Manual Percussa Synthor System 8
V1.4

September 14, 2017

Contents

1 Getting started

1.1 Assembly instructions: REMOTE, ENGINE and rack ears

- Step 1: Open the Synthor System 8 Accessory Kit. The box contains: 1x M4 HEX L-key, 8x M5 black bolts, 1x SD card, 1x USB Cable, 1x set of rack ears.

- Step 2: Attach the left rack ear to REMOTE while lifting REMOTE 1/8" (3 mm) from the table. Use the M4 HEX L-key and 2 black bolts, and screw both parts together, but don't tighten the bolts too much.

- Step 3: Attach the right rack ear of REMOTE. Please make sure the USB cable is plugged into REMOTE and fits the slot inside the right rack ear. Use the M4 HEX L-key and 2 M5 black bolts, and screw both parts together, but don't tighten the bolts too much.

- Step 4: Place ENGINE in between both rack ears. In case it doesn't fit, loosen the 4 screws that hold the REMOTE and the rack ears together. You can then use the 4 other bolts to screw the ENGINE and rack ears together.

- Step 5: Plug the USB cable into the far right USB port of ENGINE. In case the USB cable is too long you can make it shorter by putting it into the slot of the right rack ear like an S shape.

- Step 6: Put the SD card into the SD card slot. More information about the SD card see section 13.1.

- Step 7: Remove the protective sticker from the display (yellow corner).

1.2 Upgrade

A description of how to upgrade ENGINE, REMOTE and AUDIOCUBES.

1.2.1 ENGINE

More details on how to upgrade your ENGINE will become available soon.

1.2.2 REMOTE

More details on how to upgrade the firmware of your REMOTE will be available soon.

1.2.3   AUDIOCUBES

Before using the AudioCubes, please make sure to read the Percussa AudioCubes Reference Manual (it contains information on how to charge your AudioCubes, etc): `https://www.percussa.com/manuals/reference-manual/PercussaAudioCubesReferenceManual.pdf`

More information on how to upgrade the firmware of your AudioCubes can be found here: `https://www.percussa.com/manuals/upgrade-manual/PercussaAudioCubesFirmwareUpgradeManualfwupgrade-2.pdf`

Remark: AudioCubes purchased directly from Percussa in 2017 already come with the latest firmware version.

2   Switch on/off ENGINE + REMOTE

2.1   Switch ON

Plug in the 9V wall wart which comes with ENGINE into the back of your ENGINE (DC PWR).
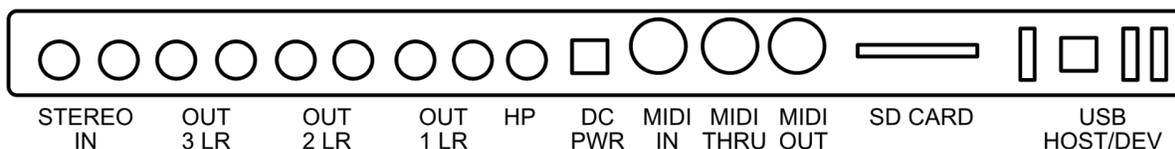
Figure 1: Percussa Engine Connectors
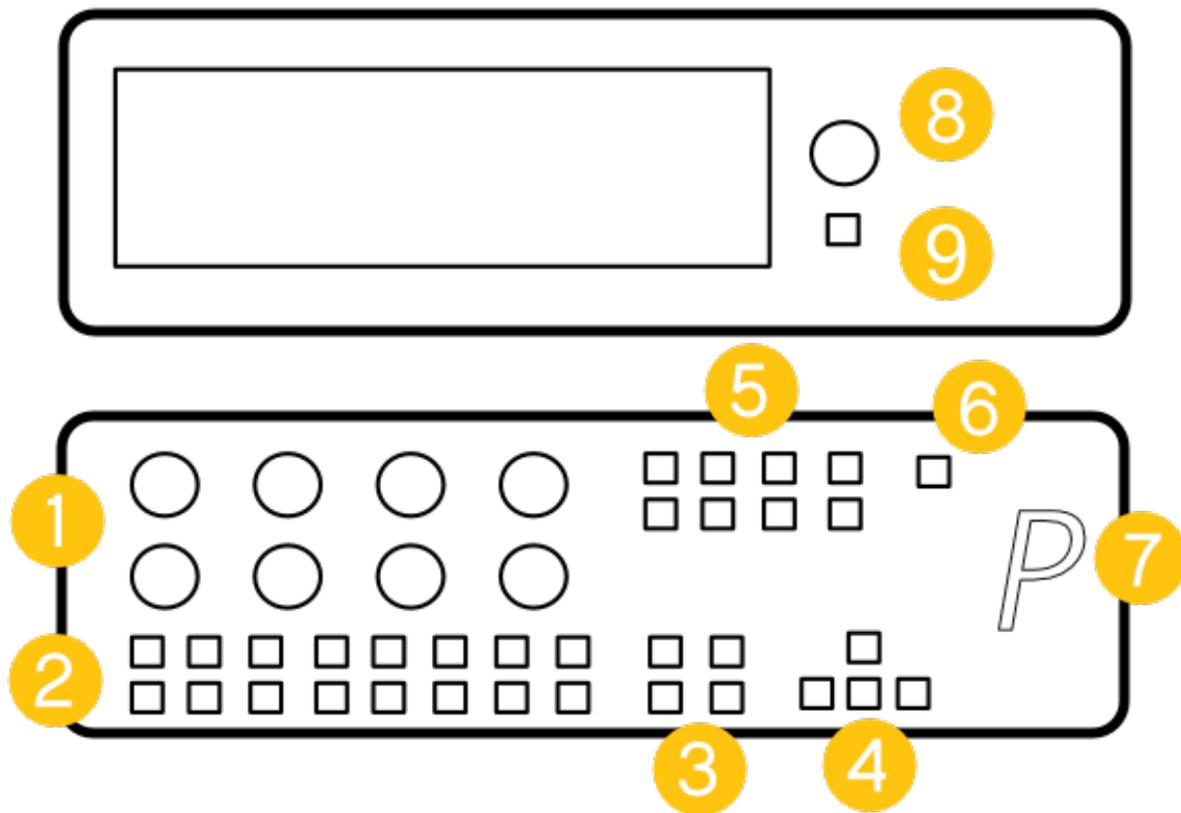
Figure 2: Percussa Engine and Remote

Make sure the USB cable which connects ENGINE and REMOTE is plugged in (nr.7).

Press the power on/off switch of the ENGINE (nr. 9) and release it when the splash screen appears on the display (about 3 sec).

Once the system has finished booting, the P sign turns purple, flashes, and is assigned number 01 in the cube grid.

When starting ENGINE, REMOTE is automatically recognized as the master or base station of the wireless network.

2.2   Switch off

To switch off ENGINE/REMOTE click the ON/OFF button (nr.9) for 1 second. The system will start the shutdown procedure. When the P sign of REMOTE (nr.7) isn't lighted-up anymore the system is completely shut down.

Once the system is completely shut down it is safe to unplug the power adapter. Please make sure not to unplug the power adapter while the system is still running. Unplugging the power adapter while the application is still running might cause data corruption errors on the SD card.

2.3   Volume

You can change the sound volume by changing the encoder of ENGINE (see nr.9).

3   REMOTE and ENGINE overview

3.1   Definitions

- Percussa ENGINE = digital hardware synthesizer running Percussas SYNTHOR synthesis software.

- Percussa REMOTE = control surface & wireless base station.

- Percussa AudioCubes = wireless modular controllers.

3.2   ENGINE connectors

- STEREO IN: see section 14.1

- 6 Channel OUT (OUT3 LR, OUT2 LR, OUT1 LR): see section 12

- HP (headphone output)

- DC Power: use the 9V wall wart which is delivered with your device

- MIDI In: see section 15

- SD card slot: see section 13.1 to learn more about how to add your own samples to the samples directory of the SD Card.

- USB Host 1 Port (supports USB 2.0 HIGH SPEED devices only) - might be used in future firmware upgrades to support additional Percussa instruments or 3rd party devices. Is not used for anything at the time this manual is being written.

- USB (OTG) Device Port - This port can be connected to your Mac (OSX El Capitan or later required) computer to record directly from the synthesizer. The device will

show up as a USB audio class 2.0 device, named Percussa Engine Out. At the time of this writing, the device is a stereo device. Multiple channel support will be added in a future update. Windows support will also be part of a future update (we are currently testing the USB audio class 2.0 driver supplied by Microsoft with Windows 10 creators edition).

- USB (OTG) Host Port - shared with the above Device Port. If you connect the device port to your computer this Host Port won't work, since they share the same bus. If you do not connect the Device Port to your computer, this port can be used as an additional Host Port that supports High, Full and Low speed USB devices and can be used in the future to support both Percussa and 3rd party devices.

- USB Host 2 Port: use this far right USB host port to connect Percussa REMOTE. The port is conveniently located right next to the cable channel in the aluminium rack ear, leading to the USB connector on the Percussa REMOTE.
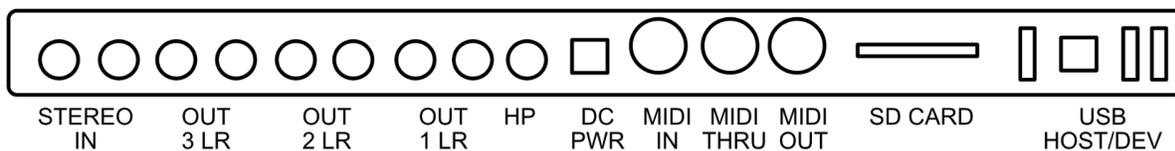
Figure 3: Percussa Engine Connectors

3.3   REMOTE and ENGINE overview
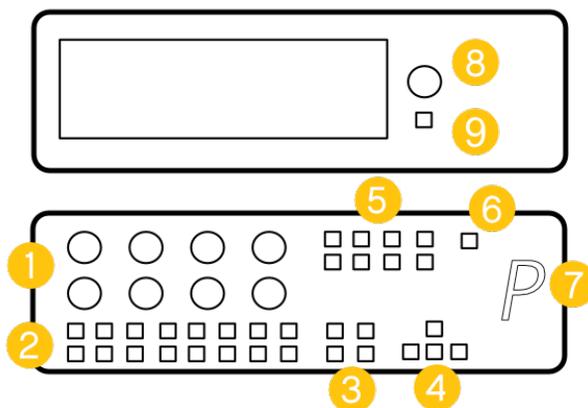
Figure 4: Percussa Engine Connectors

Percussa ENGINE: 8-9

- 8 = Volume encoder

- 9 = on/off button

Percussa REMOTE: 1-7

- 1 = encoders

- 2 = cube selection buttons

- 3 = editor selection buttons

- 4 = keypad buttons

- 5 = configuration buttons

- 6 = Bootloader mode

- 7 = USB connector

4 Synthor System 8 works with and without AudioCubes.

Patching the Synthor System 8 synthesizer can be done using the encoder knobs and buttons of the Percussa Remote, which is connected via USB to the Percussa Engine synthesizer. We call it *manual patching* in this manual.

Optionally, the synthesizer can also be wirelessly patched and modulated using the AudioCubes tangible interface. AudioCubes are smart objects capable of sensing each other's location and orientation, which is automatically translated into patch connections.

IMPORTANT: All presets (see section 16) have been patched manually, except for preset 1 - 5. At any time you can enable/disable manual patching for each preset (see section 9.5). If you want to use AudioCubes to patch the synth for preset 6 - 99, you should switch off the patch connections which have been created manually (see section 9.4).

You can also combine patching using AudioCubes with manual patching (i.e. you can have some connections patched manually while others being patched using the cubes, all at the same time). The manual patch connections work as "overrides" on top of the connections created using AudioCubes.

5   Virtual REMOTE

A virtual REMOTE is built into ENGINE. Each of the buttons shown on the screen are one-to-one linked with the buttons on REMOTE, as you can see in the screenshot below.
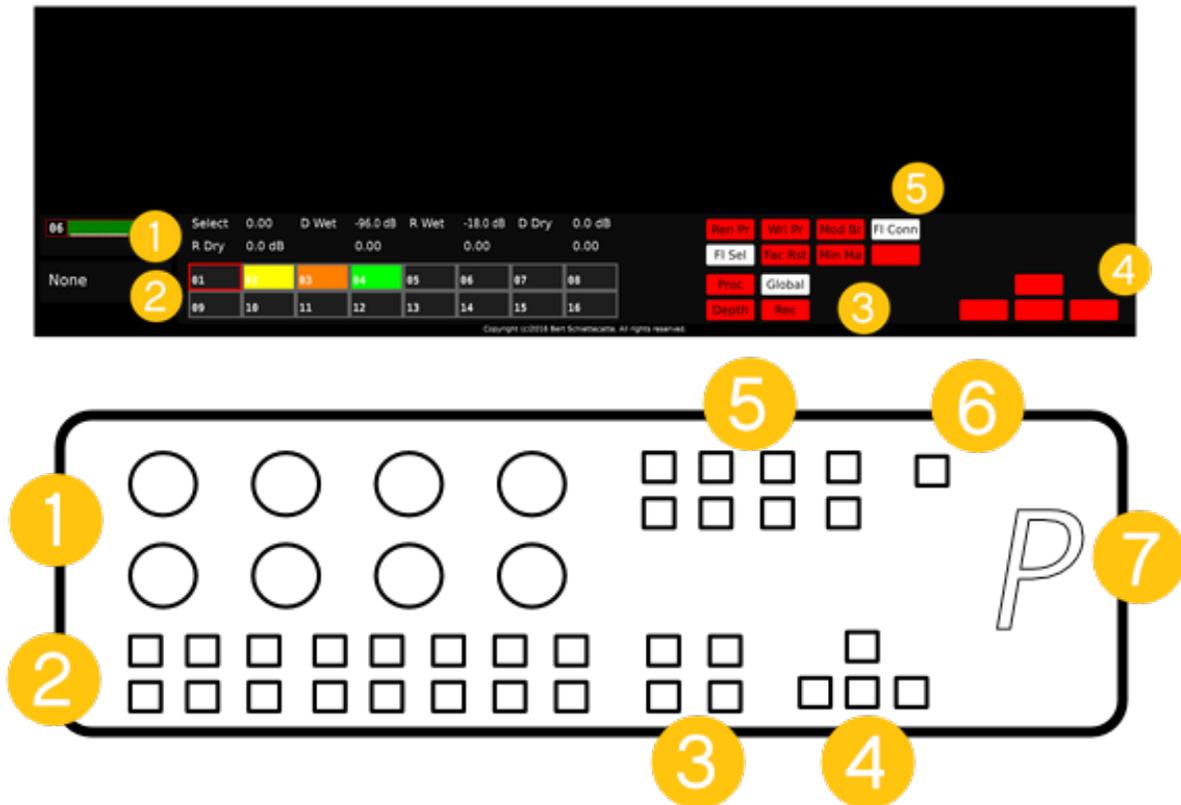
When you select a button from the editor selection buttons (nr. 3) or configuration buttons (nr. 5), the corresponding button turns white or flashes for 1 sec to indicate this function has been enabled. For examples, in the screenshot above 3 buttons are enabled: FL Conn, FL Sel and Global (see section 7).

6   Presets

You can store up to 100 presets on the SD card of the Percussa ENGINE (see section 13.1 for more information about the SD card).

6.1   Presets

To switch a preset click *Global* - one of the 4 editor selection buttons (nr. 3) - and use the up and down buttons (keypad buttons, nr. 4) to move up and down in the list of presets. Each time you switch preset, the synth modules are automatically loaded onto each cube/slot.
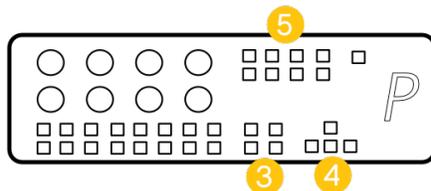
7   Global Editor

Switch to the *Global* editor using the editor buttons (nr.3).

Figure 5: Global Editor

7.1   Save preset

Every time you make changes to the preset the preset label box will turn red. Please make sure you save your changes regularly by going to the *Global* editor and clicking **Wri Pr**.

When the preset is saved, the preset label box turns green.

7.2   Rename preset

You can rename a preset (max 8 chars long) by first clicking **Ren Pr** in the *Global* editor and select a character by using the first encoder (top left). To confirm a character use the right button on the keypad (nr.4). To change a character, use the left button.

When you are done renaming a preset name, disable the **Ren Pr** button by clicking once, and select **Wri Pr** to save the changes. As soon as the changes are saved the preset label box switches from red to green.

REMARK As long as the **Ren Pr** is enabled all the other buttons will be disabled. When disabling this button, all the other buttons on the Remote will become active again.

7.3   Mod Br

Enable/disable the modulation brightness.

