

## ***Synth Controller manual Addendum for Edition 'EsiGranulator' for Emu Esi Sampler***

This edition was developed on an Emu Esi 4000. We have no idea if it also will work with other EMU sampler like E IV, 6400... If your sampler supports the feature of modulating Sample Start by Velocity, it's quite likely the Granulizer also will do for your sampler.

This manual does not focus on mapping samples to keys or defining preset keyboard zones. We somehow suspect noone ever had understood both completely ;-)

### ***The Emu ESIs do not understand any SysEx***

By factory the EMU ESIs have no built in SysEx editing capabilities like most synthesizers. Means: no editing of envelopes, LFO or other things. But the ESI allows some realtime modulations by CC and modulation of the Sample Start time by velocity – this is what the Granulizer Controller will make use of.

### ***Features of the EsiGranulator edition?***

- Your old ESI will mutate into kind of funny Granular sampler
- travel any sample in the speed and direction of your choice or freeze it completely
- Seeding frequency and length for the grains freely adjustable between 0-127
- Seeding can be synchronized to midiclock
- randomization of seeding position inside the sample. If your sample is e.g. a voice saying something, your ESI starts to talk endless nonsense in weird stuttering
- the whole thing works polyphonically, either for playing granulized chords or – after you've set the sample in **PRESET/DYNAMIC PROCESSING/7 KEYBOARD MODE** to **Nontranspose** – for making the sound more dense.
- 5 knobs for direct access to VCF Cutoff, Note-On Q, VCA Level, VCA Panning and Pressure. Pressure can be assigned to e.g. Crossfade (PRI & SEC Sample), LFO Modulations or Attack Time in the ESI's matrix.
- Pitchbend-knob for tuning the sample from the controller. The tuning width is dependent on **PRESET DEFINITION / 7 Pitch Bend Range**

### ***What is technically going on in the EsiGranulator Edition?***

The edition makes use of mapping **VELOCITY TO** in **PRESET/DYNAMIC PROCESSING/6** to **Sample Start**. While the Granulizer is ON you can send a note into the Controller's MIDI IN and the Granulizer will fire lots and lots of very short notes of

this note to the ESI. Before sending them out, the Controller replaces velocity of the MIDI data with the value of the SAMPLE POSITION knob – allowing to travel the sample with a knob.

*What needs to be set up on the ESI itself?*

**Two essential things:**

1. the midi channel of the ESI in **MASTER GLOBAL/ 9 MIDI / 2 MIDI Globals** and the Synth Controller need to be identical (see next chapter on how to learn the midichannel of the Controller)
2. For your Preset Keyboard-Zone, you need to set **DYNAMIC PROCESSING / 6 Velocity** to **Sample Start: 100%**.

Now all orange, pink and green parameters on the faceplate should work.

The blue parameters address the other modulation possibilities of ESI's realtime mod matrix. For them to do anything, you need to assign the right CC-Numbers to the right realtime slots. The Midi settings are stored in the ESI when exiting the menu and only need to be adjusted once.

The complete list:

**MASTER GLOBAL/ 9 MIDI / 2 MIDI Globals**

- Basic Channel: this channel must be the same as the Synth Controller itself is using. Data on other midichannels are passed through the Controller unchanged.
- Mod Control: 1
- Pressure Control: chp (=channel pressure)
- Pedal Control: 4
- MIDI A Control: 21
- MIDI B Control: 22

Your Preset's used Keyboard-Zone should have the following setup:

- **PRESET DEFINITION / 0 Realtime Controls:**
  - 2 Mod Control → 2 VCF Cutoff
  - 3 Pressure Control → freie Wahl
  - 4 Pedal Control → 10 VCF NoteOn Q
  - 5 MIDI A Control → 3 VCA Level
  - 6 MIDI B Control → 7 Pan
- **DYNAMIC PROCESSING / 2 VCA**
  - Level: 0%
  - Pan: -100%
- **DYNAMIC PROCESSING / 3 VCF**

- Cutoff should be set to almost or completely closed. The knob can only increase the cutoff
- Q: can be left to 0%
- **DYNAMIC PROCESSING / 6 Velocity to / Seite 3**
  - Sample Start : -100%

### *Learn Midi Channel on the Synth Controller*

To learn a new global Channel for the Controller:

- Hold button 1 and 2 for 2 seconds until they start to blink, lift your fingers
- now send a note on your desired channel into the Controller's MIDI IN
- the Controller writes the new channel into it's memory and restarts. The channel is saved and will be recalled on next startup.

### *Some useful hints for choosing the right samples*

If you map one sample across multiple keys or many samples on individual keys is perfectly up to you. Important is the keyboard zone of the Preset which is defined in **PRESET DEFINITION / 2 EDIT ASSIGNMENT**. This is the zone where you should setup the above parameters. All samples inside this keyboard zone will be able to make use of the granulizer.

