USER'S MANUAL

1.99.05 - Pre-2.0 *ALPHA RELEASE* (August 3, 2022)

THE CENTRE

Contents

Part I
Before Start

Software Update

Software Update is the most important process to keep your unit updated with the latest features and bug fixes as well as to keep it safe from breaking during update process. Updating process is fairly simple from user perspective although there might be some issues with downloading files because of specific Internet Browser behaviour during downloading.

1. Download latest firmware release from Github `https://github.com/1V-Oct/3318_the_centre_releases/releases`
2. Copy downloaded firmware file into SD Card (make sure that the filename is: 'the_centre_v4.fwx' and it is in root directory of your card)
3. Insert SD Card into The Centre
4. Power on The Centre or perform Reset
5. Go to [[System Menu]] and check firmware version.

- *NOTE: Sometimes Safari, Explorer and other browsers add some extra bits to the filename like '(1)' or '_1' to indicate that it is different file than already downloaded. Please rename the file to the correct name.*

Calibration

TL;DR: I came here to calibrate and not read poems... Here is YouTube video that shows Calibration of The Centre:
https://www.youtube.com/watch?v=uEFr7RkuP7k

2.1 Why Calibrate?

In the ideal world things are well... ideal. Although in real world things are not perfect and this is where term tolerance kicks in. Every electronic component has tolerance. Usually measured in percentage and usually this tolerance is like %1 for resistors and %5 for capacitors. Each circuit contains multiple electronic components and tolerances of those components add together making quite a huge percentage tolerance of the circuit. When circuit is operating the tolerances of this circuit do not change. Tolerance just change component properties at manufacturing stage. Therefore the circuit is always stable but might be slightly off.

Of course there are different ways to deal with the non-ideal circuits. Some of them are expensive (on hardware level) and some of them are quite cheap. One of those methods is calibration.

Calibration allows to establish default values returned by circuit under controlled environment and use them as reference points.

2.2 Calibration of music instruments

Many music instruments need calibration. Even tuning the piano or guitar. For digital or hybrid modules like The Centre the calibration process is to connect a well calibrated source of pitch that will provide stable value of voltages at two or more reference points. Usually two points are enough. The software will recalculate all the values and will apply proper algorithms to always generate correct pitch for voltages.

2.3 Calibrating The Centre

The Centre needs two voltages separated by 2V. In other words, the centre needs a Control Voltage (CV) for two C notes separated by 2 octaves. Ideally that would be C1 and C3 but many current MIDI keyboards supply only voltages between 0V and 5V which translates to C2 and C8. Yep, there is no standard for V/Oct assignemnt of voltage to notes so at 1V/OCT we assume that C2 is 0V. It does not matter anyway, because every V/Oct input has Octave and Note correction anyway.

To calibrate V/OCT inputs press two middle buttons (button 2 + 3) and it will bring System Menu. From there select ”Calibrate” and press encoder down (select).

Now every channel can be calibrated individually or 4 inputs at the same time. Use encoder to select channel or all channels (when calibrating all channels use signal splitter to send CV voltage for calibration (pitch) to all inputs).

Now follow instructions on screen. First send any note from your keyboard except note C (we calibrate by C notes) and press Start (button 1). Now press any low octave C note (lets say C3) wait 10 seconds for next instructions, move two octaves up and send note C5. Wait 10 seconds and your unit is fully calibrated.

Now you can Save your calibration settings and enjoy your fully calibrated unit.

What's In The Box

Your Eurorack module comes packaged in the box together with:

Accessory bag

There is tiny bag included with your The Centre.

Inside this bag you will find:

1. 8 small caps for knobs
2. 4 small caps for buttons
3. 5 sets of washer + nut

https://github.com/1V-Oct/3318_the_centre_releases.wiki/images/accessory_bag.jpg

The Buttons

You might want to alternate between black and white buttons. It is very easy to change button caps. Just use pliers to remove the cap and put the other one.

Knobs Caps

The 8 ”attenuator” knobs are naked because if you want to change face plate those caps sit very tight and they are hard to remove therefore I haven’t installed them. It’s very easy to install. Just position the pot in centre and put the cap pointing to the top. Thats it.

Washer + Nut Sets

I haven’t put all those under big Level knobs. They are not necessary because there is no pressure applied and 4 already secures plate well. If you want all of them attached that’s why they are inside this bag.

BPM

Many modules require clock to ensure synchronisation to given time interval requirements. Whether this is simple Random Note Generator (RNG) or Low Frequency Shaper (LFS) the supplied clock ensures that duration of quarter note in one module equals duration of quarter note in another module. There are multiple standards or just ad-hoc designs defining different number of clock pulses per beat. The most popular one is MIDI standard that estabilished 24 clocks per quarter note (24 PQN).

The Centre by default uses 24 clocks per quarter note (beat) but this value can be changed globally for all modules. That setting can be adjusted in Global Settings and can vary between 24, 12, 6, 4, 3, 2 and 1 clocks per beat.

■ *When using MIDI to control The Centre it is recommended to keep 24 CPQN (Clocks Per Quarter Note) to adhere to MIDI standard.*

Beats Per Minute (BPM) is a measure used in electronic music to define time interval of music. Beat in electronic music is equivalent to quarter note and there are 4 quarter notes to bar (4/4 tempo). The Centre by default configures all modules to work at 120BPM. 120 Beats Per Minute thats 120 beats per 60 seconds and in the end one quarter note duration is half second or 500 milliseconds (ms). To change default tempo it is necessary to provide modules with clock input via Clock CV (CLK) on modules inputs. The clock can be submitted via CVY input, MIDI input or generated internally via Clock Module (CLK). By adding CLK module we can generate Clock for other modules derived from user defined tempo.

Part II
System Overview

Audio Outputs

Audio Outputs is a fundamental mechanism of transferring audio between modules and out of The Centre.
There are 4 output channels via **VOUT1** to **VOUT4** 3.5mm jacks that output audio level signal. VOUTs are DC coupled thus capable of sending output of utility modules such as LFS (Low Frequency Shaper - free shape oscillator) or ENV (AHDSR Envelope) or even triggers and gates.