7.4   Fl Conn

AudioCubes flash for 1 sec when patching cubes together, provided the modulation rules are valid.

7.5   Fl Sel

The selected slot/module on the 2D grid will flash as well as the selected AudioCube.

7.6   Factory reset presets

At any time you can restore the factory presets by pressing the **Fac Rst** button. All presets will be replaced with the factory presets after you confirm by pressing the **Fac Rst** button a second time.

7.7   Max/Min

To prevent encoder parameters from switching from max to min when reaching the max value (or vice versa), you can enable the max/min option.

8   Assign synth modules

Switch from *Global* editor to *Proc* editor using the editor buttons (nr.3).
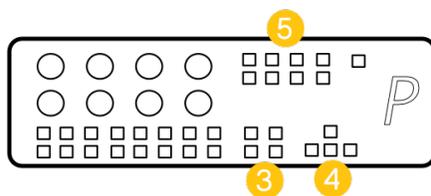
Below an overview of all synth modules currently available and the corresponding colors:

Output	yellow
LFO	green
Step Sequencer	(light) pink
Sampler	purple
Granular processor	light yellow
DC generator	red
Env generator	blue
Comb filter	(hot) pink
SVF	white
Noise	cyan
Waveshaper	light green
WTC oscillator	orange
none	no color
Remote - Master	violet

Table 1: Default colors synth modules

8.1   Assign Synth Modules using AudioCubes

Before using the AudioCubes, please read section 1.2.3.

Every cube represents a synth module, and a module is automatically assigned to every cube which joins the wireless network. It is important to remember that at least one of the cubes needs to be the output cube (see also section 12 to learn more on how to send the sound of each output cube to different output channels).

By clicking one of the 16 cube selection buttons (nr.2), you're selecting one of the cubes. The color of the button is linked to the color of the cube. Per default, a cube is flashing when it is being selected. This helps you retrieve your cube/module more easily. You can disable this option in the global settings.

You can now change the synth module assigned to this cube by using the up and down buttons (nr.4) on the keypad. Next to the preset name box, you'll see the name of the synth module changing.

Automatically a synthesizer module and corresponding color is assigned to each AudioCube. To assign a new module to one of the 16 *slots* you can follow the steps below;

- select a module slot using one of the 16 selection buttons,

- go the *Proc* editor by using the editor selection buttons and

- use the up and down buttons to select the module you want to assign to the selected slot.

As you can see in the screenshot below, we've switched on 3 cubes, and they have each joined the wireless network. A synth module and color have automatically been assigned to each cube, as shown in the cube selector below.

8.2   Assign Synth Modules when not using AudioCubes

Follow the same steps as described in previous section:

- Select a module slot using one of the 16 selection buttons,

- Go the *Proc* editor by using the editor selection buttons and

- Use the up and down buttons to select the module you want to assign to the selected slot.

9   Modulation rules

After assigning synth modules, you're now ready to define the modulation rules:

- what modulation the synth module accepts (Enabled Mod Inputs)

- what the synth module will modulate (Enabled Mod Outputs)

Remarks:

- in order to have a valid patching connection between 2 synth modules the modulations a synth module is accepting (inputs) and the ones it will modulate (outputs) must match.

- the *input:output* (Enabled Mod Inputs) of an output module always need to be enabled, otherwise there will be no sound

9.1   Depth Editor to set modulation rules

To set these modulation rules, switch from *Proc* to *Depth* editor.

On the top of the screen you'll see 2 columns:

- Enabled Mod Inputs (*what modulation the synth module accepts*, left column)

- Enabled Mod Outputs (*what the synth module will modulate*, right column).

The depth editor is linked to the selected cube. If you want to see the modulation rules of another cube, you first have to select that other cube/module by using one of the 16 selection buttons.

To select the Enabled Mod Inputs (*what modulation the synth module accepts*) and Enabled Mod outputs (*what the synth module will modulate*), you need to use the first top left encoder.

By turning the encoder you'll see the selection box moving up and down in both columns. To confirm the Enabled Mod Inputs in the left column, you click on **Togg I** using the corresponding configuration button. To confirm the selected value as the Enabled Mod Outputs click **Togg O**.

Figure 6: Depth Editor

In the screenshot above you can see one of the modulation rules of the selected cube/module (output). In this case the **Output: Input** has been selected as **Enabled Mod Inputs**, which means the output accepts Output:Input modulation.

9.2   Clear

Figure 7: Depth Editor Buttons

You can clear or reset all modulation rules of the selected module by clicking Clear.

9.3   Default Reset

We also assigned default modulation rules to certain modules. You can find an overview of the default mod inputs/outputs below.

Figure 8: Depth Editor Buttons

	Default Enabled Mod Inputs	Default Enabled Mod Outputs
Output	Output: Input	/
LFO	/	Output: Input
Noise	/	Output: Input
WT Osc	/	Output: Input
Sampler	/	Output: Input
Granular	/	Output: Input

Table 2: Default modulation rules

When pressing this button all modulation rules of this module will be erased and replaced with the default settings.

9.4   Patch using AudioCubes

By placing AudioCubes next to each other, you're patching the modules together provided the modulation rules are valid.

IMPORTANT: All presets (section 16) have been patched manually, except for preset 1 - 5. At any time you can enable/disable manual patching for each preset (see section 9.5). If you want to use AudioCubes to patch the synth for preset 6 - 99, you should switch off the patch connections which have been created manually (see section 9.4).

You can also combine patching using AudioCubes with manual patching (i.e. you can have some connections patched manually while others being patched using the cubes, all at the same time). The manual patch connections work as "overrides" on top of the connections created using AudioCubes.

9.5   Patching without AudioCubes / Manual Patching

General idea: Instead of placing cubes next to each other to patch the modules together, you use the 2D grid to indicate which modules are next to each other.
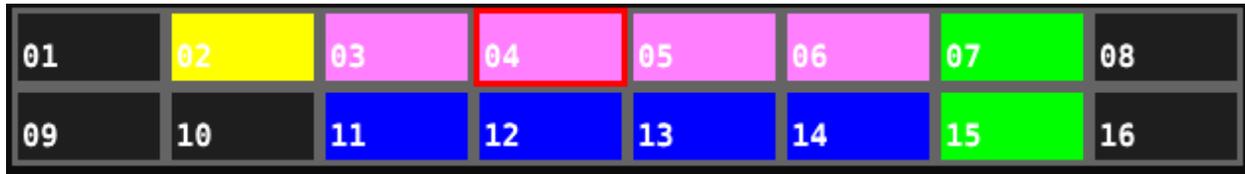
- Step 1: You first select the module which you would like to patch/place next to another module using one of the 16 selection buttons, for instance nr.4 in the screenshot above.

- Step 2: You press and hold the Global Editor button. Automatically you'll see a 2D network overview:
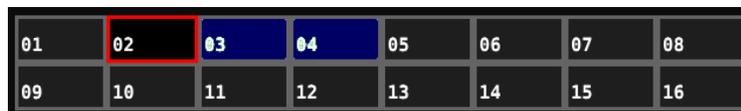
  - The slot/rectangle with a red border = selected module
  - The slots/rectangles that have a dark blue color = modules that are next to the selected module
  - You can now place another module next to the output module, for instance the LFO, by selecting the LFO module (using one of the 16 buttons).

- Step 3: after releasing the Global editor button the network grid with all the active modules will be shown again.

9.6   Example 1: first preset with 1 Output and 1 LFO module

Let's start with a preset with 1 Output and 1 LFO module which sends its signal to the output module.

- Step 1: Make sure 2 cubes are switched on and have joined the network. Let's make sure one cube is the output and the other one is an LFO. Follow the instructions described in section 8.

- Step 2: Select the output cube using one of the 16 selection buttons.

- Step 3: Switch to Depth editor.

- Step 4: Use the top left encoder to set the modulation rules for the output module: Enabled Mod Inputs (left colomn): output:input. Never forget to select this rule, otherwise you won't have any sound!
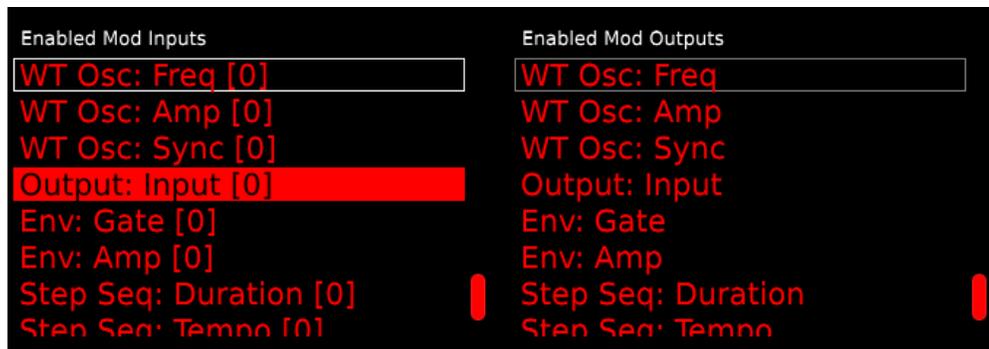
Figure 9: Modulation rules for Output module (example 2)

- Step 5: To confirm the input of this module click **Togg I**.

- Step 6: Select the LFO cube using one of the 16 cube selection buttons.

- Step 7: Use the top left encoder to select the modulation inputs and outputs of the LFO module. In this example we only want the LFO to send its signal to the output cube. Therefore, we choose output:input for its Enabled Mod Outputs.

- Step 8: Confirm this output by clicking **Togg I**.
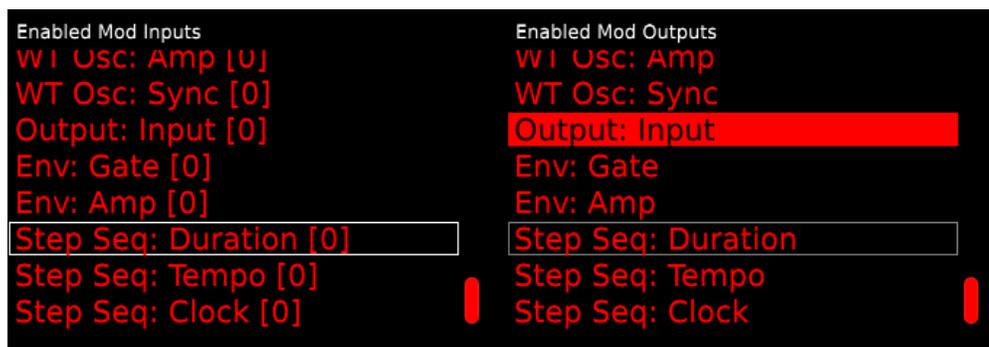
Figure 10: Modulation rules for LFO module (example 2)

- Step 9: To save your work don't forget to go the Global editor and press **Wri Pr**

You're now ready to test your first preset :-)

9.6.1 Patch using AudioCubes

Put the LFO cube/module next to the output cube to hear the sound going through the output module. The output signal is also visualized in the oscilloscope (top right of the screen).

$$LFO \Rightarrow Output$$

9.6.2 Manual Patching

$$LFO \Rightarrow Output$$

Follow the instructions described in section 9.5 to patch the LFO next to the output module.

9.7 Example 2: Modulate an LFO in its frequency with a Wavetable Oscillator (WT Osc)

For instance to modulate an LFO in its frequency with a WT Osc, we have to select the following modulation rules:

	LFO	WT Osc
Enabled Mod Inputs	**LFO:frequency**	/
Enabled Mod Outputs	/	/ **LFO:frequency**

When putting the WT Osc next to the LFO, the WT Osc will modulate the frequency of the LFO. Of course, you still need to add an output module + modulation rule for the output in order to have sound.

$$WTOsc \Rightarrow LFO \Rightarrow Output$$

	WT Osc	LFO	Output
Enabled Mod Inputs	/	**LFO:frequency**	**Output:Input**
Enabled Mod Outputs	**LFO:frequency**	**Output:Input**	/

10   Using distance to scale modulation signals

Paragraphs below explain how to scale the modulation signals.

10.1   Scaling the modulation signals using AudioCubes

The distance between the cubes is used to scale the modulation signals. If you have two cubes, and one is modulating the frequency of the other, the distance will automatically be used to scale the modulation signal (i.e. frequency modulation depth in this case).

You can also rotate the cubes to increase/decrease mod depth, because the sensors of the cubes have a viewing angle. As the cubes signals go towards the edge of the viewing angle, the signals become weaker which decreases the modulation depth.

10.2   Scaling the modulation signals when not using AudioCubes

You can scale the modulation (0 - 1) by switching to the 2nd and 3rd page of the Depth Editor, and using the corresponding encoders. You can switch between pages by using the *left* and *right* buttons on the keypad.

Cube 1	1.000	Cube 2	1.000	Cube 3	1.000	Cube 4	1.000
Cube 5	1.000	Cube 6	1.000	Cube 7	1.000	Cube 8	1.000

| 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 |
| 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |

11   Synth Modules

In this section, we'll describe the Encoder Parameters, Buttons and Modulation targets for each synth module.

11.1   Output Module

The output module will accept any other module next to it and will allow you to listen to the sound of that module. You need at least one output module.

11.1.1   Color

Default color: yellow

11.1.2   Buttons

See also section 12. You can choose to which output channel you'd like to send the signal of this output module. There are 6 output channels to choose from. As default, channel 1 and 2 are selected.

Ch1	Ch2	Ch3	Ch4
Ch5	Ch6		
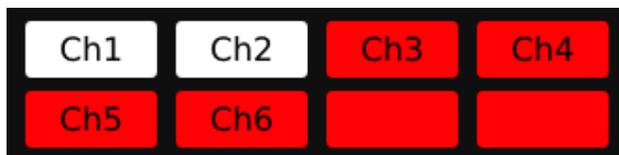
11.1.3   Modulation targets

An Output can be modulated in its input. In the Enabled Mod Inputs column (depth editor, left), you can select:

- Output: Input

Output: Input is an important modulation target which you can't forget to enable as Enabled Mod Inputs (= *what modulation the synth module accepts*): **Output:Input**. In case you don't select this input there will be no sound!
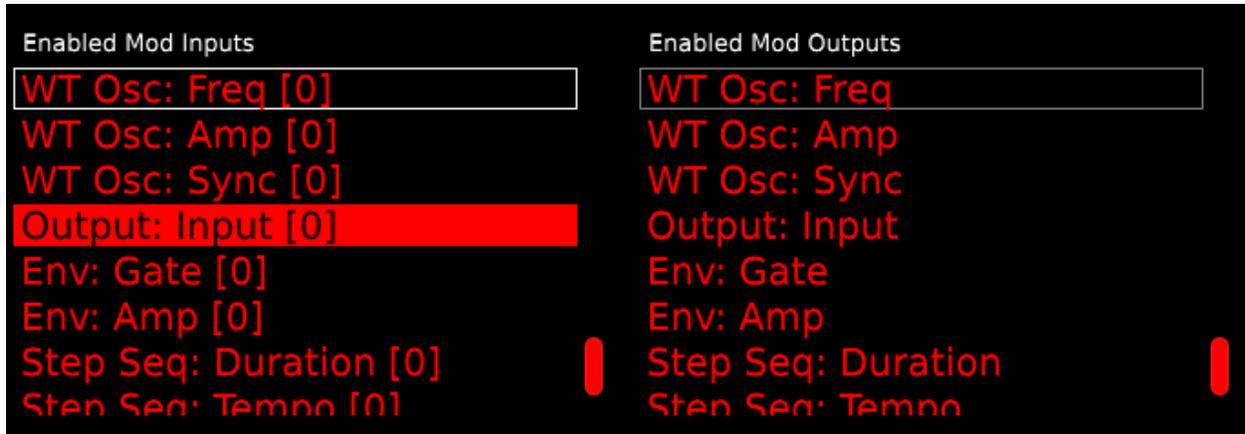
11.1.4   Example

For instance, to have an output module accept the signal of an LFO, you need to apply the following modulation rules:

$$LFO \Rightarrow Output$$

	LFO	Output
Enabled Mod Inputs	/	**Output:Input**
Enabled Mod Outputs	**Output:Input**	/

11.2   Low Frequency Oscillator (LFO)

The oscillator and LFO are embedded into the same module: LFO.

11.2.1   Color

Default color: green

11.2.2   Encoder Parameters

You can set the following parameters of the LFO generator using the first 3 encoders:

- Coarse frequency

- Fine frequency

- Waveform

By turning the frequency of the LFO module very low, you get an LFO and by increasing the frequency value you're turning it into an oscillator. You can set the frequency of the oscillator/LFO by changing the coarse and fine parameters.

Using the third encoder you can change the waveform type (sine, square, triangle, saw). It corresponds to the label Type in the middle screen.

