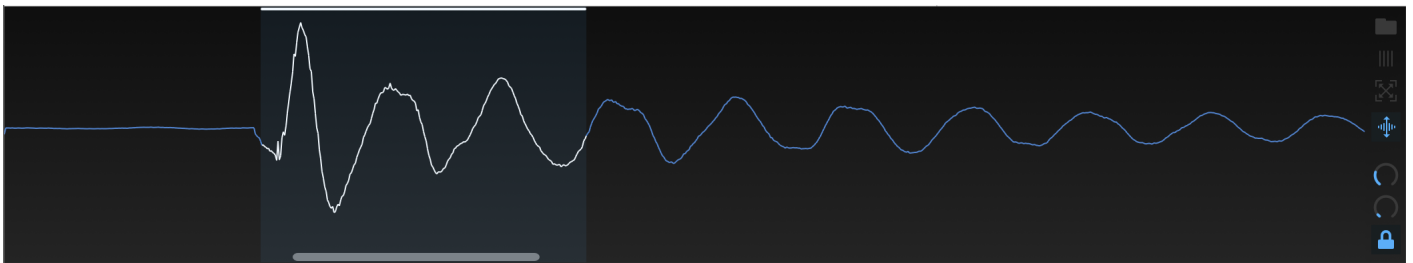### 8.2.8   Wave View & Wave View Toolbar

Figure 21: Wave View

- **Loading Audio.** To load an audio file, you can either do it by drag and drop on the wave view, or by clicking on it. if the wave view is empty you can either use left or right click. If the wave view contains audio, you can open the file browser either by clicking the folder icon in the Wave View Toolbar, or by using right click on the wave view.

- **Zoom.** To focus on and area of interest in the loaded sample you can zoom in by pressing command (macOS) or control (Windows) and performing a mouse click and drag when the aforementioned buttons are being pressed. Dragging the mouse upwards will zoom in, whereas dragging the mouse downwards will zoom out. The Wave View will also normalise its contents as you zoom in or out in order to bring up the silent parts of the loaded sample. To navigate to a zoomed waveform use the scroll bar at the lower side of the Wave View.

- **Loop Selection**. You can select a portion of the loaded audio where the plugin will operate on. This is possible by click and drag. To reset the loop area to the whole sample you can click anywhere in the Wave View.

- **Loop Resizing**. To readjust the loop start and stop time, you can move the mouse to the loop area boundaries and then click and drag the mouse.

- **Loop Relocation**. You can move the selected loop area to the left or right with shift + mouse click and drag.

- **Loop Zoom to Selection**. You can zoom to loop selection either by alt + click, or by clicking the zoom to selection item in the toolbar.

Figure 22: Zoom to Selection

- **Audio and Waveform Normalisation**. You can normalise the loaded audio, and at the same time the wave view by clicking the normalisation item in the Wave View Toolbar.
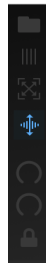

Figure 23: Audio and Waveform Normalisation

- **Loop Start and Length**. Loop start and length can now be adjusted by the corresponding knobs in the wave view toolbar. These knobs can now be automated or tweaked with the mouse or a MIDI controller, giving the ability to change the loop selection in realtime. When enabled, the "lock" item, locks the loop end to ensure that the loop length will remain stable while modulating the loop start parameter in the Wave View Toolbar.

Figure 24: Loop Start and Length

- **Grain Visualisation**. GRANULIZER 2.2.0 introduces per-voice grain location visualisation on top of the wave view. To enable grain visualisation you can click on the corresponding item in the Wave View Toolbar.

Figure 25: Grain Location Visualisation

8.2.9   Preset Browser

GRANULIZER 2 comes with factory presets, and gives the user the ability to create custom ones. The presets are located into

- **Windows** *C:\Users\<user>\AppData\Roaming\Inertia Sound Systems\Plugin Presets\Granulizer 2*