Virtual Buffer Output called in The Centre by shortened name **VBuf** is a concept of transferring audio inside The Centre between modules without occupying outside outputs. VBuf can be understand as a buffer that stores audio that can be then assigned to another module (or a few modules) and further processed indivdually.

The most important part of VBuf is that every module within The Centre has own VBuf. Furhermore VBuf Output of a module can be used as VBuf input to other modules without being modified.

★ WTO can output to VBuf and then VCF processes WTO input. At the end MIX module takes input from WTO VBuf (original oscillator signal) and VCF Vbuf (filtered oscillator signal) and MIX module can act as Dry/Wet Mixer for those two signals. In such scenario WTO VBuf (oscillator output signal) is being sent unmodified to two modules (VCF and MIX).

Audio Outputs are integral part of almost every module. Audio output of some modules can be configured to **Stereo** or **Mono** while some modules will output only single channel (Mono). Certain modules that take input of **VBuf** will detect if the input is Mono or Stereo and process it accordingly.

Part III
Module Reference

WTO - Wavetable Oscillator

[Inputs] Configure Inputs of the module

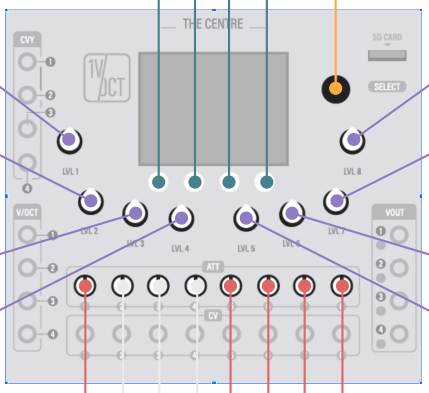
[Back] Return back to Patch Menu

[SET] Settings of the module

[ROTATE] Navigate between wavetables in current directory
[CLICK] Enter File Browser to change to chosen wavetable and to change browsing directory
[LONG PRESS] Enter Wavetable Editor

[2D/3D] Switch between display of wavetable

[WT] Wavetable Position - position of wave in wavetable. If controlled by CV moves through the table.



[DTWT] Detune Wavetable element.

[UNI] Unison mode. Creates multiple (up to 16) oscillators.

[FRQC] Frequency Coarse

[DET] Detune. Detunes oscillators in unison mode with maximum range +/- semitone

[FRQF] Frequency Fine

[AM] Amplitude Modulation Level (can be use as VCA)

[GLDT] Glide Time

Smooting - Changes the way of wavetable reproduction

Select Audio Output Destiantion

NA

[NOTE-FINE] Fine-tune note in cents (+/- semitone)

NA

[NOTE-NOTE] Tune sound by semitone (+12 semitones one octave)

NA

[NOTE-OCT] Tune note by octave (+/- 8 octaves)

Wavetable Oscillator (WTO) is the main building block of The Centre sound. WTO consists of 1 to 16 oscillators working in Unison mode and reproducing loaded wavetable with possibility to detune pitch of oscillators and detune played waveforms at different positions in wavetable.

Settings

Audio Output *Audio Output of WTO - Stereo*

Selects audio output destination for WTO. All oscillators including Polyphony mode are output through single channel (Mono or Stereo).See: Audio Outputs

Polyphony *Paraphony mode for WTO oscillator*

1 Paraphony disabled, one pitch control for WTO

2, 3, 4 Paraphony of 2, 3 or 4 oscillators running different pitch. If oscillator 1 pitch comes from V/OCT1 input then pitch for following oscillators will come from corresponding V/OCT2 - V/OCT4 inputs

Glide Scaled *Scaling of Glide Time by distance of pitch*

Off Glide Time will be same for pitch portamento between any notes

On Glide Time will change depending on disatnce of pitch. Glide Time set by Input Glide Time (see below in Inputs) will be for disatnce between pitch of one octave. For notes played within same octave with will be in fraction of semitones separating pitch of following notes

Warp Mode *Function used to process waveform during oscillation*

Warp Mode specifies extra function that is used to process waveform according to modulation that is supplied via Input ***Warp Mode***. Currently only one function is enabled.

Off No processing of waveform

FM Warp Mode Input will modulate frequency (FM) of waveform

Inputs

Unison *Unison mode (1-16 voices)*

Enables unison mode and controls number of oscillators running in parallel.

Detune *Detune oscillators*

Detunes oscillators in Unison mode by spreading them equally in Detune range. With detune set at maximum the spread range is 2 semi-tones. With odd number of oscillators the centre oscillator will always be following pitch from Note Input. For even number of oscillators there is no oscillator followin Note and each oscillator is detuned +/- from the center note.

★ *With Unison running two oscillators, detune set to maximum (1.0) and pitch set at note D there is one oscillator playing note C# and one playing note D# (no oscillator is actually playing note C)*

Wavetable *Wavetable position*

Adjusts position of waveform in wavetable. When controlled by CV allows changing texture of sound by scanning through set of waveforms contained in wavetable

Reset Osc *Reset Oscillator CV input*

When connected with CV input and set to high level it resets phase of oscillator to 0. Useful to run oscillators in Sync

WTO - Wavetable Oscillator

Inputs

AM *Amplitude Modulation*

Amplitude modulation changes sound level. Connected with CV signal of Envelope acts as VCA. Connected with LFO creates ring modulator

Detune WT *Detune Wavetable Position for oscillators in Unison mode*

In Unison mode this parameter will detune position of waveform in wavetable for individual oscillators. Each oscillator will reproduce different waveform thus creating more textured sound.

★ *A wavetable with 3 waveforms (triangle, sine, square) and Unison of 3 oscillators and Detune WT parameter set at 1.0, each oscillator will play unique waveform: triangle, sine, square - respectively*

Frequency Coarse *Adjust Frequency of oscillator in big steps*

Adjusts frequency of oscillator in range of 0Hz to 100Hz (in frequency mode) or between 1/256 note and 8bar (in BPM/note duration mode)

Frequency Fine *Fine tune frequency of oscillator*

Adjust frequency of oscillator in very small steps

Glide Time *Portamento (pitch glide) time*

Time to glide from one pitch to another upon change of pitch (Note). Glide time is in range of 0s to 1s.