11.2.3   Buttons

Encoder parameters on 2nd page. Press the *right* button on the keypad to switch to the second page.

The V1-V8 buttons allow you to assign an LFO to a voice. The incoming MIDI notes are automatically assigned to a voice, in a round robin fashion. The note number is translated to Hz and used to set the Coarse/Fine frequency parameters of the LFO. To create a 4-voice synth, one can use 4 copies of the LFO, and assign each copy to two voices (e.g. LFO 1 assigned to V1 and V5, LFO 2 to V2 and V6, etc). At the same time, an envelope generator that amplitude-modulates an LFO can also be assigned to the same voices, such that the incoming MIDI note will be used as a trigger for the envelope (scaled by note velocity).

11.2.4   Modulation targets

An LFO can be modulated in its frequency (pitch) and/or in its amplitude. In the Enabled Mod Inputs column (depth editor, left), you can select:

- LFO: Amp

- LFO: Freq

11.2.5   Example

To modulate the frequency of an LFO module, you need another module, e.g. Envelope Generator (see section 11.5), that can modulate the frequency of the LFO.

$$EnvGen \Rightarrow LFO \Rightarrow Output$$

	Env Gen	LFO	Output
Enabled Mod Inputs	/	**LFO:Freq**	**Output:Input**
Enabled Mod Outputs	**LFO: Freq**	**Output:Input**	/

11.3   Noise

There are two types of noise: simple white noise or toggle noise. Toggle noise is similar to white noise except that it has a variable frequency. The frequency determines how many times per second a random value is picked.

11.3.1   Color

Default color: cyan

11.3.2   Encoder Parameters

You can set the following parameters of the noise generator using the first 3 encoders:

- Coarse

- Fine

- Type (toggle/white)

When choosing white noise changes to coarse and fine won't have an effect anymore.

11.3.3   Buttons

At the moment, there are no buttons for the Noise generator.

11.3.4   Modulation targets

A Noise module can be modulated in its frequency and/or in its amplitude. In the Enabled Mod Inputs column (depth editor, left), you can select:

- Noise: Amp

- Noise: Freq

11.3.5   Example

Use an LFO to modulate the frequency of an Noise module, after which its signal is sent to the Output.

$$LFO \Rightarrow Noise \Rightarrow Output$$

	LFO	Noise	Output
Enabled Mod Inputs	/	**Noise:Freq**	**Output:Input**
Enabled Mod Outputs	**Noise: Freq**	**Output:Input**	/

11.4   State Variable Filter (SVF)

A SVF lets you extract low-frequency or high-frequency portions of the audio signal. It needs at least one other cube or synth processor next to it such as an LFO. When putting the output cube next to the SVF you should hear the signal from the LFO passing through the SVF.

You can use the cutoff/resonance sliders to play with the filter and you have different options to extract the audio signal: High, Low, Band, Peak.

11.4.1   Color

Default color: white

11.4.2   Encoder Parameters

You can set the following parameters of the noise generator using the first 3 encoders:

- Cutoff

- Resonance

- Type (high/low/band/peak)

11.4.3   Buttons

At the moment, there are no buttons for the SVF.

11.4.4   Modulation targets

A SVF module can be modulated in cutoff, resonance, amplitude and input. In the Enabled Mod Inputs column (depth editor, left), you can select:

- Svf: Cutoff

- Svf: Res

- Svf: Amp

- Svf: Input

11.4.5   Example

Let's have a noise generator send its signal through a SVF after which it is sent to the output module:

$$Noise \Rightarrow SVF \Rightarrow Output$$

	Noise	SVF	Output
Enabled Mod Inputs	/	**SVF:Input**	**Output:Input**
Enabled Mod Outputs	**SVF: Input**	**Output:Input**	/

11.5   Envelope Generator (ADSR)

The Envelope Generator is an ADSR envelope generator which can be used to modulate the frequency or amplitude of other processors. The envelope is per default looping.

11.5.1   Color

Default color: blue

11.5.2   Encoder Parameters

Besides the normal parameters such as Attack, Decay, Sustain and Release (all in seconds), we also embedded 3 other settings: SusLvl, Trgt A, Trgt DR.

Attack	1.800	Decay	2.000	Sustain	3.000	Release	4.000
Sus Lvl	0.550	Trgt A	10.0	Trgt DR	43.0		0.00
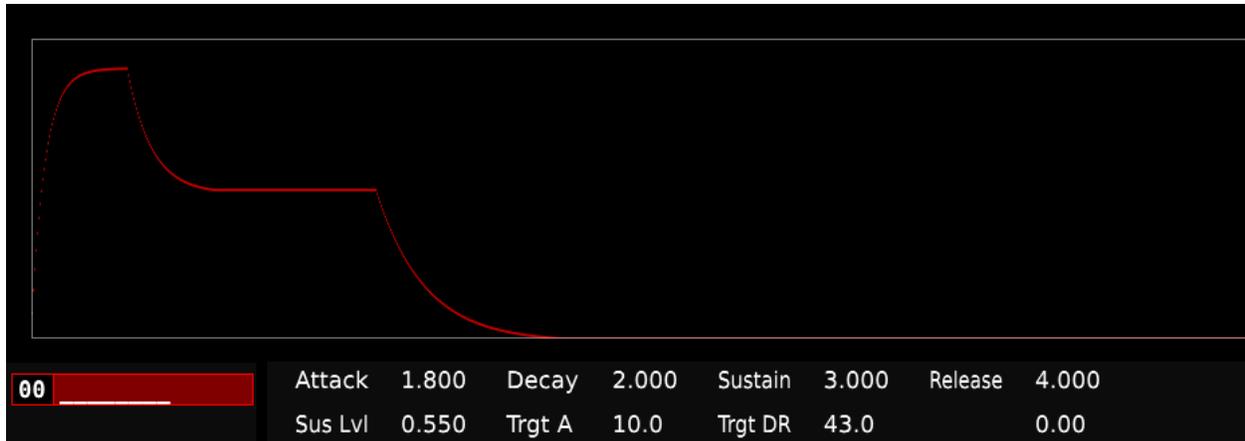
Sustain Level (Sus Lvl): changes the level of Sustain vertically

Target Attack (Trgt A): exponentially rising/decaying attack

Target Decay Release (Trgt DR): exponentially rising/decaying decay and release

11.5.3   Buttons
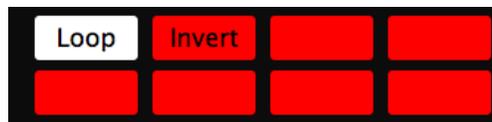
Loop: The envelope is per default looping. When putting a step sequencer next to it you need to make the envelope non looping (disable Loop) to have it triggered by the step sequencer.

Invert: by enabling invert you can invert the envelope waveform.

Encoder parameters on 2nd page. To switch between pages use the *left* and *right* buttons on the keypad.

An envelope generator that amplitude-modulates an LFO/WT Osc/ Gran Processor can also be assigned to the same voices (V1-V8 buttons), such that the incoming MIDI note will be used as a trigger for the envelope (scaled by note velocity).

11.5.4   Modulation targets

An Env Gen module can be modulated in gate or amplitude. In the Enabled Mod Inputs column (depth editor, left), you can select:

- Env: Gate

- Env: Amp

11.5.5   Example

Modulate the gate of an Env Gen using a step sequencer, after which the signal is sent to the output module.

$$StepSeq \Rightarrow EnvGen \Rightarrow LFO \Rightarrow Output$$

	Step Seq	Env Gen	LFO	Output
Enabled Mod Inputs	/	**Env:Gate**	**LFO:Freq**	**Output:input**
Enabled Mod Outputs	**Env:Gate**	**LFO:Freq**	**Output:input**	/

11.6   Step Sequencer

The Step Sequencer consists of 64 steps and you can select a set of 8 steps by using the left/right buttons on the keypad. By clicking on these buttons a different part of the step sequencer is highlighted in green as shown in the screenshot below.

11.6.1   Color

Default color: (light) pink

11.6.2   Encoder Parameters

To draw the steps use one of the 8 encoders. Each encoder corresponds to 1 step in the selected area. To change the selected area, use the *left* and *right* buttons on the the keypad.
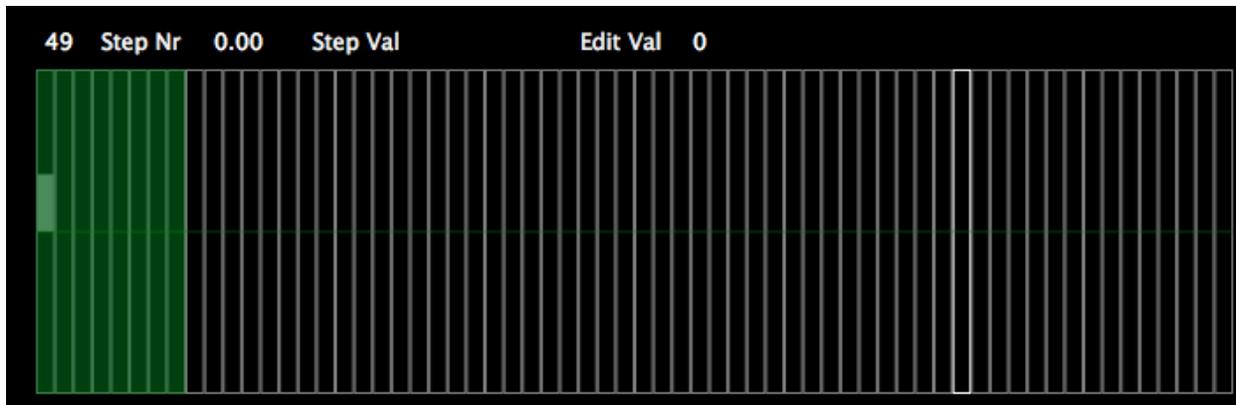
To go back to the main settings of the step sequencer click *Proc*.
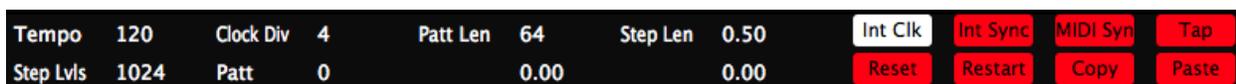
By using one of the 6 encoders you can change the following parameters:

Tempo: by turning the 1st encoder you can change the tempo of the step sequencer.

Clock Division: you can divide the internal clock by a value which of course impacts the tempo of the step sequencer.

Pattern Length: limit of the sequence length (default is 64 steps)

Step Levels: you can change the step levels to quantize the step sequence (i.e. limit it to 4 values above and 4 values below zero). Default is 1024.

Patterns: each step sequencer can have 64 patterns (from 0 until 63).

11.6.3   Buttons

Int Clk: you can use an internal clock or drive the sequencer using an arbitrary signal as a clock. Instead of using the internal clock you can also use another module, such as an LFO, and use its frequency to change the clock.

Int Sync: sequencers which run independently can be synced using this option.

MIDI Sync: sync the sequencers to the incoming MIDI clock signals (see section 15).

Tap: you can also set the tempo by clicking several times in a row on *tap*.

Reset: you can undo the value received from using the tap button by clicking Reset.

Restart: restart the step sequencer from step 1.

Patterns can easily be shared between step sequencers by using the **Copy** and **Paste** button. To copy a pattern to another step sequencer, you first click copy after which you can go the step sequencer which you'd like it have copied to. Make sure to select the pattern number of where you'd like it to have copied to and click paste.

11.6.4   Modulation targets

A Step sequencer can be modulated in duration, tempo, and clock. In the Enabled Mod Inputs column (depth editor, left), you can select:

- Step Seq: Duration

- Step Seq: Tempo

- Step Seq: Clock

11.6.5   Example

Modulate the clock of a step sequencer using the frequency of an LFO, after which the signal is sent to the output module

$$LFO \Rightarrow StepSeq \Rightarrow Sampler \Rightarrow Output$$

	LFO	Step Seq	Sampler	Output
Enabled Mod Inputs	/	**Step Seq:Gate**	**Sampler:Gate**	**Output:input**
Enabled Mod Outputs	**Step Seq:Gate**	**Sampler:Gate**	**Output:input**	/

Remark: don't forget to disable **Int Clock** of the step sequencer.

11.7   Sampler

The sampler allows you to load up to 8 samples, and then trigger these samples using a signal from the step sequencer, for example, or you can loop them using the (loop + layer) settings, which will mix all 8 samples together and loop them.

Each level of the signal corresponds to a different sample slot, so you can trigger samples using any signal you want. **When triggering a sampler using a step sequencer you can use the distance between the sampler and step sequencer to trigger different samples.**

Per default there are already a list of samples available in the sample directory on the SD-card. Of course, you can also add your own samples to the sample directory (see section 13.1).

11.7.1   Color

Default color: purple

11.7.2   Encoder Parameters
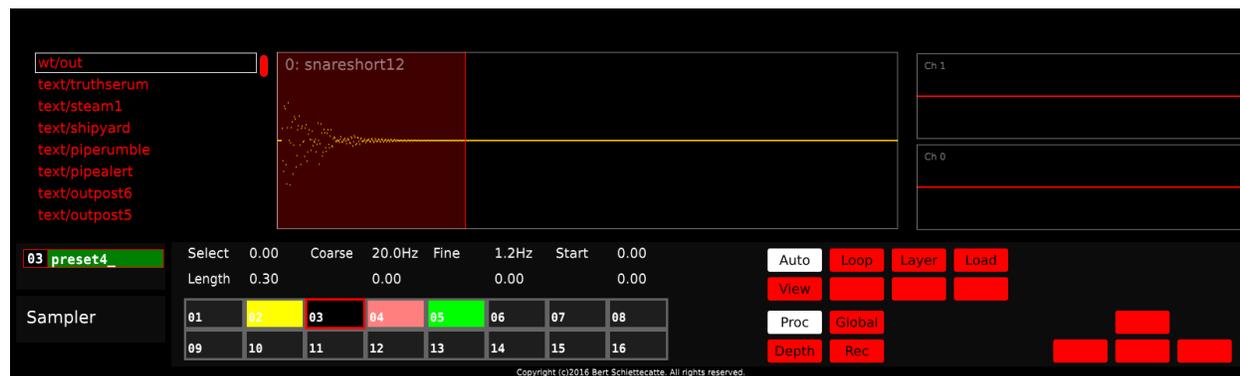
Select: scroll through the list of samples using the 1st encoder. You can add additional samples in the samples directory on the SD-card (see instructions in section 13.1).

Coarse: sets the frequency of the oscillation/looping. This only works when Auto (auto-frequency) setting is switched off.

Fine: sets the frequency of the oscillation/looping. This only works when Auto (auto-frequency) setting is switched off.

Start: choose the start of the waveform.

Length: choose the length of the waveform.

11.7.3   Buttons

Auto: frequency of the oscillation/looping is set to automatic. If you switch off the auto-frequency setting, you can set the frequency of oscillation/looping using the frequency sliders (fine and coarse). You can get some really amazing textures using the sampler.

Loop: run the sampler in loop mode, needs to be used together with layer.

Layer: layer the samples. This will mix all 8 samples together and then loops them (important to enable loop as well).

Load: to select a sample click Load. Each time you click load the selected sample will be added to the next slot.

View: gives a visualisation of the samples that are stored in a certain slot. Each time you click view the visualization of the next sample is shown.

11.7.4   Modulation targets

A Sampler can be modulated in start, gate, length, frequency and amplitude. In the Enabled Mod Inputs column (depth editor, left), you can select:

- Sampler: Start
- Sampler: Gate
- Sampler: Length
- Sampler: Freq
- Sampler: Amp

11.7.5   Example

Trigger samples of sampler using a step sequencer, after which the signal is sent to the output module

$$StepSeq \Rightarrow Sampler \Rightarrow Output$$

	Step Seq	Sampler	Output
Enabled Mod Inputs	/	**Sampler:Gate**	**Output:Input**
Enabled Mod Outputs	**Sampler: Gate**	**Output:Input**	/

11.8   Granular Processor

This module lets you load a WAV file, and then use that file for granular sound synthesis. This sound synthesis technique works by playing back very small sections of sound (e.g. 50ms long) at a certain rate or frequency. The grains that are played back in this way, are mixed together and internally allocated to grain voices, up to the limit set using the number of grains parameter.

One of the pioneers of Granular Sound Synthesis is Curtis Roads, a well known composer of electronic music and professor at UCSB.

By changing the rate the spacing between the grains in time can be changed, which allows you to blend the grains together into a texture. Lower frequencies mean that the grains are further apart, so they can be heard individually.

See 16.11 to see an example of a preset using a granular processor .

11.8.1   Color

Default color: light yellow.