- **macOS** */Users/Shared/Inertia Sound Systems/Plugin Presets/Granulizer 2*

To access the presets click on the preset browser.
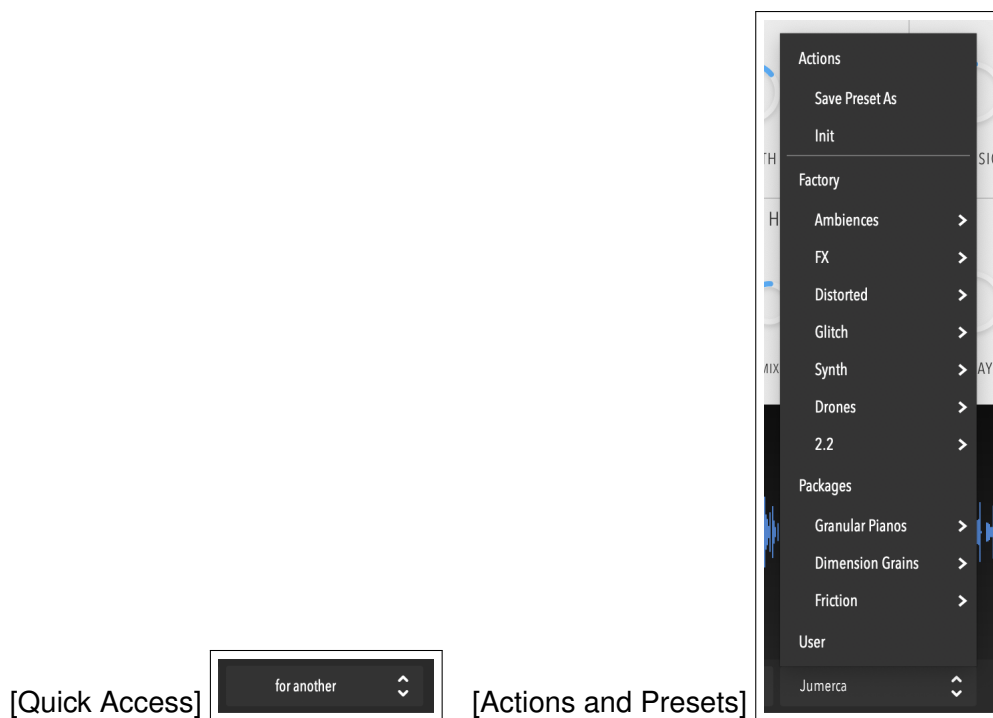
[Quick Access]   [Actions and Presets]

Figure 26: Preset Browser

You can load a preset either by clicking the up / down arrows or by choosing a preset from the popup menu. Granulizer 2.4 introduces preset folder portability, allowing custom preset folder location. It is highly recommended though that you move the whole folder as is, and that you also keep a backup of User presets. You can revert to the original presets folder location by pushing the RESET button in the SETTINGS page.

In the actions section can perform the following

- **Save Preset**. A new preset is saved in the user preset folder. The loaded audio is copied to the presets folder in order to maximize portability. When a new preset is saved the plug-in loads it immediately. Preset portability relies on the audio format that has been used. A preset created in macOS with a *.caf audio file will not be fully loaded on Windows, since caf files are not currently supported.

- **Init**. Initialises the plug-in. All parameters are set to their default values and any loaded audio is deleted.

8.2.10   Displays

- **Parameter Display**. Shows the values of the tweaked parameters.

- **Help Display**. Shows a tooltip whenever the mouse is over a parameter.

Mix: 45.1%	Sets the effect mix

Figure 27: Parameter and Help Displays

8.3 Default Values & Parameter Fine Tuning

Each knob on the ISS Granulizer can be reset to its default value by double clicking or by pressing alt + click on it. Fine tuning parameter values is possible by holding down control (Windows) or command (macOS) while tweaking a knob with the mouse.

8.4 Operation

When the plugin is fist loaded it is initialised to the default preset. You can browse the presets available, tweak them until come up with something that you like, or just initialise the synth via the Init option in the Actions section in the preset browser and start with a new sample that is dropped in the plugin.

All parameters can be automated by the host or assigned to MIDI.

9 TIPS

You can start experimenting with the ENGINE controls to make the sample play faster or slower by adjusting the SP/DST parameter. Increasing DENSITY parameter produces more grains and the sound gets richer. Extreme values create a comb filter effect.

Similar effect to that has the ENV shape parameter. High values of this parameter shape the envelope grain towards a rectangular shape making the grains sound closer to one another, whereas low values make the. grains sound more distant.

Adjusting the SIZE parameter to high values will create long grains which is useful when a percussive sample is used. A sound can get bigger by increasing the MAGIC parameter a little bit to create a wide stereo effect.

You can also get interesting results by experimenting with the FX section. Increasing the DIMENSION parameter you increase the noisiness of each grain by spectral compression. You can also alter the locality of the sound by increasing the SPREAD parameter.

Nice pads and atmos can be achieved by selecting a very small loop, adjusting speed and density to create a comb filter effect and then by applying the FX at 100% WET and with high SPREAD values.

The "WARP" section can be used to add inharmonic components to each grain, useful to create bell sounds, or non harmonic atmos.

ISS Granulizer can also be ideal for glitch effects. This can be achieved by modulating SIZE, SP/DST and / or density from the host.

You can also get interesting results with the help of HIVE. With HIVE you can create wide rhythmic delays, modulated delay effects, diffusion delays, or smooth reverbs. Turning HIVEs mix up yo 100% you can adjust the overall tone by the low and high cut filters. HIVE's feedback can be turned all up to 120% for infinite feedback and high quality analog modelled smooth saturation.

Inertia Sound Systems