■ This parameter is affected by Setting *Glide Scaled*. With Glide Scaled set to OFF the time that it takes to glide between two notes is constant and defined by Glide Time, with Glide Scaled turned ON, time is determined by pitch distance of notes played.

Warp Mode *Modulation parameter for waveform modulator*

Warp Mode is modulation parameter usually via CV to be used with Warp Mode function selected in Settings Warp Mode parameter

Outputs

OUT *Output of WTO*

Output of wavetable oscillator

RST *Oscillator reset*

Set to high when oscillator phase resets

VCO - Voltage Controlled Oscillator

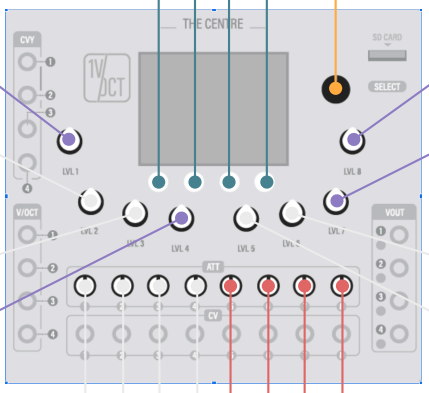
[Inputs] Configure Inputs of the module

[Back] Return back to Patch Menu

[SET] Settings of the module

[ROTATE] Switches between waveforms (Triangle Square Sine)

[ON/OFF] Turning module On or Off (Bypass)



[SKEW] Adjust level of PWM or PWM-Style effect on waveform

[FM] Frequency Modulation Level

NA

[PM] Phase Modulation Level

NA

NA

[AM] Amplitude Modulation Level (can be use as VCA)

NA

NA

Select Audio Output Destiantion

NA

[NOTE-FINE] Fine-tune note in cents (+/- semitone)

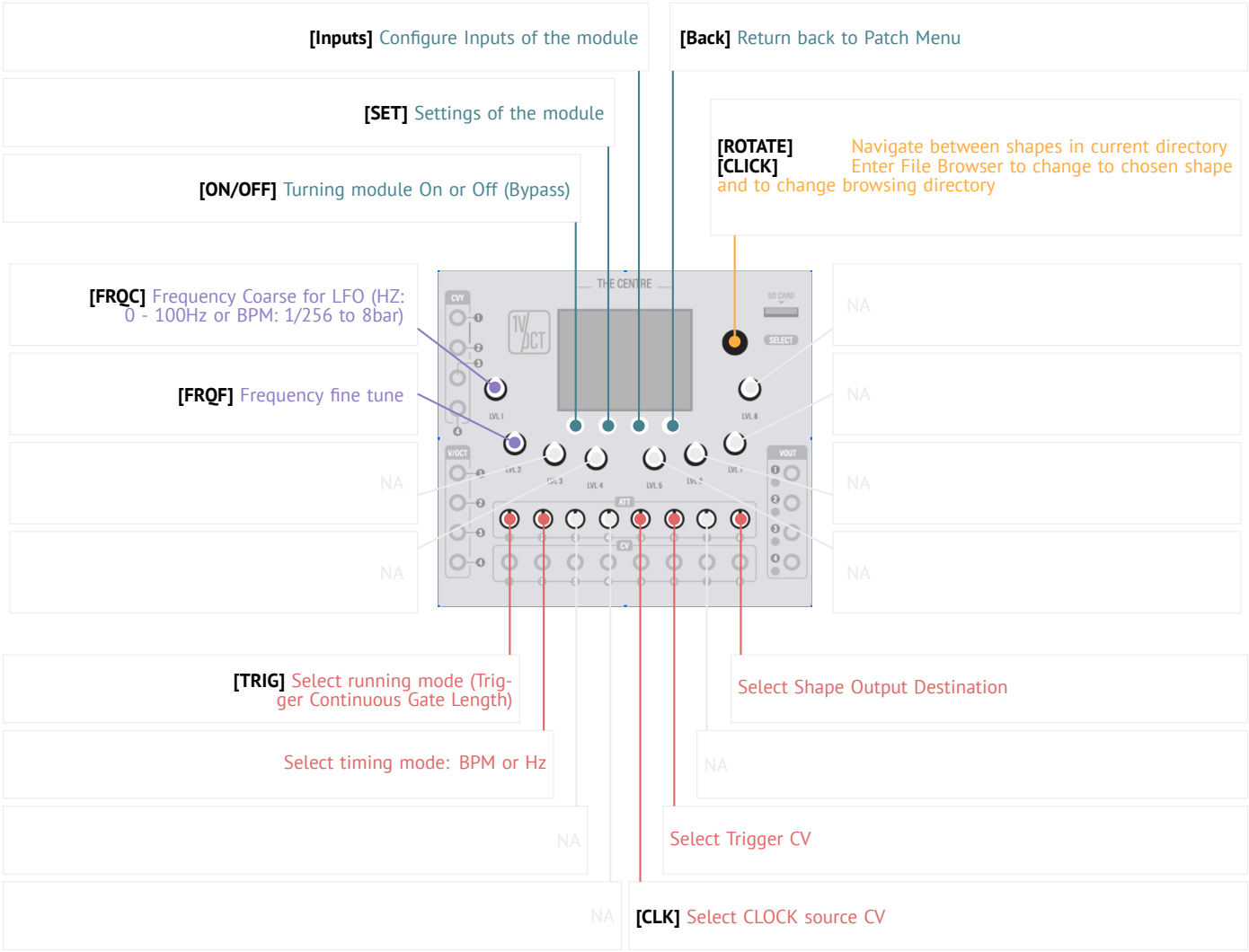
NA

[NOTE-NOTE] Tune sound by semitone (+12 semitones one octave)

NA

[NOTE-OCT] Tune note by octave (+/- 8 octaves)

LFS - Low Frequency Shaper



LFS Low Frequency Shaper (Low Frequency Oscillator generating irregular shapes)

This module creates low frequency oscillations of irregular shapes. The shapes can be either edited by user or imported from .shp (Serum) and .vitallfo (Vital) formats.