11.8.2   Encoder Parameters
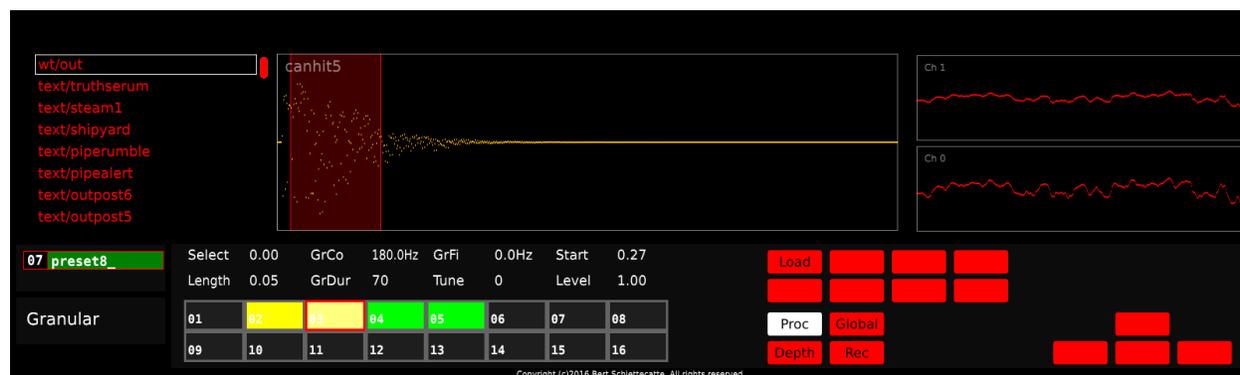
Select: You can load any WAV sample using the select encoder and the *Load* button.

GrCo: grain frequency coarse (in hz) lets you change the pitch of the grains / resulting sound, in hz

GrFi: grain frequency fine (in hz) lets you change the pitch of the grains / resulting sound, in hz

Start: start of grain selection window. The start and length parameters lets you choose a window from which grains are randomly selected for playback at the grain frequency.

Length: length of grain selection window. The start and length parameters lets you choose a window from which grains are randomly selected for playback at the grain frequency.

GrDur: length of the grains (in ms). Using the grain duration parameter, it is possible to blend the grains together or isolate them more (this works together with the grain frequency).

Tune: tuning of the grains, in cents (-1200 .. +1200). Using the Tune parameter, it is possible to tune the sound up or down +/- 1200 cents. This is useful when layering sounds which differ in pitch, so they can be made to be in tune.

Level: The level parameter is used to adjust the output level of the granular processor. Depending on the grain duration and frequency, when a lot of grains are mixed together, the output might clip, so this parameter can be used to adjust the output to avoid clipping the signal. You can keep an eye on the output scope when inside the granular processor screen to make sure it's not clipping.

Encoder parameters on 2nd page. To switch between pages use the *left* and *right* buttons on the keypad.

NrGr	808	Coarse	370.0Hz	Fine	0.0Hz	Spread	0.10
Speed	0.00	Random	1.00		0.00		0.00

NrGr: upper limit for number of grains that can be triggered. Using the number of grains parameter, it's possible to limit the number of grain voices that are available. By setting this to a low value grains that are playing back will be interrupted by new grains which start playing. By setting the value high (e.g. 800) it's possible to play a lot of grains together to create a dense texture. With the amount of grains active, the CPU usage goes up as well. Setting the parameter to a high value does not mean that the grains will be used, that depends on the grain frequency and duration. The number of grains parameter just sets an upper limit.

Coarse: frequency (pitch) of the grains, coarse (in hz).

Fine: frequency (pitch) of the grains, fine (in hz).

Random: randomization factor for grain start time and grain duration. Using the random setting, it's possible to blend between randomization of grain start time (which is derived from the grain frequency) and randomization of grain duration.

11.8.3   Buttons

Load: loads the currently selected WAV file

Encoder parameters on 2nd page. To switch between page use the *right* buttons on the keypad.

V1	V2	V3	V4
V5	V6	V7	V8

V1-V8: assigns this granular processor to a voice. The V1-V8 buttons allow you to assign a granular processor to a voice. The incoming MIDI notes are automatically assigned to a voice, in a round robin fashion. The note number is translated to Hz and used to set the Coarse/Fine frequency parameters of the granular processor. To create a 4-voice synth, one can use 4 copies of the granular processor, and assign each copy to two voices (e.g. processor nr1 assigned to V1 and V5, processor nr2 to V2 and V6, etc). At the same time, an envelope generator that amplitude-modulates a granular processor can also be assigned to the same voices, such that the incoming MIDI note will be used as a trigger for the envelope (scaled by note velocity).

11.8.4   Modulation targets

A granular processor can be modulated in start, length, frequency (real frequency, not the grain frequency) and amplitude. In the Enabled Mod Inputs column (depth editor, left), you can select:

- Gran: Start

- Gran: Length

- Gran: Freq

- Gran: Ampl

11.9   Wavetable Oscillator

Per default there is no WAV file assigned to your WT OSC. You can assign a WAV file by scrolling through the list using the first encoder and selecting the waveform by clicking on load (see Buttons below).

You can add your own WAV files in the directory, please see instructions in section 13.1.

See 16.7 to see an example of a preset using a WT Osc .

11.9.1   Color

Default color: orange
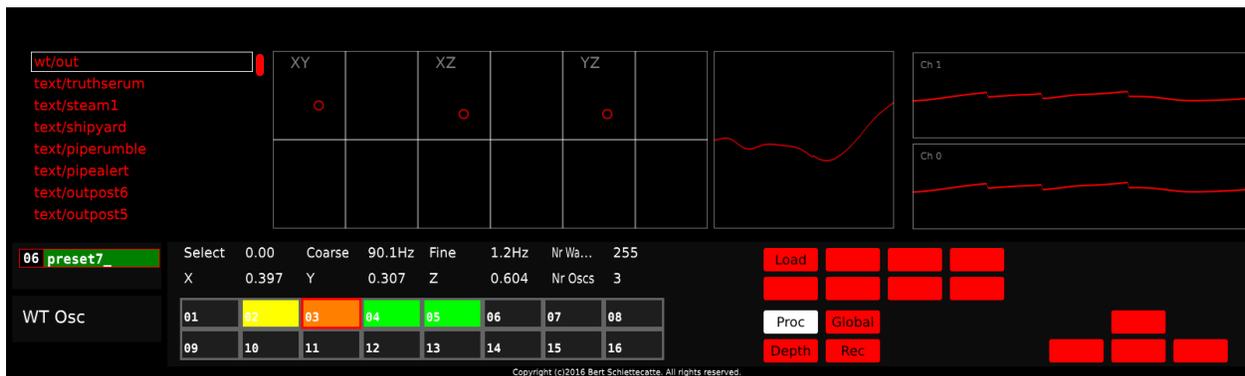
11.9.2   Encoder Parameters

Select: scroll through the list of waveforms using the 1st encoder. You can add additional WAV files in the samples directory on the SD-card. Press Load to select and load the WAV file.

Coarse: set the coarse frequency of the WT OSC.

Fine: set the fine frequency of the WT OSC.

Nr. Waves: cutting the WAV file automatically into smaller pieces or number of waves.

X: used to navigate the X axis of 3D space of the waves that is automatically generated from the WAV file (cutting it up using the nr of waves buttons).

Y: used to navigate the Y axis of 3D space of the waves that is automatically generated from the WAV file.

Z: used to navigate the Z axis of 3D space of the waves that is automatically generated from the WAV file.

Nr Osc: up to 16 oscillators per WT Osc

Spread: (2nd page of the parameter, use right button to switch to 2nd page to change the spread between the different oscillators in the cloud.

11.9.3 Buttons

In the Proc editor of the wavetable oscillator you will see the list of all the files that are in your samples directory.

Solo	Load	View	MIDI

Load: to select a new WAV file click Load. Each time you click load the selected WAV file will be loaded.

Encoder parameters on 2nd page. To switch between pages use the *left* and *right* buttons on the keypad.

V1	V2	V3	V4
V5	V6	V7	V8

The V1-V8 buttons allow you to assign a WT Osc to a voice. The incoming MIDI notes are automatically assigned to a voice, in a round robin fashion. The note number is translated to Hz and used to set the Coarse/Fine frequency parameters of the WT Osc. To create a 4-voice synth, one can use 4 copies of the WT Osc, and assign each copy to two voices (e.g. WT Osc 1 assigned to V1 and V5, WT Osc to V2 and V6, etc). At the same time, an envelope generator that amplitude-modulates a WT Osc can also be assigned to the same voices, such that the incoming MIDI note will be used as a trigger for the envelope (scaled by note velocity).

11.9.4 Modulation targets

A Wavetable Osc can be modulated in frequency, amplitude, x, y and z. In the Enabled Mod Inputs column (depth editor, left), you can select:

- WT Osc: Freq
- WT Osc: Amp
- WT Osc: X
- WT Osc: Y
- WT Osc: Z
- WT Osc: Sync
- WT Osc: Spread

11.9.5 Example

$$LFO \Rightarrow WTOsc \Rightarrow Output$$

	LFO	WT Osc	Output
Enabled Mod Inputs	/	**WT OSC: Freq**	**Output:Input**
Enabled Mod Outputs	**WT OSC: Freq**	**Output:Input**	/

11.10 Waveshaper

The waveshaper is similar to the SVF in that you need another module next to it.

11.10.1 Color

Default color: light green

11.10.2   Encoder Parameters

Drive: this is used to scale the input signal to the waveshaper

Dry/Wet: how much dry and wet signal you want

Drive	0.50	Wet/Dry	0.50	0.00	0.00
	0.00		0.00	0.00	0.00

11.10.3   Modulation targets

A Waveshaper is similar to the filter in that you need a cube next to it with Enabled Mod Inputs set to WS: INPUT. You need to have at least another module next to it with its Enabled Mod Outputs set to WS:INPUT.

A waveshaper can be modulated in drive, amplitude and input. In the Enabled Mod Inputs column (depth editor, left), you can select:

- WS: drive

- WS: Amp

- WS: input

11.10.4   Example

$$Noise \Rightarrow Ws \Rightarrow Output$$

	Noise	Ws	Output
Enabled Mod Inputs	/	**Ws: input**	**Output:Input**
Enabled Mod Outputs	**Ws: input**	**Output:Input**	/

11.11   Comb filter

11.11.1   Color

Default color: (hot) pink

11.11.2   Encoder Parameters

Damp: the dampening factor of the comb filter

Feedback

Delay parameter: set the delay of the comb filter

11.11.3   Modulation targets

A comb filter can be modulated in damp, delay, feedback and input. In the Enabled Mod Inputs column (depth editor, left), you can select:

- Comb: Damp

- Comb: Delay

- Comb: Feedback

- Comb: Input

11.11.4   Example

$$Noise \Rightarrow Comb \Rightarrow Output$$

	Noise	Ws	Output
Enabled Mod Inputs	/	**Comb: input**	**Output:Input**
Enabled Mod Outputs	**Comb: input**	**Output:Input**	/

11.12   DC generator

This just outputs a fixed DC level which can be used with other processors in case you just want to use the distance to control a parameter of another processor and don't want to use an AC signal to modulate the other processor but rather just want a fixed level.

11.12.1   Color

Default color: red

11.12.2 Encoder Parameters

DC level: set the amount of DC level

12 Sending output to different output channels

Instead of sending the sound of all output modules to the same output channels, you can choose to send the output of each output module to be sent to 6 output channels. In the screenshot the sound is sent to Channel 1 and Channel 2.
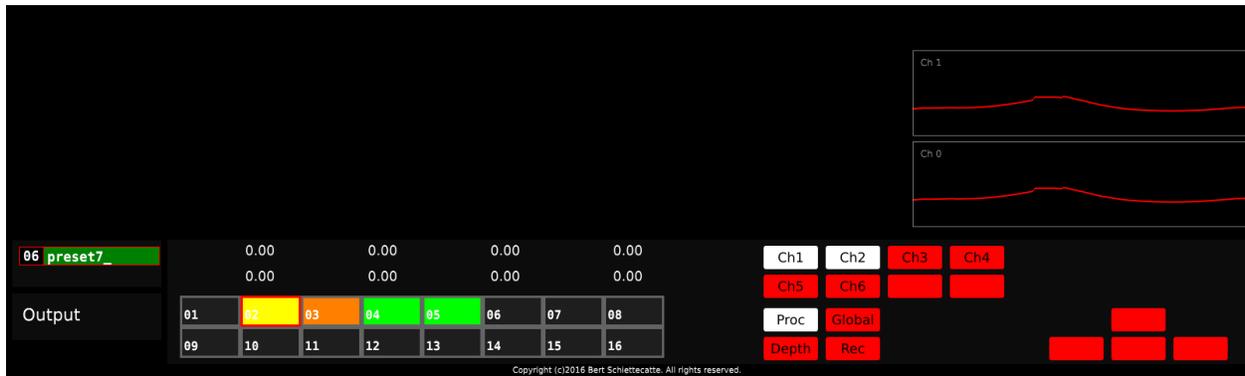
You can select different output channels by using the configuration buttons (nr. 5).
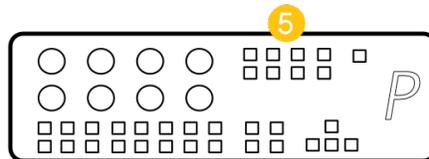
Engine comes with 6 output channels. For each output module, you can select the channels to which youd like to send the output.
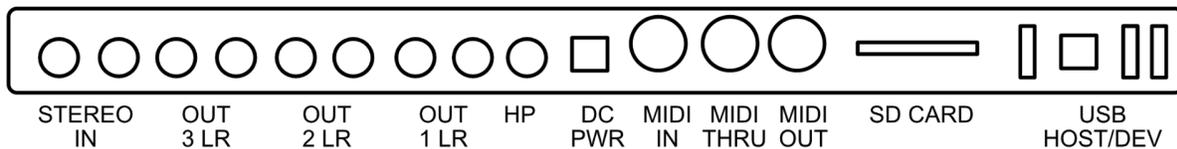
The effects that are added to each output module are only applied to channel 1 and 2.

13   Global Effects Section

You can apply effects by switching to Glob editor, and by using one of the 8 encoders below:
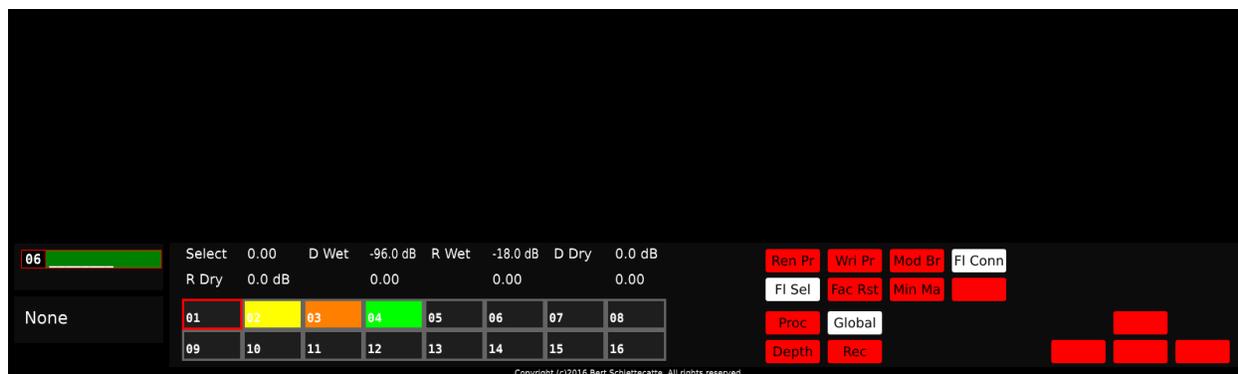
- D Wet (Delay Wet)

- R Wet (Reverb Wet)

- D Dry (Delay Dry)

- R Dry (Reverb Dry)

These effects are only applied to output channel 1 and 2 and not to the other output channels (3, 4, 5, 6).

13.1   SD Card

All the data is stored on the SD card and every ENGINE comes with a 16GB SD card. We highly recommend you backup your SD card before your start using it. Use a tool on Mac OSX or Windows to create a disk image of the entire card, which you can later on use to restore the card. On Mac OSX you can use the Disk Utility or dd tool, on Windows you can use Win32 Disk Imager.

You can add your own samples on the SD card of Engine. The samples folder is located on the SYNTHOR partition on the SD Card. On Mac OSX, you will notice that multiple partitions show up when you insert the SD card. You should only use the SYNTHOR partition. On Windows, you will not see any partitions when you insert the SD Card (DO NOT let Windows format the card when you insert it!). This is because Windows only shows the first partition on the card, which is not a FAT partition. You will need to follow instructions online to make Windows show all the partitions on the card, so you can access the SYNTHOR partition. Make sure that you eject or unmount ALL partitions before you remove the card from your computer.