Your sample should be sth between 2 and 20 seconds. For very short samples like drumsounds, the granulizing makes not so much sense. Quite promising are text passages, nature atmos or recorded chord progressions you can then travel through.

The resolution of Midi velocity is technically limited to 128 steps. This means your sample will always be chopped into 127 pieces (assuming VELOCITY TO is set to 100% steht). If your sample is 127 seconds long you would only be able to travel the sample in 1 second steps.

Quite important for the overall sound are **VCA Parameter Attack** and **Release**. A littlebit of Attack can make the grains sound less harsh, 1-3 seconds Release make grains appear longer than they essentially are and allow to fire at higher rate because identical notes unfortunately cut each other off.

Do not forget the ESI offers a primary and a secondary sample being played (and granulized) at the same time and – ! - they can be crossfaded in realtime with e.g. the PRESSURE. This might lead to interesting results. For crossfading you need to setup the following:

- in **PRESET DEFINITION / 0 REALTIME CONTROLS** set the source **3 Pressure Control** to **9 Crossfade**
- in **PRESET DEFINITION / 5 CROSSFADE/SWITCH** set the zone to **Realtime Crossfade**

## *The three button's functions*

**First button:** switch the Granulizer ON and OFF. In OFF state the Controller simply forwards all Midi data coming in to allow easy setup of the ESI. The LED shortly blinks to indicate a sign of life. If you switch the Granulizer on the LED stays red and incoming notes on the learnt base channel will be processed with the granulizing function.

**Second button:** this selects if the grains are fired fast and free or synchronized (much slower) to midiclock. The latter will become interesting when GRANLENGTH is set high. While the green LED is on, the green parameters on the faceplate come into account. GRAIN FREQUENCY allows setting the timing division from half of a bar to 32nd notes, T means triplets. The knob below with the text NOTE SYNC is a simple switch: in left position (AUTO) all notes will automatically be synced with the 1st possible tick of the selected beat division, no matter how wrong the timing of your keyboard-presses are.

When turned to FREE, the relative timing of your keypress remains the same while still being in relative sync. You can e.g. press the key on the 2 (open hi-hat in dance music) instead of the 1 (bassdrum in dance music).

After changing values for SYNC TO MIDICLOCK, NOTE SYNC or the synced GRAIN FREQUENCY it's a good idea to restart the sequencer/DAW for getting everything back in sync.

**Third button:** the LED indicates grains to be currently fired. Pressing the button resets the granulizer. By now we did not encounter issues like hanging notes but you never know ....

## *VELO/POSITION SOURCE*

If the granulator is OFF, incoming notes are forwarded to the ESI. With this switch you can set whether these notes should keep their regular velocity (INCOMING position) or whether the Synth Controller should replace the Velo with the position of the SAMPLE POSITION control. This allows precise setting of the sample position for played notes even with the granulator turned off.

## *Orange Grain Parameters*

These knobs let you to set the grain length (coarse and fine are added), the firing frequency and the position within the playing sample. The POSITION RANDOMIZER randomly scatters grains before and after the current position in time with increasing distance from the center. This condenses the sound field, as several different notes are now triggered, which do not cut each other off so quickly.

GRAIN LENGTH RAW as well as POSITION RANDOMIZER do have a dead zone in their leftmost position. To avoid confusion at the beginning, it is advisable to leave these two, as well as SMEAR, on OFF at first.

The most important parameters can also be controlled remotely via Control-Change, the numbers are available just below the parameter. Example: the sample position can be controlled remotely via CC No. 16 in the DAW. The first 4 blue knobs can also be controlled remotely via CC.

### *Smear knob*

That, too, is a switch. **It should be OFF in most cases.** A safety variable is set to the OFF position and there are no unwanted sound artifacts for the fastest GRAIN FREQUENCY at the smallest GRAIN LENGTH. In the ON position, this safety variable is set to 0 and in the extreme setting described above, the ESI becomes quite loud in leaps and bounds. What can be heard then, however, sounds too interesting for us to want to withhold it from the user. We also don't know what happens technically in concrete terms. Most likely, the ESI will be fed with NOTE ON commands faster than it can turn off the notes again, so that the case occurs that should not occur: several notes of the same key are triggered. Probably the ESI won't break but the level jump is relatively violent, so: **Be careful with the level!**

### *FAQ*

#### **There is no sound**

- Are midi channels of ESI and Synth Controller identical?
- Are you working on the right Keyboard-Zone (**PRESET DEFINITION/2 Edit Assignment**)?
- Is there any sample assigned to the keys you are pressing?
- Maybe VCF Cutoff or VCA LEVEL are turned down?
- Play with SAMPLE POSITION, maybe your sample is standing on a POSITION without sound.

#### **The Granulaizer is freaking out, does not react, hanging notes**

- the ESI does an ALL NOTES OFF when pressing it's TRANSPOSE key
- press the 1st button to switch the granulizer OFF and ON again, it will be resettet when switching it ON.