To load a shape press **[SELECT]** (Encoder down) and navigate in file browser to directory with shapes and press **[SELECT]** again to load the desired shape.

Rotating Encoder cycles through shapes in current directory.

Main Menu

Edit/Invokes Shape Editor, Set/Open Settings, Inputs/Open Inputs, Back/Return to Patch Menu	*Edit/Invokes Shape Editor, Set/Open Settings, Inputs/Open Inputs, Back/Return to Patch Menu*

Settings

Running Mode *Select type of running mode of low frequency shape*

Continuous Oscillator keeps running and never stops. Gate High (Trigger) signal will reset oscillator phase to 0.

Trigger Oscillator runs once upon the gate signal high and runs complete shape once and stops generation when phase of shape ends. Another trigger signal will reset phase to 0.

Gate length Oscillator runs as long as gate signal is high. Stops immediatelly when signal goes to low.

Timing Mode *Select timing mode for LFS*

Timing for LFS can be either selected to be calculated in Hz for more time based experience or tied to BPM and measured in length of notes or bars.

BPM Timing based on note duration

Hz Timing based on frequency

Polarity *Polarity of output*

Bipolar Outputs shape in range -5V to +5V. Good for Ring Modulation or FM

Unipolar Outputs shape in range 0V to +5V. Good for VCA

Inputs

Trigger *Trigger CV input*

Trigger or gate signal that initiates or resets oscillator

Clock/Clock for timing oscillator's phase duration in BPM mode (otherwise

Clock/Clock for timing oscillator's phase duration in BPM mode (otherwise 120BPM is used)/

Clock/Clock for timing oscillator's phase duration in BPM mode (otherwise 120BPM is used)/

Frequency Coarse *Adjust Frequency of oscillator in big steps*

Adjusts frequency of oscillator in range of 0Hz to 100Hz (in frequency mode) or between 1/256 note and 8bar (in BPM/note duration mode)

Frequency Fine *Fine tune frequency of oscillator*

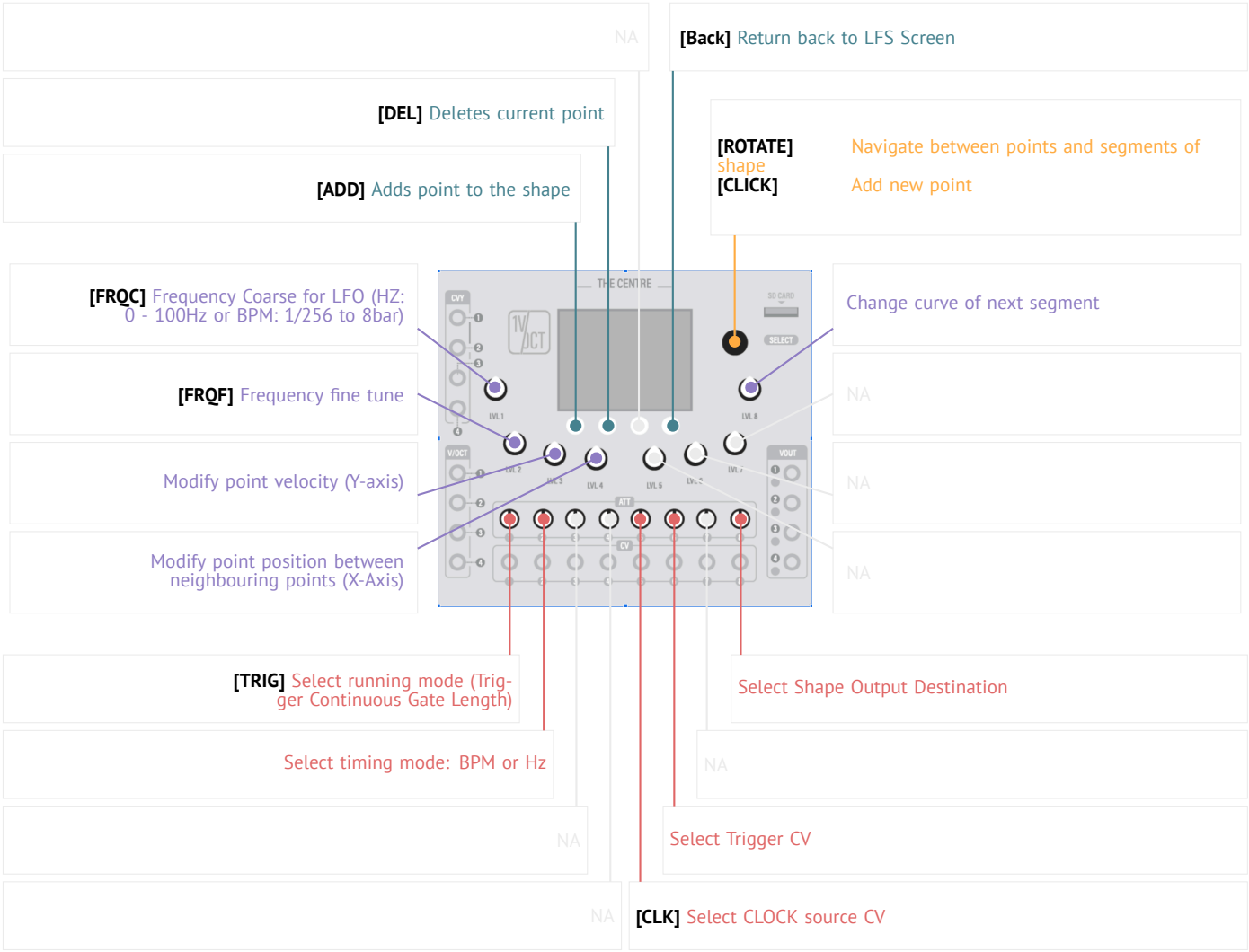
Adjust frequency of oscillator in very small steps