Please make sure to follow the instructions below carefully:

- To remove the SD card from your Engine, please make sure your device is switched off. Do not pull out the card while the Engine is running. Then, gently push on the SD card to release the lock, after which youll be able to pull the card out.

- Put the SD card in the SD card slot of your Mac or use a USB SD card reader if your computer doesnt have an SD card slot.

- Select the SYNTHOR partition. This is the partition that contains the SYNTHOR application, samples, factory and presets directory.

  - Samples: contains all samples that can be accessed in the sampler and WT OSC modules. More information about samples see section Samples.

  - Presets: 100 presets

  - Factory: factory presets. You can go back to the factory presets at any time as explained in section Presets

- Add your samples in SYNTHOR/Samples directory

- Unmount your SD card before removing it from your computer. Please make sure you dont skip this step, because it can make your SD card corrupt.

14   Recording

You can record your own samples into SYNTHOR using the STEREO IN connectors of ENGINE as well as record the sounds which you've created with Percussa ENGINE directly onto the SD card.

14.1 Record IN

Make sure the STEREO inputs are plugged in. Switch your menu editor to *Rec* (using buttons 3).
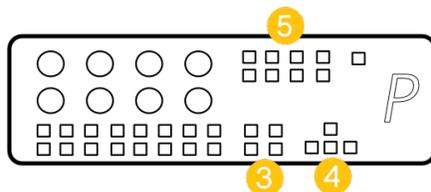
On the left side you'll see the audio coming in. To start recording press the *Reco I* toggle button. Make sure to enable *Mon* otherwise you won't hear the audio coming into the device.

The middle screen shows the *input recorder* (can be switched to output recorder, see section 14.2. On the right hand side you'll see a list of all the samples that are in the sample library. When recording your sample it will automatically be added to the sample directory on the SD card, after which you can load it into your Sampler or WT Osc module.
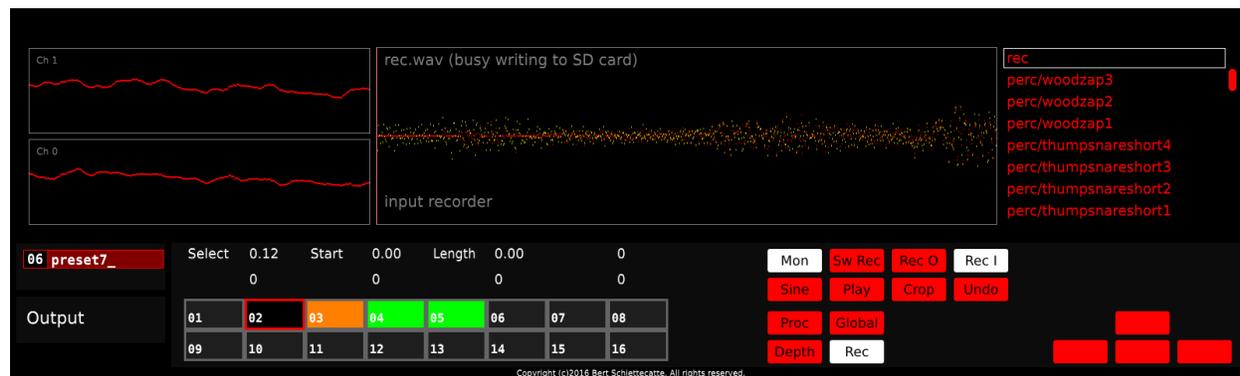
Press the Rec I button again to stop recording.

IMPORTANT - do NOT let the recording continue when you turn off the device. The device is writing to the SD card while you record, and if you turn off the device while it is writing to the card there is a (small) chance of corrupting the card.

14.2 Record OUT

Besides recording STEREO IN, you can also record the sounds which you've created with the Percussa Engine directly on the SD card by pressing *Rec O*.

IMPORTANT - do NOT let the recording continue when you turn off the device. The device is writing to the SD card while you record, and if you turn off the device while it is writing to the card there is a (small) chance of corrupting the SD card.

14.3   Recording features

Mon: you hear the sound that is coming through the STEREO inputs.

SW Rec: switch recording view from Rec O to Rec I.

Rec O: record the sound created on the Percussa Engine directly onto SD card.

Rec I: record the sound going through the STEREO input.

Sine: test sine wave.

Play: play the recorded or loaded WAV file. You can always load another WAV file and make changes to that file as well.

Crop: the recorded/loaded WAV file.

Undo: undo the previous step.

Use the right button on the keypad to switch to the 2nd page with options (or use left button to go back to the first page).

Save: the recorded file is automatically saved on the SD card, but in case you've made changes to the file, such as cropping, you can save the result by pressing save.

SaveN: save to a new file.

Ren: rename the file name.

Load: load a WAV file.

Del: delete a WAV file. You need to press a second time to confirm.

Rev: reverse the WAV file.

Norm: normalize the WAV file.

15   MIDI IN

You can send the MIDI of your MIDI compatible hardware/software to ENGINE using the MIDI IN connector. For instance, you can control the tempo of the step sequencer using MIDI.

16   Example Presets

You can store 100 presets on the SD card. You can overwrite/change every preset the way you want, and you can restore the factory presets (see section 7.6) at any time.

We created 8 easy presets for you (see below), which you can modify however you like. The other 92 presets are default presets consisting of 3 synth modules (output, WT Osc, LFO).

Preset 1 - 5: Manual patching is not enabled (see section 9.5 to patch the preset manually).

Preset 6 - 8: Manual patching is enabled (see section 9.4 to patch using AudioCuebs).

You can also combine patching using AudioCubes with manual patching (i.e. you can have some connections patched manually while others being patched using the cubes, all at the same time). The manual patch connections work as "overrides" on top of the connections created using AudioCubes. If you want to use AudioCubes to patch the synth for preset 6 - 99, you should switch off the patch connections which have been created manually.

16.1   Preset 1: Frequency and Amplitude modulation

In this preset, we use 3 modules: 1 output, 2 LFOs.

Each LFO can send its signal to the output module,

$$LFO_1 \Rightarrow Output \Leftarrow LFO_1$$

and they can modulate each other in amplitude or frequency.

$$LFO_2 \Longleftrightarrow LFO_1 \Rightarrow Output$$

16.1.1   Output module

The output cube only has an input, so for the output module you only need to select: output:input in (Enabled Mod Inputs, left column)
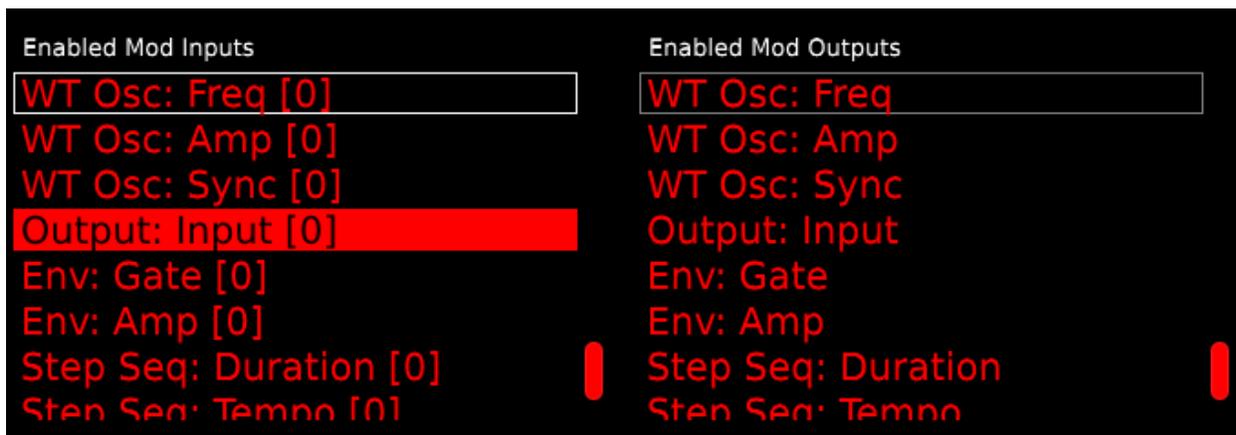
16.1.2   LFO 1

It can send its signal directly to the output module,
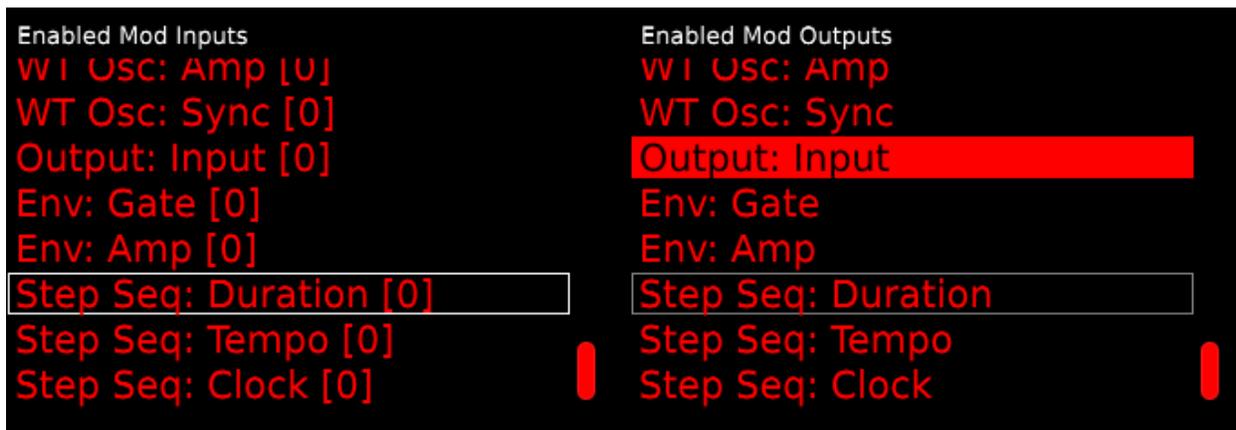
and can be modulated in its frequency (Enabled Mod Inputs) as well as modulate the amplitude of another LFO (Enabled Mod Outputs).
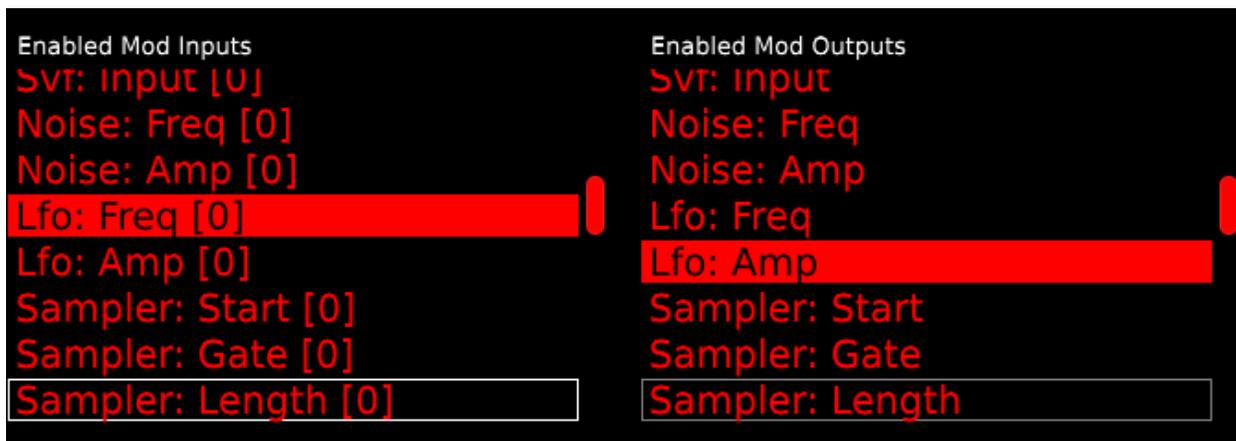
16.1.3   LFO 2

LFO 2 can also also send its signal directly to the output module,
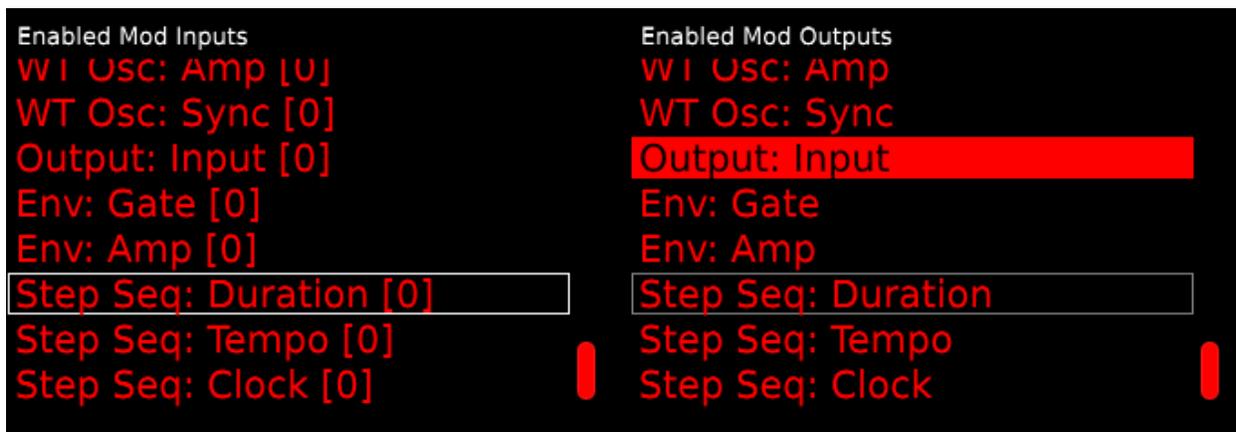
and can be modulated in its amplitude as well as modulate the frequency of the other LFO.
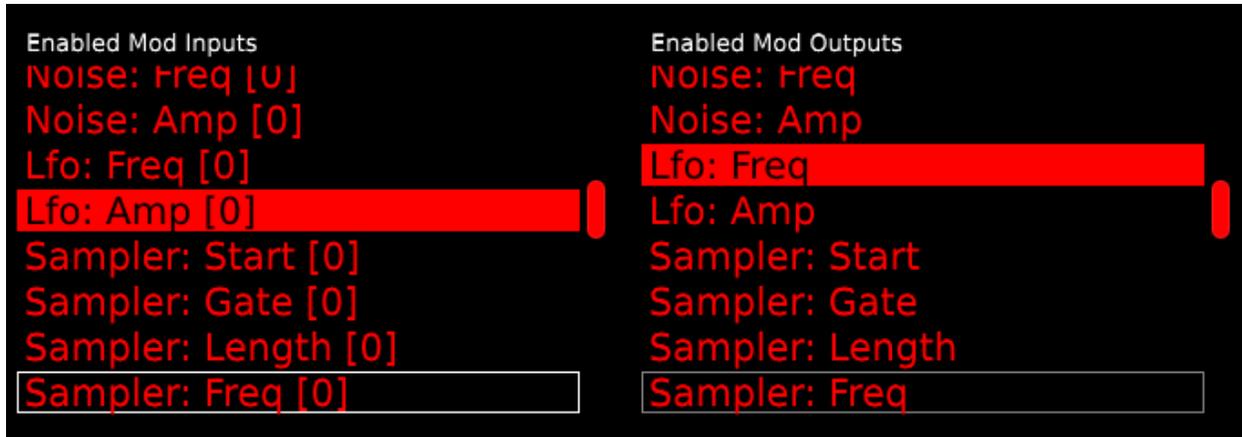
16.2   Preset 2: Filtering a Noise generator using SFV and DC gen

In this preset we use 4 modules: 1 output, 1 noise generator, 1 SVF, and 1 DC Gen. We can filter the sound of the noise generator using the SVF. The DC gen modulates the cutoff of the SVF.

$$Noise \Rightarrow SFV \Rightarrow Output$$

$$\Uparrow$$

$$DCgen$$

16.2.1   Output module

The output cube only has an input, so for the output module we selected: output:input in (Enabled Mod Inputs, left column)
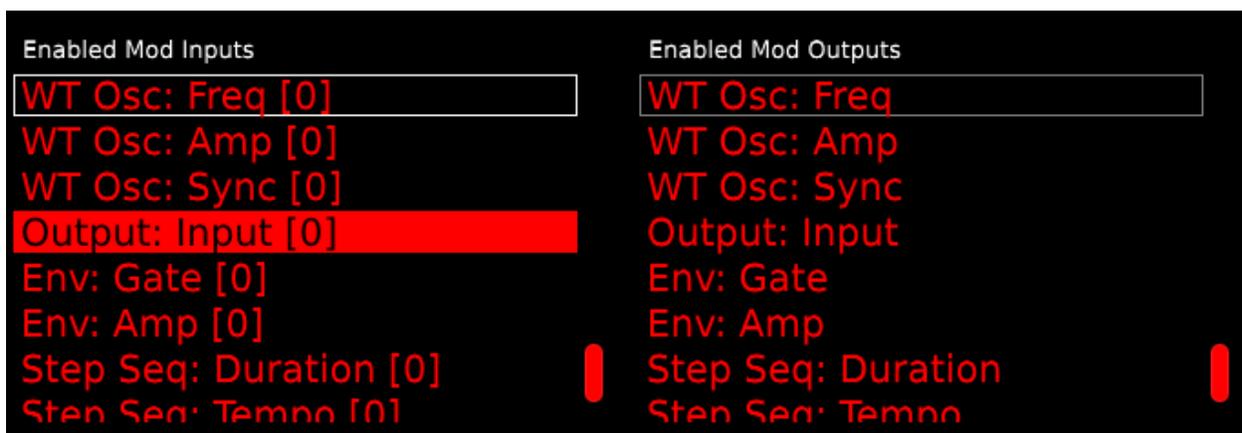
16.2.2   Noise module