Outputs

SHP *Output of*

Output of shape oscillator that can be used to modulate other signals

LFS - Shape Editor



ENV - Envelope Genereator

[Inputs] Configure Inputs of the module

[Back] Return back to Patch Menu

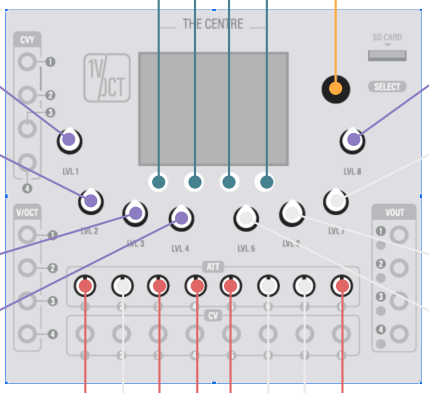
[SET] Settings of the module

NA

[ON/OFF] Turning module On or Off (Bypass)

Adjust ATTACK in range of 0.0 to 31.5s

Adjust RELEASE time in range of 0.0s to 31.5s



Adjust HOLD in range 0 to 31.5s.
When HOLD is 0s envelope is ADSR

NA

Adjust DECAY time in range of 0.0s to 31.5s

NA

Adjust SUSTAIN level

NA

Adjust curve shape of ATTACK

Select AUDIO Output of Envelope - to control other devices

NA

NA

Adjust curve shape of DECAY

NA

Adjust curve shape of RELEASE

[GAT] Select GATE Input CV

VCA - Voltage Controlled Amplifier

[Inputs] Configure Inputs of the module

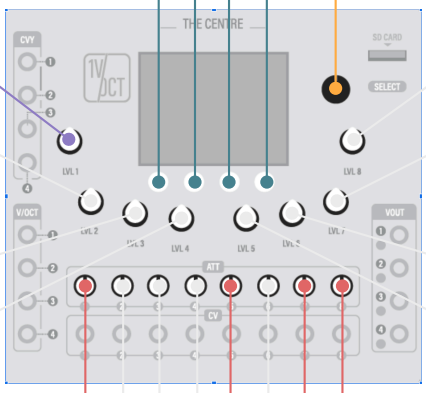
[Back] Return back to Patch Menu

[SET] Settings of the module

NA

[ON/OFF] Turning module On or Off (Bypass)

Adjust Level of Amplification



NA

NA

NA

NA

NA

NA

NA

NA

Adjust attenuation of CV input for Level

Select Audio Output Destiantion

NA

Select Input of VCA

NA

NA

NA

Select source of Level Modulation

VCF - Voltage Controlled Filter

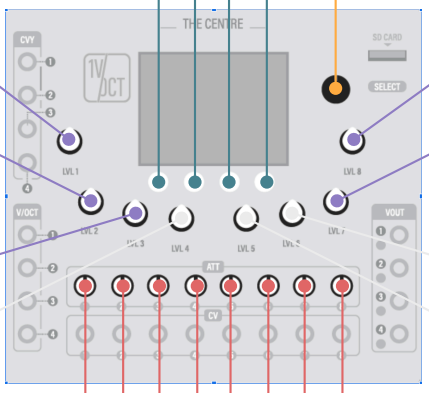
[Inputs] Configure Inputs of the module

[Back] Return back to Patch Menu

[SET] Settings of the module

[ROTATE] Switch between filter types

[ON/OFF] Turning module On or Off (Bypass)



[CTO] Adjust Cutoff Level

[VOCT] Attenuation of Key Tracking CV

[RES] Adjust Resonance

[VOCT] Select Keytracking CV

[GAI] Adjust Gain of filter

NA

NA

NA

[CTO] Attanuate Cutoff CV

Select Audio Output

[RES] Attanuate Resonance CV

Select Audio Input

[GAI] Attanuate Gain of filter CV

[GAI] Gain of filter CV

[CTO] Cutoff CV

[RES] Resonance CV

BRM - Balanced Ring Modulator

[Inputs] Configure Inputs of the module

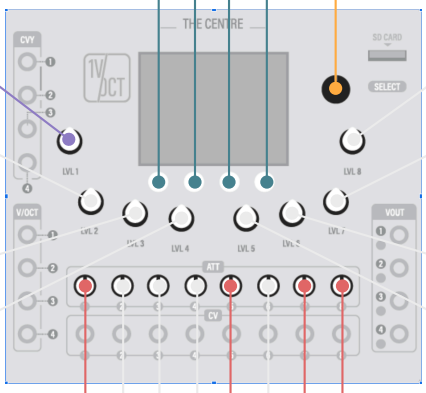
[Back] Return back to Patch Menu

[SET] Settings of the module

NA

[ON/OFF] Turning module On or Off (Bypass)

Adjust Level of Amplification



NA

NA

NA

NA

NA

NA

NA

NA

[AM] Adjust attenuation of CV input for Level

Select Audio Output Destiantion

NA

Select Input of VCA

NA

NA

NA

[AM]Select AM (Amplitude Modulation) source CV

SMP - Sample Playback

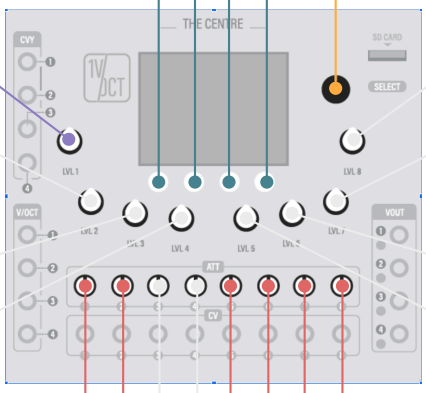
[Inputs] Configure Inputs of the module

[Back] Return back to Patch Menu

[SET] Settings of the module

[ROTATE] Navigate between sample in current directory
[CLICK] Enter File Browser to change to chosen sample and to change browsing directory

[GATE] Trigger sample playback



[AM] Level

NA

NA

NA

NA

NA

NA

NA

[TRIG] Select running mode (Trigger Continuous Gate Length)

Select Audio Output

Selects Gate CV

[NOTE-FINE] Fine-tune note in cents (+/- semitone)

NA

[NOTE-NOTE] Tune sound by semitone (+12 semitones one octave)

NA

[NOTE-OCT] Tune note by octave (+/- 8 octaves)

NOI - Noise Generator

[Inputs] Configure Inputs of the module

[Back] Return back to Patch Menu

[SET] Settings of the module

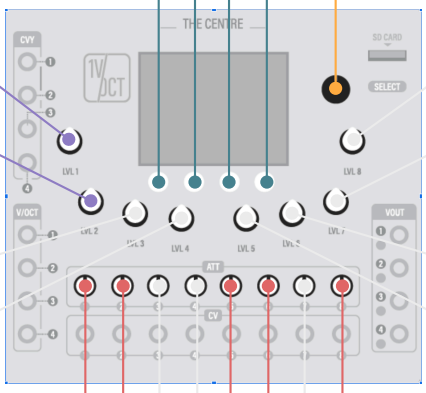
NA

[ON/OFF] Turning module On or Off (Bypass)

[LPF] Low Pass Filter Level
- Adjust colour of noise

NA

[HPF] High Pass Filter Level
- Adjust colour of noise



NA

NA

NA

NA

NA

NA

Attenuate LPF CV

Select Audio Output Destiantion

Attenuate HPF CV

NA

NA

[HPF CV] Select CV controlling High Pass Filter

NA

[LPF CV] Select CV controlling Low Pass Filter

DLY - Delay

[Inputs] Configure Inputs of the module

[Back] Return back to Patch Menu

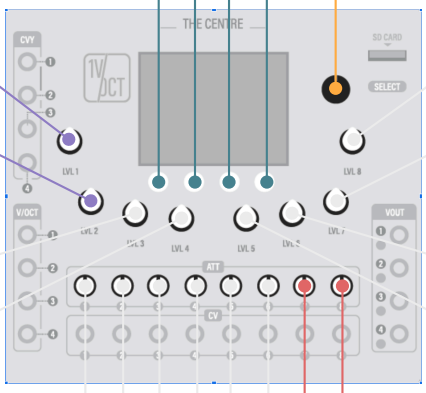
[SET] Settings of the module

[CLICK] Exit

[ON/OFF] Turning module On or Off (Bypass)

[DLY] Delay time 0s - 4s

[ECH] Percentage of echo added after delay time



NA

NA

NA

NA

NA

NA

NA

NA

NA

NA

NA

NA

Select Audio Output

Select Audio Input

DST - Distortion

[Inputs] Configure Inputs of the module

[Back] Return back to Patch Menu

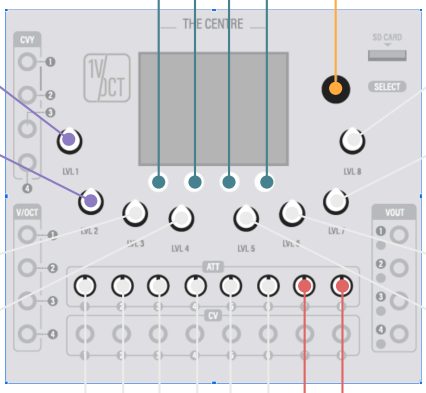
[SET] Settings of the module

[ROTATE] Change Distortion Type

[ON/OFF] Turning module On or Off (Bypass)