It can send its signal directly to the output
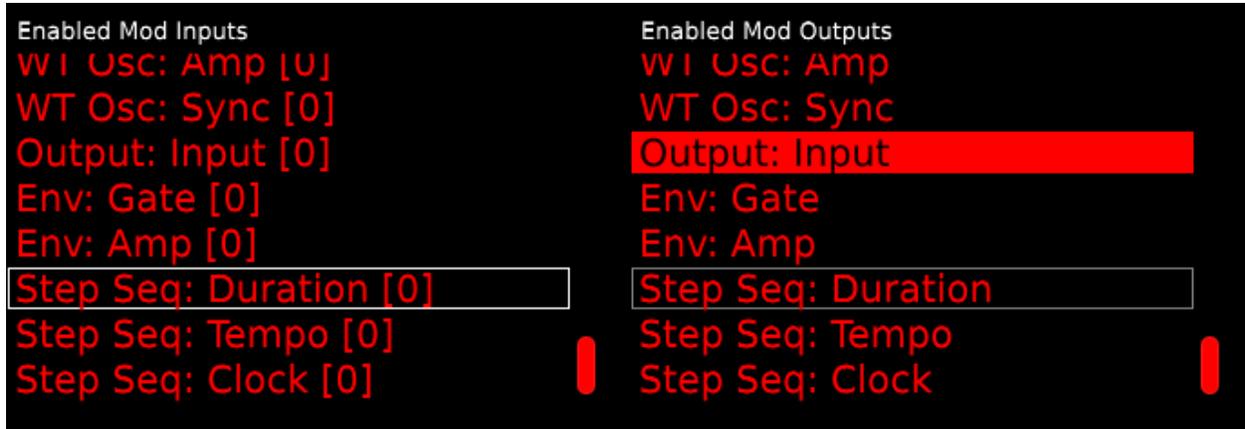
as well as modulate the input of the SVF (Enabled Mod Outputs, right column).
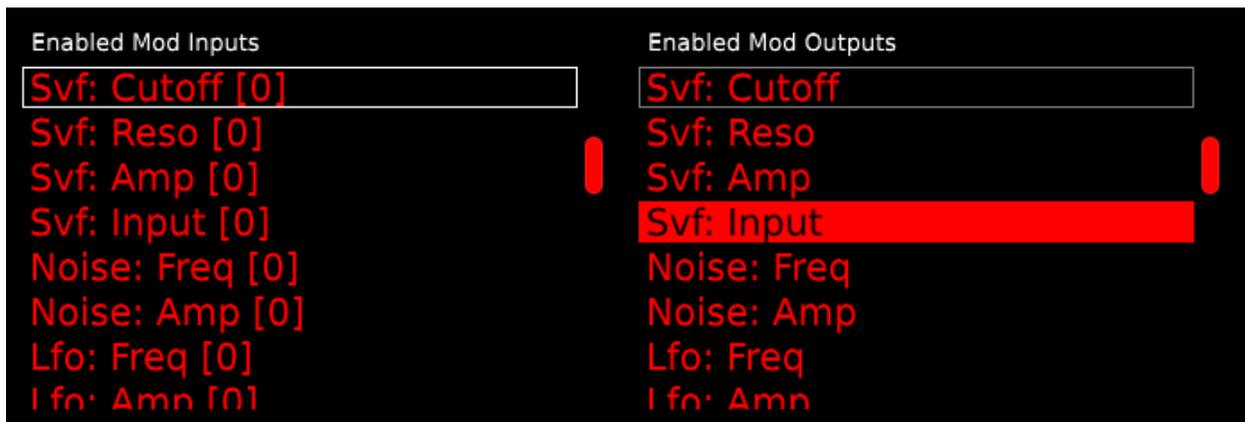
16.2.3   SVF module

The SVF sends its signal to the output (Enabled Mod Outputs, right column)
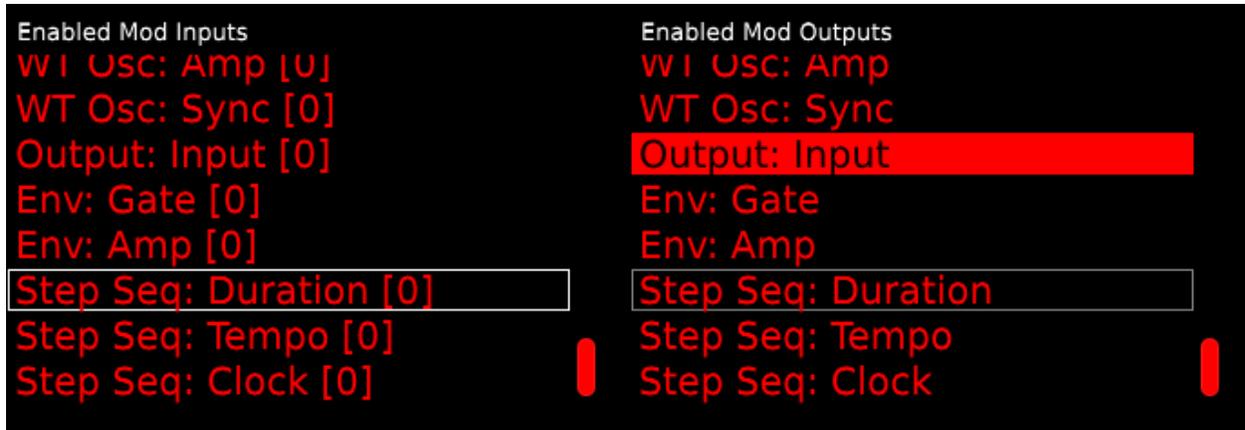
The SVF can receive input (Svf: Input) and be modulated in cutoff (Enabled Mod Inputs, left column).
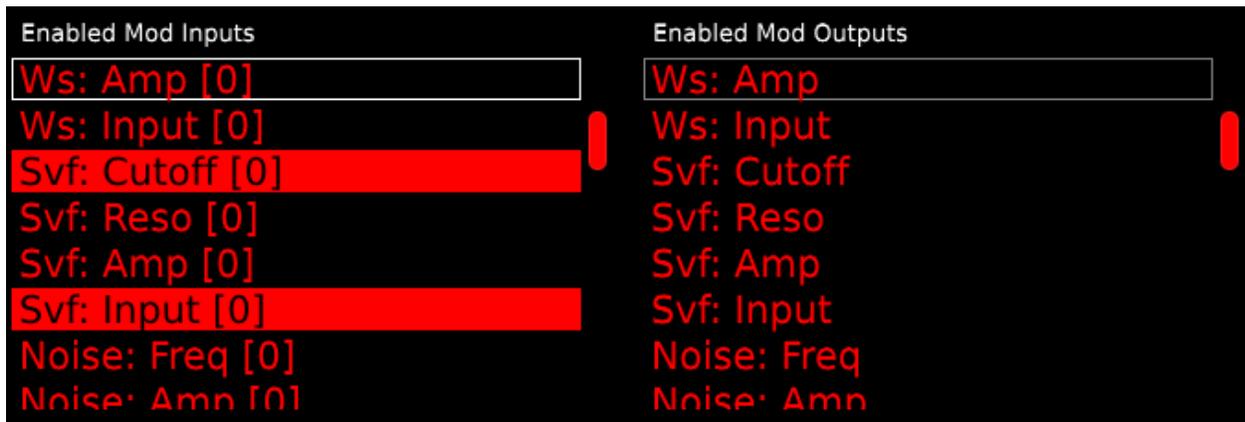
16.2.4   DC gen module

DC gen can modulate the SVF in cutoff (Enabled Mod Outputs, right column).
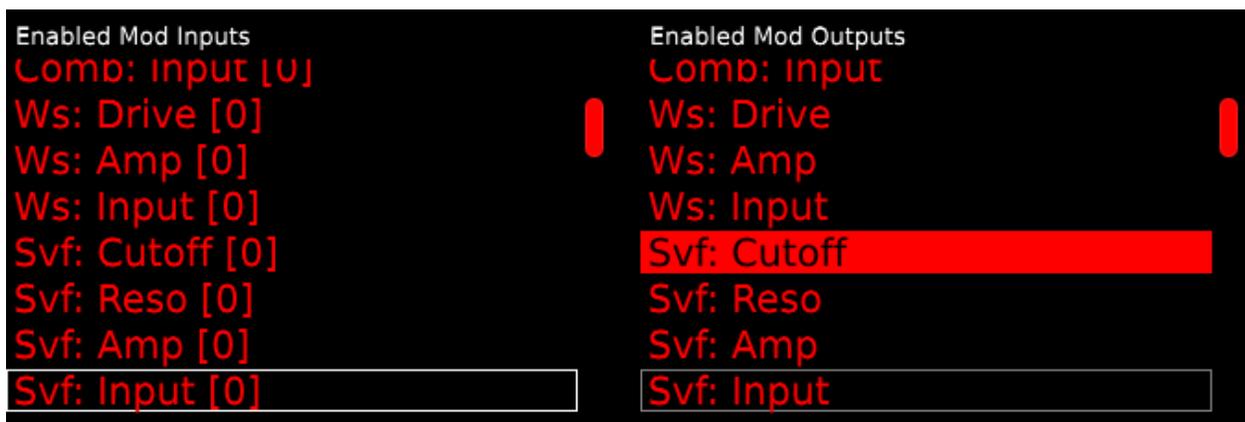
16.3   Preset 3: Modulate an LFO in frequency and amplitude using a step sequencer + Env Gen

In this preset we use 4 modules: 1 output, 1 LFO, 1 Step Seq and 1 Env Gen. We want to modulate an LFO in frequency and amplitude using a step sequencer. An Env Gen is used to modulate the duration and tempo of the step sequencer.

$$EnvGen \Rightarrow StepSeq \Rightarrow LFO \Rightarrow Output$$

16.3.1   Output module

An output cube only has an input: output:input in (Enabled Mod Inputs, left column)

16.3.2   LFO module

We'd like the frequency and amplitude of the LFO to be modulated by another module (in this case a step sequencer, see below).
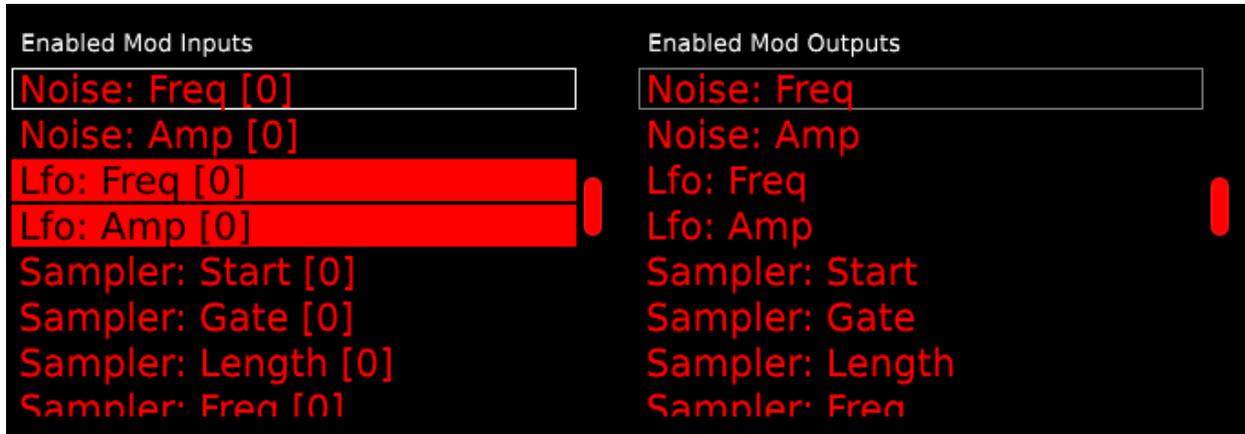
Don't forget to select output:input (Enabled Mod Outputs) so we can send the sound of the LFO to the output.
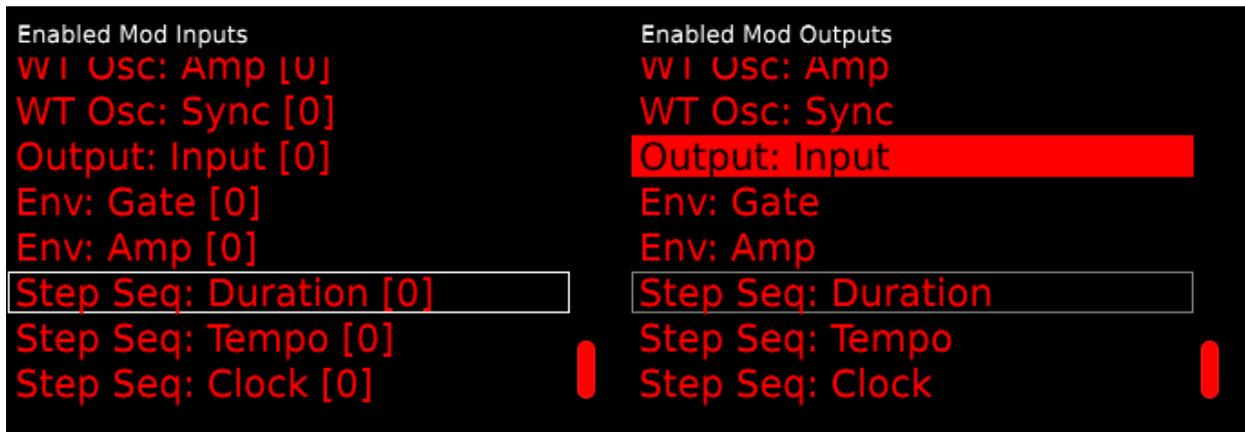
16.3.3 Step Seq

We want to modulate the amplitude of the LFO using a step sequencer. Therefore we select for the step sequencers the following modulation outputs:
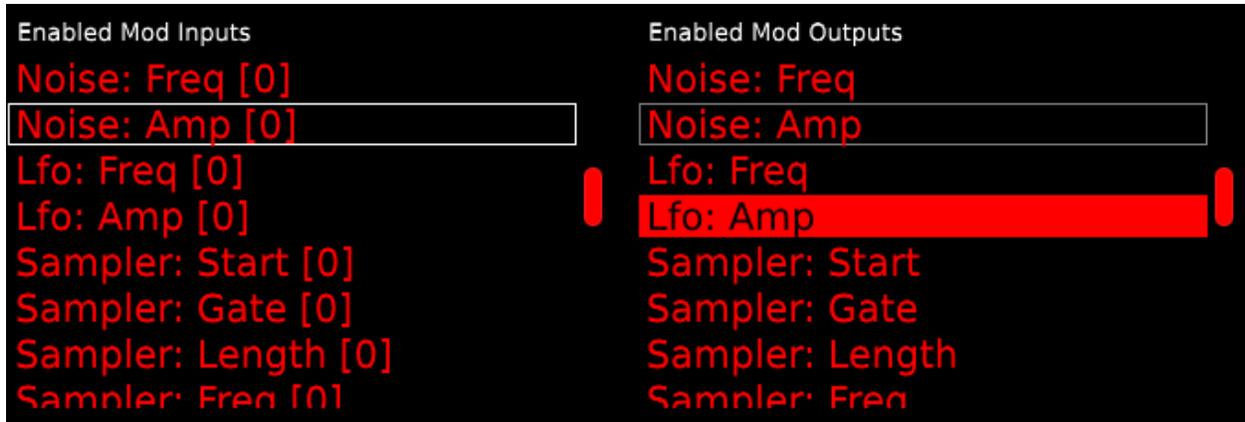
We also want the duration and tempo of the step sequencer to be modulated by another module (in this example this will be a Env. Gen, see step 4)
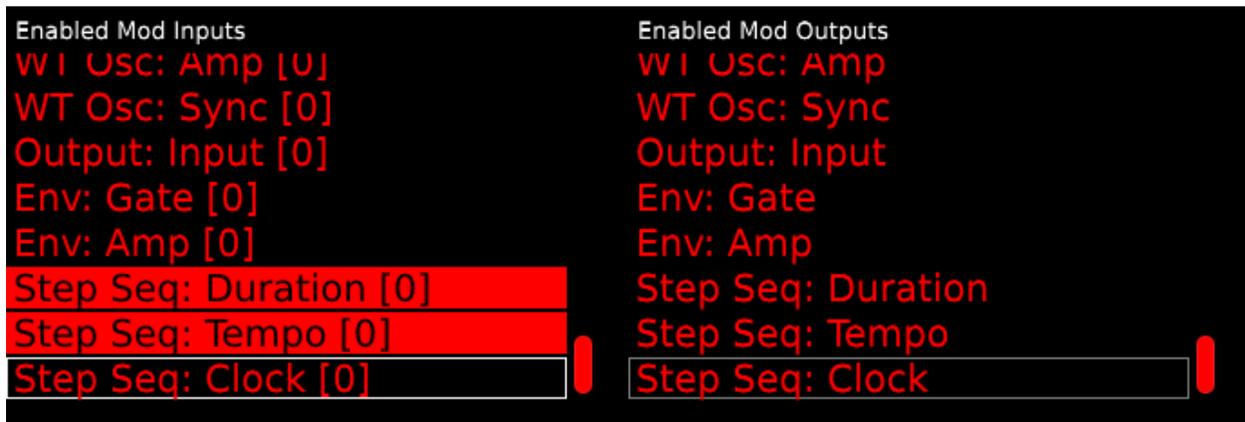
16.3.4　Env gen