[LVL] Adjust Distortion Drive

[MIX] Adjust Dry/Wet Mix



NA

NA

NA

NA

NA

NA

NA

NA

NA

NA

NA

NA

Select Audio Output

Select Audio Input

MIX - Voltage Controlled Panning Mixer

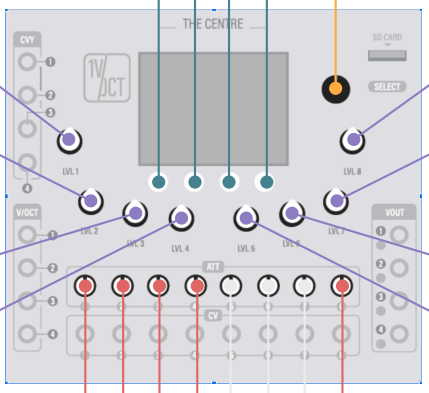
[Inputs] Configure Inputs of the module

[Back] Return back to Patch Menu

[SET] Settings of the module

[CLICK] Enter/Exit Selection Mode for Input
[ROTATE] Select Audio Input

[ON/OFF] Switches input channels On and Off



[LVL] Adjust Level for Channel 1

[PAN] Adjust Panning for Channel 1

[LVL] Adjust Level for Channel 2

[PAN] Adjust Panning for Channel 2

[LVL] Adjust Level for Channel 3

[PAN] Adjust Panning for Channel 3

[LVL] Adjust Level for Channel 4

[PAN] Adjust Panning for Channel 4

Select Channel 1 Audio Input

Select Channel 2 Audio Input

Select Channel 3 Audio Input

Select Channel 4 Audio Input

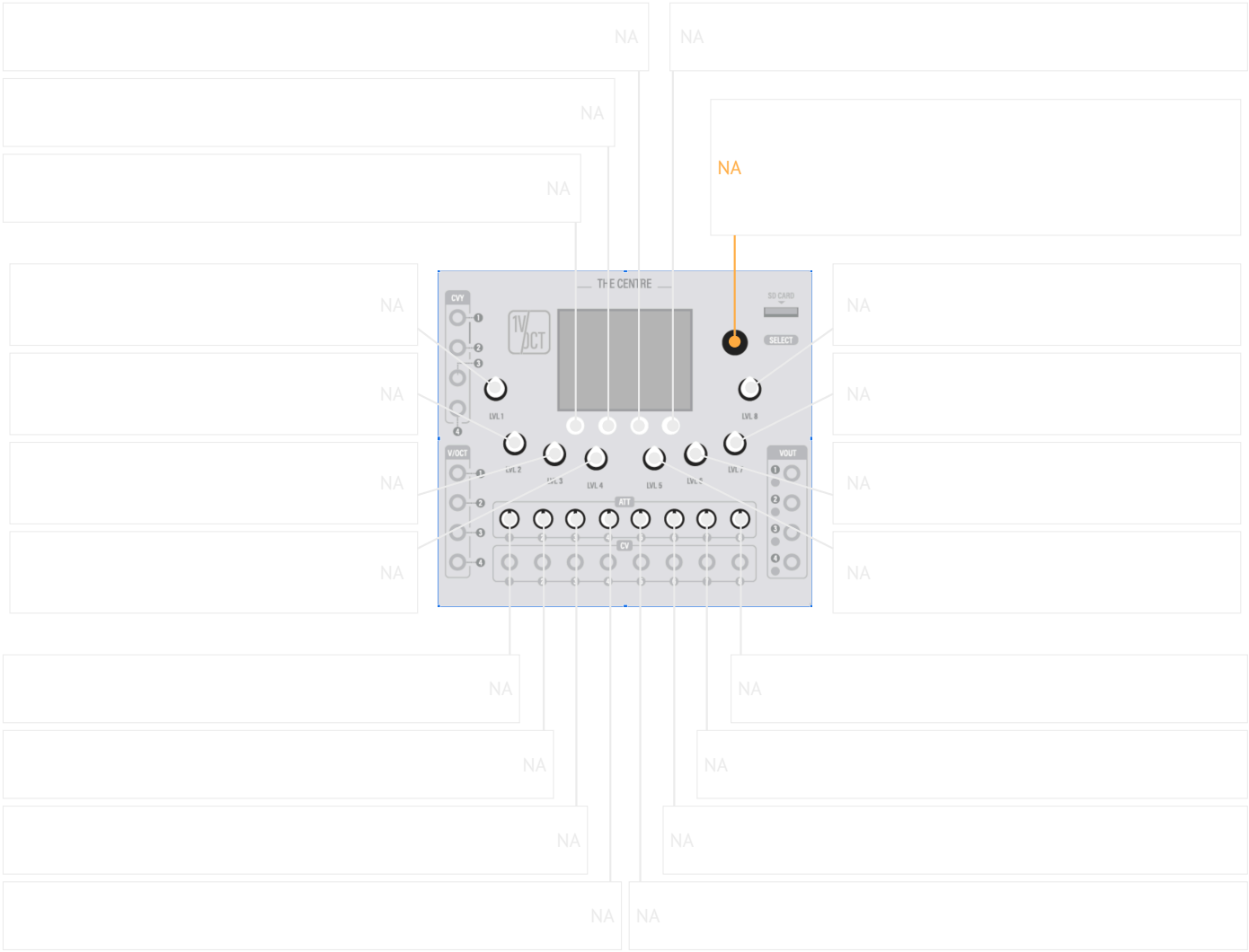
Select Audio Output

NA

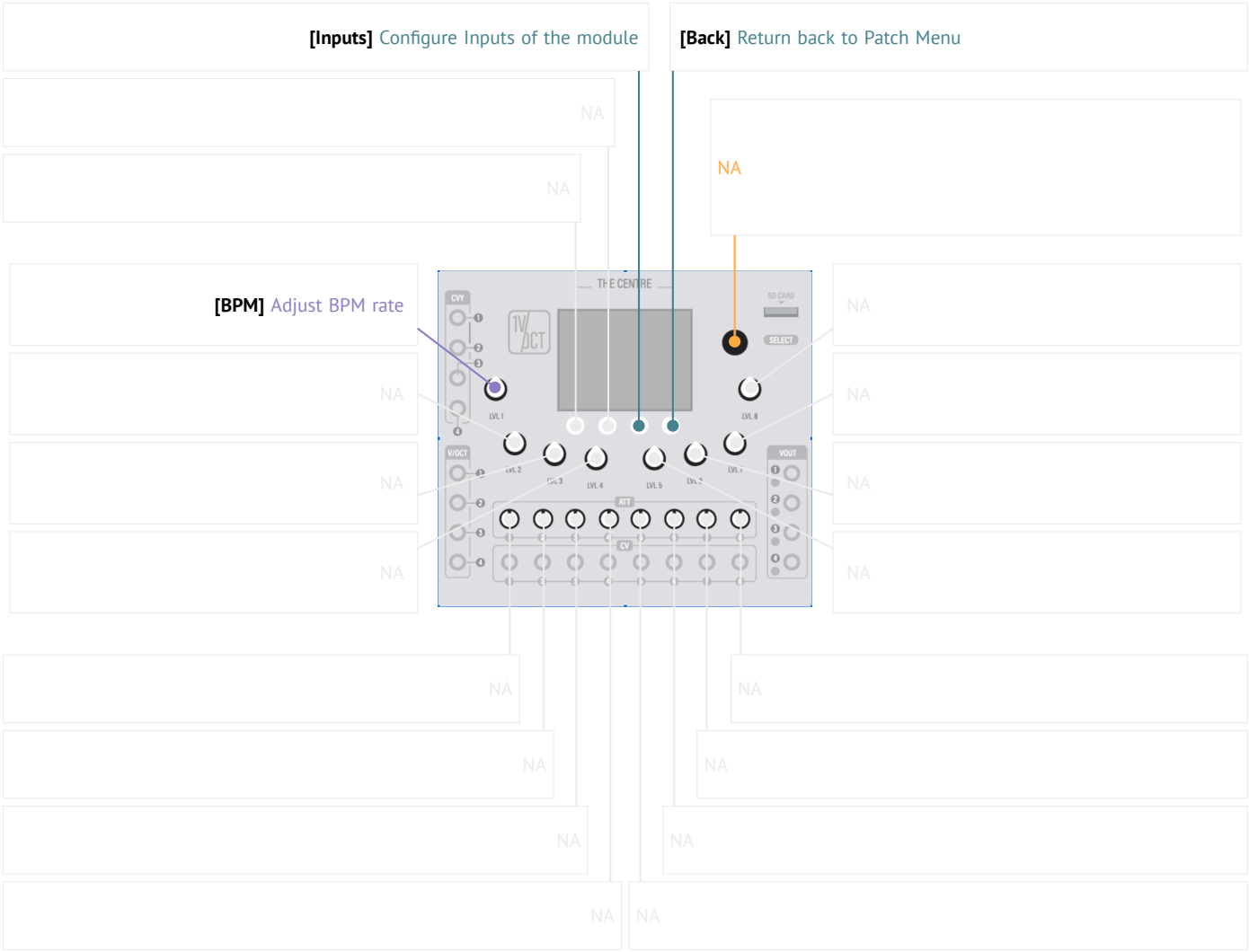
NA

NA

CVM - CV Mix and Multiple



CLK - Clock Generator



GAT - Clock and Gate Divider

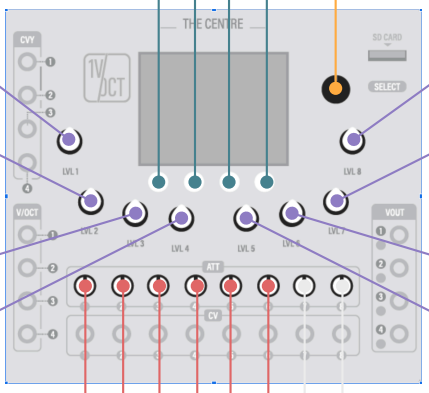
[Inputs] Configure Inputs of the module

[Back] Return back to Patch Menu

[SET] Settings of the module

[ROTATE] Select the Gate Element

[ON/OFF] Turning module On or Off (Bypass)



[INTV1] Interval for channel 1

[GLEN1] Gate length for channel 1

[INTV2] Interval for channel 2

[GLEN2] Gate length for channel 2

[INTV3] Interval for channel 3

[GLEN3] Gate length for channel 3

[INTV4] Interval for channel 4

[GLEN4] Gate length for channel 4

[DLY1] Delay for channel 1

[DLY2] Delay for channel 2

[DLY3] Delay for channel 3

[DLY4] Delay for channel 4

NA

NA

Select RESET CV

[CLK] Select CLOCK source CV

EUC - Euclidean Rhythm Generator

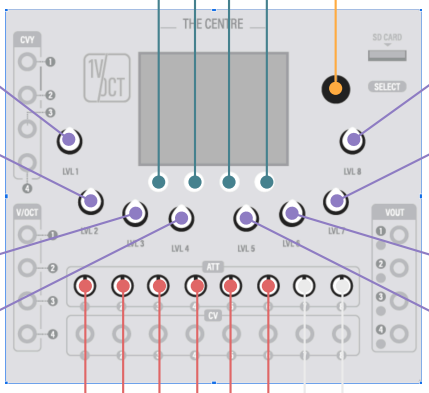
[Inputs] Configure Inputs of the module