The Env gen modulates the duration and tempo of the step sequencer
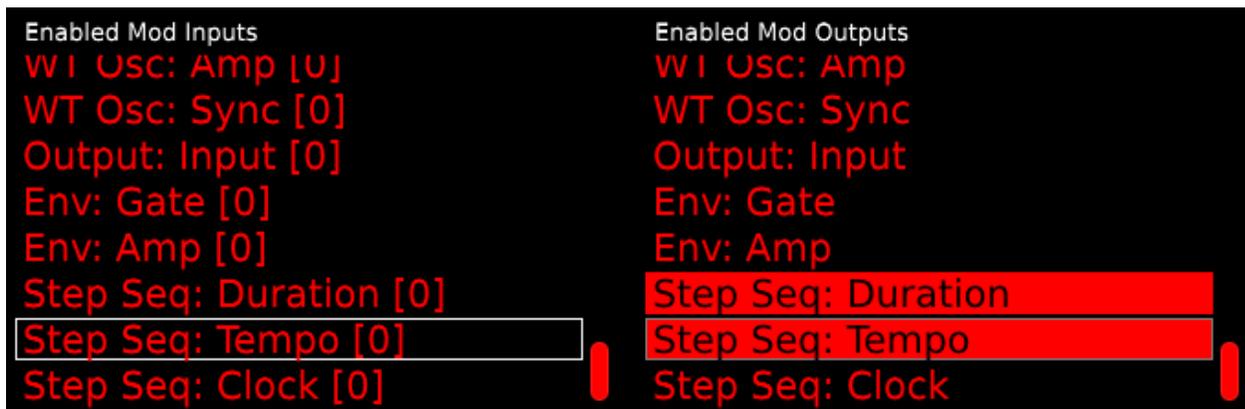
16.4   Preset 4: Clock of the step sequencer is modulated by the frequency of the LFO, step sequencer is triggering loops of sampler

In this preset we use 4 synth modules: 1 output, 1 sampler, 1 step sequencer and 1 LFO. The clock of the step sequencer is modulated by the frequency of the LFO. Using the step sequencer we trigger the samples of the sampler.

$$LFO \Rightarrow StepSeq \Rightarrow Sampler \Rightarrow Output$$

16.4.1   Output module

An output cube only has an input.

Enabled Mod Inputs	Enabled Mod Outputs
WT Osc: Freq [0]	WT Osc: Freq
WT Osc: Amp [0]	WT Osc: Amp
WT Osc: Sync [0]	WT Osc: Sync
Output: Input [0]	Output: Input
Env: Gate [0]	Env: Gate
Env: Amp [0]	Env: Amp
Step Seq: Duration [0]	Step Seq: Duration
Step Seq: Tempo [0]	Step Seq: Tempo

16.4.2   Sampler

The sampler can be triggered/modulated in its gate (Sampler: Gate, left column). We also want to be able to send its signal to the output module (Output: Input: right column).
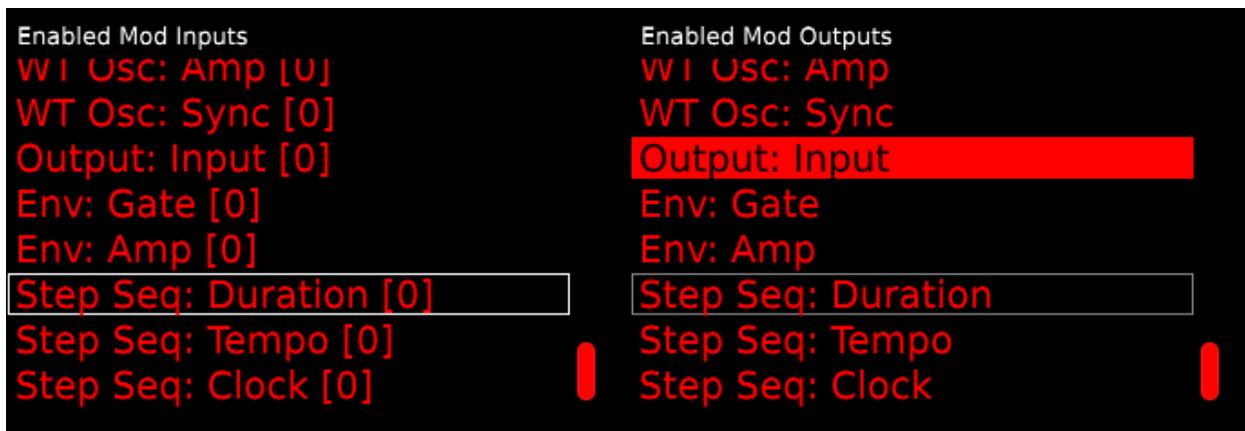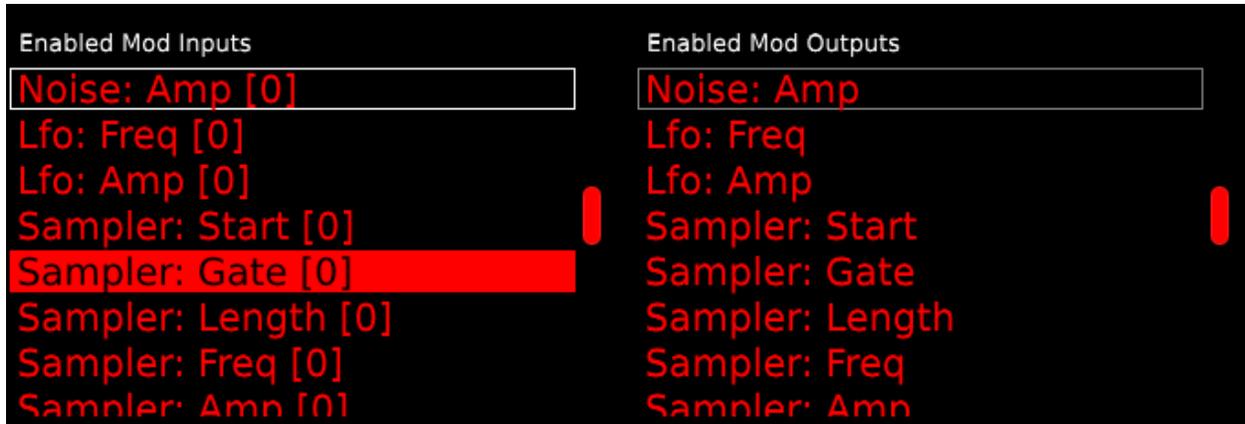
16.4.3   Step Seq

Wed like the step sequencer:

- To trigger the sampler

- To be modulated in its clock
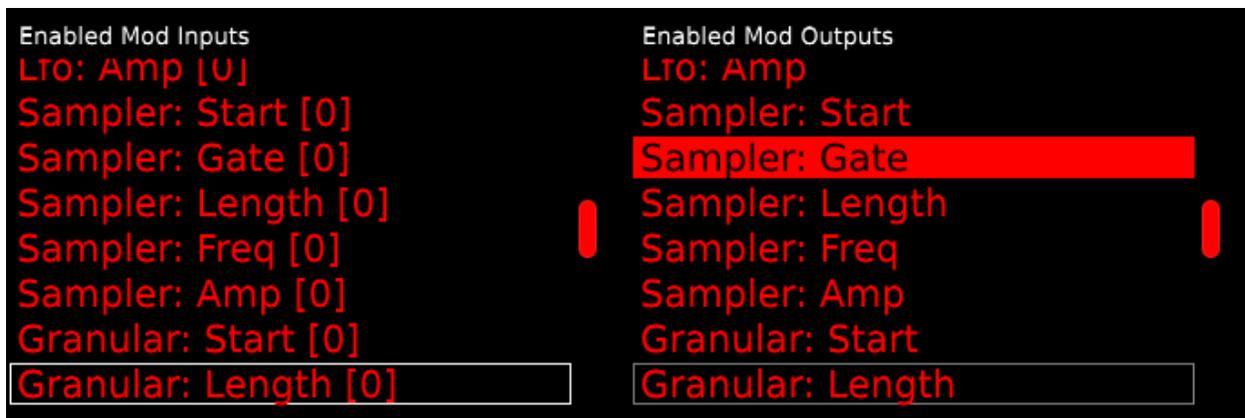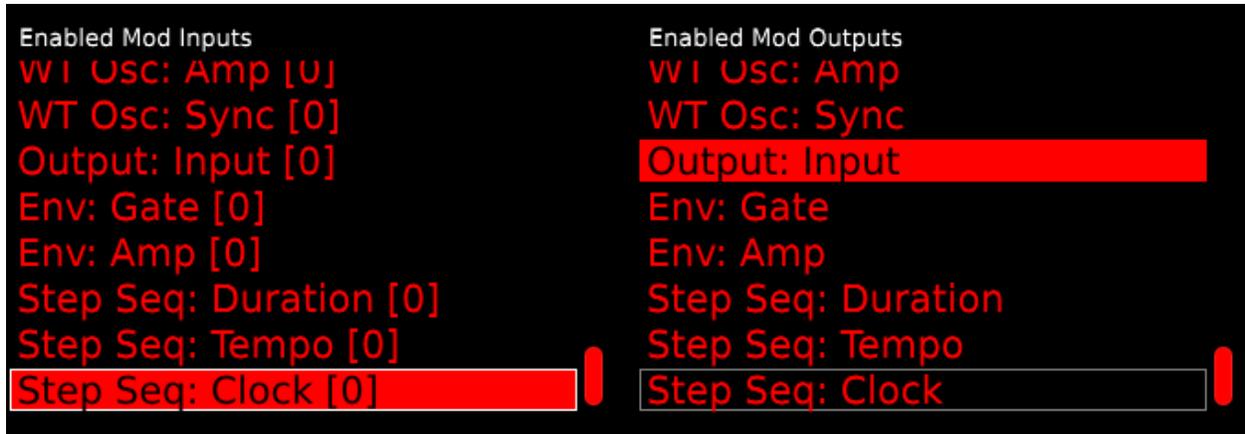
16.4.4   LFO

Since we want to use the LFO to modulate the clock of the step sequencer we select:
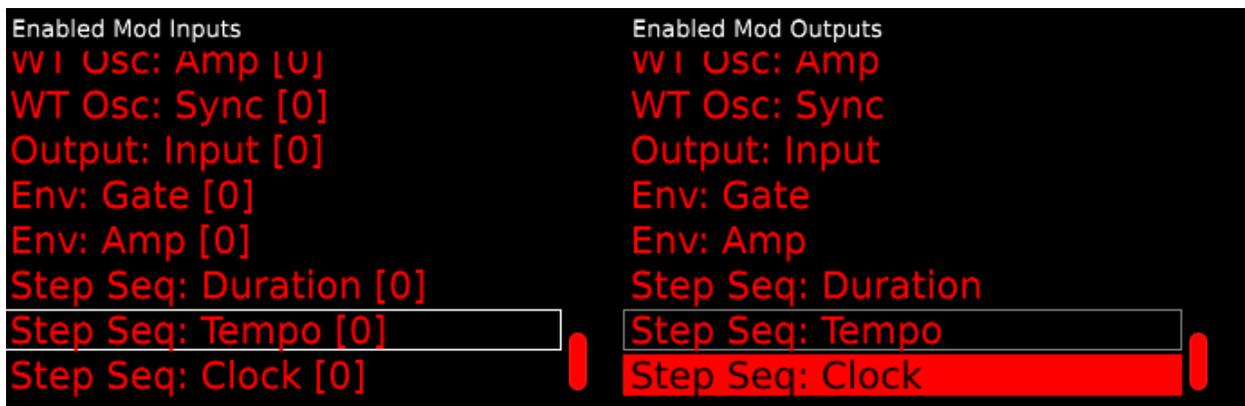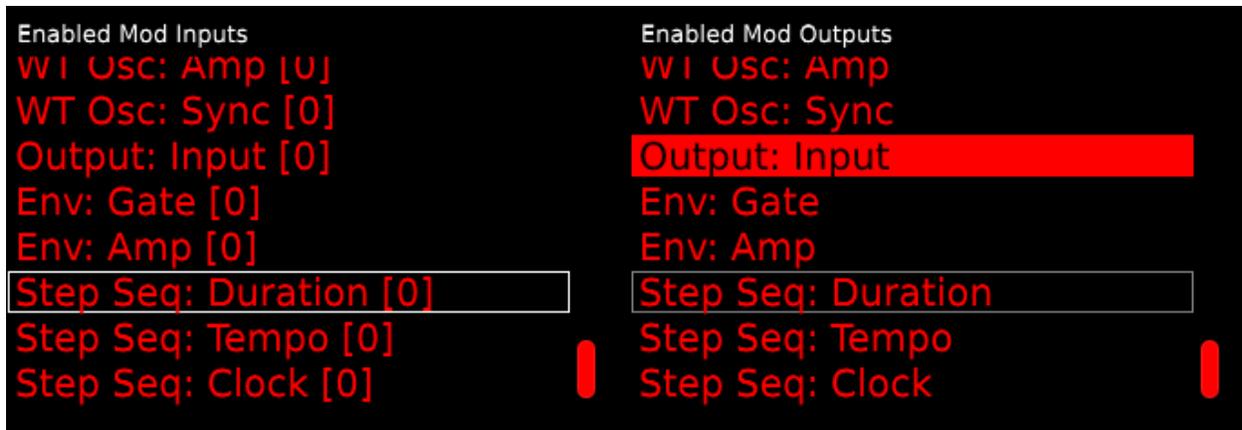
Remark: it is important to disable the **Int Clck** option of the step sequencer. Otherwise the internal clock of the step sequencer will be used instead of the frequency of the LFO.

To hear sound you will have to use the following configuration:

$$Output \Rightarrow Sampler \Rightarrow StepSeq \Rightarrow LFO$$

16.5   Preset 5: Additive synthesis with 3 LFOs

In this preset we use 3 modules: 1 output, 3 LFOs. Each LFO can send its signal directly to the output module. In this preset none of the LFOs are setup to modulate another LFO.

$$LFO_1$$

$$\Downarrow$$

$$LFO_2 \Rightarrow Output$$

$$\Uparrow$$

$$LFO_3$$
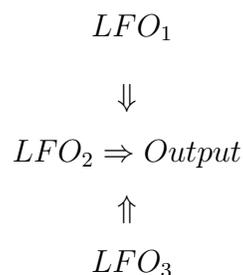
16.5.1   Output module

An output cube only has an input, so for the output module you only need to select: output:input in Enabled Mod Inputs column (depth editor, left column).
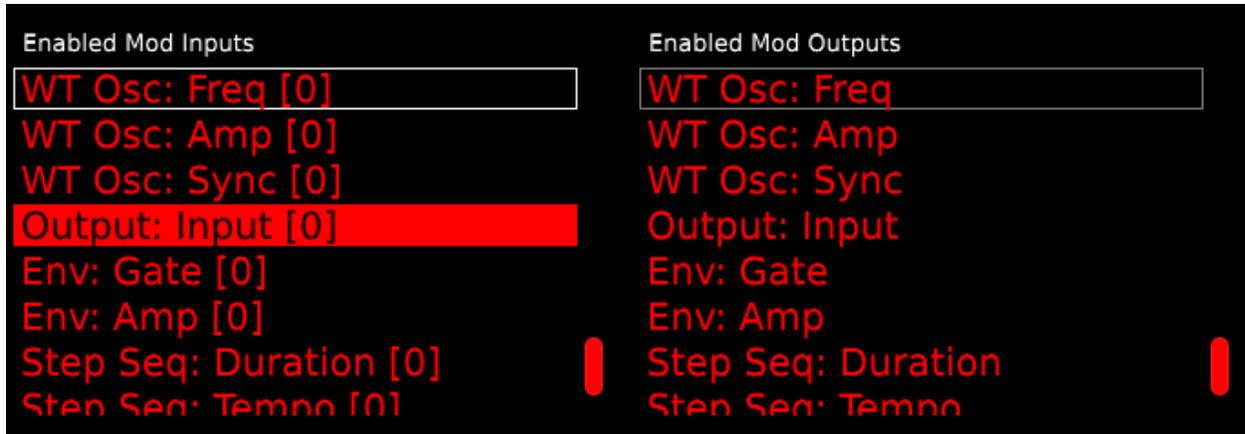
16.5.2   LFO 1 + 2 + 3

Each LFO can send its signal directly to the output module.
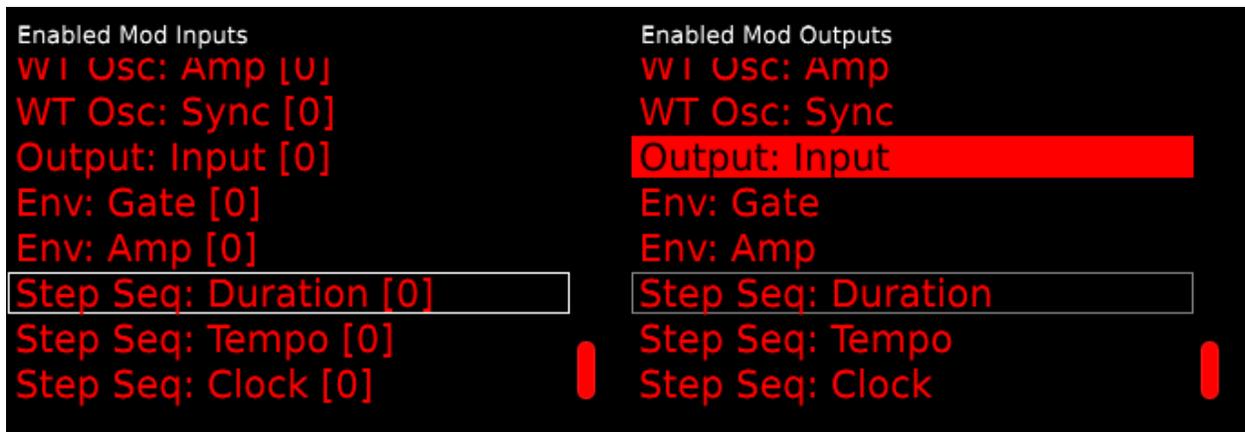
16.6   Preset 6: 15 LFOs running in parallel

In this preset we use 1 output and 15 LFOs running in parallel. The LFOs are slightly detuned and are passed through the global delay and reverb section.

**Manual patching is enabled**. To switch off manual patching follow the instructions described in section 9.5.

16.6.1   Output Module

The output module only has an input, so we only need to select: output:input in the Enabled Mod Inputs column.
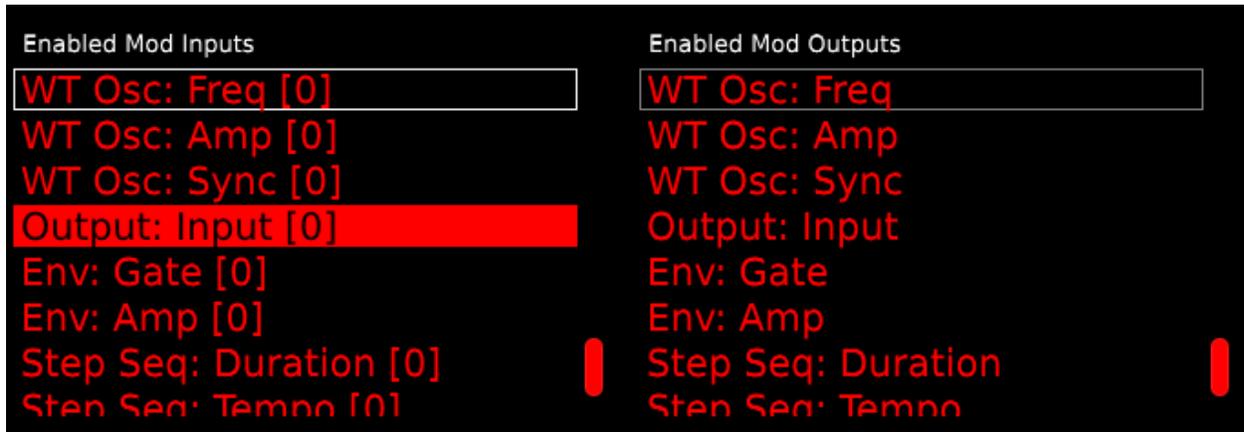
16.6.2   LFO 1 + 2 + 3 + 4 + 5 + 6 + 7 + 8 + 9 +10 +11 +12 +13 +14 +15

Each LFO can send its signal directly to the output module.
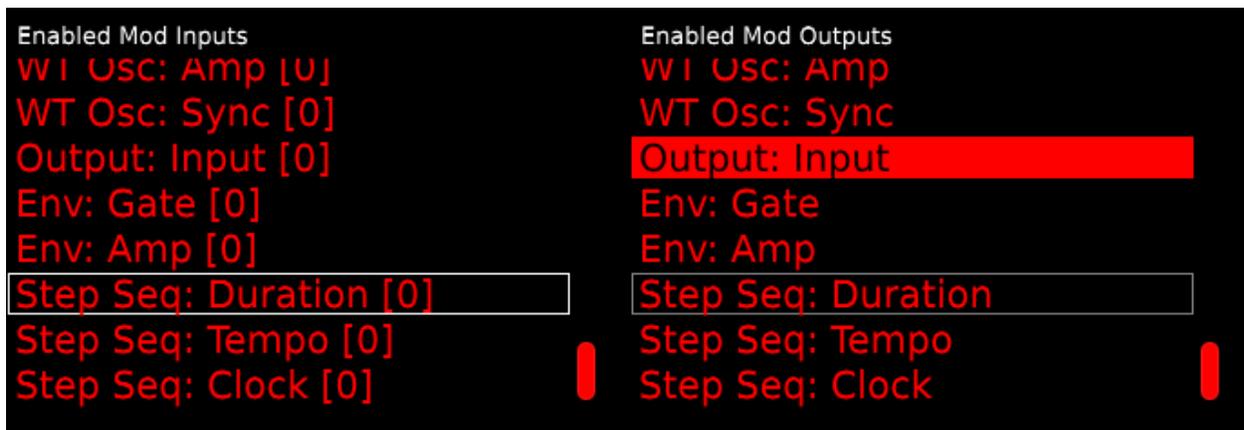
16.7   Preset 7: WTOsc + LFO

In this preset we use 1 output, and 2 LFOs to modulate the WTOsc in X and Z.

Manual patching is enabled. To switch off manual patching follow the instructions described in section 9.5.

16.8   Output
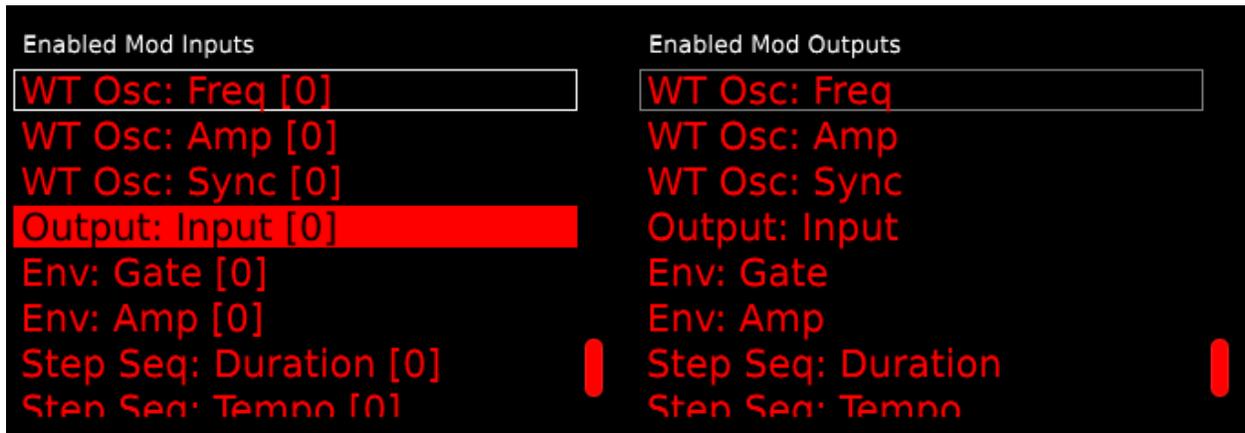
16.9   WT Osc

The WT Osc can be modulated in X, Y, and Z
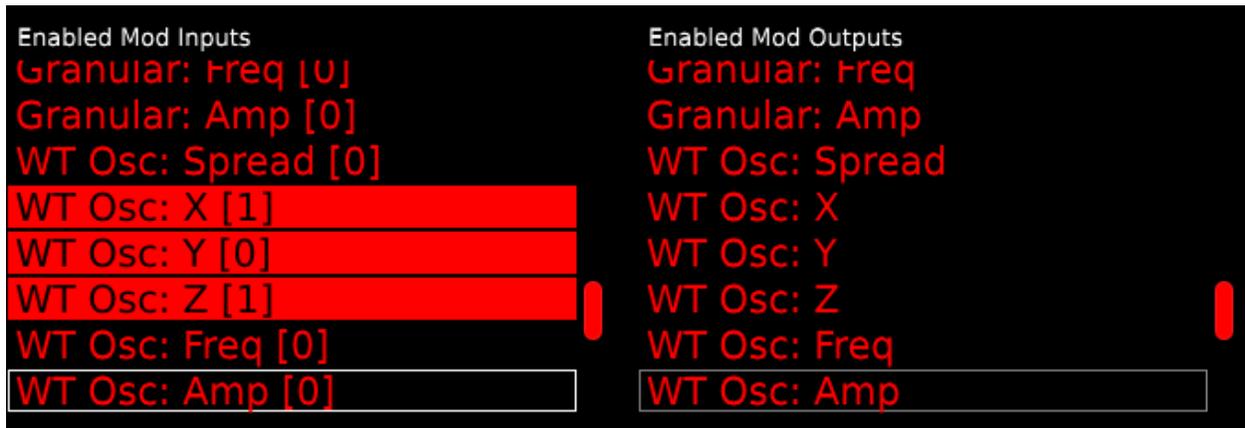
16.10   LFO 1 + 2

LFO1 modulates the WT Osc in X
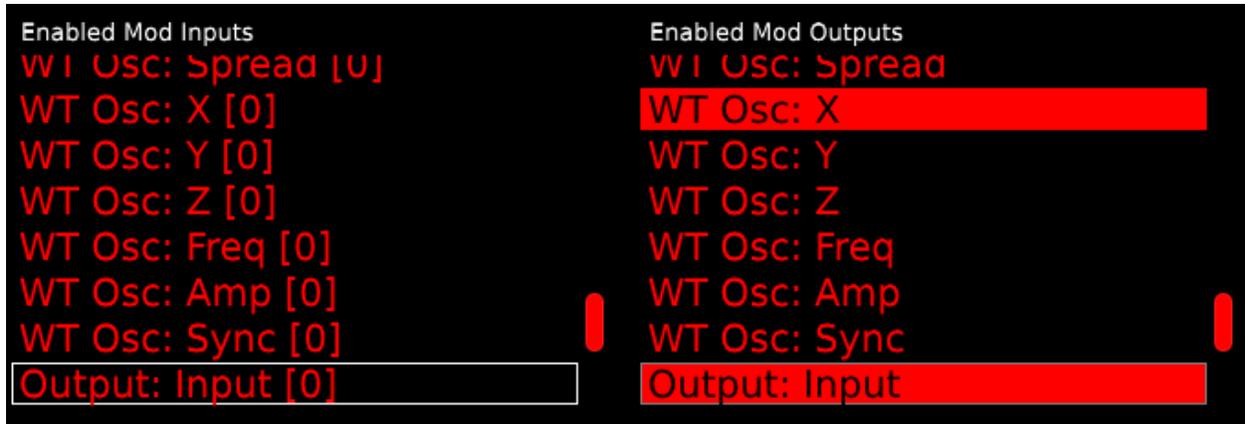
LFO1 modulates the WT Osc in z
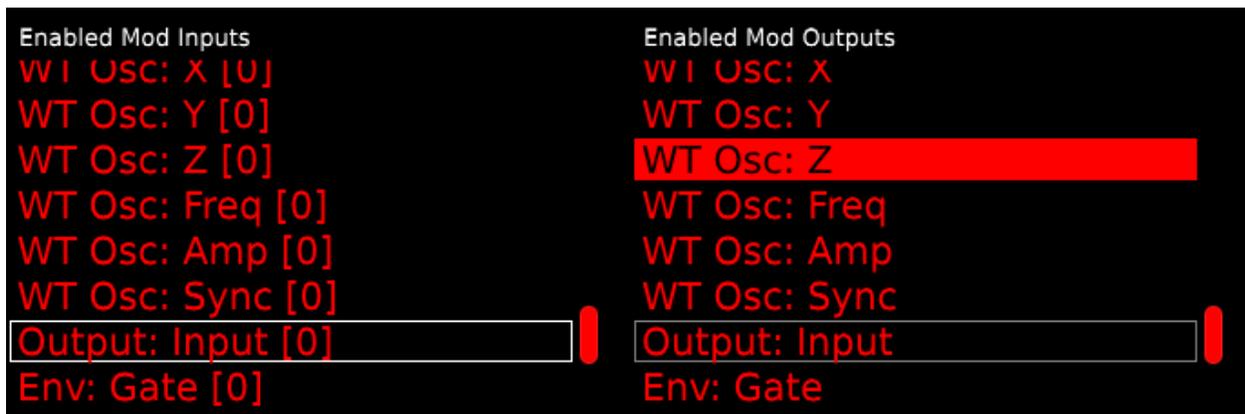
16.11   Preset 8: Granular processor

In this preset we use 1 output, and 1 granular module and 2 LFOs. The granular processor is being modulated in its length and start by 2 LFOs.

Manual patching is enabled. To switch off manual patching follow the instructions described in section 9.5.

16.12   Output

16.12.1   Granular processor

16.12.2   LFO 1

LFO1 modulates the start of the granular processor.

16.12.3   LFO 2

LFO2 modulates the length of the granular processor.
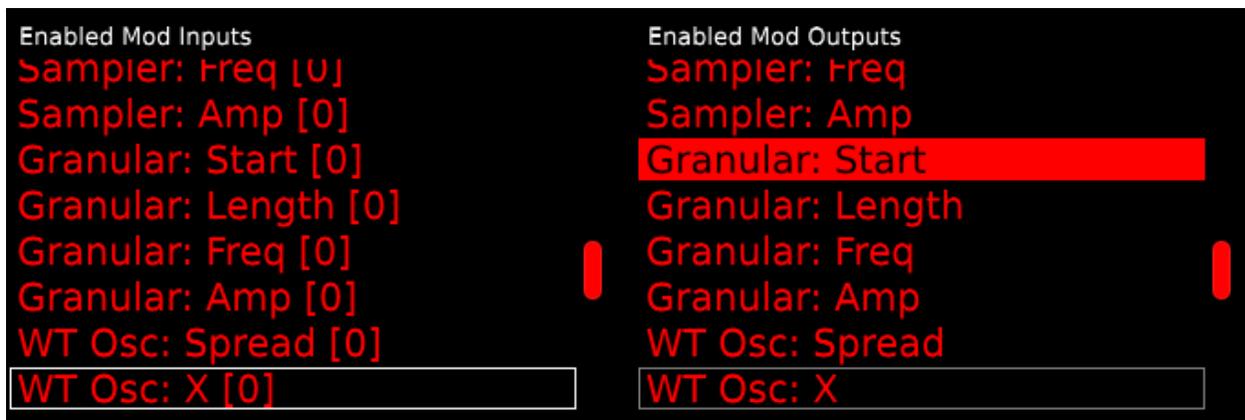
17   Sample License Agreement

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19 Hardware Information and Manuals

The hardware of Synthor System 8 (ENGINE, REMOTE and AUDIOCUBES) is described in other manuals made available via the Percussa website at `http//www.percussa.com/`. Please refer to these manuals in case you have any questions about the hardware or contact us through the website.