[Back] Return back to Patch Menu

[SET] Settings of the module

NA

[RESET] Reset all paths to starting point



[STP] Adjust number of steps for pattern 1

[PLS] Adjust number of pulses for pattern 1

[STP] Adjust number of steps for pattern 2

[PLS] Adjust number of pulses for pattern 2

[STP] Adjust number of steps for pattern 3

[PLS] Adjust number of pulses for pattern 3

[STP] Adjust number of steps for pattern 4

[PLS] Adjust number of pulses for pattern 4

[OFS1] Offset for pattern 1

NA

[OFS2] Offset for pattern 2

NA

[OFS3] Offset for pattern 3

[LEN] Adjust length of step

[OFS4] Offset for pattern 4

[CLK] Select CLOCK source CV

RNG - Random Note Generator

[Inputs] Configure Inputs of the module

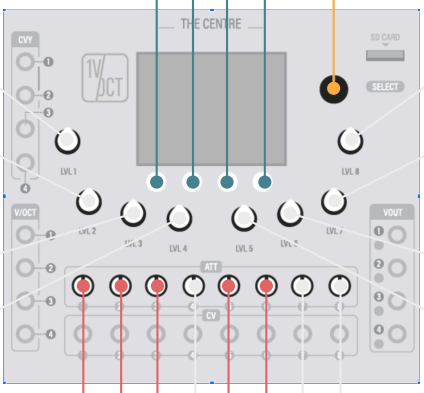
[Back] Return back to Patch Menu

[SET] Settings of the module

[ROTATE] Move between scale selector and note lengths

[CLICK] Turn on Scale Selector or Toggle Note Length

[ON/OFF] Turning module On or Off (Bypass)



NA

NA

NA

NA

NA

NA

NA

NA

[SCL] Select Scale

[NOTES] Select note lengths that will be included in randomiser

[RESTS] Select rests lengths to be included in randomiser

[TRG] Select Trigger CV - Ignores CLOCK

NA

[CLK] Select CLOCK source CV

QNT - Quantiser

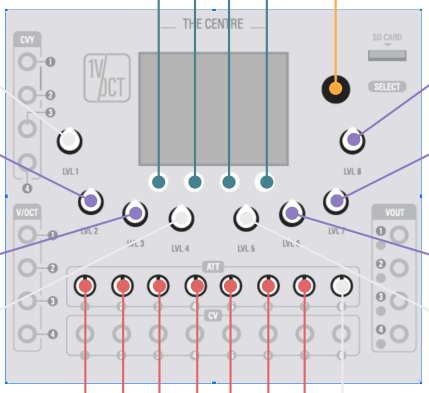
[Inputs] Configure Inputs of the module

[Back] Return back to Patch Menu

[SET] Settings of the module

[ROTATE] Select between Notes and Scale Selector
[CLICK] Turn note on or off and in Scale Selector turn to Scale Select mode

[ON/OFF] Turning module On or Off (Bypass)



NA

Enable/Disable Note F#

Enable/Disable Note C#

Enable/Disable Note G#

Enable/Disable Note D#

Enable/Disable Note A#

NA

NA

Enable/Disable Note C

NA

Enable/Disable Note D

Enable/Disable Note B

Enable/Disable Note E

Enable/Disable Note A

Enable/Disable Note F

Enable/Disable Note G